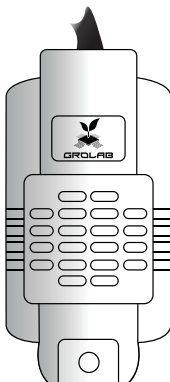


# CO2 Compact Sensor 5000ppm

HW05



## INSTALLATION MANUAL

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# 1. SAFETY

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## General guidelines

The following general safety guidelines are provided to help to ensure your own personal safety and protect your device from potential damage.

- Do not attempt to service the device. For some devices with a user-replaceable battery, please read and follow the instructions provided by the installation manual.
- Keep your device away from radiators and heat sources.
- Keep your device away from extremely hot or cold temperatures to ensure that it is used within the specified operating range.
- Do not spill food or liquids on your device.
- Before you clean your device, ensure it's not connected to any equipment. Clean your device with a dry soft cloth. Do not use liquids.
- If your device does not operate normally - in particular, if there are any unusual sounds or smells coming from it - unplug it immediately and contact an authorized dealer or the Open Grow support center.
- To help avoid the potential hazard of electric shock, do not connect or disconnect any cables, or perform maintenance or reconfiguration of your device during an electrical storm.

- The device must be protected from environmental extremes during storage as well as after installation. Ingress of dust and moisture must be prevented. Heating of the room may be necessary to prevent any incidence of humidity during storage or before commissioning.

## 2. SPECIFICATIONS

<i>Hardware Version</i>	HW05
<i>Dimensions</i>	60.5 mm x 30mm x 18.2mm
<i>Weight</i>	50g (w/ 5m cable)
<i>Exterior</i>	Casing: Plastic Colors: White
<i>Operating Conditions</i>	14°F to 140°F (-10°C to 60°C) 0 to 95% RH, non-condensing
<i>Expected Service Life</i>	>5 years
<i>Supply Voltage</i>	+5Vdc ~ +18Vdc
<i>CO2 Sensor</i>	Method: Non Dispersive Infrared (NDIR) Accuracy*: 400-5000 ppm $\pm$ 50 ppm + 5% of reading Temp. Dependence: 5 ppm per °C or 0.5% of the reading per °C, whichever is greater Calibration Interval: Not required Response Time: < 3 minutes for 90% step change typical Warm Up Time: < 2 minutes (operational) 10 minutes (maximum accuracy)
<i>Temperature Sensor</i>	Operating Conditions: -10°C ~ 60°C Accuracy: $\pm$ 1.5°C
<i>Humidity Sensor</i>	Range: 0%RH - 100%RH Accuracy: $\pm$ 6 ~ 9%RH
<i>Luminosity Sensor</i>	Range: 0% - 100% (0 ~ aprox. 700Lux)
<i>Includes</i>	1 x GroLab CO2 Compact Sensor - 5000ppm w/5m cable 1 x Installation Manual
<i>Connector</i>	RJ-12 (6p6c)
<i>Warranty</i>	3-years limited hardware warranty

## RS-485 Specifications

TIA/EIA RS-485 compliant over full supply range
ESD protection on the bus pins
IEC 61000-4-2 $\pm 12$ kV contact discharge
HBM: $\geq \pm 30$ kV
IEC 61000-4-2 $\geq \pm 12$ kV air discharge
Full hot swap support (glitch free power-up/power-down)
Full receiver short-circuit, open circuit, and bus idle fail-safe
PROFIBUS compliant
Full duplex
Up to 128 transceivers onto the bus

## 3. DESCRIPTION

CO2 Compact Sensor is a combined sensor of air temperature, relative humidity, CO2, and luminosity. This sensor operates with the RS-485 interface, and it's compatible with any GroLab PowerBot with a hardware version higher or equal to HW03.

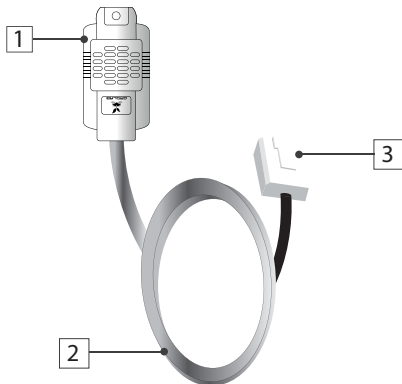
### What is in the box

- 1 x GroLab CO2 Compact Sensor - 5000ppm w/3m cable
- 1 x Installation Manual

### Sensor Pinout

Wire Color	RS-485 Function
WHITE	+5VDC
BLACK	A
RED	B
GREEN	Z
YELLOW	Y
BLUE	GND

## 4. COMPONENTS



**1** GroLab CO2 Compact Sensor - 5000ppm

**2** 3-Meter Cable (can be supplied with different lengths)

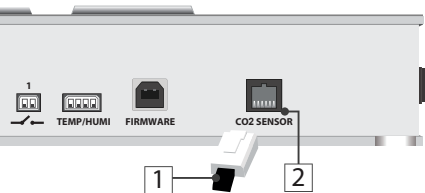
**3** RJ-12 Connector (can be supplied with different termination)



# 5. INSTALLATION

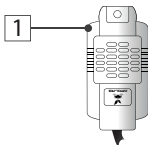
## Initial assembly

Connect the CO2 Compact sensor (1) to the module's outlet (2).



Place the sensor at the height of the plants where you could monitor the environmental state of the growing area correctly.

**Never position the sensor too close to a light source, wet it, or put it in high (90%~100%) humidity values for a long periods of time, this can damage your sensor.**



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## 6. COMMUNICATION

For the integration of this sensor with other equipment, the necessary communication details for successful communication are provided below.

### Base Parameters

Parameter	Value
Baud Rate	230 400 bps
Data Bits	8 bits
Stop Bit	1 bit
Check Bit	No
Address	0x10h

### Frame Description

Example command to acquire sensor data:

Slave ID	Command	Data [n]	CRC_H	CRC_L
0x10h	0x01h	-	0xB0h	0xCDh

Sensor Response

Slave ID	Command	Data [n]	CRC_H	CRC_L
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Sensor data request frame:

0x1001B0CDh

Example response from sensor:

0x100186EBB141FDB759425C

CF70446303C6782B42436Ch

Response frame Description:

Slave ID	Command	Temperature Double (4 bytes)	Humidity Double (4 bytes)
0x10h	0x01h	0x86EBB141h	0xFDB75942h

Pressure Double (4 bytes)	CO2 uShort (2 bytes)	Luminosity Double (4 bytes)	CRC_H uChar (1 byte)	CRC_L uChar (1 byte)
0x5CCF7044h	0x6303h	0xC6782B42h	0x43h	0x6Ch

All values are little endian.

Parameter	Value
Temperature	22.24 °C
Humidity	54.43 %
Pressure	963.24 hPa
CO2	867 ppm
Luminosity	42.87 %

## Possible Commands:

Command	Description	Data
0x01h	Get all sensor values	-
0x02h	Get FW Version	-
0x03h	Set temperature compensation (min. -10°C máx. 20°C)	Double (4 bytes)
0x04h	Set humidity compensation (Depreceated)	Double (4 bytes)
0x05h	Get temperature compensation	Double (4 bytes)
0x06h	Get humidity compensation (Depreceated)	Double (4 bytes)
0x0Ah	Get slave address	uChar(1 byte)
0x0Bh	Set slave address	uChar(1 byte)
0x0Eh	Set baudRate	uChar(1 byte) 0 - 9600 bps 1 - 19200 2 - 115200 3 - 230400

Set baudrate 115200:  
0x100E02A4F5h

Set temperature compensation 10°C:  
0x1003000020417B9Fh

## Sensor Error Response

0xD1h - Wrong CRC

0xD2h - Unkown Commmand

0xD3h - Data Error

# 7. TROUBLESHOOT

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Symptom	Possible Cause	Possible Solution
The CO2 compact sensor is plugged on PowerBot but I cannot see any values.	1) Bad connection between your sensor and PowerBot.	Re-plug your sensor.

If the information in the table does not solve the problem, please contact Open Grow technical support or return the unit to an Open Grow service center.

- Ensure that you have followed the operating instructions carefully.
- There are no user-serviceable parts internally.
- Disassembling the unit, opening the lid, or tampering with the unit is unsafe for unqualified users and will render the warranty invalid.



[www.opengrow.pt](http://www.opengrow.pt)



[support@opengrow.pt](mailto:support@opengrow.pt)

## 8. MAINTENANCE

As the unit is essentially maintenance-free, maintenance is limited to **ensuring periodically that it is free from dust or other residues.**

The service life of the CO2 Compact Sensor should be in excess of three years if operated within specification.

# 9. WARRANTY

## General terms

The warranty set forth below is given by Open Grow, Lda. (from now on, will be referred to as OPEN GROW). This warranty is only effective upon presentation of the proof of purchase.

EXCEPT AS EXPRESSLY SET FORTH IN THIS WARRANTY, OPEN GROW MAKES NO OTHER WARRANTIES, EXPRESS OR IMPLIED, INCLUDING ANY IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE. OPEN GROW EXPRESSLY DISCLAIMS ALL WARRANTIES NOT STATED IN THIS WARRANTY. ANY IMPLIED WARRANTIES THAT MAY BE IMPOSED BY LAW ARE LIMITED IN DURATION TO THE WARRANTY PERIOD.

TO THE EXTENT ALLOWED BY LOCAL LAW, THE REMEDIES IN THIS WARRANTY ARE YOUR SOLE AND EXCLUSIVE REMEDIES AGAINST OPEN GROW. THEY DO NOT, HOWEVER, AFFECT OR RESTRICT THE RIGHTS YOU HAVE AGAINST THE BUSINESS YOU BOUGHT A OPEN GROW PRODUCT FROM. IN NO EVENT SHALL OPEN GROW BE LIABLE FOR LOSS OF DATA OR FOR INDIRECT, SPECIAL, INCIDENTAL, CONSEQUENTIAL (INCLUDING LOST PROFIT OR DATA), OR OTHER DAMAGE, WHETHER BASED IN CONTRACT, TORT, OR OTHERWISE. HOWEVER, NOTHING IN THIS AGREEMENT LIMITS OPEN GROW'S LIABILITY TO YOU (I) IN THE EVENT OF DEATH OR PERSONAL INJURY TO THE EXTENT RESULTING FROM OPEN GROW'S NEGLIGENCE, OR (II) TO THE EXTENT RESULTING FROM ANY FRAUDULENT MISREPRESENTATION ON THE PART OF OPEN GROW, OR (III) TO THE EXTENT ARISING UNDER RELATED CONSUMER PROTECTION REGULATIONS. SOME COUNTRIES DO NOT ALLOW: (1) A DISCLAIMER OF IMPLIED WARRANTIES; (2) A LIMITATION ON HOW LONG AN IMPLIED WARRANTY LASTS OR THE EXCLUSION; OR (3) LIMITATION OF INCIDENTAL OR CONSEQUENTIAL DAMAGES FOR CONSUMER PRODUCTS. IN SUCH COUNTRIES, SOME EXCLUSIONS OR LIMITATIONS OF THIS LIMITED WARRANTY MAY NOT APPLY TO YOU. THIS WARRANTY GIVES YOU SPECIFIC LEGAL RIGHTS. YOU MAY ALSO HAVE OTHER RIGHTS THAT MAY VARY FROM COUNTRY TO COUNTRY. YOU ARE ADVISED TO CONSULT APPLICABLE COUNTRY LAWS FOR A FULL DETERMINATION OF YOUR RIGHTS.

This warranty applies to any OPEN GROW branded hardware product sold by OPEN GROW, its subsidiaries, affiliates, authorized resellers, or distributors (from now on, will be referred to as PARTNERS), with this warranty. **This warranty shall be governed by and construed in accordance with the laws of Portugal, without regard to its conflict of laws principles.**

**This warranty applies only to the original end-user purchaser and is not transferable.**

# Limitation of warranty

OPEN GROW warrants that the product under normal use is free from material defects in materials and workmanship during the warranty period if the product is used and serviced in accordance with the user manual and other documentation provided to the purchaser at the time of purchase (or as amended from time to time). OPEN GROW does not warrant that the product will operate uninterrupted or error-free or that all deficiencies, errors, defects or non-conformities will be corrected.

This warranty shall not apply to, and OPEN GROW shall not be responsible for, problems or damages resulting from: (a) unauthorized alterations or attachments; (b) negligence, abuse or misuse, including failure to operate the product in accordance with specifications, instruction, or interface requirements; (c) improper handling, use or storage; (d) failure of goods or services not obtained from OPEN GROW or not subject to a then-effective OPEN GROW warranty or maintenance agreement; or (e) fire, water, acts of God or other catastrophic events. This warranty shall also not apply if any OPEN GROW serial number on the product has been removed or defaced in any way. This warranty does not cover software or firmware provided with the product, except where such software is integral to the operation of the hardware and is defective due to a fault in materials or workmanship.

## Product warranty period

The product warranty period starts on the date of purchase from OPEN GROW or PARTNERS. Your dated sales or delivery receipt, showing the date of purchase of the product, is your proof of the purchase date.

You may be required to provide proof of purchase as a condition of receiving warranty service. You are entitled to warranty service according to the terms and conditions of this document if a repair to your OPEN GROW product is required within the product warranty period.

This product warranty extends only to the original end-user purchaser of this OPEN GROW product and is not transferable to anyone who obtains ownership of the product from the original end-user purchaser.

All OPEN GROW products have a 2-year guarantee except for consumables (calibration solutions, sensors and/or actuators of any type) and under normal use.



# Performance of the warranty

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If any defect occurs, OPEN GROW's sole obligation shall be to repair or replace the product free of charge provided it is returned to OPEN GROW after-sales department during the warranty period. Such repair or replacement will only be rendered by OPEN GROW at an authorized OPEN GROW repair station. All components or products that are replaced under this warranty become the property of OPEN GROW. The replacement takes on the REMAINING warranty period of the product. The replacement need not be new or of an identical make, model, or part; OPEN GROW may in its discretion make the replacement with any reconditioned equivalents.

## Warrantor

Open Grow, Lda.,  
Parque Industrial de Coimbrões,  
Edifício Expobeiras,  
3500-618, Viseu,  
Portugal

**(+351) 232 458 475**

[www.opengrow.pt](http://www.opengrow.pt)

**VAT: PT 513181547**

**Do not ship directly to OPEN GROW without first consulting with us to verify the procedure that should be followed.**

Contact our technical services at **[support@opengrow.pt](mailto:support@opengrow.pt)**.

### **DISCLAIMER:**

Application of the guarantee is excluded should the breakdown of the defective part or parts be a result of the product's inadequate and/or negligent use. Understood as inadequate and/or negligent use is any use other than the one for which the product is meant and/or that is recommended in the instructions manual, not executing the maintenance operations recommended in the instructions manual, carrying out operations that are different from those mentioned and that compromise the quality of the product, modifications that are not performed by authorized repairers and/or with non-original or non-approved parts.

# 10. COMPLIANCE



This symbol on the product or packaging means that according to local laws and regulations this product should not be disposed of in the household waste but sent for recycling. Please take it to a collection point designated by your local authorities once it has reached the end of its life, some will accept products for free. By recycling the product and its packaging in this manner you help to conserve the environment and protect human health.



This symbol on the product or packaging means that this product is compliant with RoHS Regulations of the European Parliament and Council Directive on the Restrictions of the Use of Certain Hazardous Substances in Electrical and Electronic Equipment (2011/65/EU).



This symbol on the product or packaging means that this product is in compliance with the following directives and regulations:

- (2011/65/EU) RoHS directive.
- (2014/35/EU) Low voltage directive.
- (2014/30/EU) EMC.



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# NOTES

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