



GroLab CtrlBot is a grow controller that extends the capabilities of the GroLab system, allowing it to independently control up to 10 actuators of 12~24VDC.

Designed to be an output expander for the GroLab system, it's ideal for directly controlling dosing pumps or solenoid valves, making it excellent for direct management of irrigation paths or nutrient dosing.

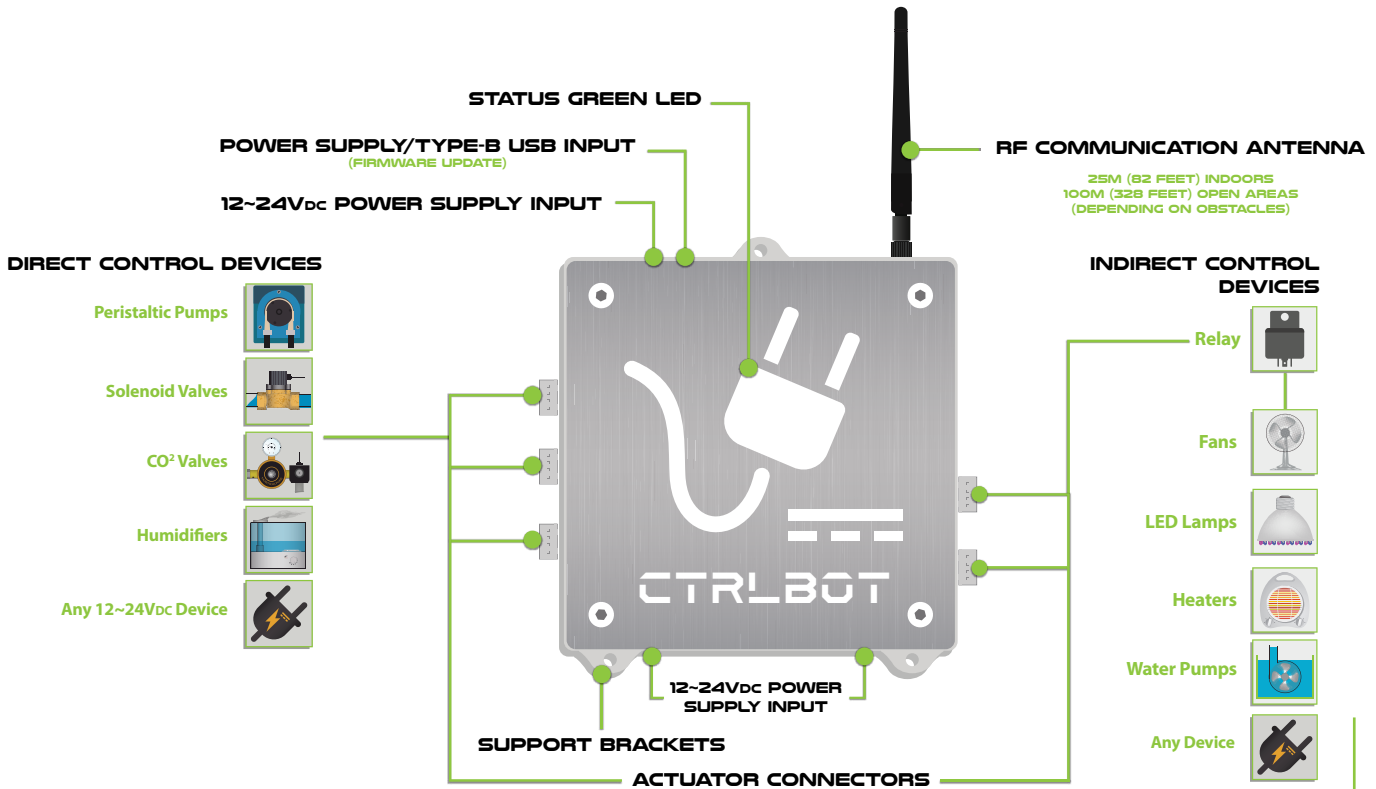
Through contactors/relays, it is capable of controlling 10 different power lines. These lines can be watering zones, lighting zones, or any function needed. Its utility is fully configurable by the user.

The capability to control relays and power contactors, also makes it possible to control electrical distribution boards. CtrlBot is a must-have tool for any large facility.

CtrlBot supports a wide variety of peripherals, like pumps, solenoid valves, relays, power contactors, and much more...

In this way, if it is necessary to add more peripherals, sensors, or even spare parts to help get the most out of GroLab, please consult the nearest specialized store (opengrow.pt/store-locator) or check out our online shop at: opengrow.pt/shop.

GroNode (the system's core module) manages the CtrlBot wirelessly through radio frequency (RF) communication.



One GroLab GroNode is required to have access to the CtrlBot features.

Learn quickly and easily with the GroLab Video Tutorials: opengrow.pt/tutorials/

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SPECIFICATIONS

CtrlBot Specifications

Hardware	HW01	Power Supply	3 x 12Vdc/2A 1 x 5Vdc/1A
Dimensions	91mm x 101mm x 28.62mm (3.58in x 3.98in x 1.13in)	Connections	USB 2.1 Type-B 5Vdc/1A SMA female 3 x 12~24Vdc (1~2A) (Jack ID 2.1mm OD 5.5mm) 5 x 2.5mm 4-Pin male (10 x 12V~24Vdc Actuators)
Net Weight	~230 grams (~8.11 oz)	Inter-Module Communication	Radio Frequency - 2.4GHz
Gross Weight	~893 grams (~31.50 oz)	Includes	Antenna USB Cable Type B-A (2-meter cable) 3 x Power Adapter 12Vdc/2A (1-meter cable) 5 x Connector Plug (2.5mm 4-Pin female) +5Vdc/1000mA USB
Exterior	Casing: Stainless Steel and Acrylic Colors: Silver and White Buttons: Reset	Warranty	3-year limited hardware warranty
Visual Indicators	Status Green LED		
Operation Conditions	0 to 55°C RH <95% non-condensing		
Expected Service Life	>5 years		
Power Consumption	@5Vdc - max. 50mA - 0,25W		



Frequency Band(s)	Max. Output Power (EIRP)
2.4 G	2.4 - 2.4835 GHz
	100 mW

Useful Pinouts

Port Name	Power Out	Outputs	Power Input
Visual Representation			
General Specifications	Vout 12~24VDC IMAX 2A	Vout 12~24VDC IMAX 0.5A	Vin 12~24VDC IMIN 2A

MAIN FEATURES



POWER SUPPLIER

CtrlBot can provide power to all peripherals of the growing environment. It has 10 connectors that support 12~24VDC actuators allowing a wide variety of devices like pumps, solenoid valves, peristaltic pumps, relays, and power contactors.



POWER LINE CONTROL

CtrlBot allows the user to choose freely amongst the numerous outputs/devices they want to control and connect them all with the same module. Since it offers 10 outputs that can connect small relays or big contactors, this enables all kinds of equipment/devices, as well as output power to be controlled.



ADVANCED IRRIGATION

Thanks to the capability of handling actuators of 12~24VDC (depending on the power supply), it is possible to create impressive irrigation systems that can independently feed multiple grows.



NUTRIENTS DOSING

Despite this module doesn't support an EC probe, it is capable to control peristaltic pumps when combined with Tankbot or Tankbot Plus. In this way, it can debit/control 10 different micronutrients.



SPEED CUSTOMIZATION

CtrlBot provides some ports with speed control, offering the capability to customize device speed. This feature can improve precision even with low-cost devices.



SECURITY PROTOCOLS

It is possible to create complex security protocols using alarms (one of the main programmable procedures type). GroLab provides several options, that can be fully customizable through the software, to prevent, notify or even react to risk situations. One of the possible reactions is to suspend some parts or even the whole system until the user gives the order to continue.

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MODULE COMMUNICATION

CtrlBot communicates with GroNode through radio frequency with a range of 25 meters (82 feet) indoors (depending on obstacles) and 100 meters (328 feet) in open spaces. This makes it easy to install the CtrlBot close to the plants.



MONITOR & ANALYSIS

Using GroLab Software users can monitor the time action of their actuators in real time. Analyses like when the devices are set on or off, and how much time they have been activated throughout the day, are some examples...



NOTIFICATIONS

When a user provides an Internet connection to GroNode it can send real-time alerts and updates to their e-mail (max of 20 e-mail notifications per hour) about the state of devices connected to CtrlBot. It will also notify in case of any issues arises.



LED INDICATOR

Its design features a LED that indicates if the module is currently powered (LED blinking) and if it is connected to the GroNode (LED static). The CtrlBot status LED operation is fully configurable through GroLab Software.



FREE FIRMWARE UPDATES

One of the advantages of a digital system is the ability to receive updates that can be easily applied. With this in mind, the Open Grow team works every day to fix any reported/discovered bugs as well as to improve and add new features to the GroLab system (software and modules). These updates are free of charge and can be quickly obtained through the GroLab Software with just a few clicks.



REMOTE CONTROL

Connecting the GroNode to a router with an Internet connection allows the user to activate the GroLab system's remote control. This feature grants user access from anywhere at any time through the GroLab Software, allowing complete control of all the modules, including CtrlBot.

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INSTALLATION EXAMPLE

The image below (Figure 1) represents a generic installation of a CtrlBot module, however, the installation may differ depending on the users’ needs as it can, for example, be installed outside the growing area.

In this installation example, the management of irrigation paths or the dosing of nutrients made by CtrlBot are perfectly visible, due to the independent direct control of five actuators such as dosing pumps.

The control of more actuators is useful for, for example, draining and refilling a tank through solenoid valves. Also, the control of devices with higher voltage is done through an electrical distribution board with 110/230VAC power lines, with this the module is recommended for industrial productions.

This module has access to all capabilities through the GroLab Software and the user can take advantage of more when using other GroLab modules together.

The installation/use of CtrlBot should be adjusted according to the growing environment and user's needs. If there is a need for help, please reach out to any GroLab representant or directly to us, we will be happy to assist.

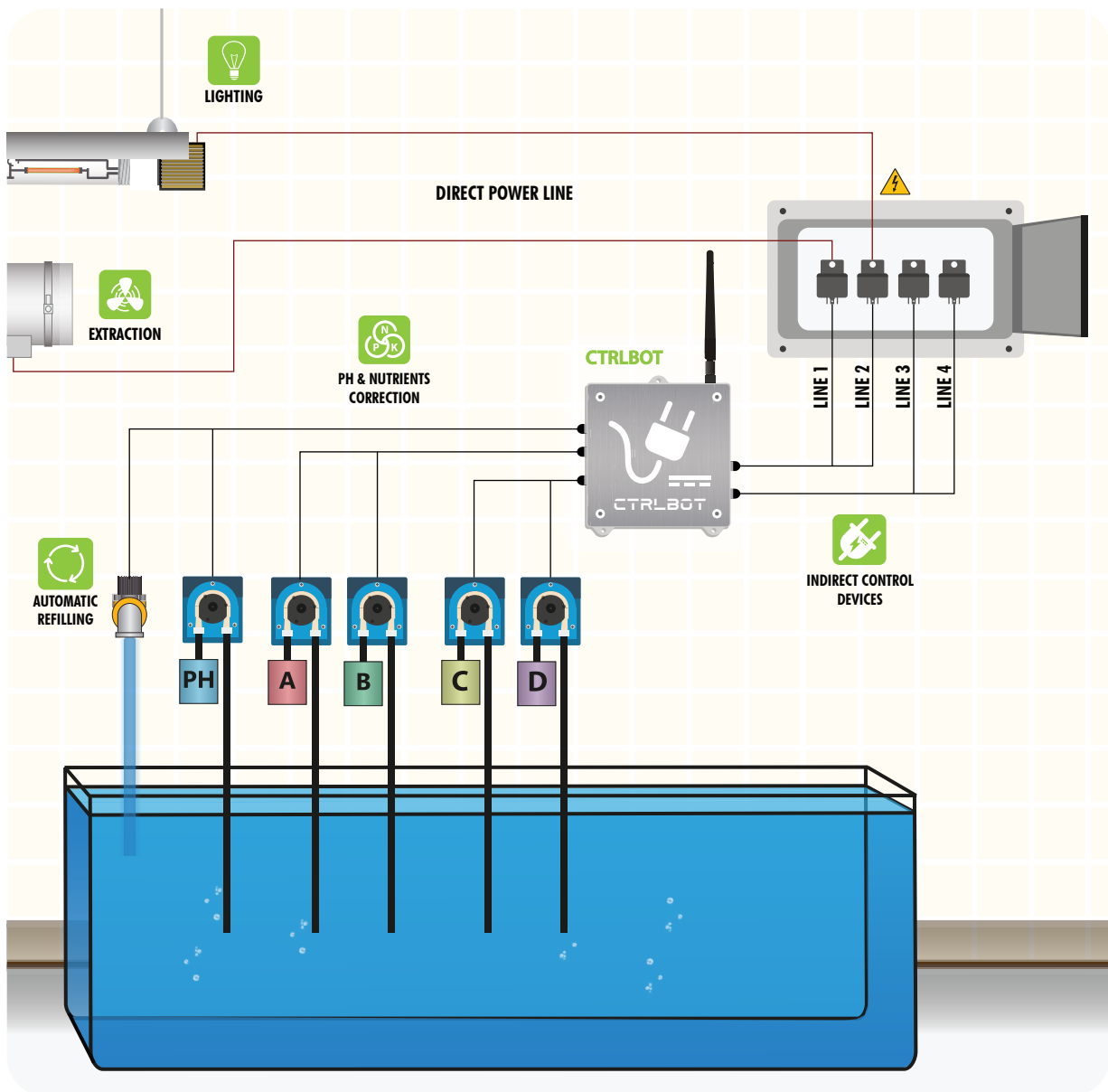


Figure 1 - CtrlBot Installation Example Schematics

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USEFUL TIPS

To facilitate and avoid possible issues, please find below some tips regarding the installation of CtrlBot.

- CtrlBot has a dedicated power supply for each set of outputs. This not only allows for the control of more robust equipment but also can have different outputs working with different voltages.
- Ctrlbot is suitable for the direct control of solenoid valves to define irrigation paths.
- CtrlBot can also be used as a peristaltic pump controller, allowing the user to dose up to 10 different nutrients.
- With the use of a power contactor/relay, CtrlBot can control heavy-duty equipment like industrial water pumps or high-wattage LED lines, among others.
- Each GroNode can control a maximum of four CtrlBots or four UserBots or a mix of both, up to a total of four modules of those types.

For better wireless communication

- Ensure that the maximum distance between CtrlBot and GroNode is not exceeded, typically 25 meters (82 feet) indoors and 100 meters (328 feet) in open areas. In addition, avoid obstacles between CtrlBot and GroNode.
- Do not install the CtrlBot near other equipment that communicates wirelessly (including GroLab modules), ensuring a minimum of 20 centimeters (0.66 feet) between equipment.
- Make sure antennas are screwed on tightly and positioned upward. When the module is installed on the wall, the antenna must be parallel to the wall. If the module is on a surface (a table, for example), the antenna must be perpendicular to the surface.

To increase the lifetime and ensure the best functioning of the CtrlBot

- Keep the CtrlBot out of extremely humid areas and prone to contact with water. When installed outdoors, CtrlBot must be protected from environmental factors.
- Perform periodic maintenance to ensure that CtrlBot remains clean and dust free.

USEFUL AUTOMATION PROCEDURES

Two main types of automation procedures can be created with the GroLab system: Schedules and Alarms.

The first type offers all the tools a grower expects from a scheduling system and even more. The second one makes it possible to trigger actions based on conditions, those actions/conditions can be freely chosen by the user.

Among several options, these procedures can act in any device or group of devices that belong to an area/grow. In addition, they provide distinct action modes, including timed actions.

These can be notified to the user by sending a warning e-mail or through sound (GroNode's buzzer).

To make it easy to understand and configure, we prepared some automation procedures examples that can be configured when using the CtrlBot and its devices:

- Figure 2 illustrates a light schedule with a duration of 12 hours straight (7 a.m. - 7 p.m.) from Monday to Sunday.



Figure 2 - Light Schedule Example



Figure 3 - Irrigation Schedule Example

- Figure 3 shows a schedule that opens the water pump for 10 minutes, and this process is repeated 50 minutes later, every day. This schedule is programmed to send an e-mail when it starts and finishes.

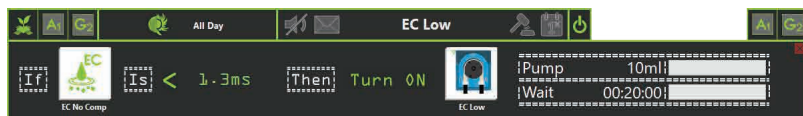
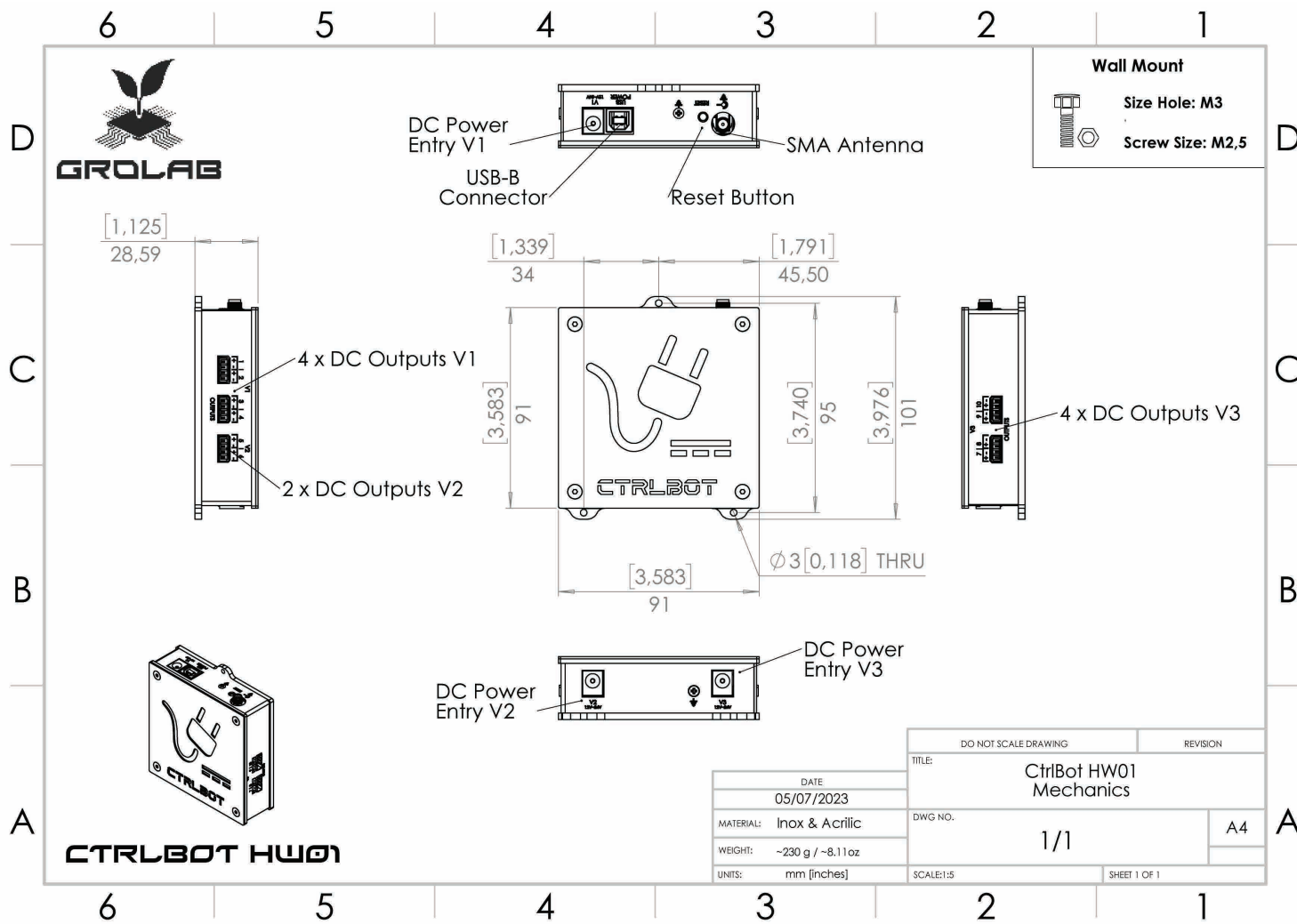


Figure 4 - Low EC Alarm Example

► Figure 4 is represented a scheduled alarm that if the EC value* is lower than 1.3 millisiemens (mS), will activate a peristaltic pump for 10 minutes, and then it will stop for 20 minutes so that the solution can be mixed and the values measured again. The process is repeated until the value is higher.

*For this alarm you will also need a TankBot or TankBot Plus .

MECHANICS



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COMPLIANCE



This symbol on the product or packaging means that according to local laws and regulations, this product should not be disposed of in 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 complies with the following directives and regulations:

- (2014/53/EU) Radio equipment directive.
- (2011/65/EU) RoHS directive.
- (2014/35/EU) Low voltage directive.
- (2014/30/EU) EMC.

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