



GroLab GroNode is an autonomous professional gardening assistant, that takes care of the growing tasks. It stores and processes all the data of the growing environment, like the light and irrigation schedules, as well as the desired conditions for the plants, like climate, pH, and nutrients.

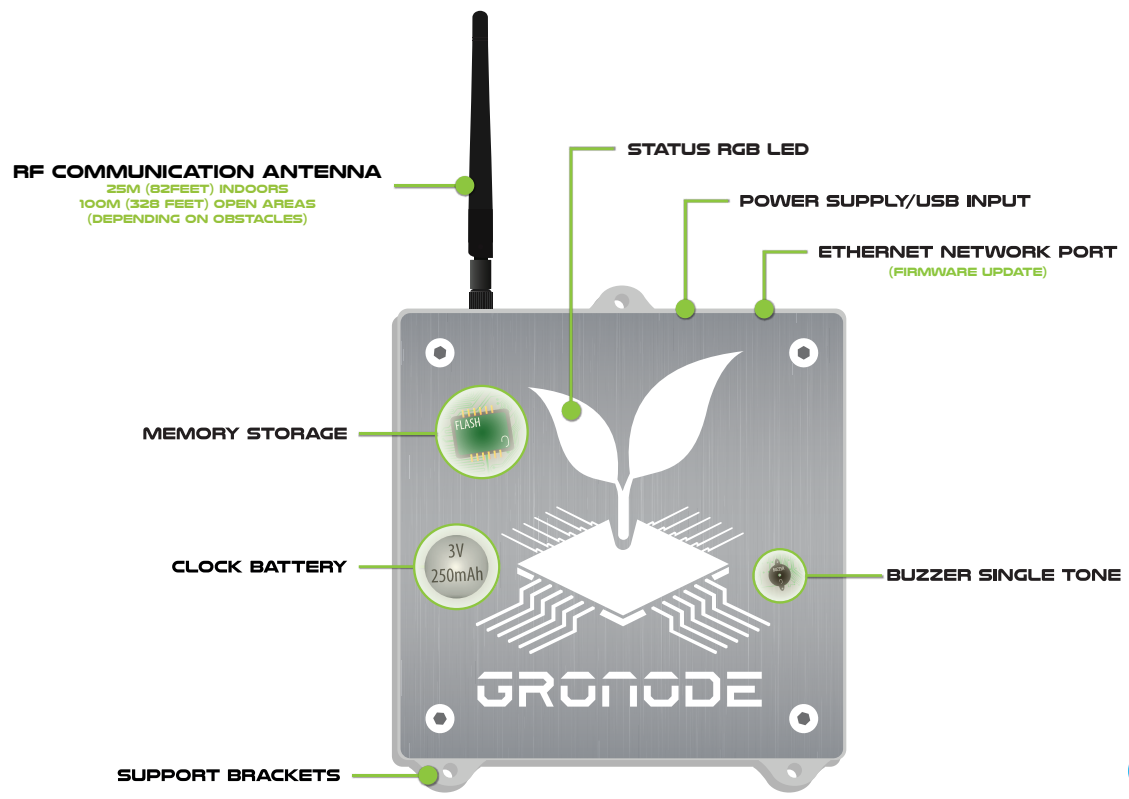
It manages up to four different growing areas with distinct growing conditions and handles multiple modules, devices, and sensors, all interconnected in one single system.

GroNode was created to work offline without any kind of Internet connection, but if web-connected it can easily become one more of the users' IoT tools, with cloud upload and e-mail notifications.

GroNode can control various modules, like PowerBot, SoilBot, TankBot, TankBot Plus, CtrlBot, and UserBot. The communication with these is wirelessly through radio frequency (RF) to perform many actions like running the procedures configured by the user.

In addition, GroNode also works with Arduino through the UserBot shield, check the UserBot Technical Specifications sheet for more info.

All of these modules and a variety of peripherals can be acquired at our online shop (opengrow.pt/shop) or the nearest specialized store (opengrow.pt/store-locator).



Designed by Open Grow, Lda. Assembled in Portugal.

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

Open Grow Technical Support:

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SPECIFICATIONS

GroNode Specifications			
<i>Hardware</i>	HW06 / HW07 / HW08	<i>Power Consumption</i>	@5Vdc - max. 220mA - 1,1W
<i>Dimensions</i>	91mm x 101mm x 28.62mm (3.58in x 3.98in x 1.13in)	<i>Power Supply</i>	USB - 5Vdc 1A
		<i>Battery</i>	CR2032 Lithium 3V 250mAh
<i>Net Weight</i>	~230 grams (~8.11 oz)	<i>Storage Memory</i>	2MB
<i>Gross Weight</i>	~600 grams (~21.16 oz)	<i>Connections</i>	USB 2.1 Type-B Ethernet LAN RJ45 SMA female
<i>Exterior</i>	Casing: Stainless Steel and Acrylic Colors: Silver and White Buttons: Reset, NET Reset, FW Update		<i>Inter-Module Communication</i>
		<i>Visual Indicators</i>	Buzzer single tone Status LED RGB
<i>Operation Conditions</i>	0 to 55°C RH <95% non-condensing	Antenna USB Cable Type B-A (2-meter cable) USB Type-A Power Adapter 230VAc-5Vdc Ethernet Cable (1.52-meter cable)	
		<i>Expected Service Life</i>	>5 years



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

MAIN FEATURES



AUTONOMOUS

GroNode is a powerful computer that can do hundreds of tasks by itself. This means that it is not necessary to have a PC or other third-party device connected to GroNode for it to continue working. GroLab Software is only required to configure the system and to monitor the grow(s).



MODULAR

GroNode is the core of the GroLab modular architecture, it is capable of controlling up to four modules of each type (PowerBot, TankBot, TankBot Plus, SoilBot, CtrlBot, and UserBot)*. This architecture also allows easy adapt GroLab system to any environment regardless of its size, type, growing medium, or growing system.

*CtrlBot shares communication slots with UserBot, as well as TankBot with Tankbot Plus, thus this max limit applies to any module using these slots.



SECURE

All GroLab communications are protected by several layers to protect data, securing the users' valuable data. This means that if the PC gets compromised the GroLab will stay safe. GroNode uses a private server as a redirection point to send safely e-mail notifications, this way the IP can't be linked to the users' location. Still, GroLab can operate without an Internet connection, and using it that way entirely hides it from the world.



PROGRAMMABLE PROCEDURES

There are two main types of programmable procedures: alarms and schedules. GroNode can store and execute up to 100 of each type allowing precise and extensive automation of any grow(s).



AUDIOVISUAL INDICATORS

Its design features a LED that changes color based on the current GroNode state: green color when it's powered ON, blue color when it's connected to the GroLab Software, red color when a security alarm is active, yellow color when performing a firmware upgrade, and other colors for general functionalities.

The buzzer emits a sound when GroNode (re)starts or when an alarm is active (with buzzer option enabled).



MULTITASKING

GroNode can perform hundreds of tasks simultaneously. This capacity provides the GroLab system with fast and precise reactions based on the desired user instructions.





MODULES COMMUNICATION

GroNode communicates with other modules through RF 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 organize the modules through the growing area(s) or even on the outside.



ACCESSIBILITY & CONNECTIVITY

GroNode can be configured, monitored, and controlled through easy-to-use software. The user can choose whether they connect GroNode to a router, directly to a PC, or to other access points with Ethernet support.



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), keeping them updated about the state of the grow(s) anywhere, anytime. Just need to permit GroNode to access the Internet, and configure it to notify in case of any issue arises.



DATA-LOGGING

GroNode has a memory that is capable of storing hundreds of thousands of data. With data-logging and data-visualization features, it is possible to do a detailed analysis of the life cycle of the user's plants.



BATTERY

GroNode has a battery that ensures that the internal clock remains synchronized during certain periods without electricity. In this way, in the event of a power failure, the same rigorous precision will be guaranteed when the electrical conditions are restored.



POWERFAIL DETECTION

GroNode can detect power fails and set itself into a deep sleep mode. This way, no second is lost by the GroNode, being able to restart all necessary operations when powered again.



REMOTE CONTROL

When connecting the GroNode to a router with an Internet connection, it allows to activate the GroLab system's remote control. This feature grants user access from anywhere at any time through easy-to-use 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.



SECURITY PROTOCOLS

It is possible to create complex security protocols using alarms (one of the main programmable procedures type). They provide several tools 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. Besides that, when a security alarm activates, GroNode will blink red and can also be configured to emit a loud beep and send e-mail notifications.



CLOUD UPLOAD

Connecting GroNode to the Internet allows the user to configure a cloud server to periodically upload the data log from all sensors/devices. One feature that opens the door to a multitude of advanced data analysis possibilities, and is essential for comprehensive studies.



IP CAMERAS

GroNode supports IP cameras allowing the user to keep their grows and surrounding areas under constant surveillance from anywhere at any time, through an intuitive interface provided by the GroLab Software.

INSTALLATION EXAMPLE

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

In this installation example, GroNode controls the entire system through the GroLab Software. This connection is made due to the Ethernet LAN system that GroNode has equipped. In this case, the connection is made through the router, however, it can also be directly via the PC or any other access point with Ethernet support.

GroNode makes the bridge between the user's grow and the digital world, through the GroLab Software that is accessible to configure, control, and monitor the grow. It communicates with the other modules via RF, by sending them instructions. With this, the user can retain all aspects of the grow.

Due to its Internet connection, it allows the user to activate the GroLab system's remote control, ensuring access to the grow from anywhere and anytime through the software.

Finally, this module has a major impact on security, protecting the user's data when requesting login credentials to use the GroLab Software. It also lets the user have constant monitorization of the grow and involvement area with an IP Camera.

The installation/use of GroNode 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.

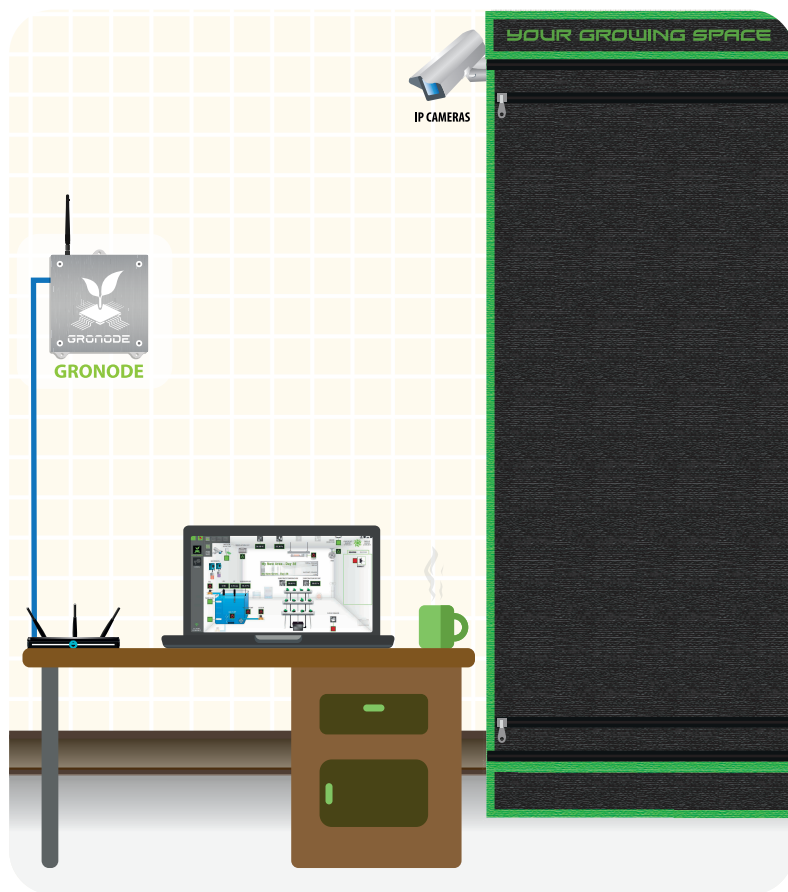


Figure 1 - GroNode Installation Example Schematics

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USEFUL TIPS

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

- GroNode has the ability to store all that is happening with the users' grow, even if the software is not running. In this way, one should be sure to configure the data logs to have access to the grow history.
- If the GroNode has Internet access, it is best to fully remove the battery and set the GroNode internal clock to be fetched from an Internet server.
- Network configurations are quite versatile, allowing the user to set a fixed IP to GroNode, or just use the router DHCP server to acquire an IP.
- GroNode has a predefined RF channel to communicate with its modules, this channel can be set from 1 through 5, allowing several GroNode and GroLab modules to share the same space without any conflict.
- One GroNode can support up to four units of each module type (PowerBot, TankBot, TankBot Plus, SoilBot, CtrlBot, and UserBot). However, please note that CtrlBot shares communication slots with UserBot, just as TankBot shares with Tankbot Plus, so this maximum limit applies to any module that uses these slots.
- If using the battery, check its state in the GroLab Software and replace it if needed.

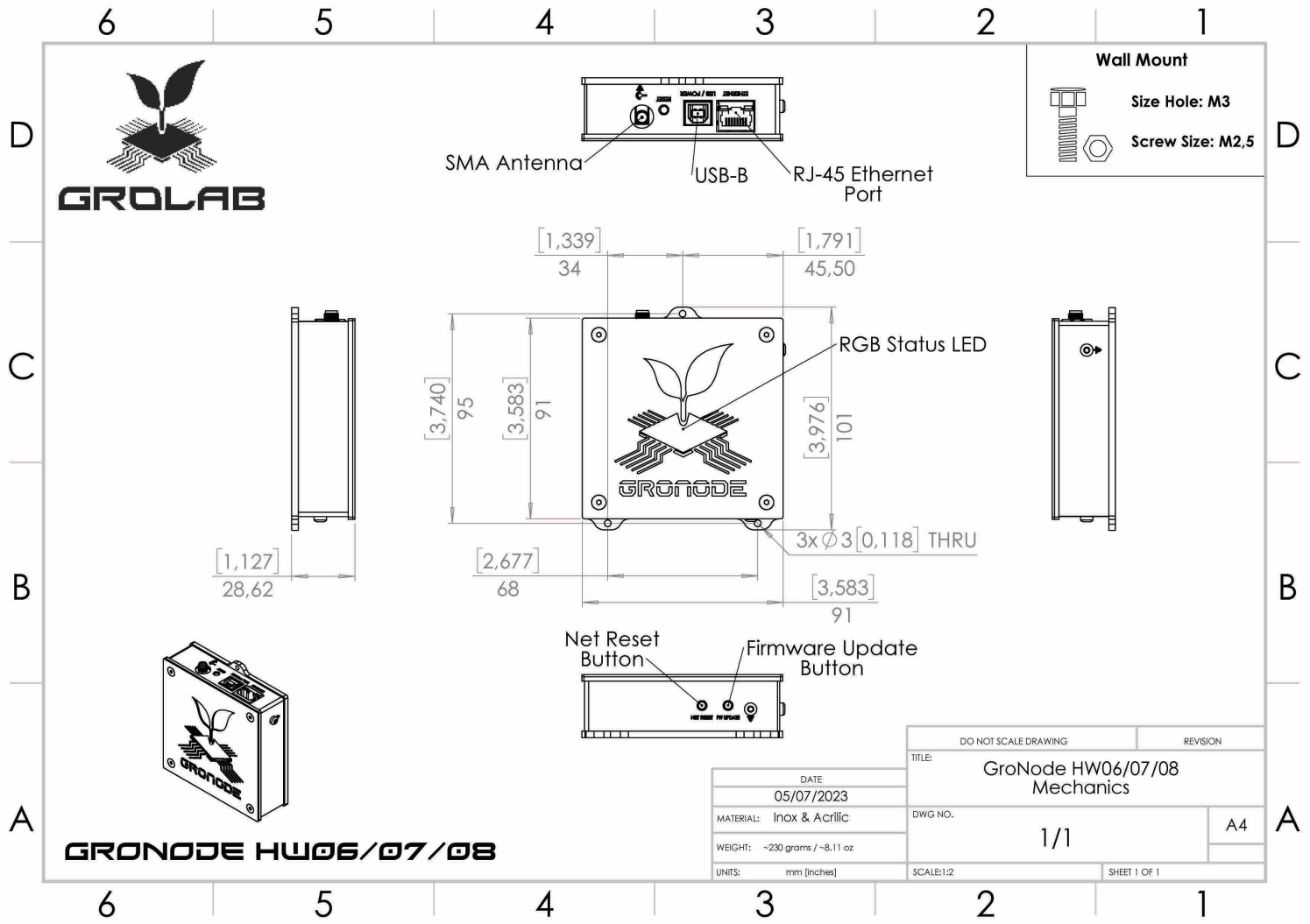
For better wireless communication

- Ensure that the maximum distance between GroNode and other modules is not exceeded, typically 25 meters (82 feet) indoors and 100 meters (328 feet) in open areas. In addition, avoid obstacles between modules and GroNode.
- Do not install the GroNode 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 GroNode

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

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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