



GROLAB SOILBOT

EAN 0768855932272

GroLab SoilBot is a rigorous and versatile substrate analyzer that makes part of the GroLab family. It can monitor the plants' substrate regardless of whether it is soil, rock wool, coconut, or a recurrent dipping of roots in water.

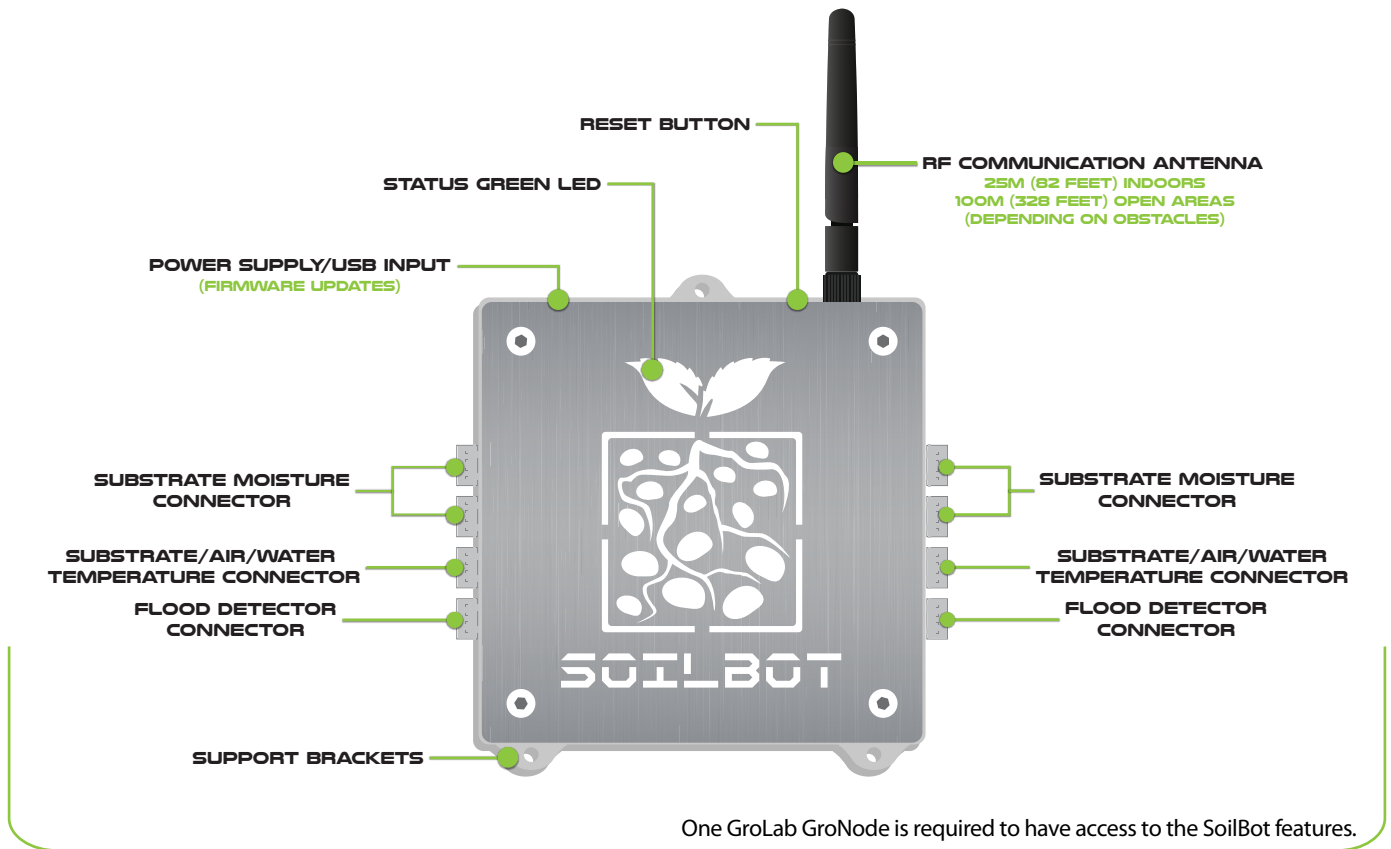
This module supports up to four moisture sensors allowing the monitoring of four different groups of plants at once. When combined with PowerBot or TankBot, it grants complete irrigation automation, ensuring the ideal moisture for the plants and avoiding water waste.

SoilBot also supports two temperature sensors extending the substrate analysis and two flood detectors that enable the system to react/notify in case of flood detection.

Since SoilBot supports twice the sensors included in its box, the user can add two extra moisture sensors, one temperature sensor, and one flood detector, allowing SoilBot to handle four distinct groups of plants with different absorption rates.

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 SoilBot wirelessly through radio frequency (RF) communication.



Designed by Open Grow, Lda. Assembled in Portugal.



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

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



Open Grow Technical Support:

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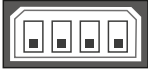
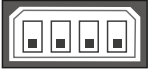
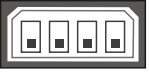
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SPECIFICATIONS

SoilBot Specifications			
<i>Hardware</i>	HW03	<i>Connections</i>	USB 2.1 type B SMA female 4 x Moisture Sensor (2.5mm 4-Pin male) 2 x Temperature Sensor (2.5mm 4-Pin male) 2 x Flood Detector (2.5mm 4-Pin male)
<i>Dimensions</i>	91mm x 101mm x 28.62mm (3.58in x 3.98in x 1.13in)		
<i>Net Weight</i>	~220 grams (~7.76 oz)		
<i>Gross Weight</i>	~715 grams (~25.22 oz)		
<i>Exterior</i>	Casing: Stainless Steel and Acrylic Colors: Silver and White Button: Reset	<i>Inter-Module Communication</i>	Radio Frequency - 2.4GHz
<i>Visual Indicators</i>	Status Green LED	<i>Includes</i>	Antenna USB Cable Type B-A (2-meter cable) USB Type-A Power Adapter (230VAC-5VDC/1A) 2 x Moisture Sensor (2-meter cable) Temperature Sensor (2-meter cable) Flood Detector (2-meter cable)
<i>Operating Conditions</i>	0 to 55°C RH <95% non-condensing		
<i>Expected Service Life</i>	>5 years	<i>Warranty</i>	3-year limited hardware warranty
<i>Power Consumption</i>	@5Vdc - max. 100mA - 0.5W		
<i>Power Supply</i>	USB - 5Vdc/1A		

Useful Pinouts			
Port Name	Moisture	Temperature	Flood Detector
<i>Visual Representation</i>			
<i>General Specifications</i>	Vsupply + 5Vdc Range: 0% ~100% Accuracy*	Vsupply + 5Vdc Range: 0°C ~150°C Accuracy*	Vsupply + 5Vdc Digital Operation: ON/OFF

*It depends on the model of the sensor used. Check our online shop or partners for more information.

MAIN FEATURES



MOISTURE

SoilBot can monitor any substrate's moisture regardless of whether it is soil, rock wool, coconut, or a recurrent dipping of roots in water. SoilBot can also be used in a hydroponic setup. This module supports up to four moisture sensors allowing the monitoring of four different groups of plants at once. When combined with PowerBot or TankBot, it grants complete irrigation automation, ensuring the ideal moisture for the plants and avoiding water waste.



TEMPERATURE

This versatile module supports two temperature sensors that extend its analysis capabilities, ensuring complete monitoring of the substrate's temperature. In addition, besides substrate, these temperature sensors can also be used on air or water depending on the user's needs. By combining SoilBot with PowerBot or Tankbot, it is possible to create procedures to maintain the ideal temperature for plants to grow healthier.



FLOOD PREVENTION & DETECTION

Equipped with a flood detector, SoilBot will quickly detect any water leaks/excesses and automatically activate the programmed security features to minimize damages. These security features offer numerous options, from simply notifying when any anomaly is detected to even acting on the devices (when combined with other GroLab modules).



MODULE COMMUNICATION

SoilBot 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, which makes it easy to install the SoilBot close to the plants.



MONITOR & ANALYSIS

Through GroLab Software, the user can monitor and analyze in real-time the moisture and temperature values, as well as the state of the flood detectors. This software provides all the tools for deep data analysis, like charts, notifications, and grow(s) overview. If the user needs the sensors' values for external analysis, this software also offers an export-to-file feature of all the data from the plant's life cycle. In addition, the GroLab system can periodically send reports in JSON files to a specific IP which facilitates integration with third-party services.

NOTIFICATIONS

When GroNode is operating with an Internet connection it can send real-time alerts and updates via e-mail about the state of the sensors connected to the SoilBot. GroNode also notifies in case of any issues arise.

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 SoilBot 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

When GroNode is operating with an Internet connection it's possible 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 SoilBot.

INSTALLATION EXAMPLE

The image below (Figure 1) represents a generic installation of a SoilBot 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, the versatility of the SoilBot is perfectly visible, being useful both in drip irrigation systems, increasing the irrigation precision, and in hydroponic systems, ensuring the ideal moisture and temperature for the roots, preventing them from drying out or suffering from excessive irrigation.

Usually, there is some sort of medium to support the plants, for example, soil, clay, and rock wool, with the SoilBot's moisture sensors, the user will be able to monitor any of these mediums up to a maximum of four different plant groups (one sensor per group). SoilBot also supports two temperature sensors capable of monitoring any substrate, these sensors can also be used for water and air monitoring.

Finally, this versatile module is equipped with a flood detection system (up to two detectors), which is extremely useful to notify the user (via e-mail and software) and mitigate eventual water leaks. Combined with other GroLab modules, it allows instant action on the irrigation equipment related to the affected grow(s), without harming the other grows in operation.

The installation/use of SoilBot 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.

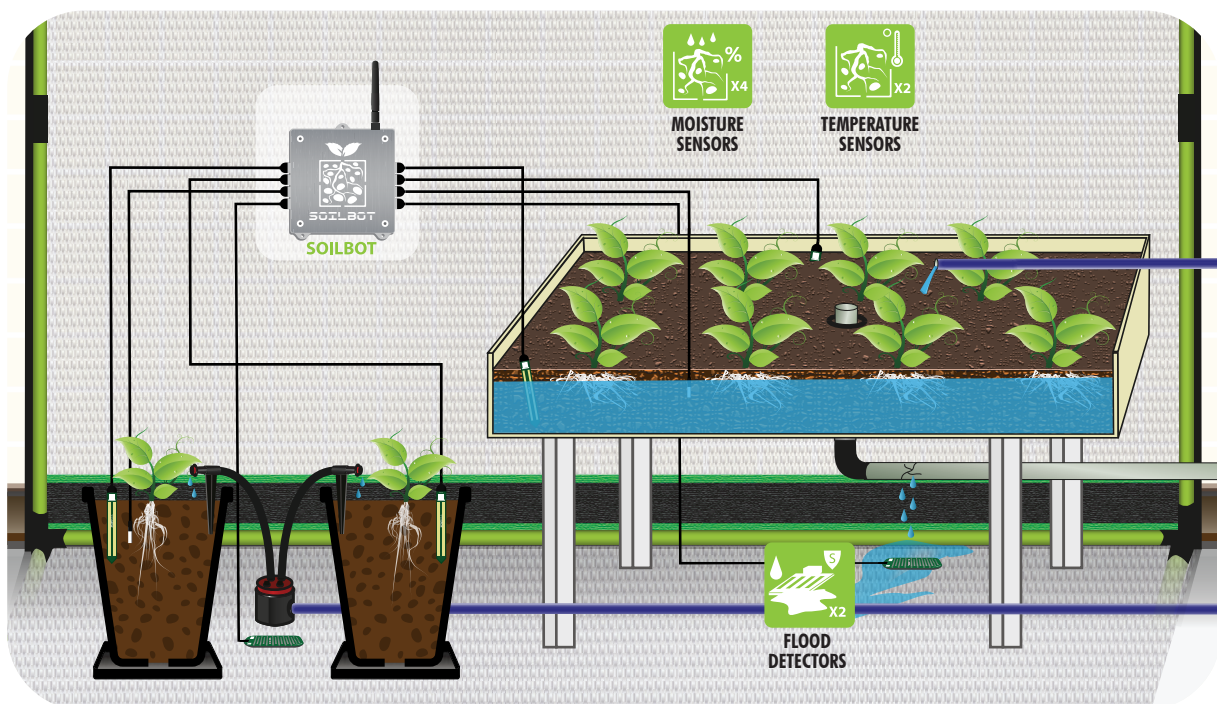


Figure 1 - SoilBot Installation Example Schematics

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USEFUL TIPS

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

➤ GroLab Software offers the possibility to configure the SoilBot’s LED status. For that, the user can access the modules menu, choose the respective SoilBot, and click on the LED configuration button. Figure 2 represents the LED configuration menu which communicates when the module is turned ON (LED blinking) or connected with the GroNode (LED Static). Besides that, there’s the option to control the time between the blinks. These configurations can be disabled by clicking on the checkbox "Enable status LED".

For better wireless communication

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

- Keep the SoilBot out of extremely humid areas and prone to contact with water. When installed outdoors, SoilBot must be protected from environmental factors.
- Perform periodic maintenance to ensure that SoilBot remains clean and dust free.
- The moisture sensors aren't powered by default, SoilBot will only power them up momentarily whenever a measurement is taken. This behavior prevents corrosion on the sensors and possible interference with the plants' roots. The time interval between measurements can be defined for each sensor in the respective configuration menu (Figure 3), from one minute to one hour.

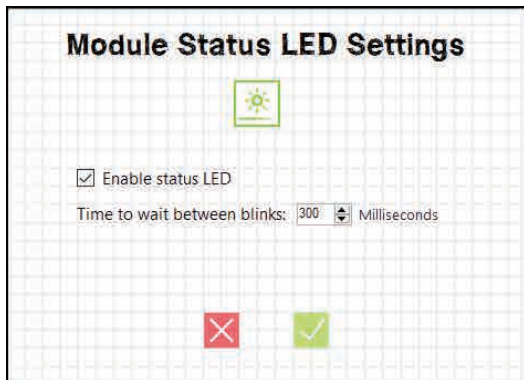


Figure 2 - Module Status LED Configuration

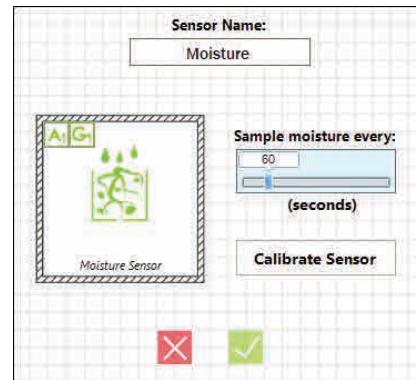


Figure 3 - Moisture Sensor Sampling Time Configuration

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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.

Since SoilBot does not directly interface devices, we will focus on the Alarms procedures. 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.

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

- ▶ Figure 4 shows an alarm that turns ON the water pump whenever the substrate humidity gets below 45%. It pumps water for 30 seconds and waits 5 minutes for a value higher than 55% of substrate moisture. If this value is not reached after 5 minutes, it repeats the process until the value is higher than 55%.



Figure 4 - Irrigation Alarm Example

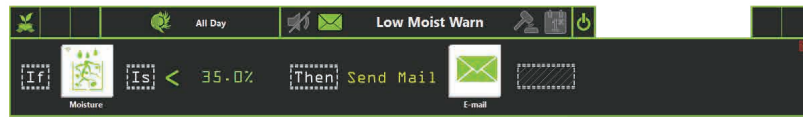


Figure 5 - Low Moist Warn Example

- ▶ In Figure 5 there's a representation of an alarm programmed to send a warning e-mail when the substrate moisture drops below 35%.

- ▶ Figure 6 illustrates a set of alarms programmed to send a warning e-mail when the substrate temperature drops below 14 degrees Celsius (°C), or gets higher than 21°C.

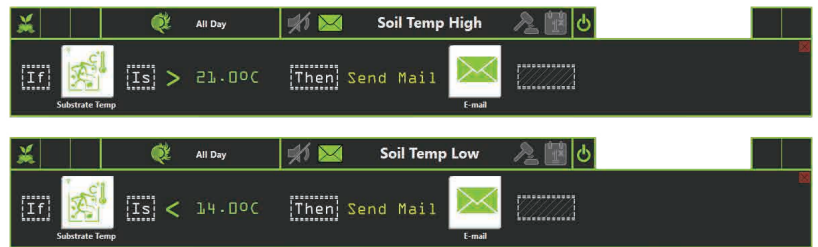


Figure 6 - Substrate Temperature High/Low Alarms Examples

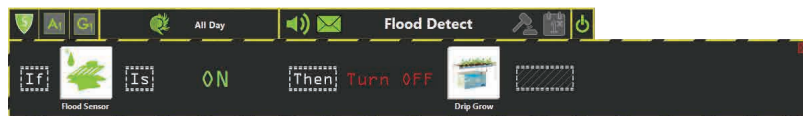
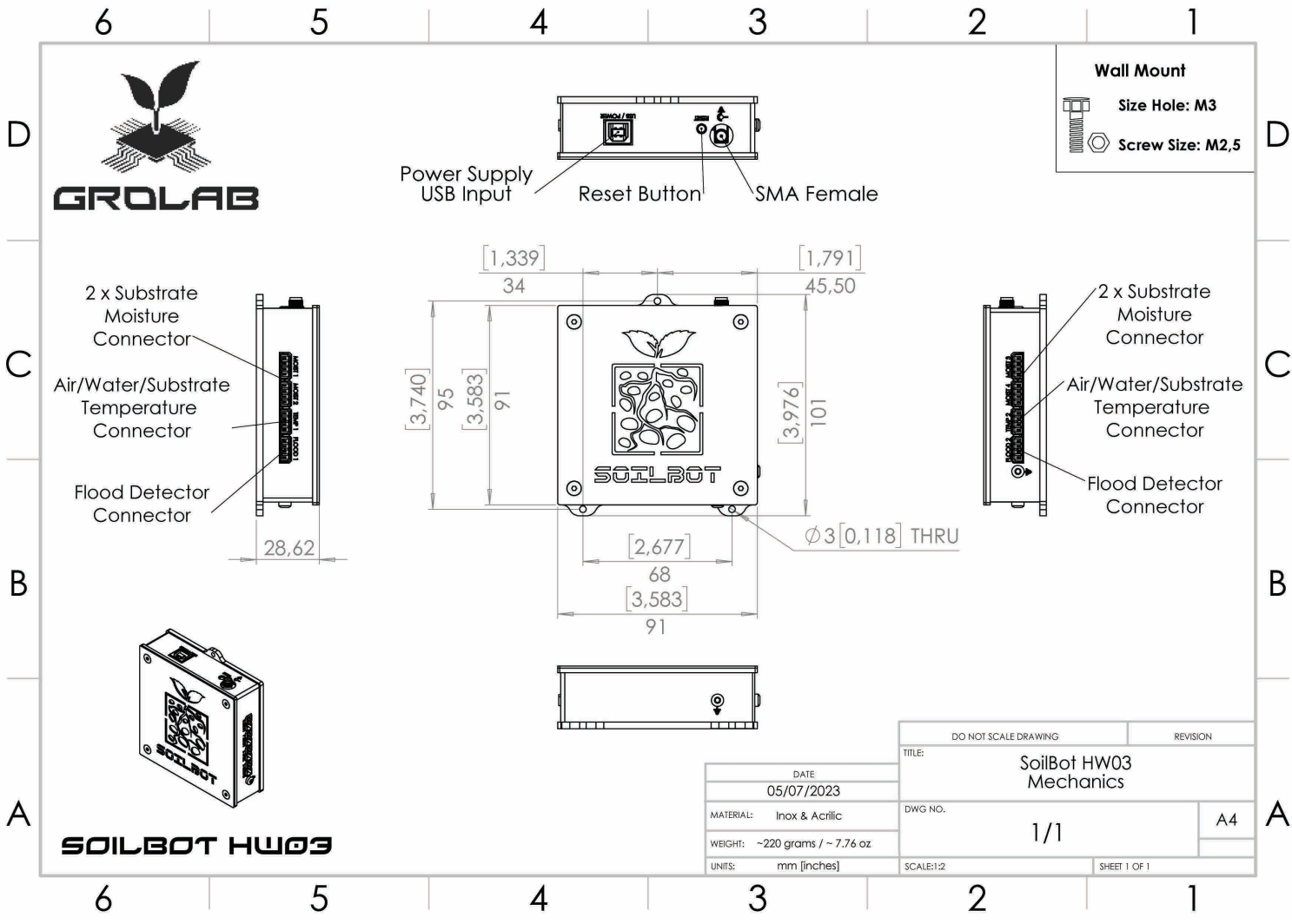


Figure 7 - Flood Detection Alarm Example

- ▶ In Figure 7 there's a representation of a security alarm programmed not only, to send a warning e-mail when the flood sensor is triggered, but also to turn OFF all devices from the drip grow. All automation procedures related to the area/grow in question will be halted until user validation, preventing the problem escalation.

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MECHANICS



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COMPLIANCE



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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.
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