GROLAB®

TANKBOT PLUS
(HW20)

INSTALLATION MANUAL

MANUAL DE INSTALACIÓN

MANUEL D'INSTALLATION

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TABLE OF CONTENTS

1. SAFETY

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, disconnect it from the electrical outlet. 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.
- Check the voltage rating before you connect the device to an electrical outlet to ensure that the required voltage and frequency match the available power source.

- Ensure that your GroLab devices and attached devices are electrically rated to operate with the AC power available in your location.
- Do not plug the power cables into an electrical outlet if the power cables are damaged.
- Do not use the device with an unstable electrical installation, or if it is prone to power surges or voltage transients.
- To prevent electric shock, plug the power cables into properly grounded electrical outlets.
- To avoid the risk of shock, do not expose this equipment to rain, moisture, or liquid spillage.
- If you use an extension power cable, ensure that the total ampere rating of the devices plugged into the extension power cable does not exceed the ampere rating of the extension cable.
- 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.

The dangers from electricity

Harm can be caused to any person when they are exposed to 'live parts' that are either touched directly or indirectly by means of some conducting object or material.

Electrical shocks from faulty equipment can cause severe and permanent injury and may also lead to indirect injuries due to falls from ladders, scaffolds, or other work platforms. Faulty electrical devices can also lead to fires. As well as causing injuries and loss of life, fires cause damage to plant, equipment, and property.

Most electrical accidents occur because: **individuals are working on or near equipment which is thought to be dead but which is, in fact, live; individuals are working on or near equipment which is known to be live, but where those involved are without adequate training or appropriate equipment, or they have not taken adequate precautions; misuse equipment or use electrical equipment which they know to be faulty**.

Reducing the risk of electric shock

To reduce the risk of electric shock:
- Install the device in a temperature and humidity controlled indoor area free of conductive contaminants. Ambient temperature must not exceed 55°C.
- Remove watches, rings, and other metal objects.
- Use tools with insulated handles.
- Wear personal protective equipment (PPE).

First Aid

Before commencing any work:
- Find out the location of a suitably stocked first-aid box.
- Find out the arrangements that exist on-site for first-aid, and who is responsible for taking charge of these.

2. SPECIFICATIONS

Hardware Version	HW20
Dimensions	159.31 mm x 112.97mm x 36.03mm
Exterior	Casing: Stainless Steel Colors: Silver Buttons: Reset, 6 x Output Control
Ambient Operating Temperature	0 to 55ºC
Relative Humidity	<95% non-condensing
Expected Service Life	>5 years
Power Supply	12V_{DC}/3A
Connections	USB 2.1 type B SMA female 12/24V_{DC} 8A (Jack ID 2.1mm OD 5.5mm) 2 x 12/24V_{DC} Direct Power Output (2.5mm 4-Pin male) 6 x 12/24VDC Actuator (2.5mm 4-Pin male) 6 x Switch Sensor (2.5mm 4-Pin male) Temperature Sensor (2.5mm 4-Pin male) Flood Detector (2.5mm 4-Pin male) PH Connector (BNC) EC Connector (BNC)
Includes	Antenna USB Cable Type B-A (2 meters) Power Adapter 12V_{DC}/3A PH Probe (2 meters) Temperature Sensor (2 meters) 7 x Connector Plug (2.5mm 4-Pin female)
Inter-Module Communication	Radio Frequency - 2.4GHz
Visual Indicators	Green LED
Warranty	2-years limited hardware warranty

3. DESCRIPTION

TankBot Plus is a grow controller that completely monitors and manages any water tank, making it essential for any agricultural growing system.

Supports a wide variety of peripherals like peristaltic pumps, solenoid valves, and power contactors, that can automate tasks like nutrients dosing, pH regulation, water recycling, tank refilling...
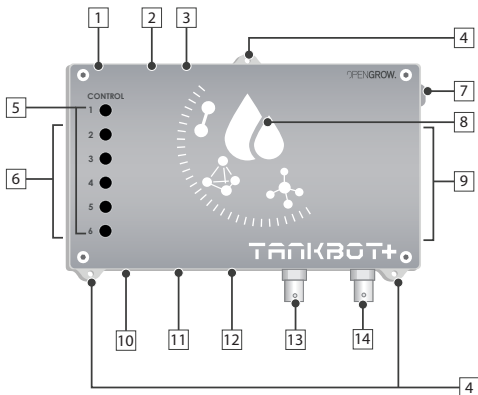
TankBot Plus can also monitor the pH, EC, water temperature, flood detector, and universal switch sensors.
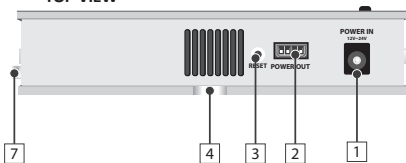
What is in the box

• TankBot Plus;
• Antenna;
• Power supply;
• USB cable type B-A;
• Temperature sensor;
• PH probe;
• PH calibration solutions;
• 7 x 4-pin connectors;
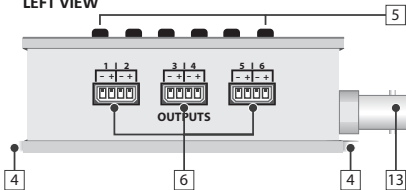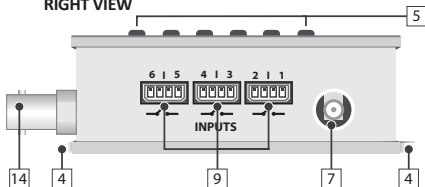• Installation manual.

4. COMPONENTS

FRONT VIEW

TOP VIEW

1. 12~24V$_{DC}$ power supply input
2. Direct DC power out
3. Module reset button
4. Brackets for wall-mounting
5. Manual switch buttons
6. 12~24V$_{DC}$ actuators/outputs
7. RF antenna connector
8. Status signal LED
9. Switch sensor connectors
10. Type-B USB connector
11. Flood detector connector
12. Temperature sensor connector
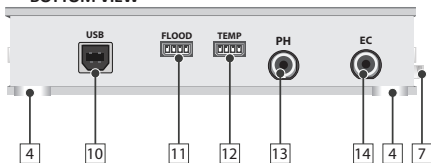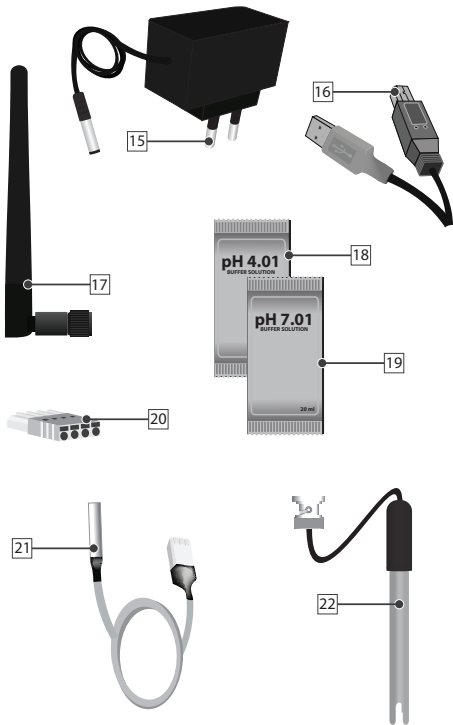13. PH probe connector
14. EC probe connector

LEFT VIEW

5

1 | 2   3 | 4   5 | 6
- + - + - + - + - + - +

OUTPUTS

4   6   4   13

RIGHT VIEW

5

6 | 5   4 | 3   2 | 1

INPUTS

14   4   9   7   4

BOTTOM VIEW

USB   FLOOD   TEMP   PH   EC

4   10   11   12   13   14   4   7

9

4 Brackets for wall-mounting

5 Manual switch buttons

6 12~24V_{DC} actuators/outputs

7 RF antenna connector

9 Switch sensor connectors

10 Type-B USB connector

11 Flood detector connector

12 Temperature sensor connector

13 PH probe connector

14 EC probe connector

pH 4.01 BUFFER SOLUTION

pH 7.01 BUFFER SOLUTION

20 ml

11

15 110~230Vac / 12Vdc power supply

16 USB Type-B cable (Firmware updates)

17 RF communication antenna

18 PH 4.01 calibration solution

19 PH 7.01 calibration solution

20 4-Pin quick connector

21 Water/soil/air temperature sensor

22 PH probe with BNC connector

5. INSTALLATION

Initial assembly

Place the module on a firm surface, far from flood-prone areas. It is recommended that the module be mounted on a wall, use the brackets for wall-mounting (4), and appropriate screws (M3 screws type), also make sure to use appropriate tools for this task.
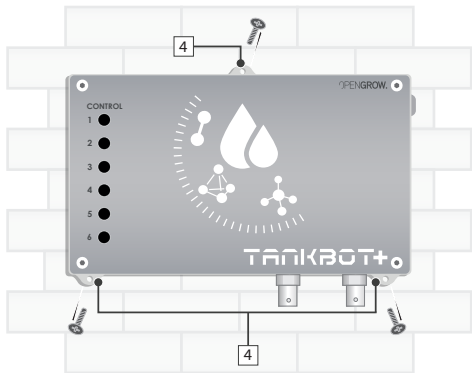
NOTE: It is recommended to place the module at least 40 centimeters away from other GroLab modules.

Antenna connection

Once the module has been mounted, screw the communication antenna (17) into the module port (7). For correct communication, turn the antenna to position it vertically according to the direction of the module. Please, refer to the two illustrations below that shows the correct position for the antenna based on where the module was installed.
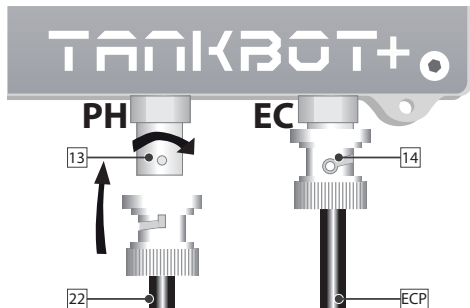
Wall-mounted

FRONT VIEW

On a surface

BOTTOM VIEW
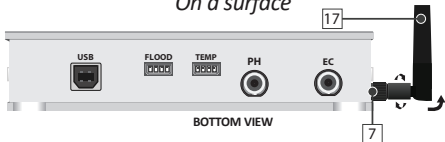
Peripherals connection

Connect the pH probe (22) to the respective connector (13). For that, insert the tip of the plug and turn it clockwise to screw it in, as shown in the picture below.


Note that TankBot Plus also supports an EC probe that can be acquired separately. To connect the EC probe (ECP) to the TankBot Plus, follow the same steps as the pH probe but plug it into the respective connector

⚠ **NOTICE: Never exchange the position of the pH and EC probes. A wrong connection may deteriorate your devices or the module itself.**

After connecting the probes to the TankBot Plus, it is required to perform the calibration. To calibrate the probes it is required to install and run the GroLab software.

Inside the respective module's menu, click on the desired probe, a menu should appear, inside that menu click on the calibrate button. After that, follow the software instructions.

Note that the calibration solutions (18 and 19) for the first calibration of the pH probe are already included.
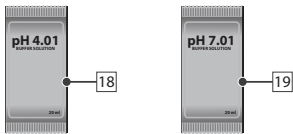

For more information regarding the calibration process, please access the GroLab Video Tutorials that come with the GroLab software USB drive, or access the following website:

www.opengrow.pt/tutorials/

⚠ NOTICE: To ensure good precision, it is recommended to calibrate the probes once a month.

Connect the water temperature sensor (21) to the respective connector (12) as shown in the picture below and place it in the water tank.

BOTTOM VIEW

21 12
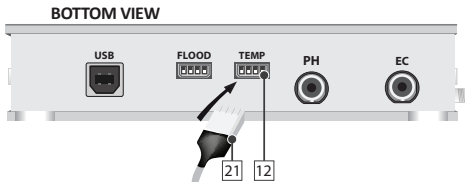
⚠ **NOTICE: If you use any system to heat the water, maintain the sensor away from it.**

Note that TankBot Plus also supports a flood detector that can be acquired separately. To connect the flood detector (FD) to the TankBot Plus, plug the sensor into the respective connector (11) as shown in the picture below. The flood detector should be placed on a flat surface and in areas susceptible to water leakage problems, for example near the water tank.

BOTTOM VIEW

FD 11
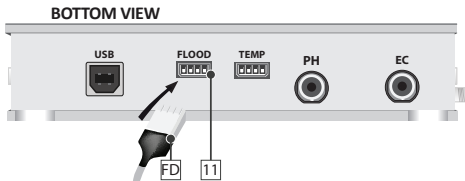
To connect 12~24VDC devices/actuators to the TankBot Plus it is required to first connect the device cables to the 4-pin quick connectors (20). Each quick connector (20) is divided into two sections, one for each device.

Perform the following steps to connect the peripherals correctly without generating polarity problems.

First, connect the cables from the devices/actuators in the following order, respecting the position of the connector (20):
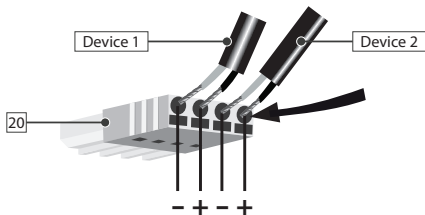
Twist the bare wire and cut it with a cutting tool so that, when inserted in the quick connector (20), it is not exposed and does not cause bad contact with other cables.

To remove a wire from the connector (20), use a pin to press the hole associated with each cable located on the surface of the connector. Finally, pull the cable out of the hole to remove it.

Lastly, connect the quick connectors (20) to the desired outputs (6). It is possible to manually control the outputs through the control buttons (5).
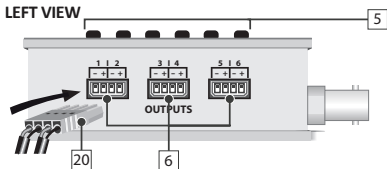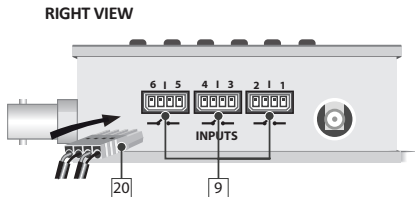

⚠ **NOTICE: A wrong connection can deteriorate your devices or the module itself.**

Next, carry out the same procedure on your sensors (INPUTS). Keep in mind that by inverting the polarity of the sensor you will also invert the data recorded by the TankBot Plus.

You can also invert this polarity on the software without the need to re-wire the system.

Lastly, connect the quick connectors (20) to the desired inputs (9).

RIGHT VIEW

⚠ NOTICE: Never connect sensors to the OUTPUTS and devices to the INPUTS. A wrong connection can deteriorate your devices/sensors or the module itself.

Power connection

Once the connection of the peripherals is done, it is time to connect the power supply (15). In this way, connect the cable from the power supply (15) to the module's power supply input (1). The transformer from the power supply (15) should be plugged into a 110~230Vac outlet.

TOP VIEW
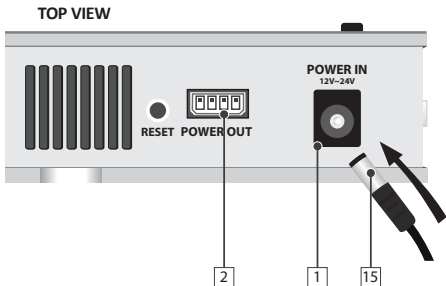
With this connection made your module is powered and the LED indicator (6) should start blinking green. You also now have power available on the direct DC power out connector (2).

6. COMMUNICATIONS

Connection to GroNode

Make sure the GroNode is correctly installed and accessible through the GroLab Software. If not, follow the instructions provided inside the GroNode's manual.

After completing all the TankBot Plus installation steps, open the GroLab Software, establish a connection with the GroNode and then, access **Modules** through the main menu, as shown in the picture below.
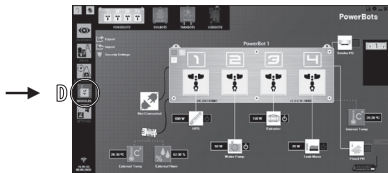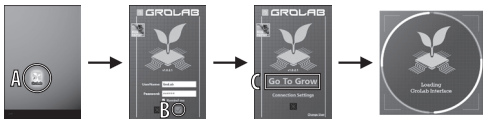
Usually, 2 or 3 minutes are enough for GroNode to detect a newly installed module. The module status signal LED (6) will keep blinking green until GroNode detects the module and starts communicating with it, at this point the status signal LED (6) stops blinking and keeps steady in green.

Once the module is detected by GroNode, it will automatically appear in the **Modules** menu under the respective module type section.
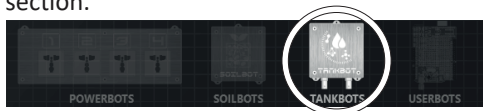
The TankBot Plus is identified as a TankBot by the GroLab Software, so it appears under the TankBot section.
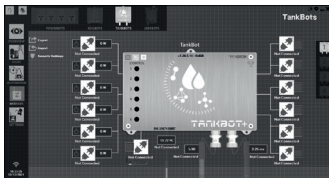
NOTE: You can check the list of modules of the same type on the right side of this menu. One GroNode supports a maximum of 4 modules of each type.

Problems or losses in communication

The GroNode was designed to communicate with the other modules through radio frequency signals. The **range of action** is **25 meters (82 feet) indoors** and **100 meters (328 feet) outdoors**, depending on space conditions.

Access the **Modules** menu on the GroLab Software and check if your modules are available. If they aren't available or they are experiencing communication losses, you may have exceeded the distance between your modules and GroNode.

Inside the **Modules** menu, you can find a wireless signal icon that indicates if the selected module is connected to the GroNode.

If the problem persists, perform a test run by placing the module next to the GroNode and check the module's communication status through the software. If communication has been successfully re-established, repeat this operation at different distances until you detect the maximum communication distance.

If the module is not found at all, try to cycle the GroNode through all the available communication channels until you find your modules, allowing 3 minutes between channel changes.

To change the communication channel, open the GroLab Software, and connect to the GroNode. Inside the **Main Menu (Configurations)**, go to **Settings (GroNode) → General Settings Tab**. Click the button in the lower right corner to enable editing and change the communication channel to the desired channel. To apply the changes, click the green button in the lower right corner.

⚠ **NOTICE: Some load-bearing walls and electronic devices may interfere with the signal.**

If after following the previous steps your modules still don't show up on the GroLab Software, please contact our technical support.

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7. UPDATES

Firmware Updates

Keep in mind that some software updates may require that you update the firmware of your GroLab modules.

All updates provide crucial improvements that ensure optimal system performance.

Connect the type-B USB cable (21) to your device's USB connector (10) and follow the instructions indicated in the GroLab Software.

BOTTOM VIEW
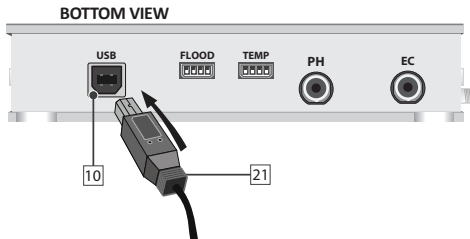
NOTE: It is recommended to disconnect the power supply (15) before applying a firmware update.

8. TROUBLESHOOT

Symptom	Possible Cause	Possible Solution
The unit does not appear to be functioning.	1) No power is available on the input.	Ensure that you are using the correct voltage 110~230Vac.
The unit seems to have power but the peripherals do not actuate.	1) The cables used to connect the peripherals to the 4-pin quick connectors might be loose or damaged. 2) The 4-pin quick connectors might be loose or damaged.	Replace the cables and/or the 4-pin quick connectors. Ensure that the power supply is correctly working.

If the information in the table, presented on the previous page, 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.

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9. MAINTENANCE

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

Regarding the EC and pH probes, it is recommended to calibrate both probes once a month. Besides the probes, when using a peripheral connected to the unit that requires calibration (either physically or via GroLab software), it is recommended to be recalibrated every month. In addition, whenever cable replacement or any extension of cables is performed on peripherals that require maintenance, they must be recalibrated.

The service life of the TankBot Plus should be in excess of five years if operated within specification.

It is recommended to **perform periodic inspections (at least once per year)** to **ensure that the entire installation is in accordance with local and international safety regulations**.

10. 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.

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.

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

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

Warrantor

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Edifício Expobeiras,
3500-618, Viseu,
Portugal

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www.opengrow.pt

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**.

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.

11. 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:
- (2014/53/EU) Radio equipment directive.
- (2011/65/EU) RoHS directive.
- (2014/35/EU) Low voltage directive.
- (2014/30/EU) EMC.

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

Open Grow, LDA., reserves the right to update and/or modify the content of its products at any time without prior warning. Check out our Terms & Conditions at www.opengrow.pt.

OPENGROW.

NOTES

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