

Connected gardening

Starter Kit

User Manual



Version : 1

Date : 29/09/2021

Contact : support@digiplant.com

Table of contents

1. INTRODUCTION.....	3
2. KIT CONTENT	3
3. INSTALLATION GUIDE	4
3.1. Device installation	4
3.1.1. <i>DpEC mounting</i>	4
3.1.2. <i>First boot</i>	6
3.2. App installation	7
3.3. App provisioning.....	9
3.3.1. <i>Mainbox</i>	9
3.3.2. <i>Blynk IoT app</i>	10
4. APP USER GUIDE.....	14
4.1. Inputs	14
4.2. Outputs	15
4.2.1. <i>Type selector</i>	16
4.2.2. <i>Auto switch</i>	17
4.2.3. <i>Manual button</i>	17
4.2.4. <i>Output parameter</i>	17
4.3. Options	18
4.4. Info.....	19
4.5. Charts	22
5. AUTOMATIC CONTROL.....	23
5.1. Water	23
5.2. Light.....	26
5.3. Fan.....	26
6. MAINBOX USER GUIDE.....	27
7. WARRANTY.....	28
8. FCC STATEMENT	29

1. INTRODUCTION

Thank you for purchasing the Digiplant Starter Kit !

This kit is your entry point to the connected gardening world and your purchase supports us in the further development of the Digiplant and other devices. We took great care to design a simple to use, fun and - in the best of our ability - affordable system. We hope you will enjoy using it !

Please read this manual carefully, since all chapters contain valuable info regarding the operation of the equipment, getting-started instructions, app usage, and everything about our automatic loop control.

Please check the digiplant.com/support page for the latest version of this manual (PDF download) and latest DpOS version (more details at digiplant.com/about-the-tech).

In case of any device problem, do not hesitate to contact us at support@digiplant.com.

For any suggestion you can mail us at contact@digiplant.com. We are always glad to receive your valuable comments and tips !

Now let's get started.

2. KIT CONTENT

Kit dimensions (L x W x H) : 26 x 21 x 8 cm

Kit includes :

1. 1x Mainbox
2. 1x TH Sensor
3. 1x SS7 Soil Sensor
4. 1x 12V 5A Power Supply
5. 1x Water Level Sensor + 2m cable
6. 4x Output Quick Connectors + Adapters
7. 3x Long Range Sensors Cables (0.5m, 1m, 2m)



3. INSTALLATION GUIDE

3 easy steps:

- Device installation
- App installation
- App provisioning

3.1. Device installation

3.1.1. DpEC mounting



Every long range sensor uses DpEC™, for *Digiplant Easy Connect*. It is our unique mounting technique that allows for modular and waterproof daisy chain connection, in a simple and reliable way.

Step 1 : remove cap



Step 2 : insert cables into cap



Step 3 : connect cables to sensor



Note: the two connectors are identical.

Step 4 : insert cap into sensor



Step 5 : slide cable seal into cap



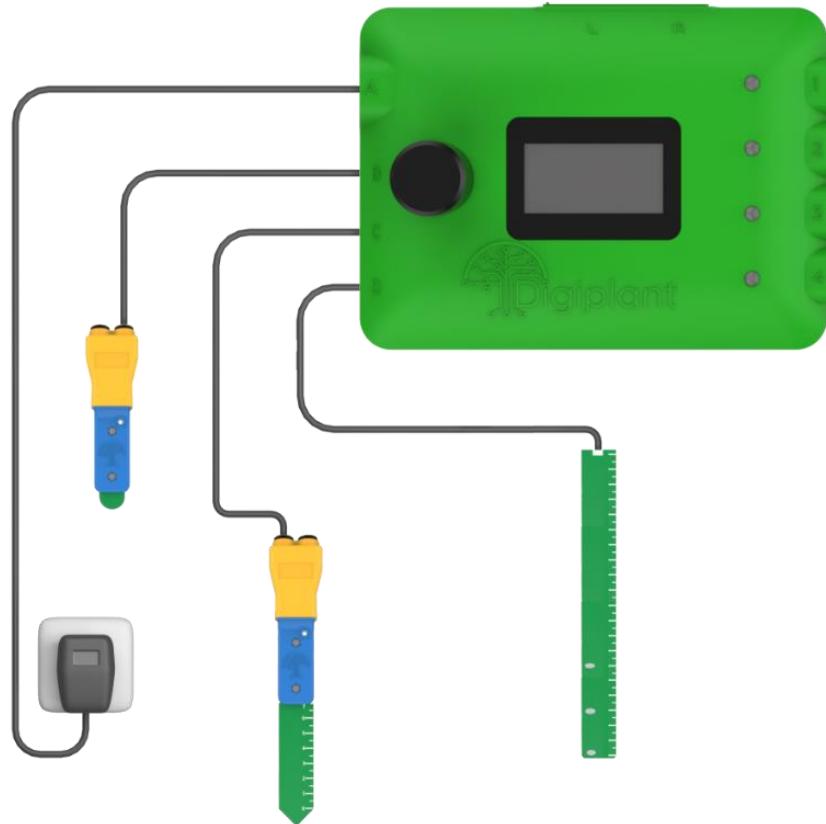
Sensor is now ready to be positioned in its environment (air or soil).

3.1.2. First boot

- A) Connect power supply
- B) Connect TH sensor with any of the LRS* cable (4 pins)
- C) Connect soil sensor with any of the remaining LRS* cable (4 pins)
- D) Connect water level sensor with its 2m cable (3 pins)

* **LRS**: Long Range Sensor

Note: Inputs B & C are identical, TH and soil sensor can be connected to any of them.



After boot screen, device displays inputs page.

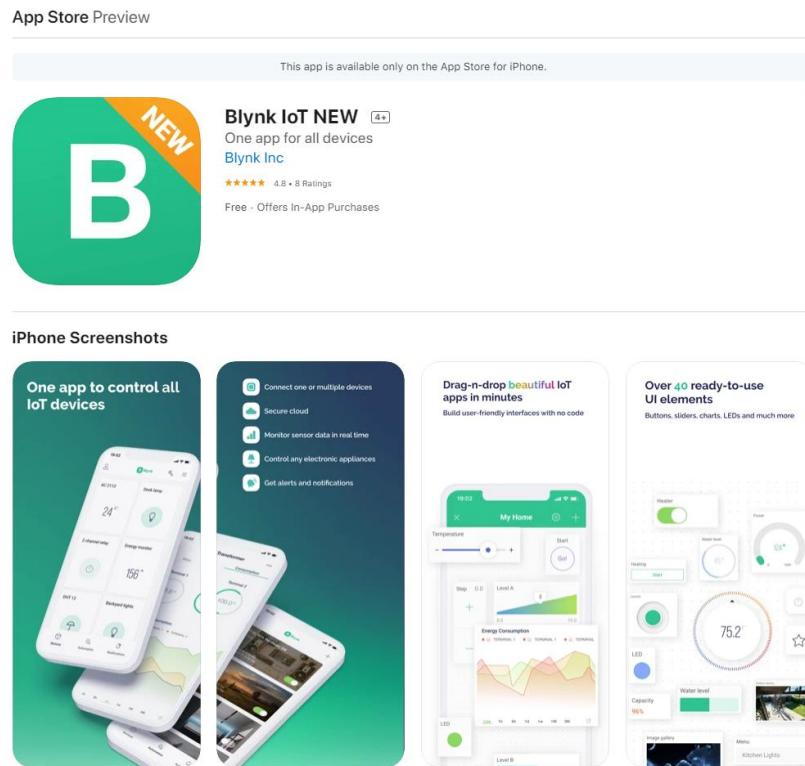
INPUTS				
T:	30°C	RH:	56%	○
S1:	0%	S2:	NC	▪
S3:	NC	S4:	NC	▪
S5:	NC	S6:	NC	▪
S7:	NC	S8:	NC	▪

Digiplant equipment is installed and ready to connect to the internet.

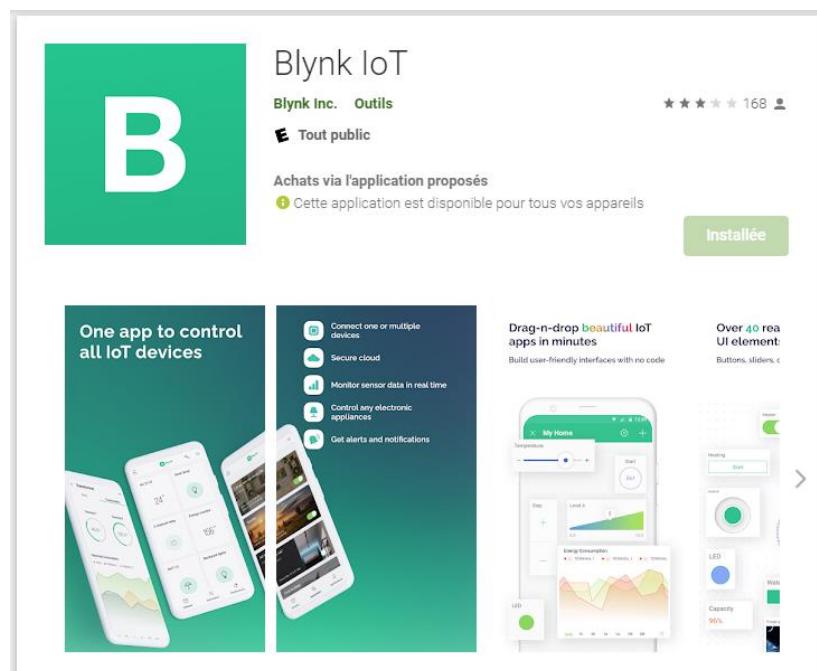
3.2. App installation

Digiplant uses **Blynk**, one of the most popular IoT platform to connect devices to the cloud and manage them remotely. Blynk app is available for both iOS and Android.

iOS:



Android:

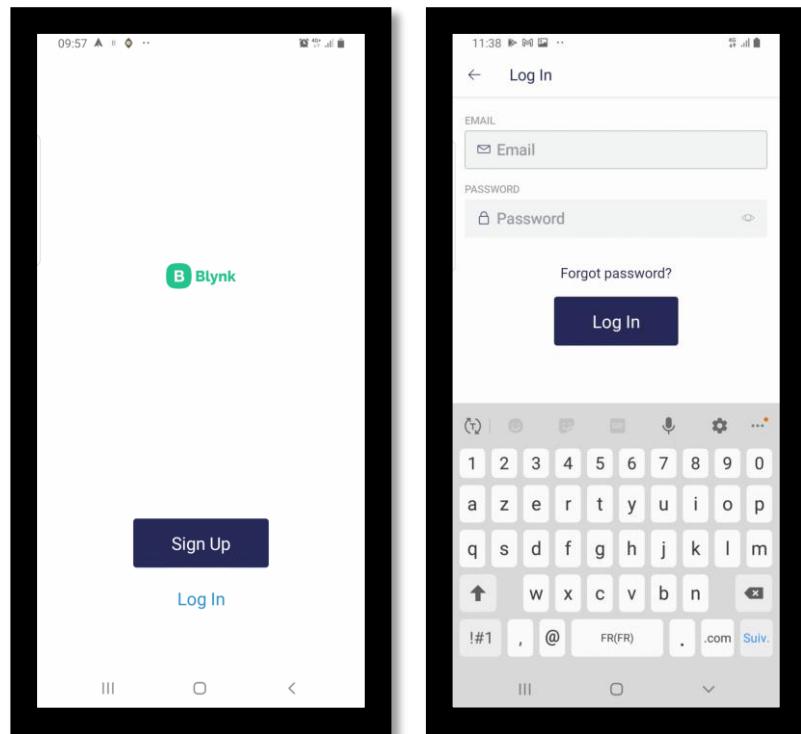


After your purchase you should have received an invitation to create an account.

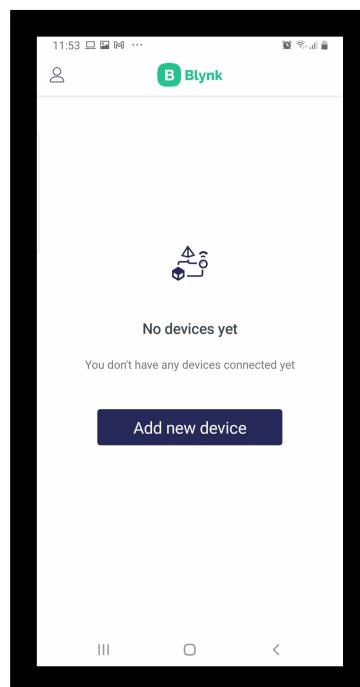
Note that you can go directly to Blynk website and create a generic account, but **it won't be linked to Digiplant**. You must sign up with the **link provided in the invitation mail**.

If you did not receive this invitation yet, please send us a message at support@digiplant.com.

Once app is installed, start it and enter login page.



Once logged, main page is displayed:



App is ready to add new device.

3.3. App provisioning

The mainbox must know your WIFI credentials (SSID and password) to connect to the internet. The process of providing it those informations is called *provisioning* and is securely done with the Blynk app.

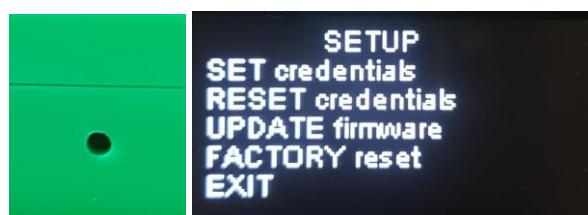
No worries: no obscure coding or tweaking required, but a simple & clear process.

Here is how it goes.

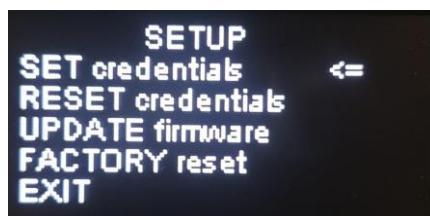
3.3.1. Mainbox

First step is to enter provision mode in mainbox:

- 1) Power ON device
- 2) Press secret button to enter *SETUP* mode



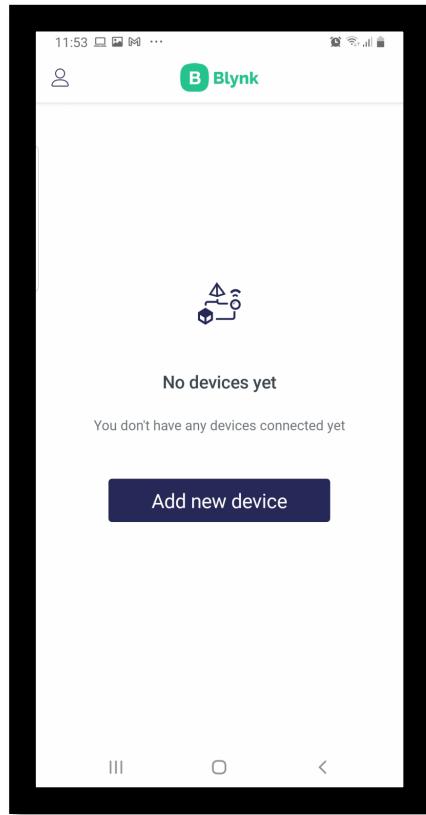
- 3) Press knob button to highlight *SET credentials* with the arrow cursor.



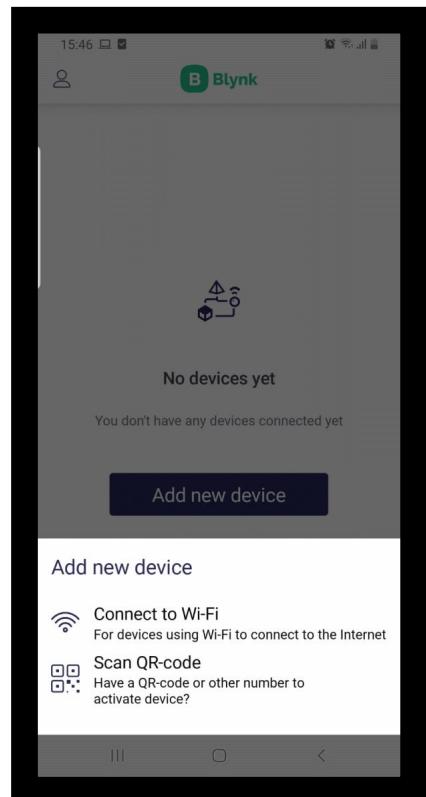
- 4) Press again knob to enter provisioning mode.
Screen is displaying *Waiting for credentials*.

3.3.2. Blynk IoT app

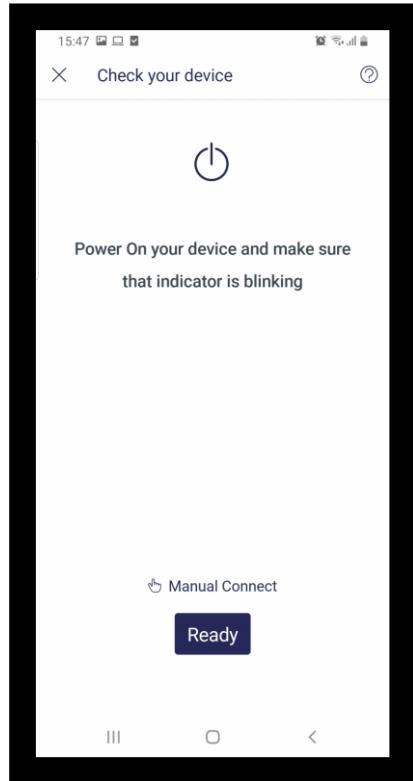
1) Add new device



2) Connect to Wi-Fi



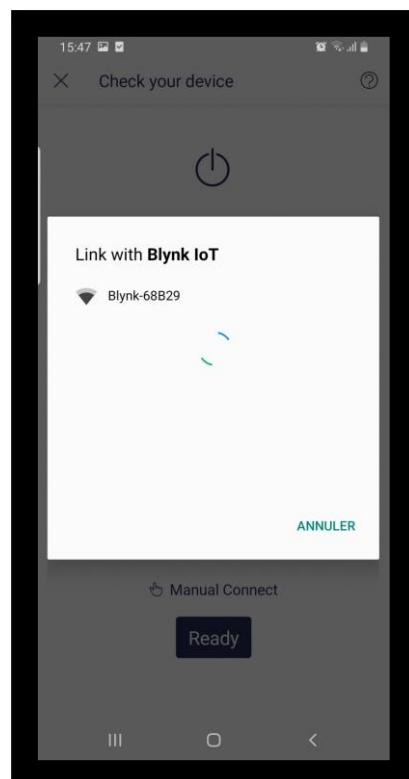
3) *Ready*



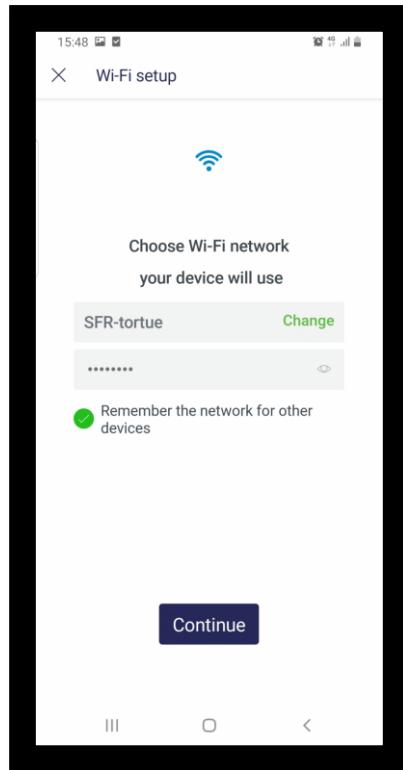
Note 1: please ignore generic instruction (no blinking).

Note 2: Make sure mainbox is still *waiting for credentials* before pressing *ready*

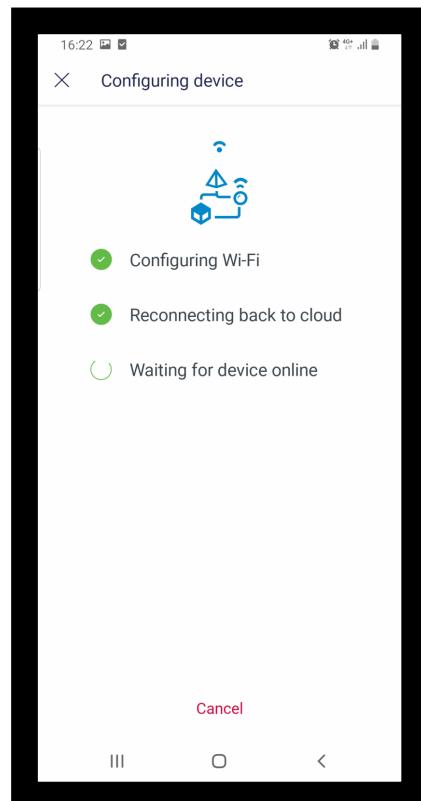
4) Select mainbox access point with the following SSID format: "Blynk-XXXX"
Note: "XXXX" being a random value.



5) Enter your WIFI router SSID and password then press *Continue*

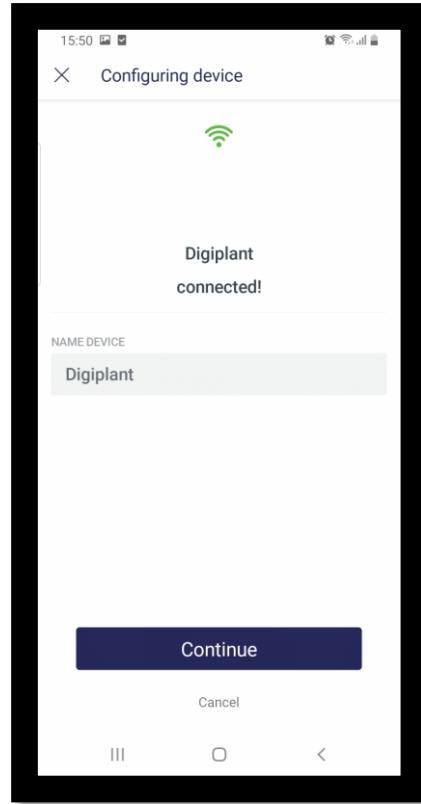


Device configuration is usually fast (<10s).



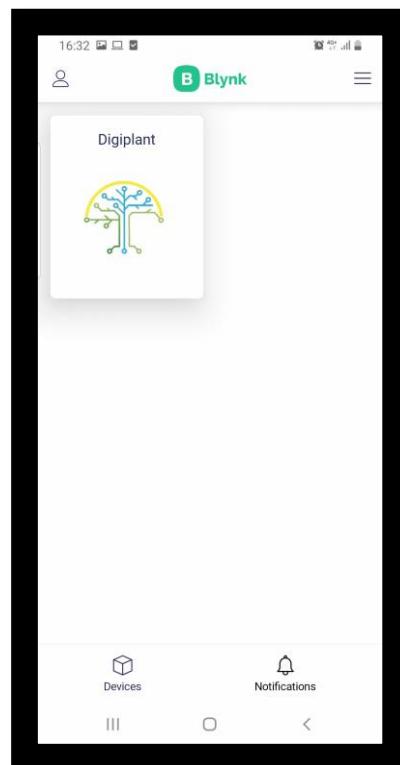
Note: If configuration is stuck (rare), *Cancel* and repeat from *Add new device*.

Once provisioning is complete:



You can change for a custom device name, then it is all set !

Newly added device is now visible in the app main page:

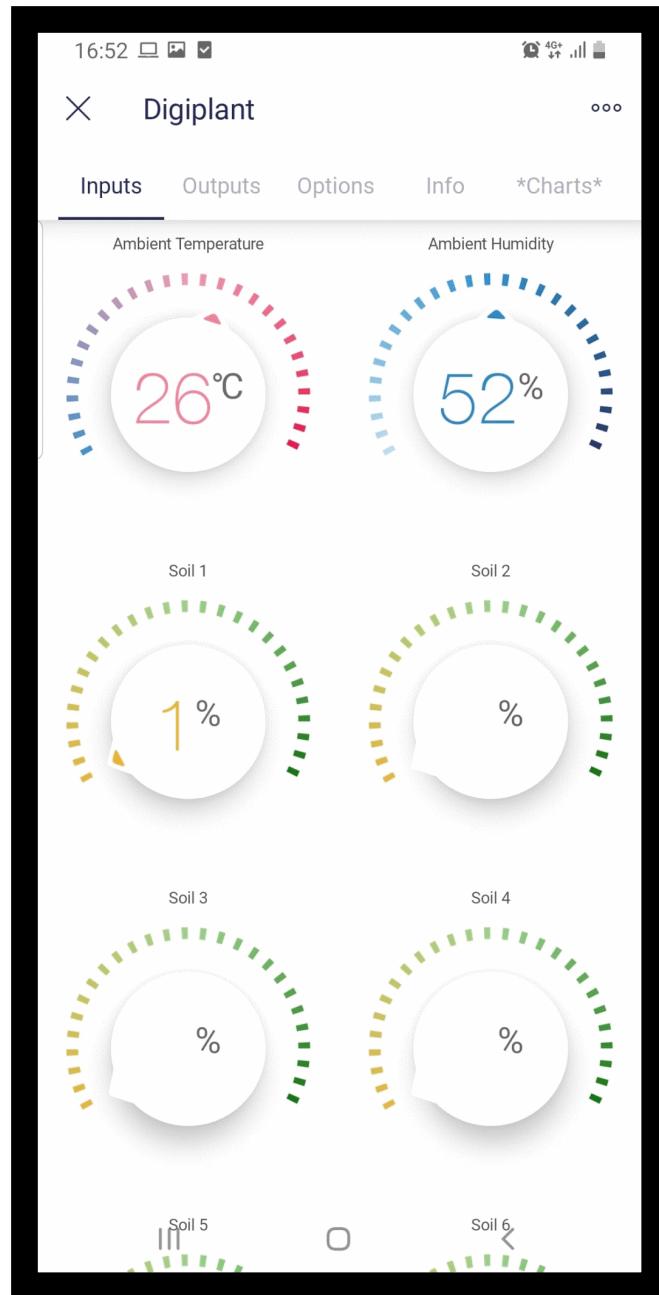


You can either enter Digiplant device app or repeat provisioning to add a new one.

4. APP USER GUIDE

User interface is laid out in the same order as mainbox screen: Inputs / Outputs / Options / Info.
+ *Charts* (in app only)

4.1. Inputs



In the first tab, you can visualize live sensors values:

- Ambient temperature
- Ambient humidity
- Soil moisture (1 to 8)

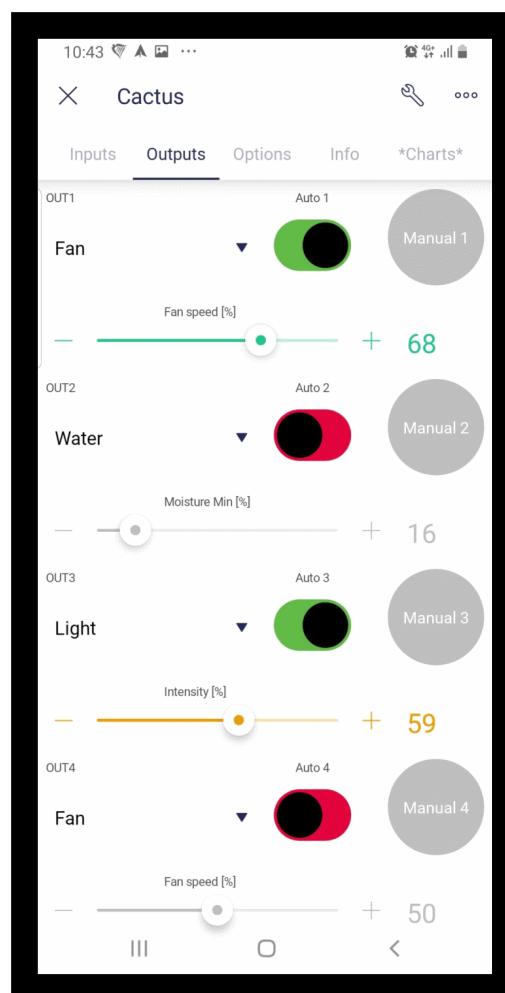
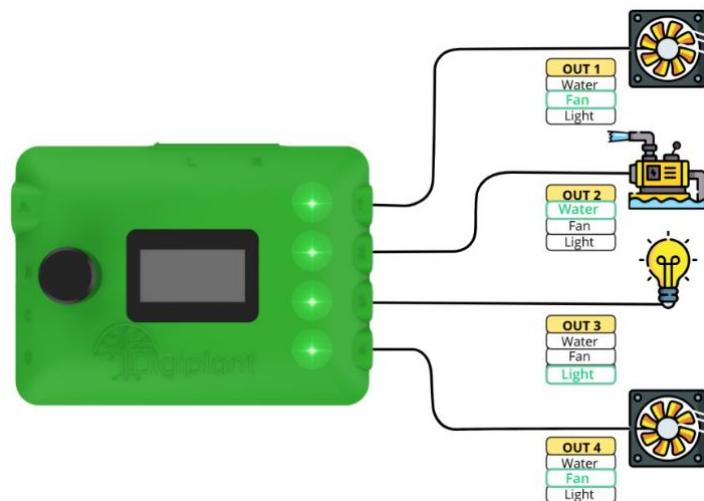
By default, ambient and soil 1 to 4 are displayed. Scroll down to read all other values.

4.2. Outputs

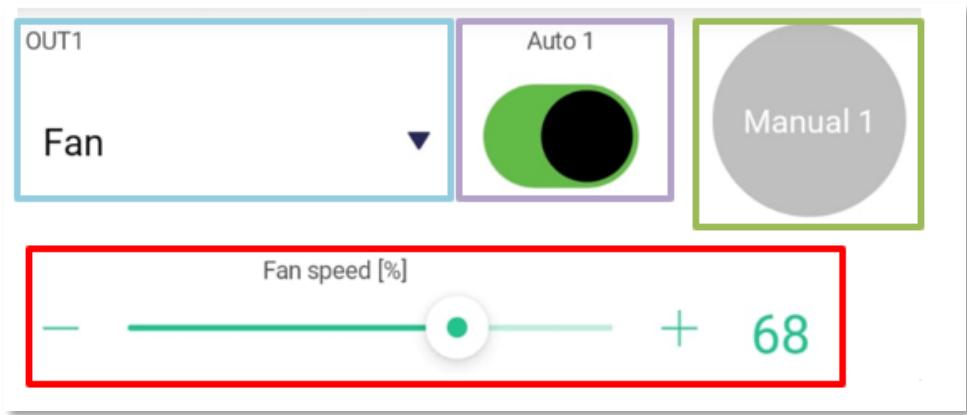
Each 12V output can be configured to any of the following type:

1. Water (pump or valve)
2. Fan
3. Light
4. *Not used*

For example:



There are 4 widgets per outputs:

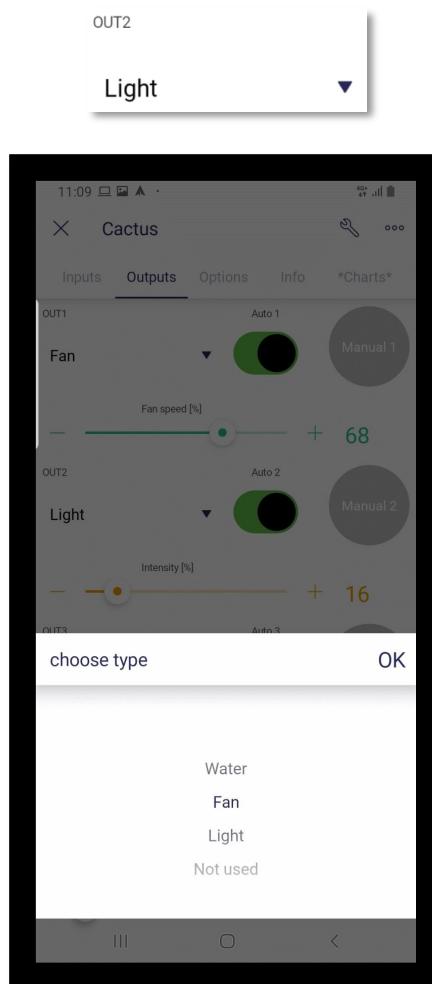


From left to right, top to bottom:

- Type selector (*Not used* by default)
- Auto switch (OFF by default)
- Manual button (push to activate, OFF by default)
- Output parameter (colored when auto ON, grey by default)

4.2.1. Type selector

To configure output type, press selector and use scroll menu:



4.2.2. Auto switch

Each output type can be operating either with **constant parameter** or **automatic control**.

Auto switch is used to enable the latter.

After setting type, output is working by default with constant parameter (auto OFF). Slider is grey.

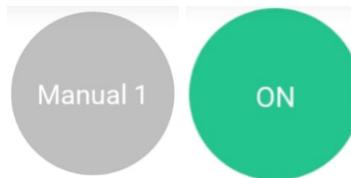


Example: user choose OUT1 as fan and set slider value to 50%. Fan is constantly running at 50% speed.

Once auto is enabled, slider is colored and the control is operating, according to measurement and user-defined parameters.

More details about automatic control on corresponding chapter.

4.2.3. Manual button

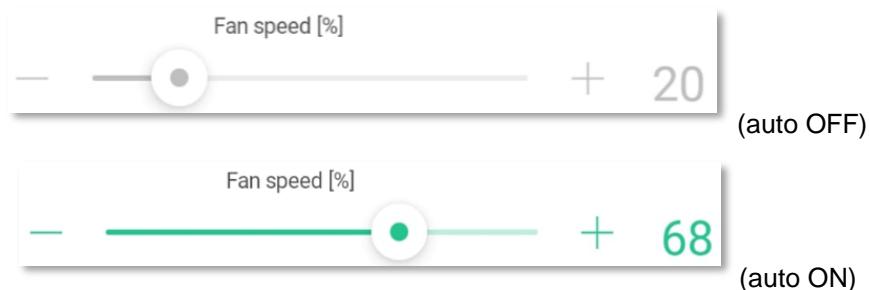


Manual button is active **only when pressed**. It works with all types and activates output to 100%.

Example: user choose OUT1 as water. He then presses manual button, pump/valve is powered.

Note: manual button works both with auto ON & OFF.

4.2.4. Output parameter



For each type, the slider is used for a different parameter:

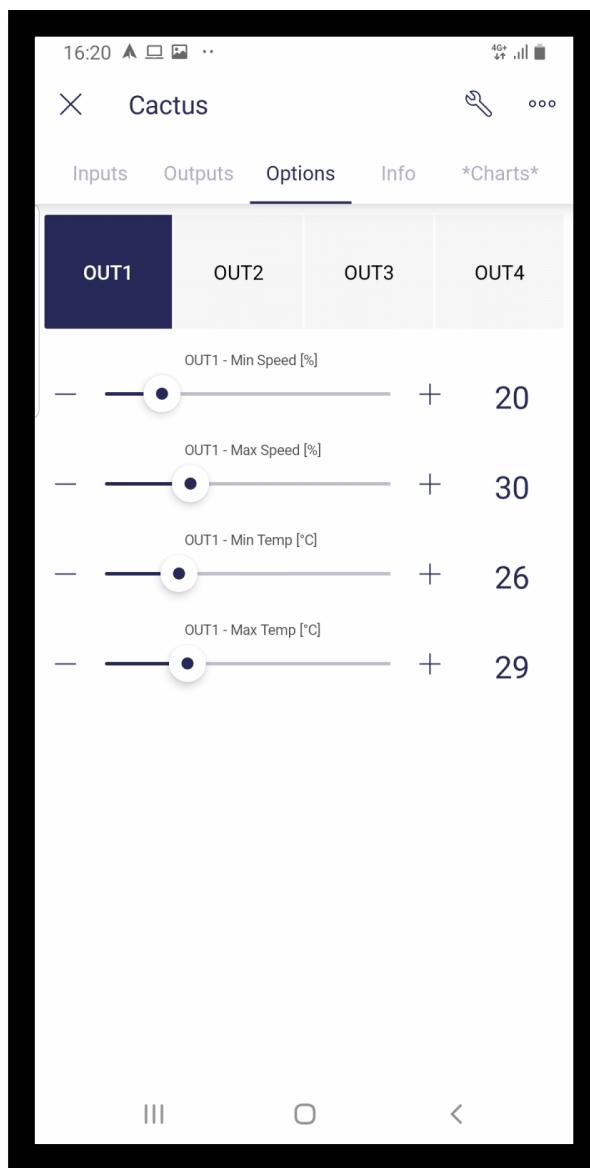
Type	Parameter	Unit	If auto OFF	If auto ON
Water	Moisture min	%	Not used	Used
Fan	Fan speed	%	Used	Not used
Light	Intensity	%	Used	Used

Notes:

If auto switch is **OFF**, water parameter is **not used**. *Moisture min* is only for automatic control.

If auto switch is **ON**, fan parameter is **not used**. *Fan speed* is controlled by mainbox.

4.3. Options



There are up to 5 parameters per output (depending on output type):

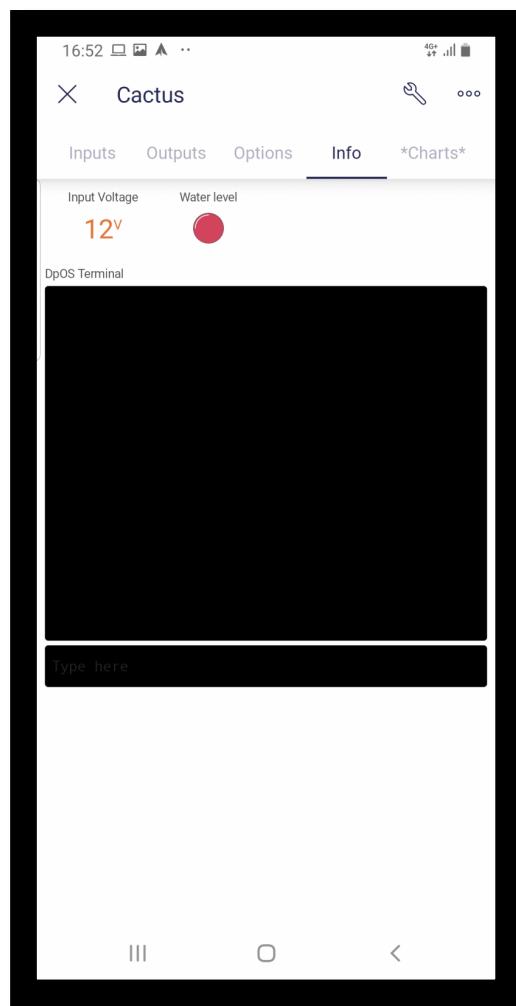
- 1 output parameter
- 4 options parameters

These options are used for automatic control.

To select output options, simply press corresponding square. App updates sliders names and values accordingly.

More details on each of these parameters in chapter 5.

4.4. Info



Info page displays 3 widgets :

- Input Voltage
- Water Level (**low**, **medium**, **full**)
- DpOS Terminal

Terminal is used to configure the system with simple command lines.

Command	Usage
sensor	Change sensor address
alert	Set min/max alert values
gmt	Change timezone (useful for light controller)
clear	Clear terminal

> **sensor**

By default, all sensors are defined as **Soil 1**.

If you want to connect multiple sensors, **sensor** command must be used to assign to each of them a specific address.

Note: to avoid address conflict, out-of-the-box sensors must not be connected all together, but first configured **one at a time**.

DpOS Terminal

```
> sensor

Initial address (1..8):
> 1

New address (1..8):
> 2

Setting new address..

New address set correctly
```

> **alert**

Digiplant allows to define min and max levels alerts for each measurement.

When measurement is above max or below min, a notification is sent to the phone.

After sending **alert** command, user selects one of these inputs:

Input	Description	Default min	Default max
T	Ambient temperature	0°C	100°C
RH	Ambient humidity	0%	100%
S1 to S8	Soil moisture	0%	100%
VIN	Input voltage	0V	100V
WL	Water level	0	4

Note: for water level, 1 is low, 2 is medium and 3 is full. 0 and 4 are non-active.

Note 2: input names are case insensitive. Meaning you can ask for *s1* or *S1*, *vin* or *VIN*, and so on.

DpOS Terminal

```
> alert

Select input:
> s1

min or max ?
> max

Enter max value:
> 70

Alert set correctly
```

It is also possible to check all alert levels at once with:

> *all*

> *read*

DpOS Terminal

```
> alert
Select input:
> all
read or reset ?
> read

*** List of all alerts ***
T:  Min: 0°C  Max: 100°C
RH:  Min: 0%  Max: 100%
S1:  Min: 0%  Max: 70%
S2:  Min: 0%  Max: 100%
S3:  Min: 0%  Max: 100%
S4:  Min: 0%  Max: 100%
S5:  Min: 0%  Max: 100%
S6:  Min: 0%  Max: 100%
S7:  Min: 0%  Max: 100%
S8:  Min: 0%  Max: 100%
VIN: Min: 0V  Max: 100V
WL:  Min: 0    Max: 4
```

While *reset* command brings back all values to default.

> **gmt**

Current time is displayed in mainbox screen at info page and while it is not an essential feature, it surely is handy for the light controller to switch ON and OFF at the right time.

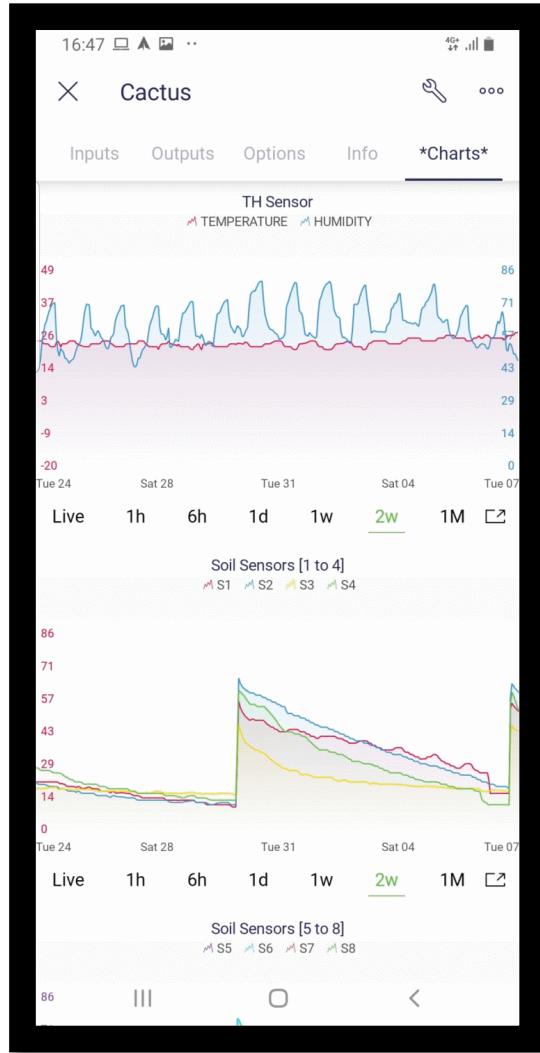
Timezone is stored in memory and can be updated with *gmt* command.

DpOS Terminal

```
> gmt
GMT + ? Enter value:
> 2
GMT set correctly - please reboot device
```

Note: simply add “-“ sign for negative timezone.

4.5. Charts



All sensors' data are recorded for display in *Charts* page.

There are 3 charts blocks:

- TH Sensor
- Soil Sensors [1 to 4]
- Soil Sensors [5 to 8] (*scroll down to visualize*)

You can change timeframe from *Live* values up to 1 month.

To get a specific value at any given time, press the screen and slide your finger to the desired time.

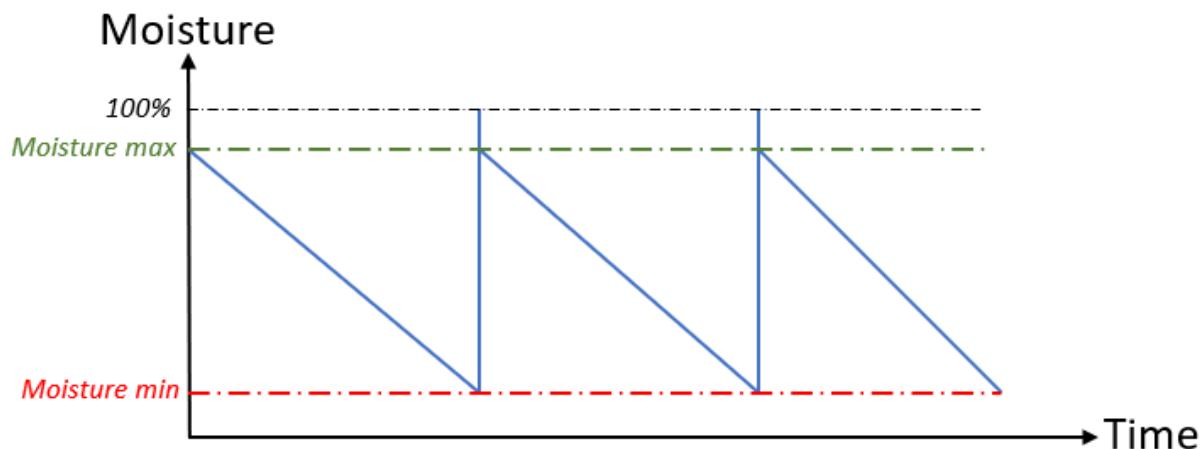


5. AUTOMATIC CONTROL

5.1. Water

One of Digiplant's key feature is the water controller for automatic watering.

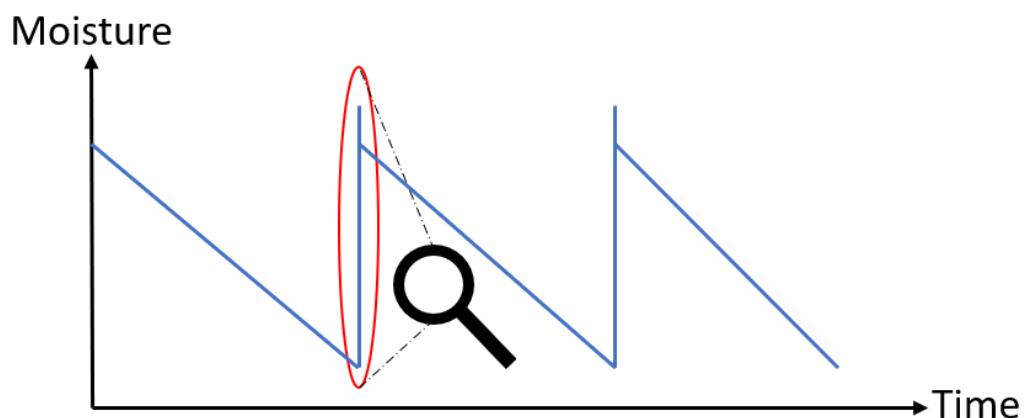
When a plant is monitored through a soil moisture sensor, the acquired data tends to always follow the same trend, as drawn below.

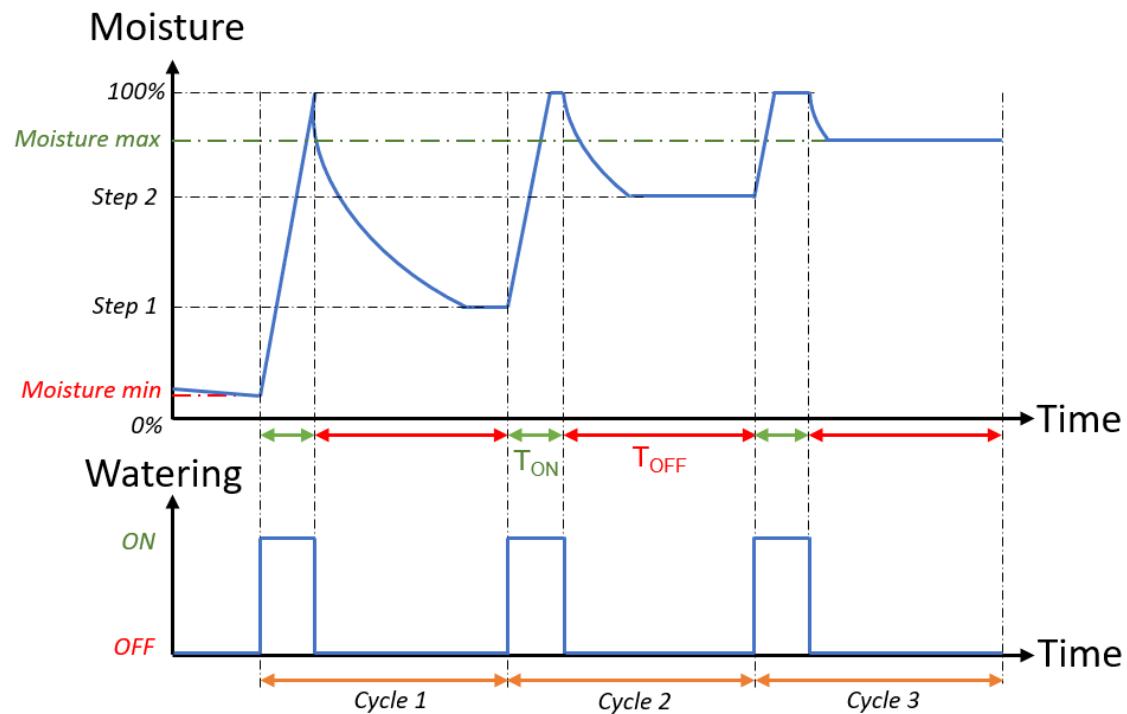


The descending slope of this saw-tooth will vary according to the plant type, size, age, climatic conditions, and so on.

This slope is a good indication of a plant's draining capability and vitality: steeper slope is most likely to indicate higher metabolism thus healthier plant.

Let's zoom at the watering moment.

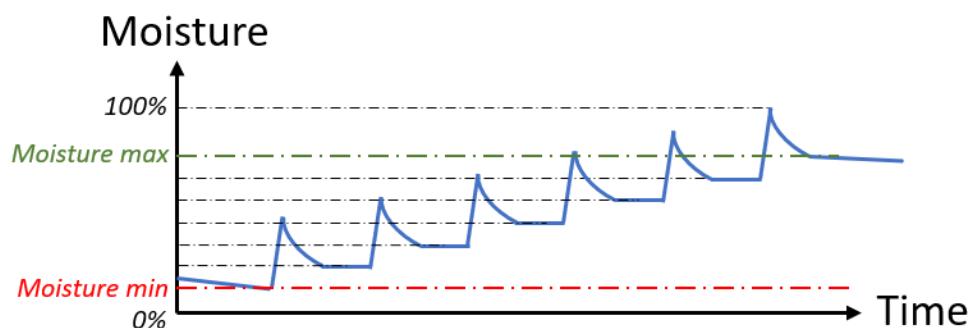




The watering process, either by an automated irrigation system or manually by the gardener, always follows these steps:

1. Water is poured into the soil
2. Sensor measures a quick rise of the moisture value
3. Water spreads into the soil in all direction
4. Soil moisture decreases to a steady-state level
5. Cycle is repeated until moisture steady-state value is close to target

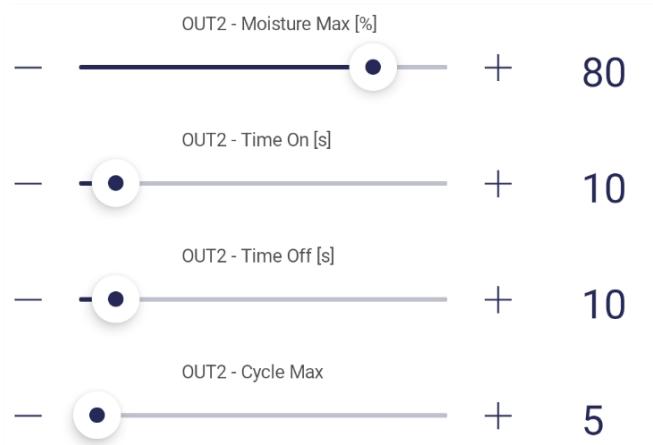
Note: in the above example, moisture rises to 100% but it can also rise to a lower value, depending on the water quantity poured into the soil. A good illustration is a drop-by-drop irrigation system, where each watering increases the moisture only by a small amount. See below.



There are 5 important parameters:

- Moisture min [%]
- Moisture max [%]
- Time ON [s]
- Time OFF [s]
- Cycle Max

You can tune each of these parameters according to your plants need.



For the water controller to operate, a soil sensor must be connected.

Soil 1 is linked to OUT1, Soil 2 to OUT2, and so-on until OUT4.

If soil measurement is inferior to *moisture min*, set in *Outputs* page, a new water cycle starts.

Output is ON for *Time On* seconds, then off for *Time Off* seconds.

Water controller checks if the new soil measurement is above *moisture max*. If not, cycle is repeated.

This cycle is repeated up to *Cycle Max*, until soil measurement is above *moisture max*.

Then it stops and wait for the next soil moisture drop below *moisture min*.

There are two safety conditions to protect the system.

First safety condition:

After first watering cycle, if soil moisture is not above *moisture min* it is considered a failure state, thus entering safety mode.

Two possible reasons:

- Irrigation system is not working properly
- Soil sensor is not positioned properly

This condition is a safety in case the water is not reaching the soil, to avoid flooding the floor.

Second safety condition:

After all the watering cycles (*Cycle Max* reached), if soil moisture is not above *moisture max* it is considered a failure state, thus entering safety mode.

Two possible reasons:

- Parameters are not tuned properly (*moisture max too high ? Cycle max too low ?*)
- Soil sensor is not positioned properly

This condition is a safety to indicate to the user to improve the watering tuning.

5.2. Light

If you use artificial light for your plants, it needs a timer to reproduce natural cycle.

Light controller enables a timer with *Light On/Off* parameters.

During the *Light On* period, the light is powered at the *intensity* defined in *Output* page.

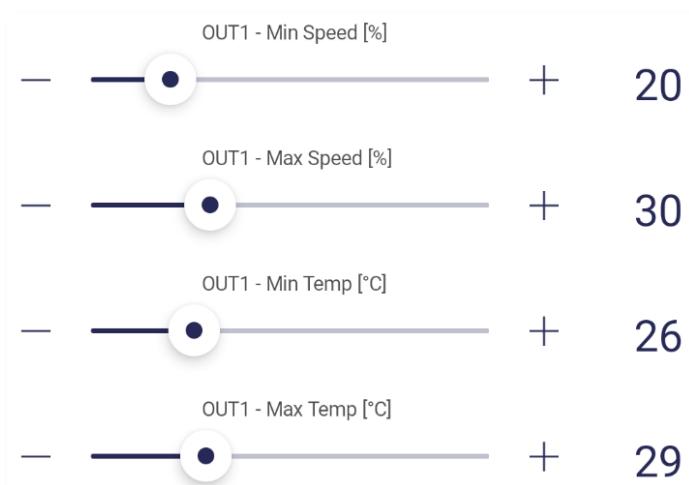
Important: If using a relaybox to drive an AC light panel, intensity must be set to 100%.



5.3. Fan

When fan controller is ON, fan speed is regulated according to ambient temperature.

For this purpose, 4 parameters are necessary:



When ambient temperature is equal to *Min Temp*, fan speed is set to *Min Speed*.

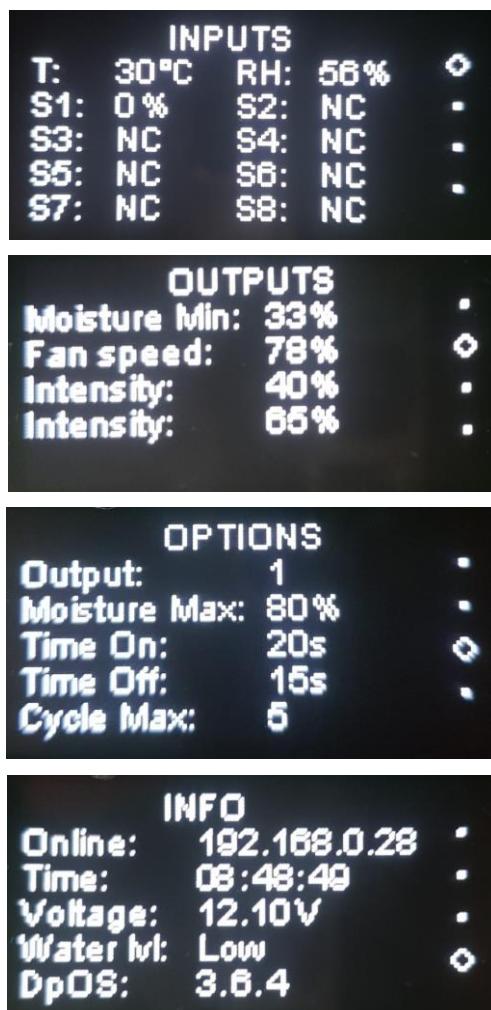
When ambient temperature is equal to *Max Temp*, fan speed is set to *Max Speed*.

Between *Min & Max Temp*, the fan controller adjusts linearly between *Min & Max Speed*.

Note: During auto ON, *Fan speed* slider in *Output* page is the live value set by the regulation. Moving this slider during auto ON has no effect.

6. MAINBOX USER GUIDE

Similarly to app, there are 4 main pages:



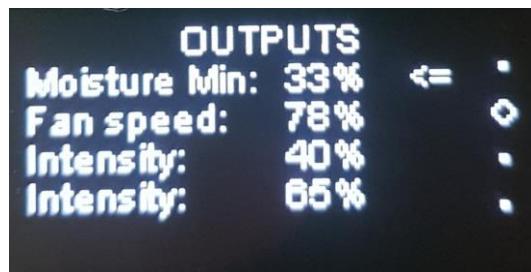
Rotate the knob to simply move between them.

For **OUTPUTS** and **OPTIONS** page, it is possible to modify parameters value with knob (rotation & push). There are 3 knob modes:

Mode	Pop-up	Rotation effect	Push effect
Page (default)	None	Change page	Enter <i>selection mode</i> (OUTPUTS & OPTIONS page only)
Selection	Arrow	Change arrow position or Exit <i>selection mode</i>	Enter <i>value mode</i>
Value	Blinking arrow	Increase or decrease value	Exit <i>value mode</i> (back to <i>selection</i>)

To change a parameter with knob:

- **Push** to enter *selection mode* (arrow appears)



- **Rotate** to highlight wanted parameter
- **Push** to enter *value mode* (arrow blinks)
- **Rotate** to change value
- **Push** to validate & exit *value mode*, back to *selection mode*
- **Rotate** beyond first or last line to exit *selection mode* back to *page mode*

You can observe how any modification is reported to the app, and vice versa.

7. WARRANTY

Digiplant Corporation ('Digiplant') warrants this product to the original purchaser to be free from defects in material and workmanship, under normal use and conditions, for a period of **2 years** from the date of original purchase.

Digiplant agrees, at our option during the warranty period, to repair any defect in material or workmanship or furnish an equal product in exchange without charge, subject to verification of the defect or malfunction and proof of the date of purchase.

There is no other express warranty. This warranty does not apply:

- If the product has been modified from its original condition;
- If the product has not been used in accordance with directions and instructions in the user manual,
- To damages or defects caused by accident, abuse, misuse or improper or inadequate maintenance;
- To damages or defects caused by service or repair of the product performed by an unauthorized service provider or by anyone other than Digiplant;
- To damages or defects occurring during commercial use, rental use, or any use for which the product is not intended;
- To damages or defects exceeding the cost of the product.

Digiplant will not be liable for indirect, incidental, or consequential damages in connection with the use of the product covered by this warranty.

This warranty extends only to the original consumer purchaser of the product and is not transferable to any subsequent owner of the product regardless of whether the product is transferred during the specified term of the warranty.

This warranty does not extend to products purchased from unauthorized sellers. Digiplant's warranty extends only to products purchased from authorized sellers that are subject to Digiplant's quality controls and have agreed to follow its quality controls.

All implied warranties are limited to the period of this limited warranty.

This warranty gives you specific legal rights and you may also have other rights which vary from state to state. Some states do not allow the exclusion or limitation of incidental or consequential damages, so the above limitation or exclusion may not apply to you.

If you discover that your product is defective within the specified warranty period, please contact customer support via support@digiplant.com.

DO NOT dispose of your product before contacting us. Once our Customer Support Team has approved your request, please return the product with a copy of the invoice and order ID.

Every Digiplant product automatically includes a 2-year warranty. To make the customer support process quick and easy, register your product online at www.digiplant.com/warranty.

This warranty is made by:

Digiplant SAS

31 Avenue de Ségur

75007 Paris, FRANCE

8. FCC STATEMENT

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

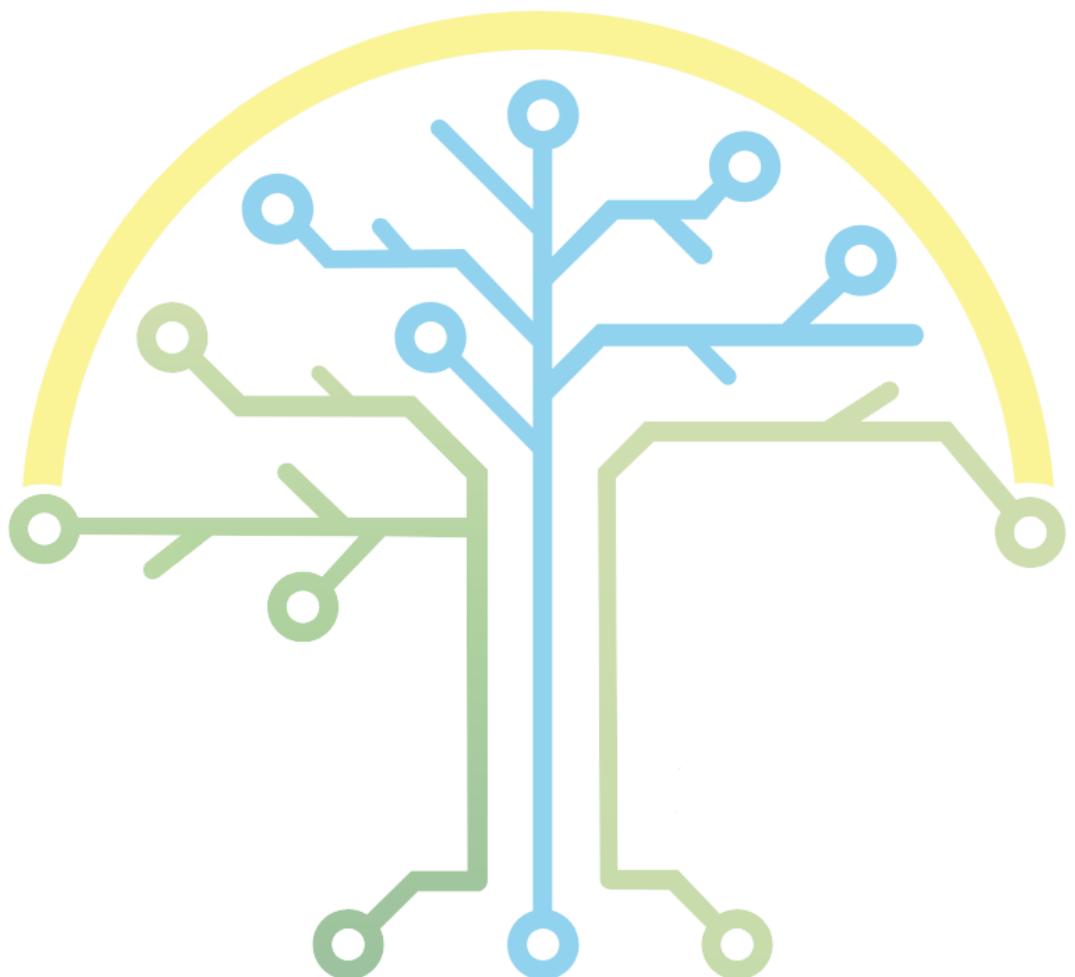
Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation.

If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with minimum distance 20cm between the radiator and your body. This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.



*Digiplant® and its logos are a registered trademark property of the Digiplant company
Company registered at Paris trade court - RCS 882 013 667
Registered office at 31 Avenue de Segur 75007 Paris*