

# SwitchDoc Labs

## The Smart Garden System Version 2 Blynk Configuration

July 2020  
Version 1.2





# SmartGarden System

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## Why you should build this project

Imagine buying a fully functional computer for \$35 and then tracking the weather at your home, and even watering your houseplants from your phone? Imagine learning a little about electronics without messing with soldering, resistors, and transistors? Ever been curious about “coding” but have no interest in taking a class? This great little project will take you less than six hours at your kitchen tables and when you are done, you will know:

- What a solenoid and valves do
- The purpose of a relay
- Python Coding Language
- How simple computer works
- How stuff connects to the Internet and your phone

This is the ultimate IoT you have been reading about – the Internet of Things. If you are a tinkerer and love to invent stuff, this is for you. Engage your kids and learn something new together!

## What is Blynk

Blynk is a digital dashboard for your iOS or Android device that allows you to easily build graphical interfaces by dragging and dropping widgets. Blynk runs on iOS and Android apps to control Arduino, Raspberry Pi and the likes over the Internet.

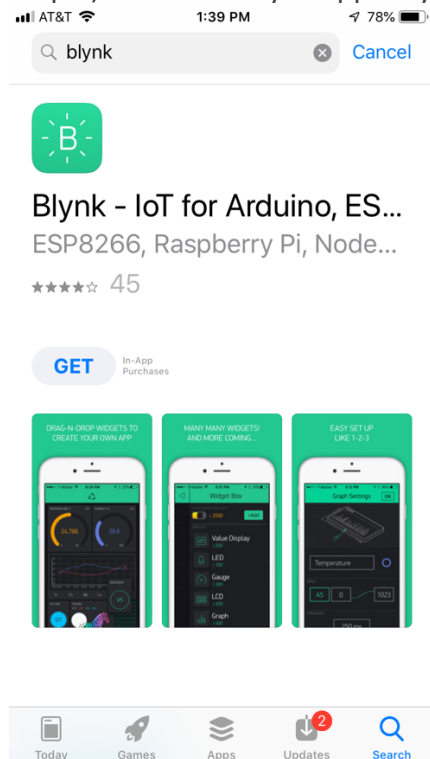
It's a digital dashboard where you can build a graphic interface for your project by simply dragging and dropping widgets.

## Ready to begin!

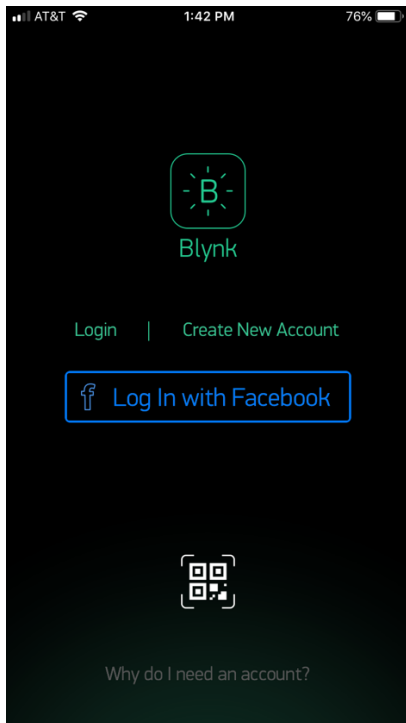
Blynk can be installed on either Android based or iOS based devices. The following is for the iPhone, but it is very similar to installing on an Android based phone.

### Step by Step Instructions for Blynk

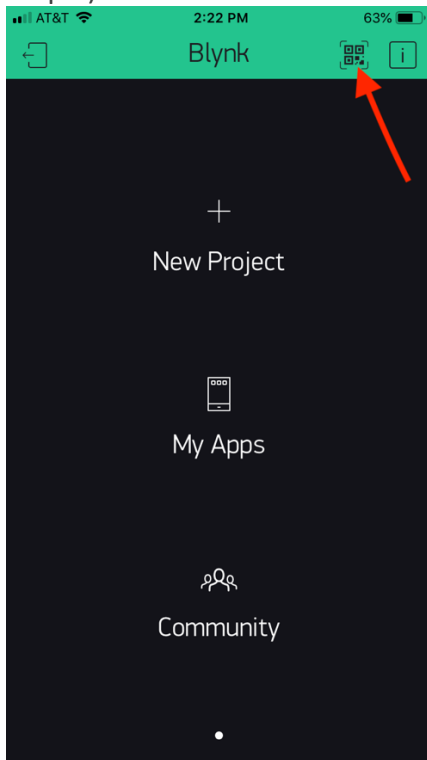
Step 1) Install the Blynk app on your mobile phone



Step 2) Open the Blynk app and create an account

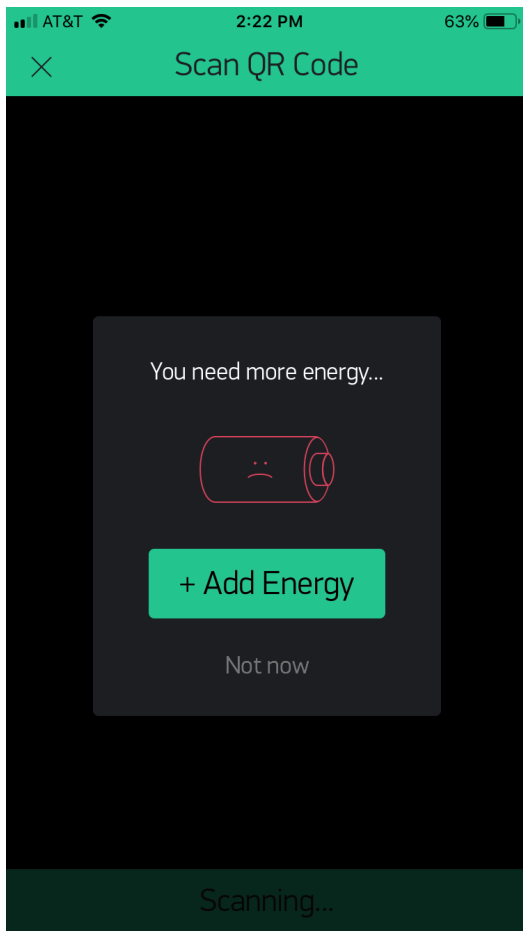


Step 3) Now click the button to scan a QR (see arrow)

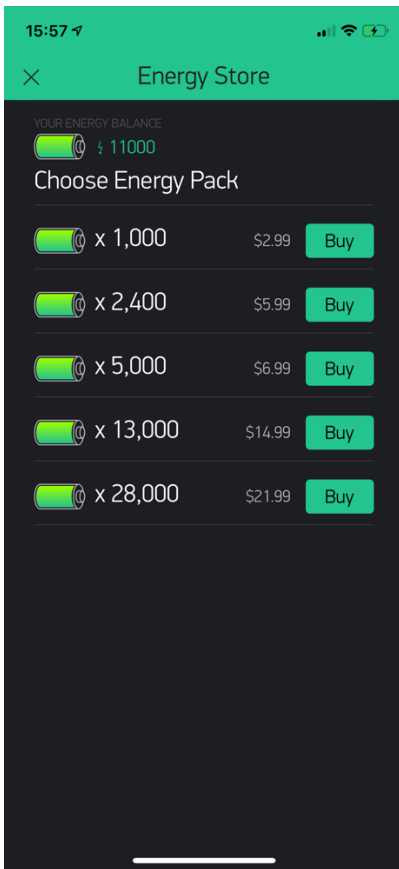


4) The current QR code for your Blynk App is located on the Smart Garden System product page. This QR code contains all the Blynk App programming so you can add new fields and new screens if you wish. This does require adding Python code to the Smart Garden System.

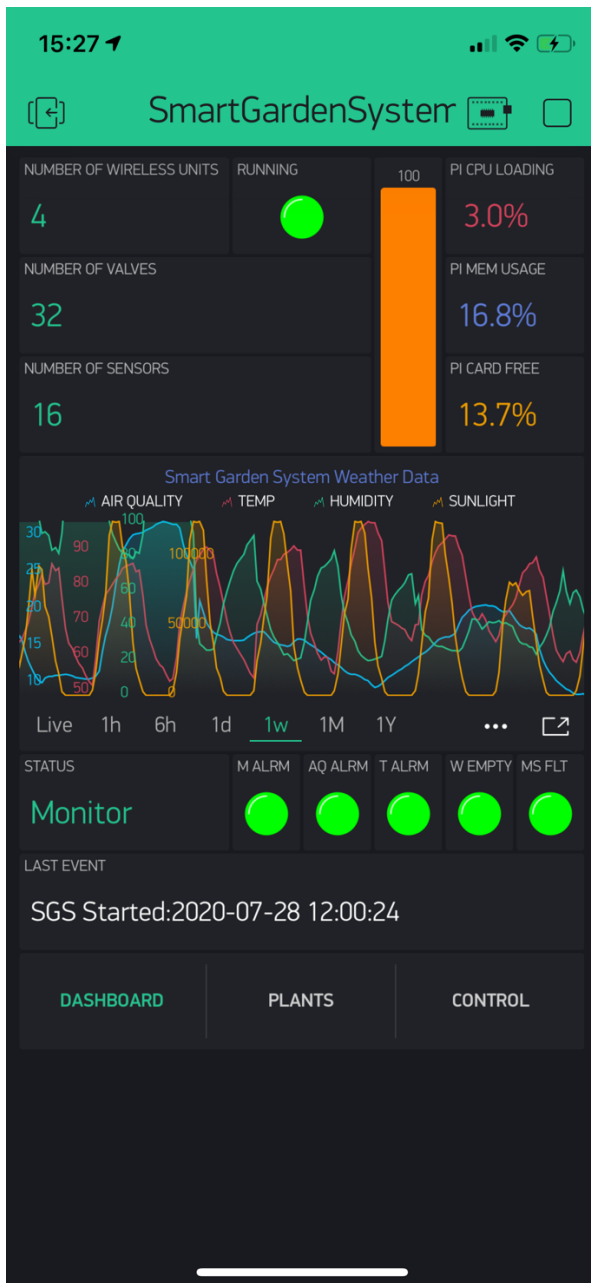
<https://shop.switchdoc.com/products/smart-garden-system-v2-raspberry-pi-based-smart-gardening-kit-no-soldering>



Step 5) Add Energy. The Smart Garden System requires a total of 9900 Blynk energy. You start your account with 2000, so you need to purchase 7900 Blynk Energy. As of this writing, it will cost about \$10.00. It varies according to your location and the time of the month. SwitchDoc Labs does not control this pricing and we don't receive any amount of this. It is controlled by Blynk.

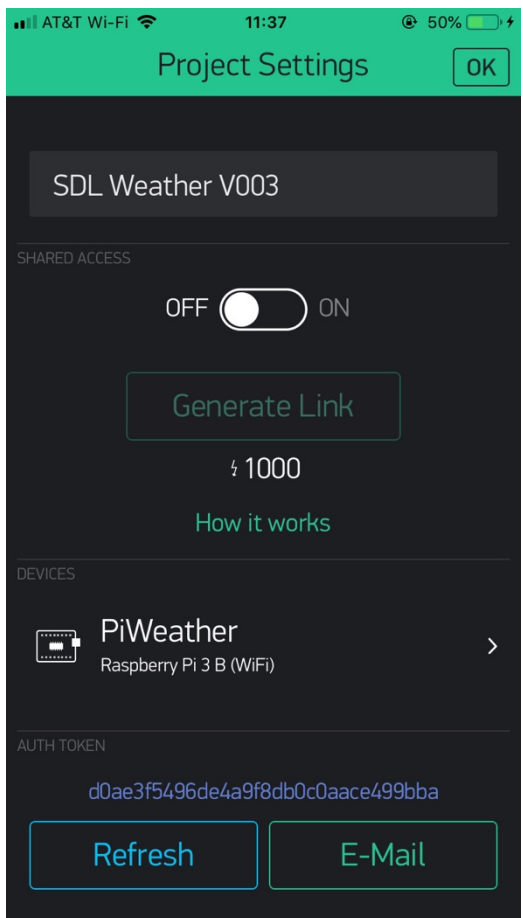
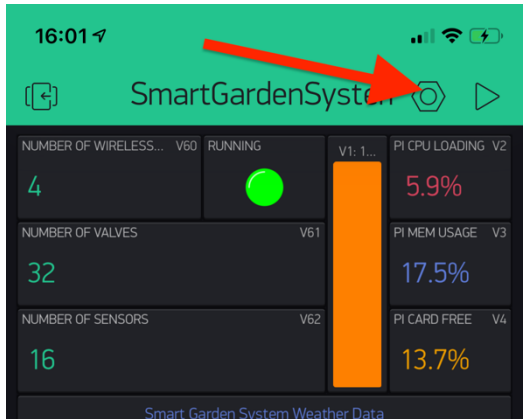


Step 6) Scan the QR code again. You will now see the Smart Garden System App on your screen.



Step 7) Click in middle of the project to select the project. Then click the indicated button to go to project settings. Now copy and paste or email yourself the authentication token (AUTH TOKEN) as we will be putting this in the SGSConfiguration program in the next section. The one below WILL NOT WORK. You need your own.

Your screens will look somewhat different than the ones below.



You have completed the Blynk Smart Garden System App installation.

## Installing the Blynk Authentication Code into the Smart Garden System

The final step to connecting your Smart Garden System to the Smart Garden System App is to copy your Authentication Token (AUTH TOKEN above) to the proper field in the SGSConfigure page. Note: You should have already completed the configuration of the Smart Garden System. If you haven't done this, go back to the Smart Garden System Assembly and Test manual and complete those tasks.

Step 1) Open up SGSConfigure by doing this:

Run SGSConfigure.py

```
sudo python3 SGSConfigure.py
```

You will see something like this:

```
pi@SwitchDocLabs:~/SDL_Pi_SmartGardenSystem2 $ sudo python3 SGSConfigure.py
SGSConfigure.py:24: DeprecationWarning: AppURLopener style of invoking requests is deprecated. Use
newer urlopen functions/methods
  myURLopener = AppURLopener()
remi.server      INFO      Started httpserver http://0.0.0.0:8001/
remi.request     INFO      built UI (path=/)
SGS.JSON File does not exist
SGSConfiguration.JSON File does not exist
```

Now open up a browser window (either on the Raspberry Pi or on another computer on your local WiFi network) and enter this URL:

On your Raspberry Pi: <http://127.0.0.1:8001/>

On another computer type: <http://xxx.xxx.xxx.xxx:8001/>

Where "xxx.xxx.xxx.xxx" is the IP address of your Raspberry Pi.

You will see something like this screen on your browser:



# SmartGarden System

Smart Garden System Configuration Tool V003

Save

Cancel

Save and  
Reload SGS

Reset to Defaults

Save and Exit

SGS Configure Valve Report Name Change DM MTN PSMAX WS-WU B-TB Pins CMQTTR


ReScan For SGS Hardware

Scanning IP: N/A

Found Wireless  
Extenders: 1

Corn Rows / 8EDD / 192.168.1.38

Step 2) Click on the “B-TB” Tab and you will see the following.



# Smart Garden System

Smart Garden System Configuration Tool V003

Save Cancel Save and Reload SGS

Reset to Defaults

Save and Exit

SGS Configure Valve Report Name Change DM MTN PSMAX WS-WU **B-TB** Pins CMQTTR

Blynk / ThunderBoard AS3935 Tab

## Blynk Configuration

☐ Enable Blynk

Blynk App Authorization

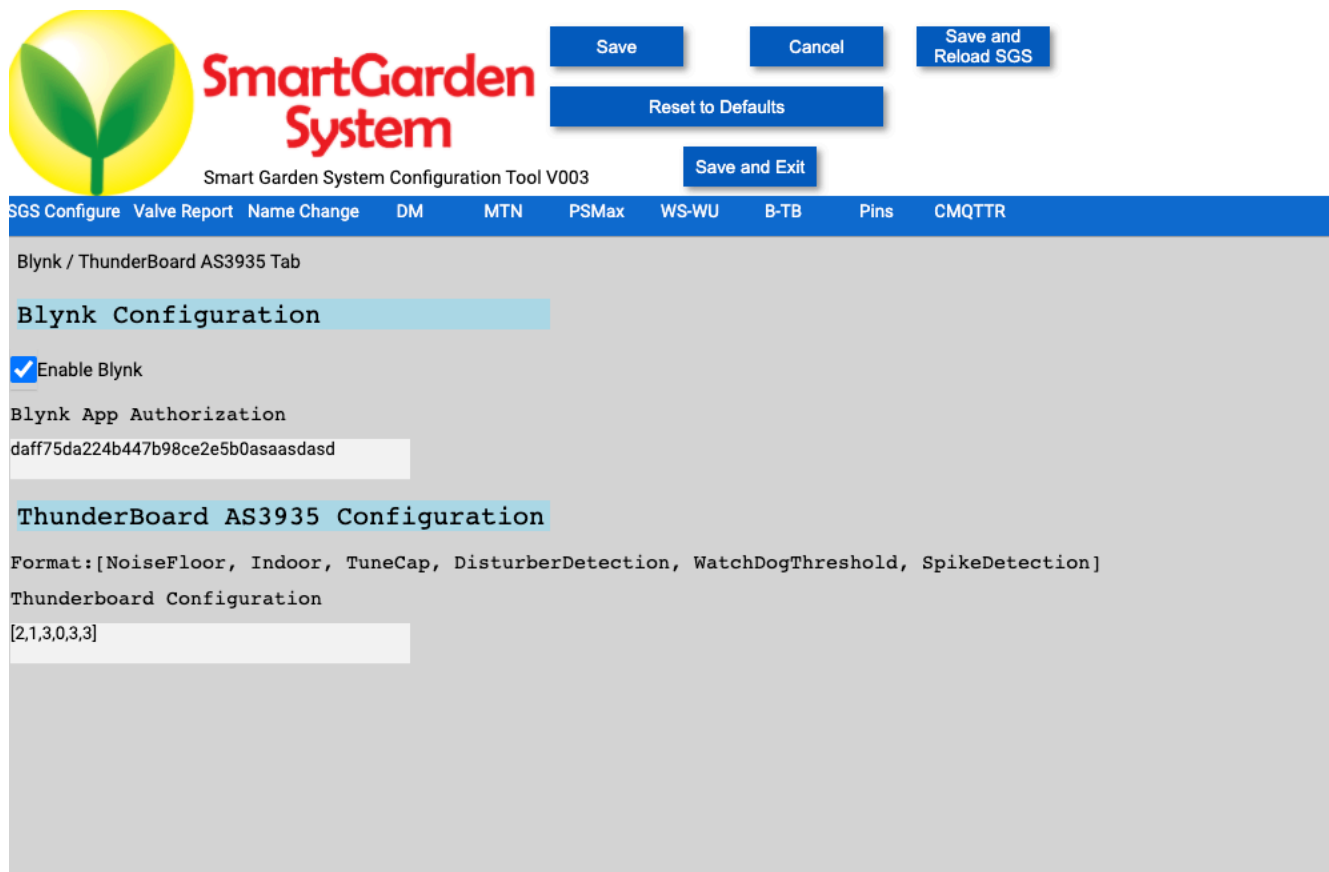
## ThunderBoard AS3935 Configuration

Format:[NoiseFloor, Indoor, TuneCap, DisturberDetection, WatchDogThreshold, SpikeDetection]

Thunderboard Configuration

[2,1,3,0,3,3]

Step 3) Copy your Blynk Authentication Code and check the Enable Blynk check box. You must use your authentication code. The one below will not work.



The image shows the 'Smart Garden System Configuration Tool V003' web interface. At the top left is a logo with a green plant inside a yellow circle. To its right is the text 'SmartGarden System' in red and black. Below this is 'Smart Garden System Configuration Tool V003'. On the right side, there are five blue buttons: 'Save', 'Cancel', 'Save and Reload SGS', 'Reset to Defaults', and 'Save and Exit'. Below the buttons is a blue navigation bar with links: 'SGS Configure', 'Valve Report', 'Name Change', 'DM', 'MTN', 'PSMax', 'WS-WU', 'B-TB', 'Pins', and 'CMQTTR'. The main content area has a header 'Blynk / ThunderBoard AS3935 Tab'. Below it is a section titled 'Blynk Configuration' with a blue highlight. Under this section is a checked checkbox labeled 'Enable Blynk'. Below that is 'Blynk App Authorization' with a text input field containing 'daff75da224b447b98ce2e5b0asaasdasd'. Another section titled 'ThunderBoard AS3935 Configuration' has a blue highlight. Below it is 'Format:[NoiseFloor, Indoor, TuneCap, DisturberDetection, WatchDogThreshold, SpikeDetection]' and 'Thunderboard Configuration' with a text input field containing '[2,1,3,0,3,3]'. The background is light gray.

Step 4) Now click on “Save and Reload SGS” button wait a few minutes and you should see data start coming up on your Blynk app.

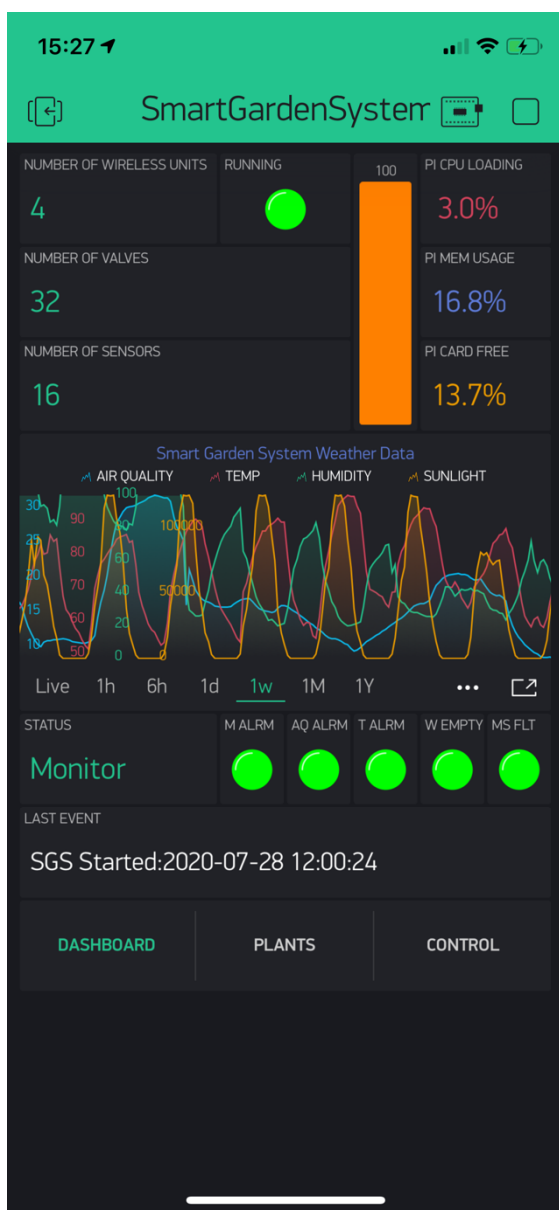
If SGS2 was not running at this time, start the Smart Garden System program now. (sudo python3 SGS2.py)

What is in the Smart Garden System Blynk App?

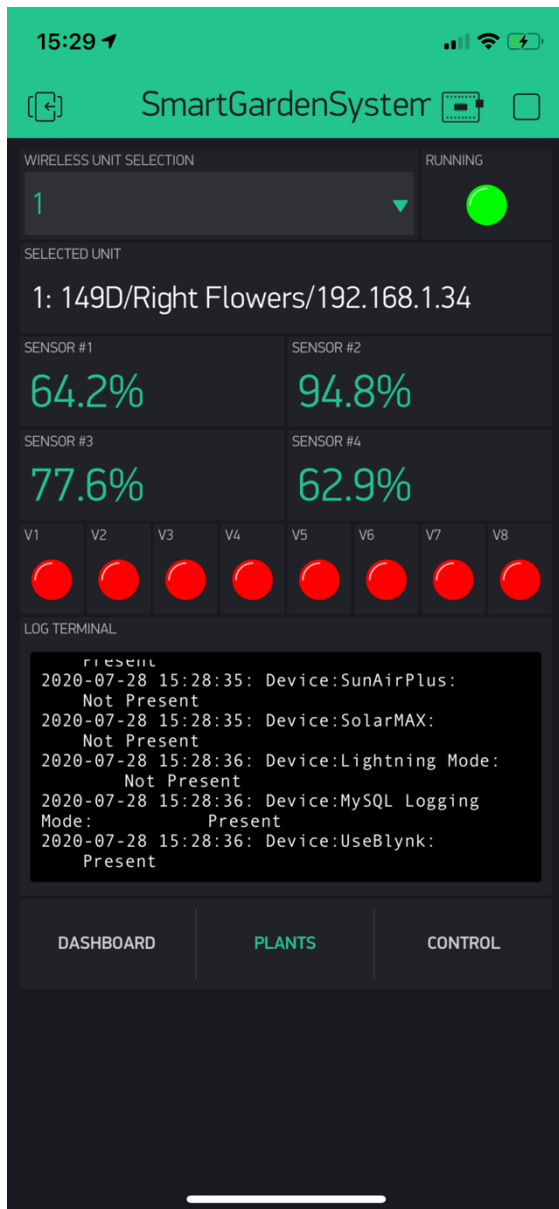
There are three screens in the Blynk App. They are:

- **Dashboard** – Shows the current overall state of the Smart Garden System and the Raspberry Pi. The graphs are from the option Weather Add-in Kit.
- **Plant** – Shows the status of sensors and valves on the selected SGS Wireless Extender
- **Control** – Allows manual control of all the Smart Garden System Valves and pumps on all of the Wireless Sensors. **Note for educators: Manual Control can be turned off in the SGSConfigure program. So students can look at the status without being able to turn pumps on and off. Look under the “DM” tab for the “enable Manual Watering” checkbox.**

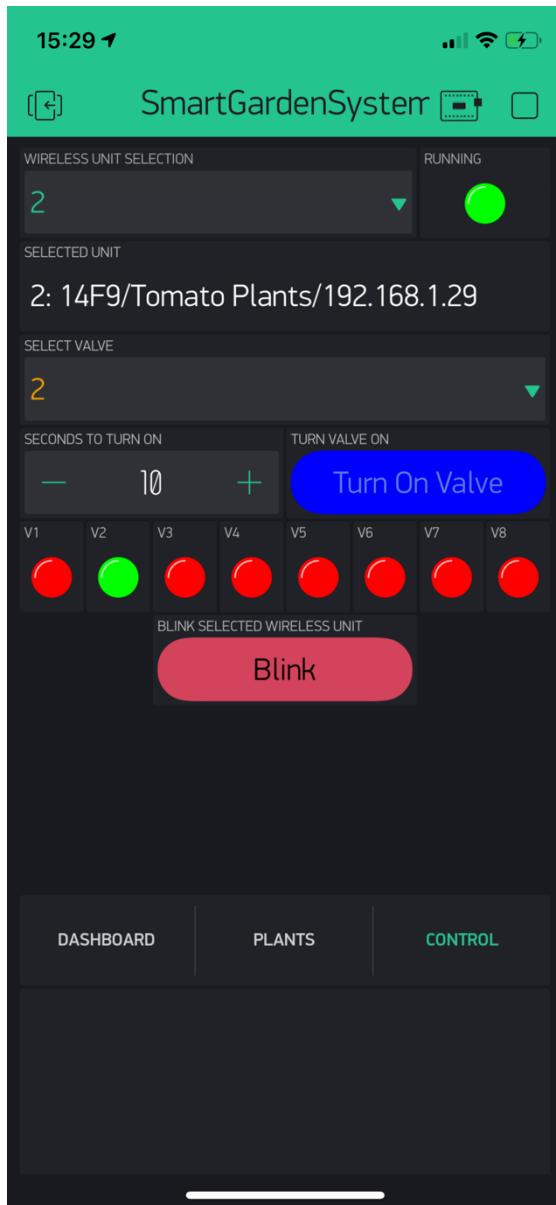
Dashboard Screen



- **Number of Wireless Units** – How many Wireless Units you have in your SGS
- **Number of Valves** – Number of Valves/Pumps/etc. in your SGS
- **Number of Sensors** – Number of Sensors in your SGS
- **Running** – LED Blinks green when SGS is reading and updating the state of your Blynk App
- **Active Wireless Units** – A Graph of the number of Active Wireless Units in your SGS system. If one or more of your units go off line, this will decrease from 100%.
- **Pi CPU Loading %** - current Pi CPU loading. Pi 4's can go up to 400%!
- **Pi Mem Usage %** - How much memory is currently being used in your Pi
- **Pi SDCard Free %** - How much space is left on your Pi SDCard
- **Weather Data from Weather Add-on Kit**
  - **Air Quality** – 24 hour Average AQI
  - **Outside Temperature** – In C or F depending on your setting
  - **Outside Humidity** – Percent Relative Humidity
  - **Sunlight** – in Lux
- **Status** – Current state of the SGS system
- **Alarm List** (Not currently implemented)
- **Last Event** – Last significant event
- **Screen Tabs** – Use to navigate to other screens



- **Wireless Unit Selection** – Select which Wireless Unit to Display. *Note: Due to a problem in the Blynk App Interface we have to use cardinal numbers here rather than a description of the Wireless Unit. After selecting a number, wait for the Running LED to blink and then you will see the Full Wireless unit information in the “Selected Unit” block.*
- **Running** - LED Blinks green when SGS is reading and updating the state of your Blynk App
- **Selected Unit** – Displays the Wireless unit information of the select number in the Wireless Unit Selection Screen
- **Sensor #1 – #4** – Displays the current moisture sensor values of the selected wireless unit.
- **V1 – V8** – Displays current On / Off states of the Valves (pumps, etc.) of the selected wireless unit.
- **Log Terminal** – Shows the latest log entries from the Smart Garden System. Scrollable.
- **Screen Tabs** – Use to navigate to other screens



- **Wireless Unit Selection** – Select which Wireless Unit to Display. Note: Due to a problem in the Blynk App Interface we have to use cardinal numbers here rather than a description of the Wireless Unit. After selecting a number, wait for the Running LED to blink and then you will see the Full Wireless unit information in the “Selected Unit” block.
- **Running** - LED Blinks green when SGS is reading and updating the state of your Blynk App
- **Selected Unit** – Displays the Wireless unit information of the select number in the Wireless Unit Selection Screen
- **Select Valve** – Number of the Valve to be turned On for the “seconds to turn on” when the “Turn On Valve” button is pushed.
- **Seconds to Turn On** – How many seconds to turn the selected Valve on. Note: This overrides the current state of the valve. If the valve (or light) is on for 100 seconds and you click the Turn Valve On button, the Valve will stay on for 10 seconds and then turn off until the next event from the Smart Garden System program.
- **Turn Valve On** – Clicking this button turns on the selected valve for the length of time specified. It will turn on when you see the Running LED blink green. The Valve LED will then illuminate shortly after that.
- **V1– V8** - Displays current On / Off states of the Valves (pumps, etc.) of the selected wireless unit.
- **Blink Selected Wireless Unit** – Clicking this button will flash the Pixel LED on the front of the selected Wireless Unit.

## Support

As with all SwitchDoc Labs products, technical support is given through the forums on [Forum.switchdoc.com](http://Forum.switchdoc.com). If you have issues that can be solved by our fabulous customer service department, please go to [www.switchdoc.com](http://www.switchdoc.com) and send your issues through our Contact page on the top menu.

## Disclaimer

SwitchDoc Labs, LLC takes no responsibility for any physical injuries and possession loss caused by those reasons which are not related to product quality, such as operating without following the operating manual and cautions, natural disasters, or force majeure.

SwitchDoc Labs, LLC has compiled and published this manual which covers the latest product description and specification. The contents of this manual are subject to change without notice.