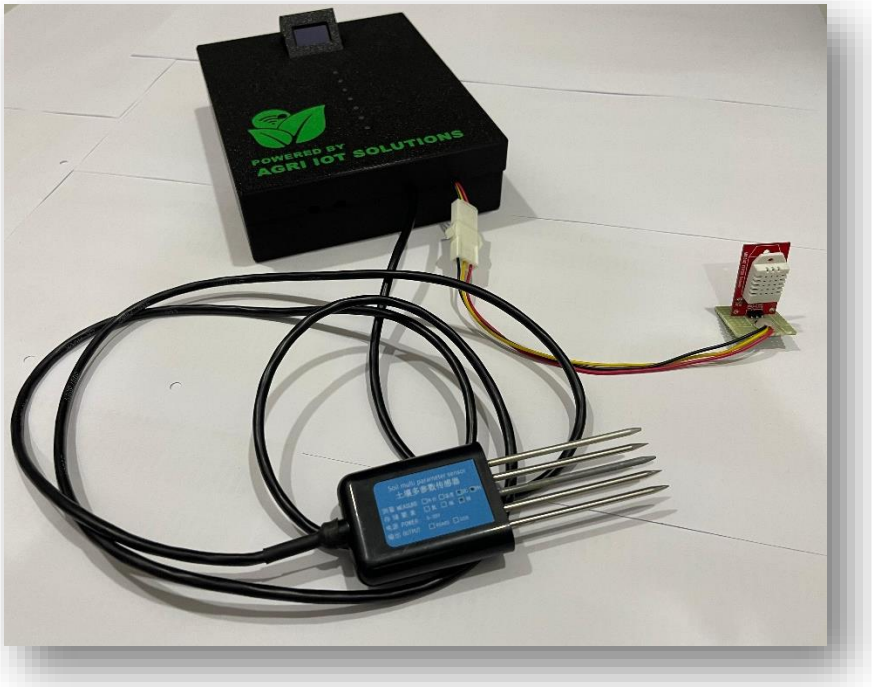
User Manual for Agri Sense V1.0



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Agri IOT Solutions

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What is Agri Sense V1.0?

Welcome to the user manual for the **"Agri Sense V1.0"**. This system automates the key aspects of greenhouse management, irrigation and nutrient controlling, temperature and humidity controlling, monitoring greenhouse environment properties with web application, monitoring and controlling greenhouse environment properties with mobile application and optimize plant growth.

For Users

First Carefully read this user manual to familiarize with the Agri Sense and get brief idea about features, functions and mechanism. Understand how to build and connect the system and maintain the device for optimal performance.

1. Installation Tips

- Choose a right location to place the Agri Sense to get accurate result. This unit gives the best result in a controlled environment like Greenhouse and is designed to control and continue the controlled system environment.
- After system installation give minimally 24 hours to the system, initialize the data and power up to the saturation mode.
- Take the support from the user manual and do the installation of the mobile application, web application and connect with hardware.
- After power goes up to saturation mode you only need to open the greenhouse for device cleaning, device maintenance and pick up the harvest.
- Always refer to the user manual for correct wiring, setup and operating instruction.
- If you notice any unnatural reading or behavior in circuit and can't sort it by using this manual, please get our technical support and guidance.

2. Additional Guidance

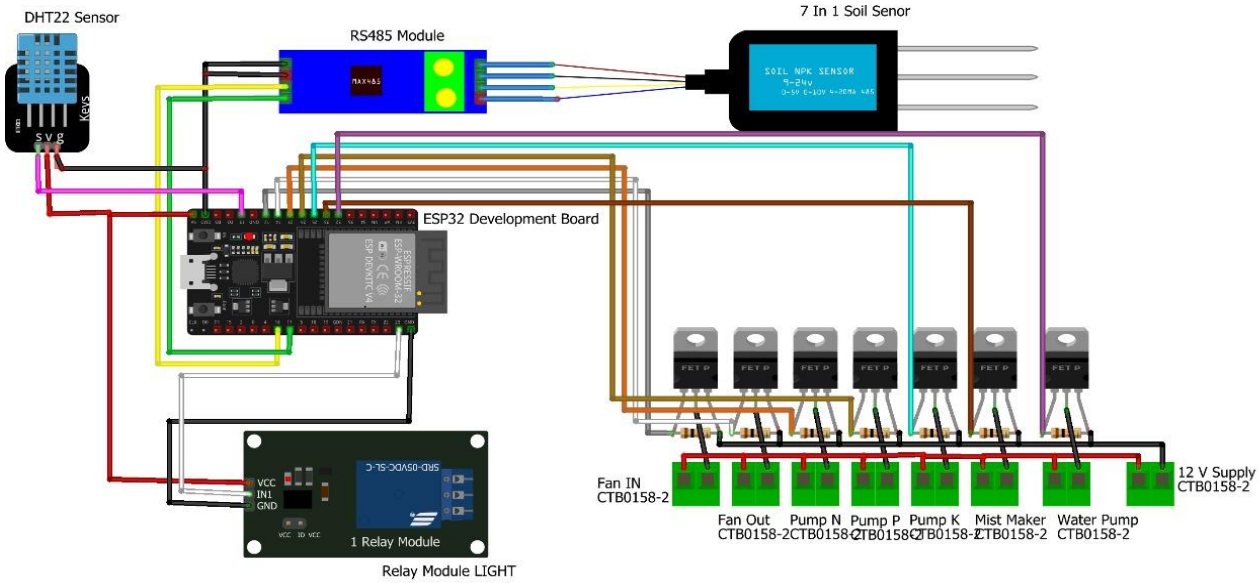
- Always keep the main circuit, electronics and power supplies dry and clean.
- Protect your device from high voltage and supply the voltage as mentioned on the enclosure.
- NPK sensor probes are very sensitive and handle the device with care.
- Always use the accessories that provide with the Agri Sense.
- Before connecting and cleaning the device, remove the power and perform any other works.

System features and setup procedures

In this system we are providing,

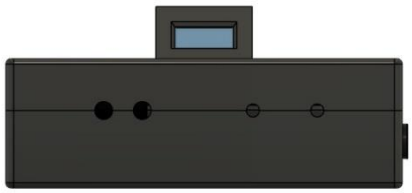
- **Hardware system.**
- **Mobile Application.**
- **Web Application.**

1. Hardware setup

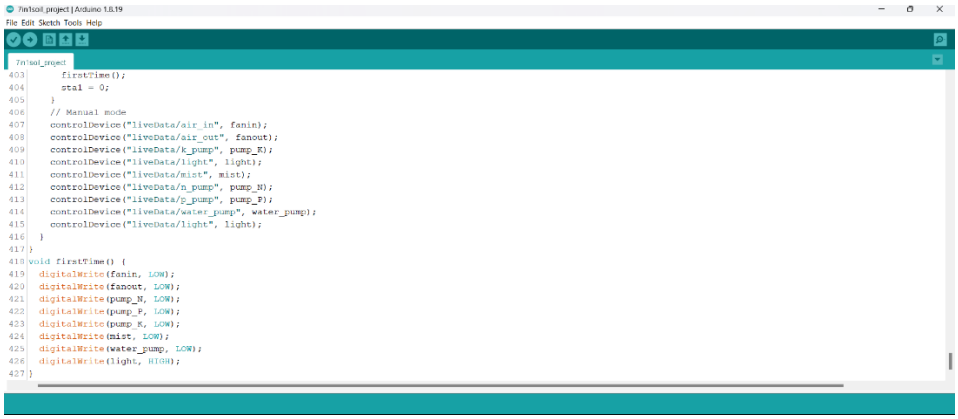


- All the wiring paths were done as above-mentioned image.

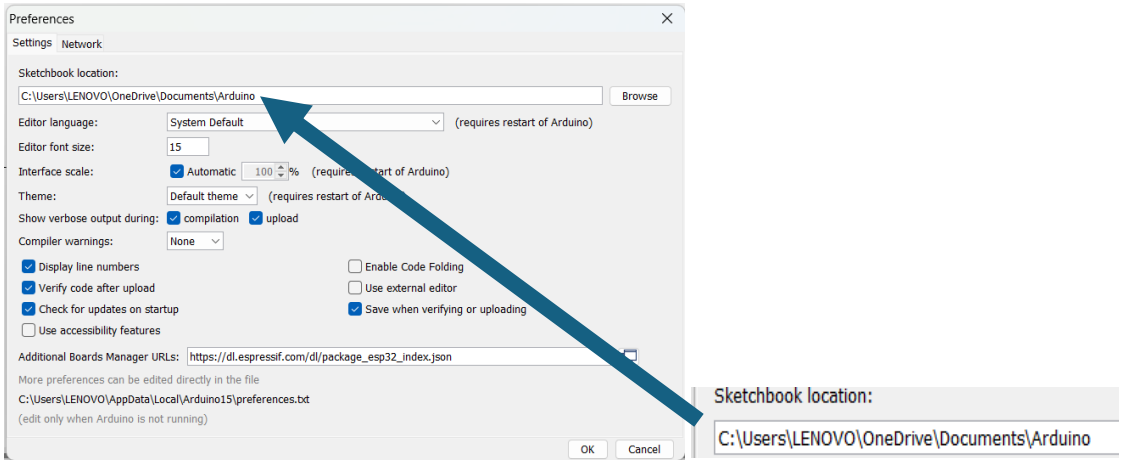
- Only you must do is connect actuators to the device. 5VDC power Supply, fan in socket, fan out Socket, N pump Socket, P pump Socket, K pump Socket, mist maker Socket, Water pump socket, 12VDC power Supply (Right to Left).



- Switching is doing by IRF540N power mosfet and only one Relay module is working with 230VAC (AC inputs which are given to the relay can connected through left side two holes) to control light bulb in the green house. (Only working in manual mode)



- Install Arduino IDE - (https://downloads.arduino.cc/arduino-1.8.19-windows.exe} and download the libraries folder in this google drive given below mentioned (https://drive.google.com/drive/folders/19PATxCn9Ce1EbG0z-U4M_lE40wHa_QfO?usp=drive_link) and replace it to the system library file. (library file in this location **file → Preferences**)



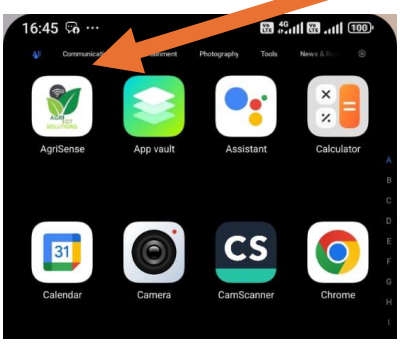
- Then upload the code to Arduino IDE and upload it to the ESP 32 board. (Code file is in same google drive).
- Finally connect actuators to the system and attach them to the greenhouse.




- If there is any error with sensor (not include NPK sensor) or ESP 32 module refer to the manual. If it's not sorted by them replace them as previously connected.
- If there is any error with actuators refer to the manual. If it's not sorted by them, you can replace them with new ones.
- If you note NPK readings are not correct, please take our technical team support to solve the problem.

2. Software setup

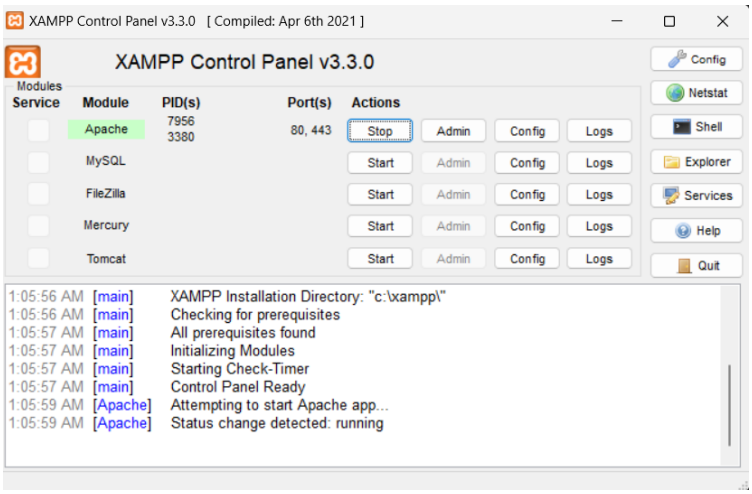
- Download the APK from this google drive given below mentioned (https://drive.google.com/drive/folders/19PATxCn9Ce1EbG0z-U4M_lE40wHa_QfO?usp=drive_link). You can see the app in your mobile wallet.



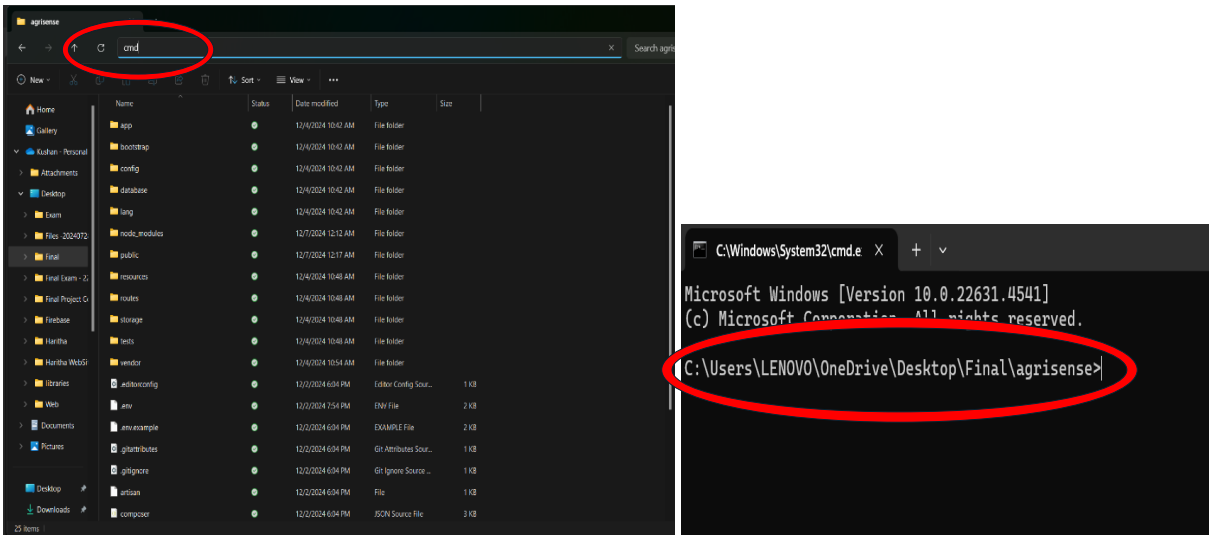
- Features: Live data feed, History & charts, Plant registration, Auto/manual mode.
- For any other requirements, fixing errors or further information please contact our technical team.

3. Web Application setup

- When you are buying the device our team setup your device. You can open the web application by using these commands in **“command prompt terminal”.**
- Before that open XAMPP and start Apache server (Download - https://sourceforge.net/projects/xampp/files/XAMPP%20Windows/8.2.12/xampp-windows-x64-8.2.12-0-VS16-installer.exe).



- Open the web application file and open the Command prompt in that folder.



- Type **“Code .”** and open VS code software.

```
C:\Users\LENOVO\OneDrive\Desktop\Final\agrisense>code .
```

- Then give **“npm install”** command.
- If this msg is not coming give these two commands and again run **“npm install”** command. (**Get-ExecutionPolicy** & **Set-ExecutionPolicy -Scope Process -ExecutionPolicy Bypass)**

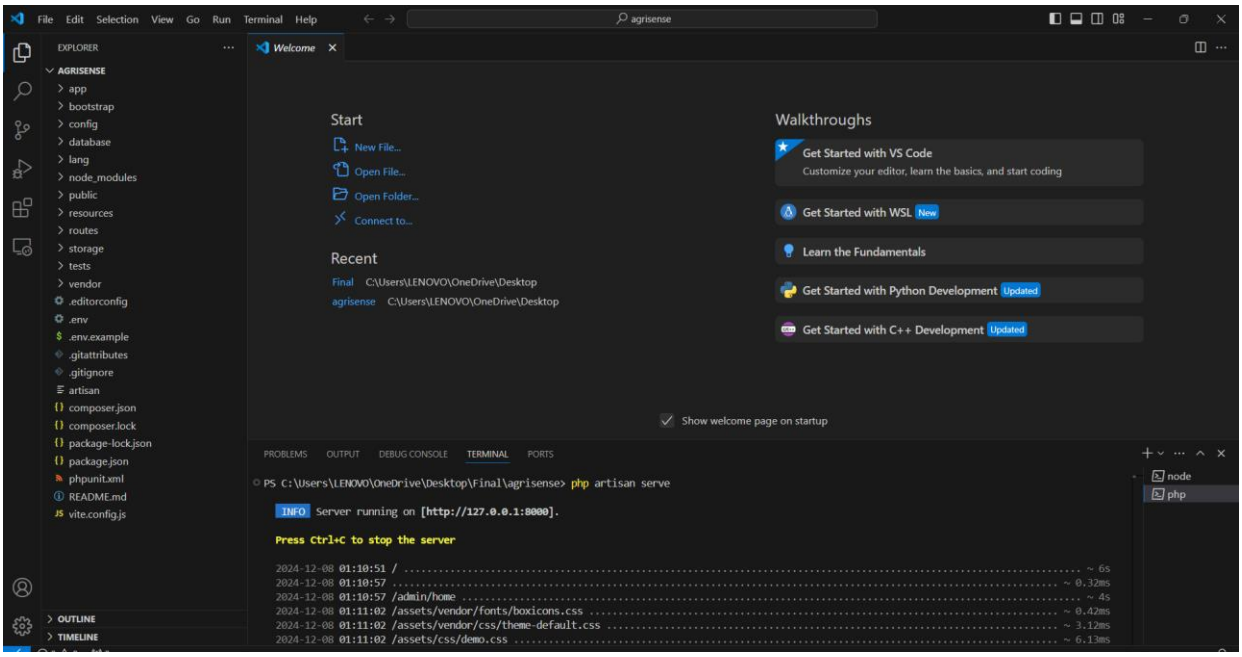
```
Microsoft Windows [Version 10.0.22631.4541]
(c) Microsoft Corporation. All rights reserved.

C:\Users\LENOVO\OneDrive\Desktop\Final\agrisense>Get-ExecutionPolicy
```

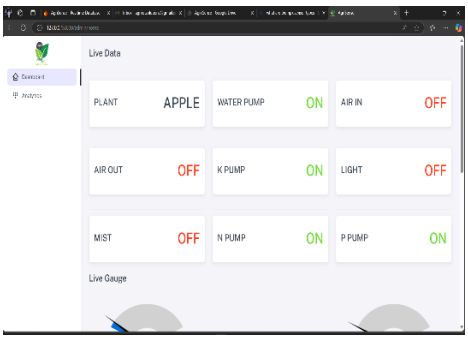
```
Microsoft Windows [Version 10.0.22631.4541]
(c) Microsoft Corporation. All rights reserved.

C:\Users\LENOVO\OneDrive\Desktop\Final\agrisense>Set-ExecutionPolicy -Scope Process -ExecutionPolicy Bypass
```

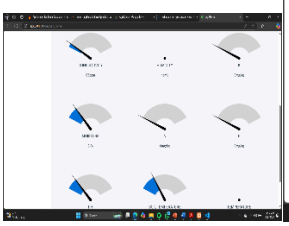
- Then give **“npm run dev”** command.

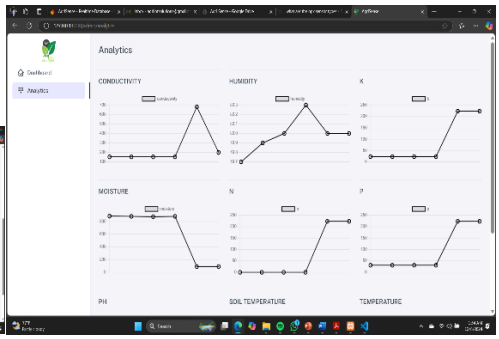
```
PS C:\Users\LENOVO\OneDrive\Desktop\Final\agrisense> npm run dev
```

- Finally give **“php artisan serve”** and take the address and load the website

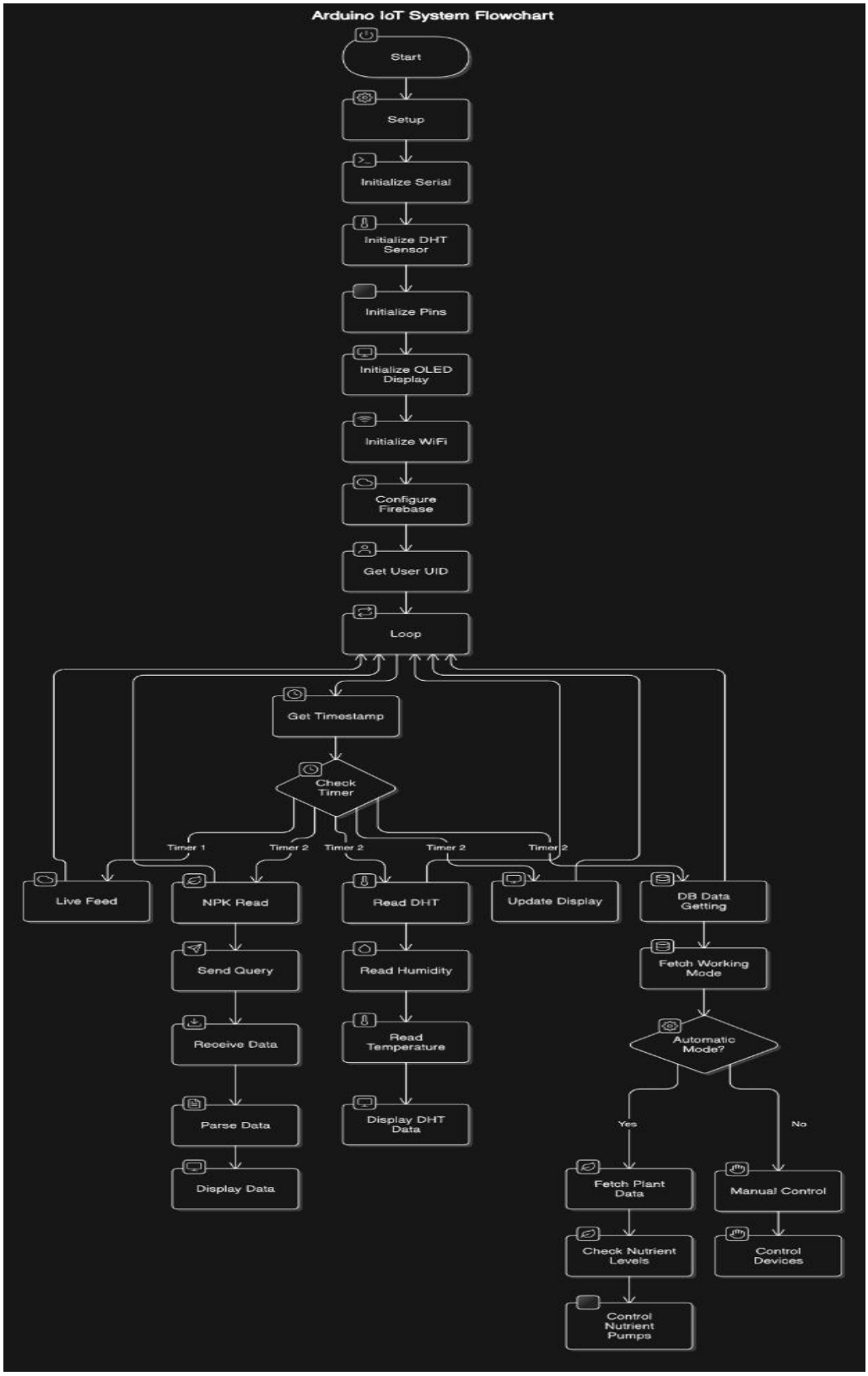






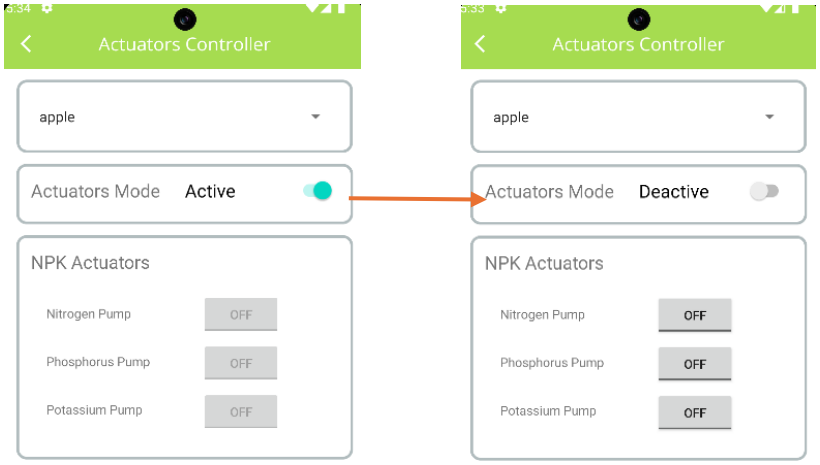


Operation Flowchart



Operating the system

- Open the mobile application and web application.
- Power up the unit and connect the actuators and Arduino code to ESP 32 board as mentioned before.
- First put manual mode in the app.



- Then check all actuators connectivity manually by using the on/off button (you can check it by using LED bulbs which are connected to the circuit paths).
- If all functions work properly in hardware, then check the web page functions changes.
- If they were work properly too then activate the auto mode. After activating the auto mode, it will take some time to work properly the system cause the system is initializing. (Minimum 24 hours).
- After that check again all functions in the mobile application and changes in the web application.
- If the functions are not working well check the hardware function as mentioned in the manual. If it is still not working, then contact technical support.

Troubleshooting

In the event of any issues with your Agri Sense, refer the following troubleshooting steps for swift resolution. If a problem persists, contact the technical team for assistance.

- Confirm that the Agri Sense is correctly connected to 12VDC and 5VDC sockets and 230VAC bulb socket.
- Confirm that the code uploaded to the ESP 32 board is correct and check the power side. If the connection still fails reset the board.

- All above work is done check the actuators' part work separately. Then connect all devices and power up at the same time and check the power side.
- If the system failure connects all wiring again and check.
- Open the mobile application and check the live data displaying is correct. If it's not restarted the app and check again.
- If it is working, then load the actuator controlling interface and check all actuator system separately and check all together.
- Then switch the auto mode and check the status of the actuators and controlling. If the system is not syncing well restart the system.
- Check the status of the web application and the actuators, if it is not working restart the system.
- After doing all the above work and still the unit is not working properly then contact the technical team for your support.

Maintenance and Cleaning

Proper maintenance and cleaning can ensure the longevity and optimal performance of your Agri Sense. Follow the below-mentioned guidelines to the device to maintain well.

- Clean the dust on the unit, fans and pumps regularly.
- Check the sensors reading regularly with correct units. You can check DHT 22 readings with digital thermometer. Also, NPK sensor temperature and humidity values can be checked as same. PH value can be checked with water (water PH should be near 7.0).
- But the NPK values can't be checked properly because their mechanism can be changed. For that contact the technical team for your support.
- Do not clean the device ports by using sharp objects. It can be damaging sensitive components.
- Store in dry place.
- For further information contact the technical team.

Technical Data

Component	Specification
Microcontroller	ESP32 (dual-core processor, Wi-Fi, and Bluetooth-enabled)
Power Supply	12VDC and 5VDC inputs, compatible with 230VAC for relay operations
Sensors Included	NPK 7-in-1 Sensor, DHT22 (temperature and humidity), soil moisture sensors
Communication Protocols	Modbus RTU (for NPK sensor), I2C (for display and other peripheral communication)
Actuator Control	MOSFET-based 7 switches (IRF540N), one 230VAC relay module for manual control
Software Requirements	Arduino IDE (Version 1.8.19 or later), associated libraries provided via Google Drive link
Mobile Application	APK available for download; features include live data feed, history/charts, plant registration, auto/manual mode
Web Application	Node.js-based laraval interface; requires npm setup via Command Prompt
Display	20x4 LCD (I2C protocol)
Connectivity	Wi-Fi enabled for mobile and web application communication
Operating Modes	Manual and Auto
Initialization Time	Minimum of 24 hours for system saturation
Recommended	Greenhouse or other controlled agricultural environments
Troubleshooting Tools	Manual diagnostic checks, mobile app functionality tests, and web application status monitori
Maintenance	Regular cleaning of unit, fans, pumps, and calibration of DHT22 and NPK sensors
Safety Measures	Handle sensitive components like NPK sensors carefully; avoid sharp objects near device ports
LED Indicator	Multi-color for power, charging, pairing, battery status
Weight	~100g

This chart gives a concise overview of Agri Sense technical features. You could further customize it by including columns for "Model Variations" or "Additional Features" if relevant. The chart can be presented visually in a user manual, in product brochures to help users quickly reference key specifications.

Warranty and Support

Warranty Coverage:

Your Agri Sense device comes with a 1-year warranty covering manufacturing defects. This warranty does not cover damage caused by improper use, unauthorized modifications, or accidental damage**.**

Customer Support:

For assistance with your hearing aid, contact our customer support team via:

Email: agriiotsolutions@gmail.com

Phone: +94 77 042 2198

Service and Repairs:

If your Agri Sense device requires servicing or repairs, please reach out to our authorized service centers listed on our website. Unauthorized repairs may void your warranty.