Automated Greenhouse

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Abstract

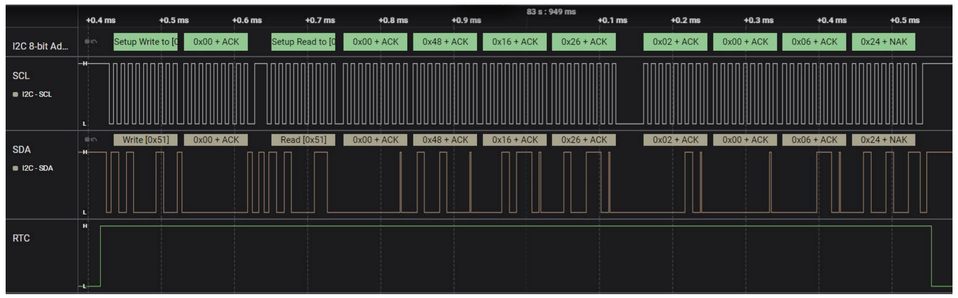
The Automated Greenhouse is a self-contained system designed to create a stable environment for common household plants. It monitors and regulates temperature, soil moisture, and humidity. If any of these parameters deviate from user-defined ranges, the system automatically adjusts them to the desired levels. The system uses a heater for temperature control, a fan with a linear actuator to remove excess heat or humidity, and a water pump to irrigate the soil. Continuous measurements are taken by a temperature and humidity sensor, as well as a soil moisture sensor, and compared against user-set minimum and maximum thresholds to ensure optimal conditions. The Automated Greenhouse also gives the user the option to designate a daily lighting schedule.

Background

There are many plant enthusiasts out there who's homes lack the outdoor space needed to grow anything. Plants need adequate light, water, and the proper environment to grow properly. The automated greenhouse was created to give them a plant growing environment that can work indoors. This allows anyone who wants to grow plants without needing an outdoor space to do it .

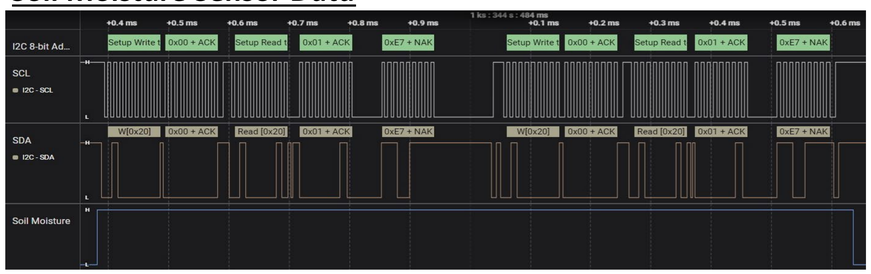
Results

Real Time Clock Module



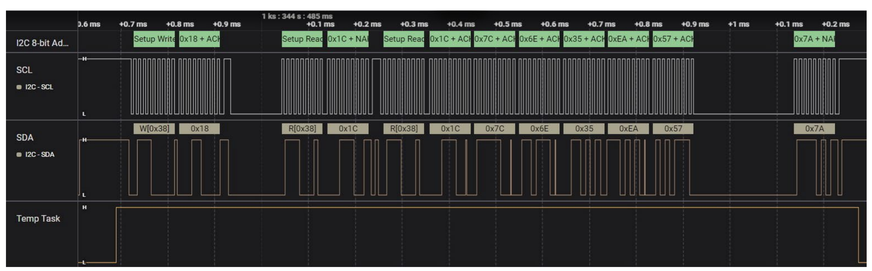
- *Accurate calendar for month, day, year.*
- *Accurate clock for time of day.*
- *Means for daily lighting schedule.*

Soil Moisture Sensor Data



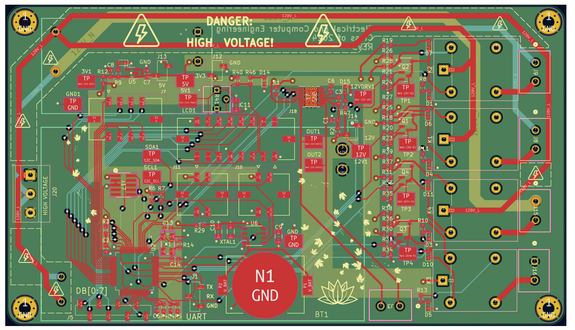
- *Irrigates soil if percentage falls below the minimum.*

Temperature/Humidity Sensor Data

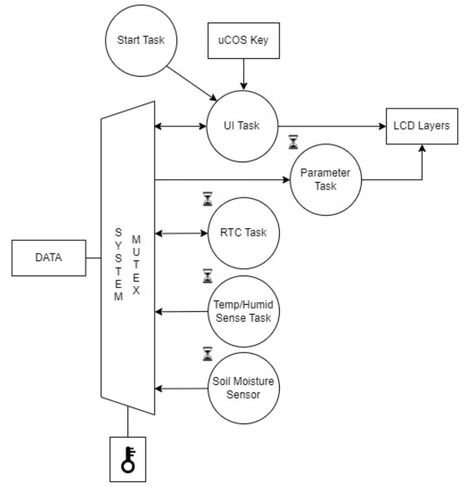


- *Turns the heater ON when temperature falls below the minimum.*
- *Turns the heater OFF temperature exceeds the maximum.*
- *Extends/Retracts linear actuator to open/close a vent.*
- *Enables a cooling fan to expel air when maximum temperature or humidity is exceeded.*

Automated Greenhouse Printed Circuit Board (PCB)



Software System Diagram



Conclusion

The Automated Greenhouse can accurately read sensor and time data which is then used to activate peripherals and change the internal greenhouse environment. This will allow users to grow plants year-round and in various environments. While the project works as intended, there are many places it can go next, like an EEPROM to save user settings, or a water level detector to tell users the water level.

Acknowledgements

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