

Digital Twin of a Smart Greenhouse



Abstract

Digital Twin of a Smart Greenhouse project consists of designing and building a greenhouse system with its both hardware and software. Greenhouse is able to detect temperature, CO₂, moisture and light intensity and makes adjustments to make environment perfect for plant to grow healthy.

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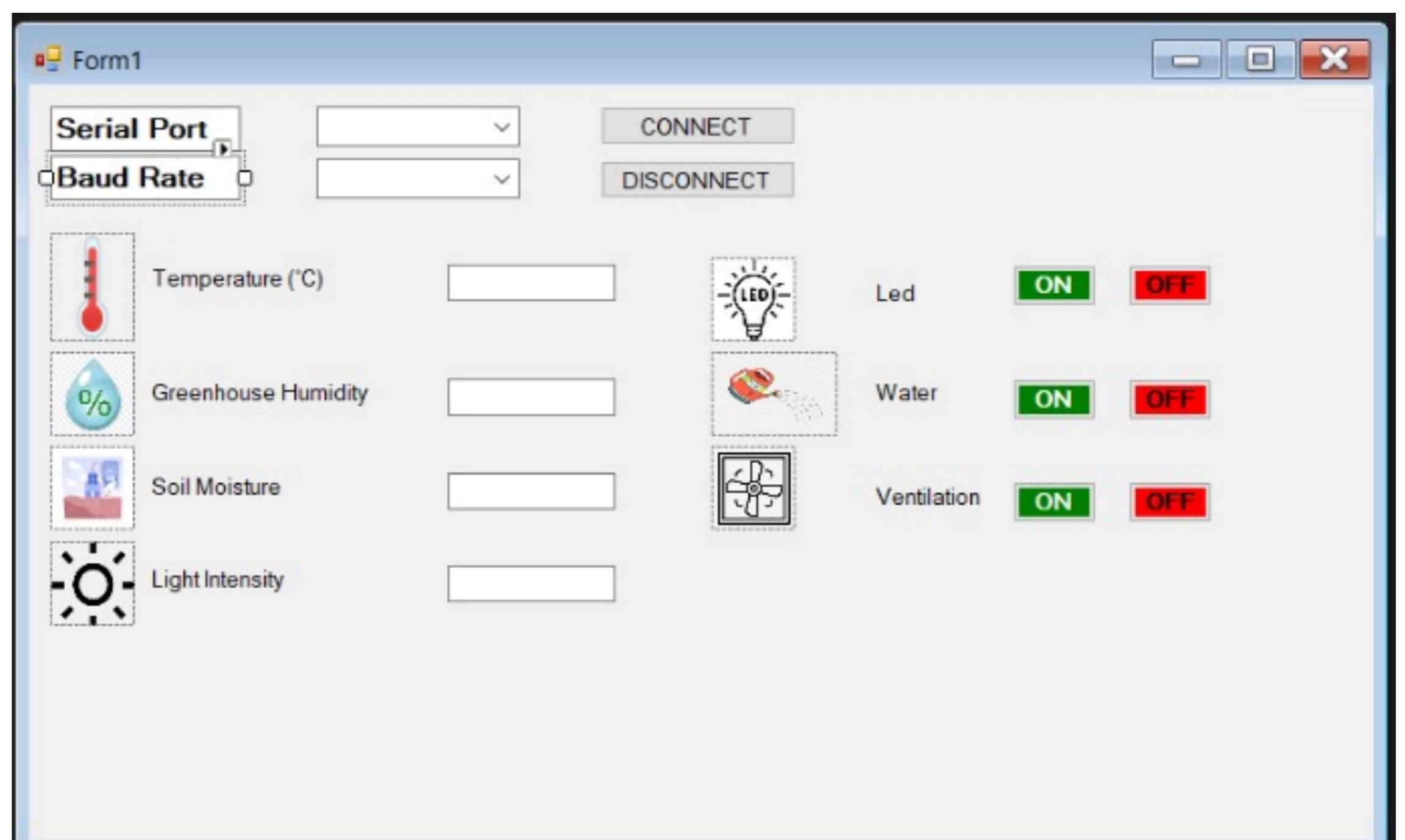
Components

Smart Greenhouse consist 2 parts which are hardware and software. Hardware part consists of electronics such as Controller Board, Sensors and output components.

Software consists interface and controlling codes of sensors.

How it Works?

Sensors collect data about environment inside the greenhouse and send data to control unit. Control unit can either make adjustments by itself or allows user change conditions manually. In result of these adjustments, plant grows safely.



Conclusion

After building hardware and integrating software, greenhouse worked as it should be and made adjustments. Also adding more profiles for different plant types can be used with this smart greenhouse's abilities.

References

- <https://www.sciencedirect.com/science/article/pii/S0168169922005002#:~:text=A Digital Twin of a,in a greenhouse compartments, etc>
- <https://www.ijert.org/research/digital-twin-technology-in-greenhouse-IJERTCONV10IS04051.pdf>
- <https://ieeexplore.ieee.org/document/9140726>
- [https://upcommons.upc.edu/bitstream/handle/2117/384176/Digital Twin of a greenhouse for smart farming - final version.pdf?sequence=1&isAllowed=y](https://upcommons.upc.edu/bitstream/handle/2117/384176/Digital%20Twin%20of%20a%20greenhouse%20for%20smart%20farming%20-%20final%20version.pdf?sequence=1&isAllowed=y)
- [https://upcommons.upc.edu/bitstream/handle/2117/384176/Digital Twin of a greenhouse for smart farming - final version.pdf?sequence=1&isAllowed=y](https://upcommons.upc.edu/bitstream/handle/2117/384176/Digital%20Twin%20of%20a%20greenhouse%20for%20smart%20farming%20-%20final%20version.pdf?sequence=1&isAllowed=y)