IJCRT.ORG ISSN : 2320-2882

INTERNATIONAL JOURNAL OF CREATIVE RESEARCH THOUGHTS (IJCRT)

An International Open Access, Peer-reviewed, Refereed Journal

# GREEN HOUSE MONITORING AND CONTROL SYSTEM USING BLUETOOTH COMMUNICATION

Department of Electronics and Communication Engineering.

Kalasalingam Academy Of Research and Education, Srivilliputhur , India

TEAM MEMBERS;-T.JANARDHAN REDDY,
K.JEYA PRAKASH,
G.KUMAR REDDY,
R.NARENDRA.

1.1.**ABSTRACT:-** A greenhouse is a building with walls and a clear roof that is used to monitor climatic conditions. These structures are used to grow plants, fruits, and vegetables that require a particular amount of sunlight, temperature, humidity, and soil moisture. The Greenhouse Environment Monitoring and Controlling Project, which uses Bluetooth and Arduino to keep these conditions in the green house, is built to keep them there. Temperature, Humidity, and Light are detected by the four sensors used in the Bluetooth and Arduino-based Greenhouse Environment Monitoring and Control project. If the humidity value determined by the sensor exceeds the threshold value or the soil moisture in the greenhouse decreases, the microcontroller can turn on the blower to minimise humidity and open the water outlet to increase moisture in the soil and soil moisture in the greenhouse.
Keywords:-bluetooth module,turbidity sensor,DHT11sensor.

**1.2.INTRODUCTION:-** A greenhouse is a structure used to grow plants, as the name suggests. Greenhouses are widely used to cultivate flowers, tomatoes, fruits, and tobacco plants. Plant growth is influenced by sunlight, soil water content, temperature, CO2 concentration, and other basic factors. In a greenhouse, these physical factors are difficult to control manually, necessitating the use of automated design. Greenhouses are beneficial because they maintain a constant temperature around plants, protect them from weather extremes, extend the growing season by allowing you to sow and harvest plants earlier, and enable commercially important crops such as tomatoes, cucumbers, melons, and aborigines to develop successfully [1].Military applications, home automation applications, health applications, industrial applications, and environmental applications are all examples of WSN applications, some of which are futuristic but many of which are practical, and all of which are relevant to our research [2].

**1.3.LITERATURE SURVEY**:- Different types of greenhouse and environmental monitoring systems built nowadays. However, due to a lack of understanding, as well as cost and implementation concerns, these systems were abandoned. In 2010, a DSP-based prototype Greenhouse Environment Monitoring system was developed. Then, in 2012, a digitally embedded greenhouse monitoring and control system was developed. This system used a low-power, cost-effective chip, microcontroller-based circuit to monitor and record humidity and moisture values in order to achieve maximum plant growth. A study on "The Project GreenBee" by the Bharat Institute of Technology focusing on greenhouse environment monitoring and control. According to the paper, the device is modelled for greenhouse automation using embedded systems. A Zigbee-based Greenhouse Monitoring and Controlling device was also established in 2013. However, Zigbee has a drawback: it is not widely accessible. This project uses an Android software for greenhouse maintenance and control, which is easily upgradeable and accessible on most smartphones. In automated wireless connection technology, manpower is saved and accuracy is increased. A greenhouse is a structure where certain plants are grown. Greenhouses shield crops from extremes of heat and cold, dust storms, and blizzards, and also maintaining pests at bay. Greenhouses can turn non-arable land into arable land by controlling light and

temperature, resulting in increased food production in remote areas. As shown in Fig. 1, greenhouses are becoming increasingly important in the food supply of high-latitude countries. They make it possible to grow those crops all year. The closed environment of greenhouses has its own set of specifications as compared to outdoor production. Pests and diseases, as well as extremes of heat and humidity, must be controlled, and irrigation is needed to provide water. When growing warm-weather vegetables in the winter, large amounts of heat and light can be needed. Since greenhouse temperatures and humidity must be constantly monitored to maintain optimal conditions, a WSN could be used to collect data remotely. The data is sent to a central location and used to monitor heating, cooling, and irrigation systems [1]. Automatic irrigation systems have undergone significant technological advancements in recent years.

**1.4.METHADOLOGY:-**The developed control system keeps track of temperature, humidity, light intensity, and soil moisture. This project proposes and collects data on these parameters to compensate for this restriction, allowing the change in crop condition as a result of greenhouse internal climate factors to be measured. The system's temperature sensor and control system works according to the temperature value set by the user. It gets the user's feedback first, then shows the temperature on the LED panel for easy reference. A fan mounted within the greenhouse lowers the greenhouse's temperature. The greenhouse's temperature is increased by placing a heater in the foundation, which ensures that the entire greenhouse is heated uniformly. The amount of light that reaches the greenhouse is regulated by the light control system. When there isn't enough light, the LDR detects it and switches on the lights. When there isn't enough sun, the light bulbs are turned off. The system, however, would automatically turn on at night, which is harmful to the plants, so we built a switch to turn off the lights when we don't think they're required. A fixed value is kept track of and retained by the humidity level control system.

**1.5.DHT11 Sensor:-**The sensor or device collects all of the air's relative humidity and sends it to the IoT data storage. Relative humidity is a measurement of the temperature difference between air and moisture. When rain is present, it aids in assessing the weather situation and making decisions on whether or not to take action. It's used in vehicles, HVAC systems, and metrological systems. After a rainstorm, the air would be damp. The water seemed to be suspended in mid-air. The mood brightens up if you push a few buttons on those air conditioners. A humidity sensor detects, measures, and records both moisture and air temperature (or hygrometer).

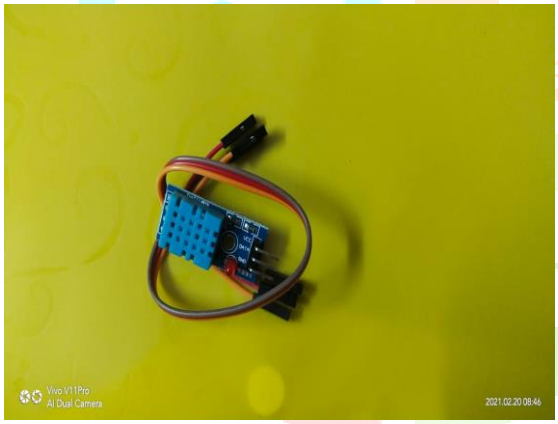



Figure1.5

**1.6.Bluetooth module:-**The HC-05 Bluetooth Module is a simple Bluetooth SPP (Serial Port Protocol) module that allows you to create a wireless serial connection that is transparent. It communicates with a controller or PC through serial communication, making it easy to link. You can use the HC-05 Bluetooth module in both master and slave mode, which means you can use it to receive and transmit data.

Figure1.6

**1.7.Turbidity sensor module:-**The amount of light scattered in water by suspended solids is measured by turbidity sensors. If the total suspended solids (TSS) in the water increases, the turbidity (and cloudiness or haziness) of the water increases. Turbidity sensors are used in a variety of applications, including river and stream gauging, wastewater and effluent measurements, settling pond control instrumentation, sediment transport monitoring, and laboratory measurements. Global Water's Turbidity Sensor is a submersible instrument that can be used for environmental or process monitoring in real time.Turbidity sensors are used in a variety of applications, including water quality testing and management, river monitoring, stream assessment, reservoir water quality testing, groundwater testing, water and wastewater treatment, and effluent and industrial regulation. The Turbidity Sensors are a 90-degree scatter nephelometer that calculates turbidity according to USEPA Method 180.1.

Figure1.7

**Tensiometer Sensor:-** Soil moisture sensors use gravimetric values to measure the amount of water in the soil. The sensor generates the soil resistance value by connecting a source and a detector probe. This sensor is useful in the field of agronomy because it allows farmers to better monitor their irrigation systems. It activates a cutting-edge device that maximises crop growth while conserving water. Other uses included horticulture and environmental or weather research.

- Calculate the amount of moisture lost due to evaporation and plant uptake over time.
- Determine the ideal soil moisture content for different plant species.
- In greenhouses, track soil moisture content to regulate irrigation.
- Make your Bottle Biology experiments more interesting.

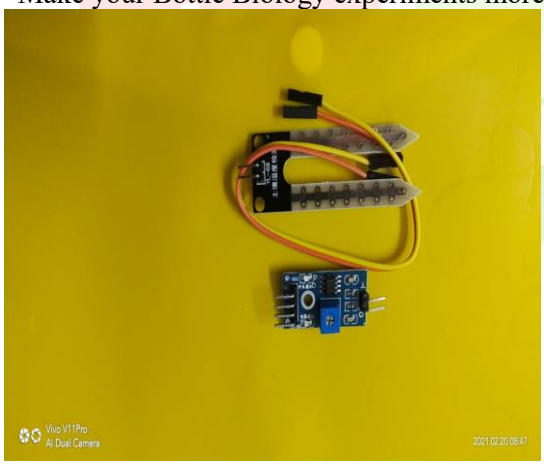
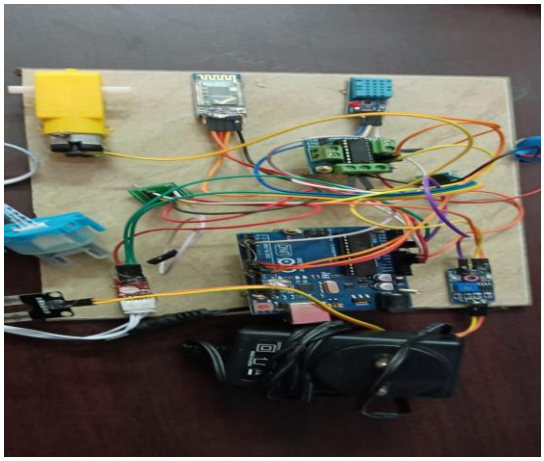


Figure1.7

**Project output:-**



**CONCLUSION:-**A greenhouse parameter monitoring and control framework, as well as its design and implementation, has been proposed. This system will collect data on key environmental parameters such as temperature, humidity, and light within the greenhouse. You can also hold these parameters smaller than the outside world by using two simple fans. The XBee's analogue to digital converters in the end devices transform the analogue signals from different sensors into digital values. These data are wirelessly transmitted to a central computer, which analyses them and makes a decision.The system is based on a simple fuzzy controller that sends appropriate digital command signals to the XBee's digital outputs to track greenhouse parameters for a particular crop. The wireless sensor network's overall architecture was built using only XBee and no microcontroller, which reduced the system's cost and required power, as well as making the system simpler and easier to mount. The gathered information and generated control signals are entered into a database and analysed for crop improvement. We're here to assist you in developing an Android-based integrated greenhouse maintenance and control system.

**REFERENCES:-**

[1] N. Putjaika, S. Phusae, A. Chen-Im, P. Phunchongharn, and K. Akkarajitsakul, "A control device in an intelligent farming using arduino technology," Nakhon Pathom, 2016 Fifth ICT International Student Project Conference (ICT-ISPC), pp. 53-56.
[2] A. Abdullah, S. A. Enazi, and I. Damaj, "AgriSys: A smart and ubiquitous controlled-environment agriculture framework," in Muscat, 2016 3rd MEC International Conference on Big Data and Smart City (ICBDSC), pp. 1-6.
[3] P. B. Chikankar, D. Mehetre, and S. Das, "An automated irrigation device using ZigBee in a wireless sensor network," 2015 International Conference on Pervasive Computing (ICPC), Pune, pp. 1-5, 2015.
[4] J. Gutiérrez, J. F. Villa-Medina, A. Nieto-Garibay, and M. Porta-Gándara, "Automated Irrigation System Using a Wireless Sensor Network and GPRS Module," IEEE Transactions on Instrumentation and Measurement, vol. 63, no. 1, January 2014, pp. 166-176.
[5] J. John, V. S. Palaparthy, S. Sarik, M. S. Baghini, and G. S. Kasbekar, "Design and implementation of a soil moisture wireless sensor network," 20th National Conference on Communications (NCC), Mumbai, 2015, pp. 1-6.
[6] Nakutis et al., "Remote Agriculture Automation Using Wireless Link and IoT Gateway Infrastructure," 25th International Workshop on Database and Expert Systems Applications (DEXA), Valencia, 2015, pp.99-100.
[7] P. Y. Dattatraya, J. Agarkhed, and S. Patil, "Cloud aided performance enhancement of smart applications in Wireless Sensor Networks," WiSPNET 2016, Chennai, pp. 347-351.