INTERNATIONAL JOURNAL OF ADVANCE RESEARCH, IDEAS AND INNOVATIONS IN TECHNOLOGY

ISSN: 2454-132X
Impact factor: 4.295
(Volume3, Issue3)
Available online at www.ijariit.com

Enhance Energy Efficient Low Cost WSN System for Precision in Agriculture Zone

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Abstract: Big amount of data is collected by the sensors from the end Subsequently, this considerably big amount of data must be processed, analyzed and stored in effective ways. In this manner, an of computing resources and storage be provided to compute this large amount of data. To focus on introducing the latest technologies like as sensors, WSN to revise approaches to agriculture by collecting the data about the various parameters of soil, analyzes the data and performed the computations, giving the best optimal solutions for the farming. The application of computing in the agricultural economy will open up a vast range of prospects, such as the vast storage of agriculture information, the cloud management of agricultural production process, the storage of agricultural economy information, early-warning and policy-making based on the agricultural products market, the tracing management of agricultural products quality.

Keywords: Sensors, Computing Resources, WSN, Tracing Management, Policy-Making.

I. INTRODUCTION

The parameter data elements of Aurdnio sensor based feedback advisory system include many different types of sensors, like as temperature, humidity, soil moisture, and wind velocity, placed on the field with data loggers to communicate the observations to the server. Apart from sensor information, the farmer loads information about climatic conditions, soil conditions, rain and fertilization, and the pesticide and insecticide history. By giving all this information to the value of the farmer query, the expert can diagnose the problem and promptly provide advice to the farmer in a message and maybe even use feedback system. This classification and modelling of agricultural events, modelling of the agricultural experiences, and a method to browse through the history of agriculture experiences soil type, season, and if available fertility status. In the challenges involved in the Developments of decision support system to be used by farmers as the end user are presented, however, aims to reduce the gap between farmers, agricultural experts, the institutions, soil testing labs, agriculture system and other agriculture institutions. The propose a new experiential computing approach which aims to provide insights to an expert by detecting, storing and analysing the history of various value in agriculture. With weather station has atmospheric, soil and plant parameters monitoring sensors; data log and new for data storage and transmission; battery to use for all blocks of the weather station and a solar panel based battery charging system. Sensors that are available with weather station has a temperature, relative humidity, soil moisture, soil temperature, wind direction, wind speed, solar radiation, rain gauge, leaf temperature and leaf wetness, and virtual dew sensor. The data log on weather station collects the data from sensors and transmits. The farmer, get the service, is initially required to perform parameter by providing the details of the field location, crop, analysis reports, and history of irrigation, fertilizer and pesticide application on the field.

RESEARCH METHODOLOGY

The software design, communication layers have the energy conservation for the server. The communication between the sensor nodes and the network system as an example to introduce the flow of communication between the ZigBee transceiver modules. ZigBee transceiver module needs effective, When the server receives weather data from the sensor, the server will check the weather data With notification value by using decision techniques.

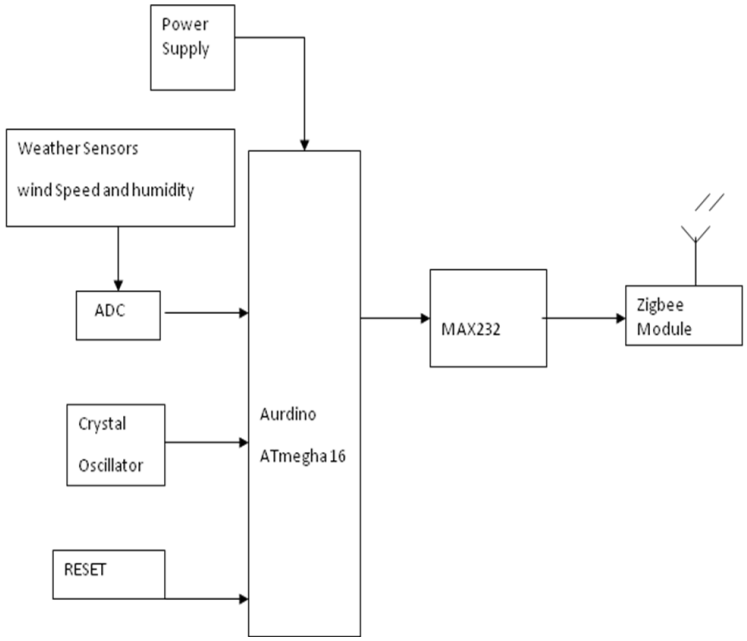

Figure 1 Transmitter Circuit

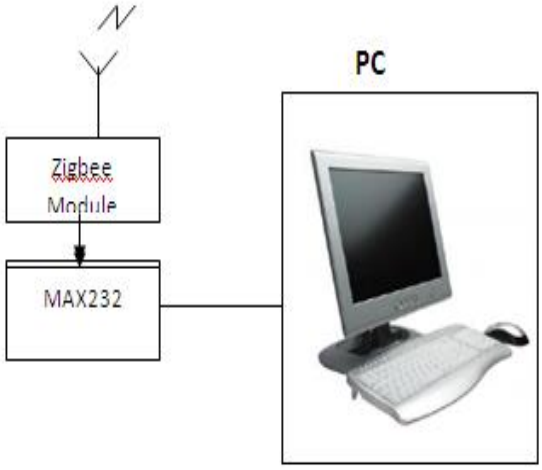

Figure 2. Receiver Circuit

If it matches with the previous conditions, to notify the system administrator and record of the warning and automatically store data in the database. The communication between sensor and server and exchange between server and Networks coordination are same. Software design mainly programmed with C# language combining the collected data display, analysis, and storage etc. The server receives data from sensors, the server will check the weather data with notification value by using decision techniques. If it matches with the previous conditions, it will notify the administrator and record of the notification and automatically store data in the database.

II. DESIGN OF EXPERIMENTAL SET-UP

ZigBee is a standard give a set of communication protocols for low data rate short-range wireless networking. ZigBee-based wireless devices operate has 2.4 GHz frequency bands. The maximum data rate with 250 K bits. ZigBee is mainly for battery-powered applications where low data rate, low cost, and long battery life are main requirements to transmit a single variable to a receiver unit which outputs a 4-20mA or 0-10V signal corresponding to the input. To transmit multiple input values to a receiver unit which provides either multiple 4-20mA outputs or a single Ethernet also RS232 connection. The transmitter and receiver units are identical units configured for either function.

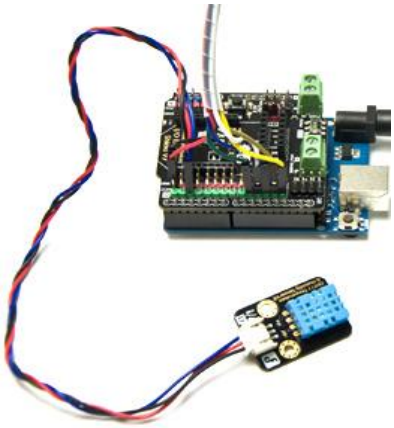

Figure 3. Sensor Circuit

Figure 4. Output Result

The main data elements of Aurdnio sensor based feedback advisory system include many different types of sensors, such as temperature, humidity, placed on the field with data loggers to communicate the observations to the server. Digital receiver's for.4 GHz band Zigbee IEEE 802.15.4 applications designed by researchers in the last six years, in terms of architecture, design methodologies, and final output. Various studies have designed digital receivers with different approaches very -high speed integrated circuit hardware description language CMOS standard cells, and 0.18 µm TSMC standard cells. Then, the design is either implemented on field-programmable gate array (FPGA) or application-specific integrated circuit would benefit design engineers in selecting simple and time -efficient design methodologies. It consists of a driver IC MAX 232. A voltage converter is used to transmit data from microcontroller to PC. It is needed because the voltage level corresponding to 0 and 1 for PC and microcontroller are different the output of voltage converter MAX232 is given to PC through connector RS232. With a wide range of serial communications interfaces, they are also very well suited for communication gateways, protocol converters, and embedded soft modems as well as many other general-purpose applications. This project uses two power supplies, one is regulated 5V for modules and another one is 3.3V for the microcontroller. 7805 three terminal voltage regulator is used for voltage regulation. Bridge type full wave rectifier is used to rectify the ac output of secondary of a 230/12V step-down transformer.

When the server receives weather data from sensor nodes, the server will check the weather data with notification value by using Decision Tree techniques. If it matches with the pre-conditions, it will notify the system administrator and record of the notification and automatically store weather data to the database.

III.CONCLUSIONS

This research focuses on developing devices and tools to manage, display and alert the warnings using the advantages of a wireless sensor network system in a mesh topology. The system can work over far distances. The system uses arduino microcontroller and Xbee Wireless module base on the Zigbee standard. The developed system is very accurate. The developed system has core competency including Display weather information, and alert when weather conditions match using decision technique with weather information.

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