World Journal of Engineering Research and Technology
WJERT
www.wjert.org
SJIF Impact Factor: 3.419

SMART FARMING SYSTEM USING IOT

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Article Received on 22/03/2016 Article Revised on 15/04/2016 Article Accepted on 08/05/2016

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ABSTRACT

Smart Farming enables the farmer to maintain his or her field in a smart way. Here sensors are deployed in the field to constantly monitor his or her farm. Sensors used are Smoke sensor, Temperature sensor, Moisture sensor, Soil sensor along with a relay water pump. In this project GSM module along with a renesas microcontroller is used which forms the heart of the project. The microcontroller unit keeps an eye on all the data collected by the sensors. As soon as the sensors detect something signal is generated and accordingly desired action is performed. Android application is developed which enables the farmer to constantly monitor and get connected with his farm.

KEYWORDS: renesas microcontroller, GSM, Relay water pump, soil sensor, temperature sensor, smoke sensor.

INTRODUCTION

In human history, agriculture has been one of the most important industries for humans' living since it is responsible for producing resources such as food, medicine, energy, fibre. As with advances in other industries, the agriculture industry has been also accelerating to develop by deeply employing information and communication technologies (ICT). In particular, automated farm systems, built with diverse wireless sensor devices and actuators, are able to monitor the environmental conditions and control the deployed devices according to the collected data through wireless access networks.

Even after the industrial revolution, most countries have been emphasizing the essential roles of the agriculture industry and related technologies affecting agricultural production. For example, heavy equipments and agricultural planes deployed were able to increase the work efficiency in agriculture dramatically increasing agricultural productivity.

In this project we present a remotely controlled farm wherein farmers can monitor and control using smart phones or tablets without visiting the fields. For example consider a pig farm monitoring system, which can effectively manage the farm by monitoring the environmental data using different sensors such as temperature, humidity, moisture, which enables him to plan for his crops. Controlling of environmental data via mobile devices is also possible using Internet of Things.

MATERIALS AND METHODS

With Smart technology people can achieve anything in this world. In our project we are using RL 78 renesas 64 pin micro controller which forms the heart of our project. A GSM module used for sending and receiving messages via Subscribe Identity Module commonly known as SIM card. A Smoke sensor, Temperature sensor, Moisture sensor, Soil sensor is introduced. Renesas micro controller is a general purpose register of 8 bits *32 registers. ROM has 512 KB, RAM: 32KB, Data Flash Memory: 8KB. Renesas has an on- chip high-speed oscillator, On-chip single-power-supply flash memory.

An ALCD (Alpha-Numeric Liquid Crystal Display) is used which is a flat panel display. LCD consists of an array of tiny segments (called pixels) that can be manipulated to present information. Liquid Crystals do not emit light directly instead they use light modulating techniques.

HSM 20-G Humidity sensor is essential for those applications where the relative humidity can be converted to the standard voltage output.

LM-35 Temperature sensors whose output voltage is linearly proportional to the Celsius temperature. Hence LM-35 has an advantage as the user has no need to subtract a large amount of voltage.

RELAY is an electrically operated switch. Current flowing through the coil of the relay creates a magnetic field which attracts the lever and changes the switch contacts.

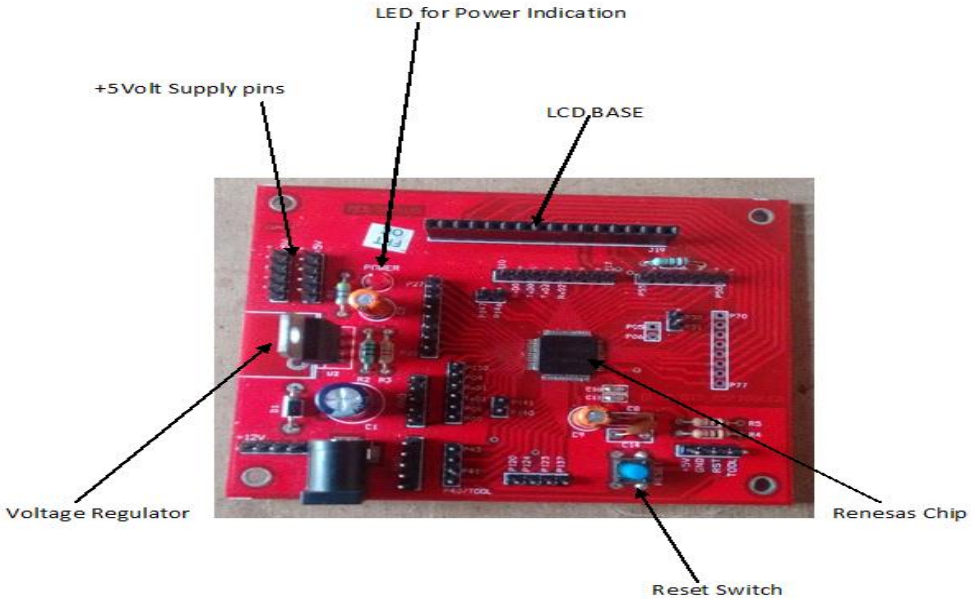

Fig: 1.1 Renesas microcontroller.

RESULTS AND DISCUSSION

In this project we represent the farm which is controlled entirely by sensors. When the temperature hits high than the threshold value the message is sent through the GSM which is read by the farmer through android which in turn automatically switch on the relay water pump installed in the field so that the crops wont drain of due to immense heat. Similarly the same concept applies when temperature goes low or any fire detected in the field triggers the pump automatically which ensures safety of crops in the field. Humidity whereabouts and soil conditions will be constantly updated and will be delivered to farmer through Android Application via GSM.

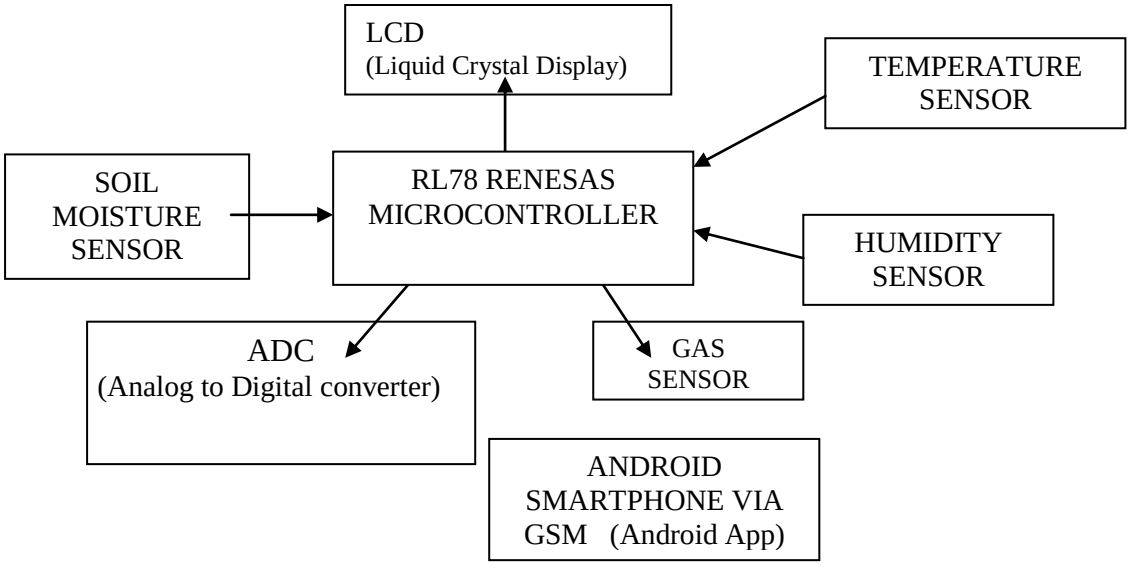

Fig: 1.2 Overview Diagram.

CONCLUSION

In this project we are representing an IOT based smart farming system. Here the farmer can continuously read the data and monitor his surrounding environment through one touch android application. This also enables other people of different stream take up farming. Smart farming shows a promise of building a farm knowledge expert system.

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