

WSN DEPLOYMENT FOR ECOLOGICAL MONITORING USING IoT

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Abstract--IoT(Internet of Things) is an identifiable embedded computing devices within the existing Internet infrastructure. Typically, IoT is expected to offer advanced connectivity of devices, systems, and services that goes beyond machine-to-machine communications. It covers a wide variety of protocols, domains, and applications over internet. The interconnection of these embedded devices (including smart objects) is expected to automation in each and everyfields. Things in the IoT refers to a wide variety of devices such as heart monitoring implants, biochip transponders on farm animals, automobiles with built-in sensors, or field operation devices that assist fire-fighters.The computing nature of many IoT devices use low-cost platforms. In fact, to minimize the impact of such devices on the environment and energy consumption, low-power controllers are likely to be used for connection to the Internet. Well established Cellular Network technologies remain an actively developing research area. However, the IoT will not be composed only of embedded devices, since higher order computing devices will be needed to perform heavier tasks.

In this project,the microcontroller plays a major role in detecting the output from the sensors and fed to the output side of the project where it is detected by the Ethernet module through MAX232. Using the IP of the Ethernet module the output can be predicted in Internet gateway.

Keywords:Humidity Sensor, Carbon-di-oxide sensor, Temperature Sensor, AT89s52 Microcontroller, Ethernet module, MAX232, Port adapter, Internet gateway.

I. INTRODUCTION

An atmosphere consists of various gases such as carbon-di-oxide, oxygen, humidity, etc. These are sensed by sensors such as temperature sensor, humidity sensor and carbon-di-oxide sensor.These sensors are connected to signal conditioning module and then to ADC circuit. Whereas temperature sensor is directly connected to the circuit which are then sent to the microcontroller from where it is sent to the Ethernet module through MAX232. Port adapter gives IP address to the connection and the output is got through

internet gate way where we can monitor the physical environment through internet.

II. ARCHITECTURE DESIGN

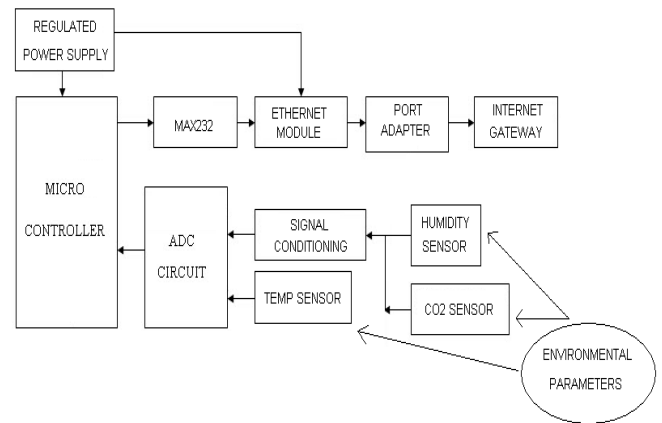


Fig 1.1: System block diagram(Transmitter Side)

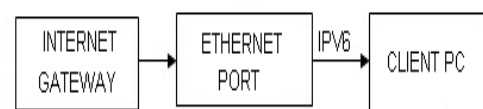


Fig 1.2 System block diagram(Receiver Side)

III. DESIGN METHODOLOGY

In this project, overall steps that are taken to be carried out to successfully achieve the objectives are:

- i. Testing the Multiple Sensors Module
- ii. Choosing a Microcontroller
- iii. Interfacing the MultipleSensors with the Microcontroller

- iv. Testing of MAX232
- v. Testing of Ethernet Module
- vi. Testing of Internet Gateway
- vii. Testing of Power supply unit

IV. DESCRIPTION

A. Multiple Sensors

The LM35 has an advantage over linear temperature sensors calibrated in Kelvin, as the user is not required to subtract a large constant voltage from its output to obtain convenient Centigrade scaling. Humidity is the measure of the amount of water vapor in air. This sensor detects an invisible gas that varies between 1-4 % of our atmosphere by volume. Carbon-di-oxide sensor measures the concentration of carbon-di-oxide gas from the atmosphere that has a range of 300-1000ppm.

B. AT89S52 Microcontroller

The AT89S52 is a low-power, high-performance CMOS 8-bit microcontroller with 8K byte of in-system programmable Flash memory. The device is manufactured using Atmel's high density non-volatile memory technology and is compatible. AT89S52 is a powerful microcontroller which provides a highly-flexible and cost effective solution to many embedded control applications. The AT89S52 provides the following standard features: 8K bytes of Flash, 256 bytes of RAM, 32 I/O lines, Watchdog timer, two data pointers, three 16-bit timer/counters, a six-vector two-level interrupt architecture, a full duplex serial port, on-chip oscillator, and clock circuitry. In addition, the AT89S52 is designed with static logic for operation down to zero frequency and supports two software selectable power saving modes. Because of the inbuilt ADC, AT89S52 reduces the complexity of the circuit as there is no need to design a separate ADC block.

C. MAX232

MAX232 is compatible with RS-232 standard, and consists of dual transceiver. Each receiver converts TIA/EIA-232-E levels into 5V TTL/CMOS levels. Each driver converts TTL/ COMS levels into TIA/EIA-232-E levels. The MAX232 is characterized for operation from 40°C to +85°C for all packages. MAX232 is used for application in high-performance information processing systems and control devices of wide application. Input voltage levels are compatible with standard CMOS levels. Output voltage levels are compatible with EIA/TIA-232-E levels.

D. Ethernet Module

The S2E module includes one 10/100 Ethernet port, two serial ports and 10-bit, 3-channel ADC with flexibility that includes both RS-232 and CMOS/TTL level signalling, flow control and hardware support for both synchronous and asynchronous serial communication. The most common application for the S2E module is for augmenting legacy products that contain a serial port for control interface. Simply installing a S2E module into the legacy serial device provides instant networking capability with no major board re-design or software changes, and cable lengths much longer than what is available for simple serial connections.

V. CONCLUSION

Thus this paper addresses all phases of the practical development from the things that points to a WSN platform for environmental monitoring IoT applications. It starts by analysing the application requirements and defining a set of specifications required. A real-life, demanding applications are selected as reference to choose the best solution for the exploration and the implementation of the above design.

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