

ZIGBEE BASED WIRELESS WEATHER MONITORING

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ABSTRACT:

The result is monitoring the weather condition in PC. The overall cost for weather condition sensors cost is reduced so does the maintenance cost of the systems. All the devices such as 16X2 LCD, Zigbee, Temperature sensor are being interfacing to microcontroller which forms the control unit of the project. The uniqueness of this project is, it sends a data to lcd as well as it post the values in personal computer by using hyperterminal software. In an industry during certain hazards it will be very difficult to monitor the parameter through wires and analog devices such as transducers. To overcome this problem we use wireless device to monitor the parameters so that we can take certain steps even in worst case. Few years back the use of wireless device was very less, but due the rapid development is technology now-a-days we use maximum of our data transfer through wireless like Wi-Fi, Bluetooth, Wi Max, etc.

Keywords: Arm7, Temperature Sensor, Zigbee.

INTRODUCTION:

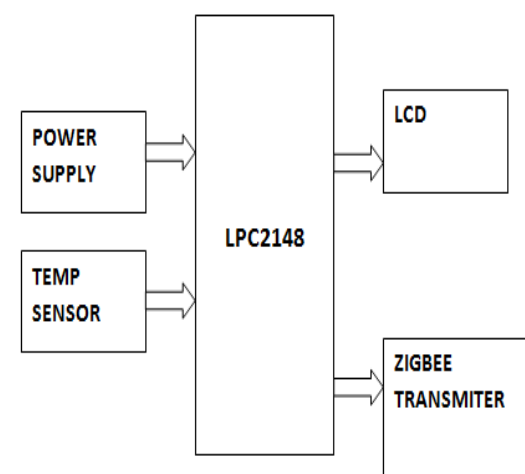
The fundamental aim of this project is to develop an embedded system to design a wireless weather monitoring system which enables to monitor the weather parameter in an industry or anywhere by using Zigbee technology and display the parameter on the PC's screen using visual basic.

The system contains two parts. One is transmitter node and another one is receiver part and both can be any number. The transmitter part consists of whether sensors, microcontroller and ZigBee and the receiver part consist of a PC interfaced with Zigbee through PC serial port. In this project we deal with monitoring the weather related parameters through wireless Zigbee modules. Here we monitor temperature, wind speed, wind direction and humidity with the help of respective sensors. The data from the sensors are collected by the micro controller and transmitted to the receiver section through wireless medium. All the parameters are viewed by the pc using visual basic program in the receiver side.

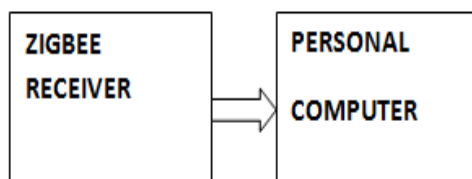
In view of all this things, the design of wireless parameter progress helps in an industry to monitor the parameter in real time with the use of zigbee, is an easy installation platform, cost effective method for the low bit rate transmission, so with the help of the ready zigbee platform by using the embedded c language we interface the module with

the pc by the help of visual basic we monitor the parameters in the system. The main use of this module helps in an industry during the worst cases as the analog device may be damaged may be during the fire accidents, etc. But with the wireless transmission we have not have an accurate data but when compared to the analog failure the errors are very minimum so we use wireless to monitor the parameter in an industry where their no means of human interface to monitor the parameters.

BLOCK DIAGRAM:



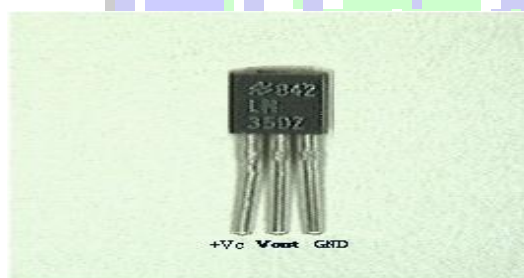
RECEIVER SECTION



TEMPERATURE SENSOR - THE LM35:

The LM35 is an integrated circuit sensor that can be used to measure temperature with an electrical output proportional to the temperature (in °C) The LM35 - An Integrated Circuit Temperature Sensor

- You can measure temperature more accurately than a using a thermistor.
- The sensor circuitry is sealed and not subject to oxidation, etc.
- The LM35 generates a higher output voltage than thermocouples and may not require that the output voltage be amplified.



LM35

WORKING OF LM35:

- It has an output voltage that is proportional to the Celsius temperature.
- The scale factor is .01V/°C
- The LM35 does not require any external calibration or trimming and maintains an accuracy of +/-0.4 °C at room temperature and +/- 0.8 °C over a range of 0 °C to +100 °C.
- Another important characteristic of the LM35DZ is that it draws only 60 micro amps from its supply and possesses a low self-heating capability. The sensor self-heating causes less than 0.1 °C temperature rise in still air.

ZIGBEE:

Zigbee modules feature a UART interface, which allows any microcontroller or microprocessor to immediately use the services of the Zigbee protocol. All a Zigbee hardware designer has to do in this case is ensure that the host's serial port logic levels are compatible with the XBee's 2.8- to 3.4-V logic levels. The logic level conversion can be performed using either a standard RS-232 IC or logic level translators such as the 74LVTH125 when the host is directly connected to the XBee UART. The below table gives the pin description of transceiver. line of sight of the reader.

ARM PROCESSOR:

The LPC2141/2/4/6/8 microcontrollers are based on a 32/16 bit ARM7TDMI-S CPU with real-time emulation and embedded trace support, that combines the microcontroller with embedded high speed flash memory ranging from 32 kB to 512 kB. A 128-bit wide memory interface and unique accelerator architecture enable 32-bit code execution at the maximum clock rate.

FEATURES OF ARM PROCESSOR:

- 16/32-bit ARM7TDMI-S microcontroller in a tiny LQFP64 package.
- 8 to 40 kB of on-chip static RAM and 32 to 512 kB of on-chip flash program memory.

128 bit wide interface/accelerator enables high speed 60 MHz operation.

- In-System/In-Application Programming (ISP/IAP) via on-chip boot-loader software.

Single flash sector or full chip erase in 400 ms and programming of 256 bytes in 1 ms.

- Embedded ICE RT and Embedded Trace interfaces offer real-time debugging with the

on-chip Real Monitor software and high speed tracing of instruction execution.

- Single 10-bit D/A converter provides variable analog output.

- Two 32-bit timers/external event counters (with four capture and four compare

channels each), PWM unit (six outputs) and watchdog.

- Low power real-time clock with independent power and dedicated 32 kHz clock input.

RESULTS:



CONCLUSION:

Zigbee-based weather monitoring system serves as a reliable and efficient system for efficiently monitor the environmental parameters. Wireless monitoring of field not only allows user to reduce the human power, but it also allows user to see accurate changes in it. It is much cheaper in cost, consumes less power and can control 254 devices, which in turn leads to the development of lots of new technologies like Home Automation, Health Care Automation etc

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