Journal of Engineering Sciences
Vol 13, Issue 05, May /2022
ISSN NO:0377-9254

MODELING AND DESIGNING OF AUTOMATIC PLANT WATERING SYSTEM USING ARDUINO

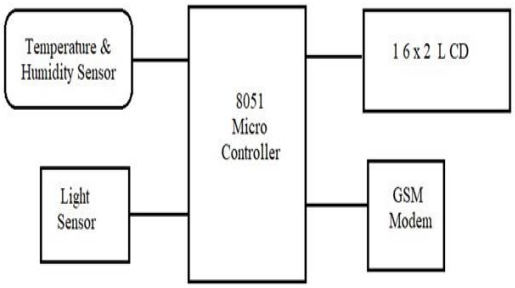
P. ESWAR[1], M.S.N. VIHARI[2], P. SURYA TEJA[3], M.SAILAJA[4], D.S. MOUNICA[5]
[12345]UG Students, Dept. of ECE, PRAGATI ENGINEERING COLLEGE

ABSTRACT

Here we propose a Gsm based weather sensing and reporting project. The system senses temperature, humidity and light and conveys this to the user wirelessly. Our system uses temperature sensors to detect and record current temperature. It uses a light sensor in order to detect current lighting conditions. Also, a humidity sensor is used to detect current humidity conditions. All this data from sensors is conveyed to the microcontroller. The microcontroller now processes this data and passes it on to a gsm modem interfaced to it. The gsm modem now encodes this data as SMS message and sends this message to programmed user. Thus, this puts forward a wireless gsm based weather monitoring system where the person does not need to be near the equipment to constantly monitor weather reports. The data is automatically sent to the user via an SMS. GSM based Digital weather station has 3 sensors. Temperature, Light and Humidity sensor. The values of all these 3 sensors are sent to the user through SMS via a GSM modem. These values are also displayed on LCD display. SMS is sent after a particular time interval.

INTRODUCTION

Microcontroller is a general-purpose device, which integrates a number of the components of a microprocessor system into a single chip. It has inbuilt CPU, memory and peripherals to make it as a mini computer.



Here we propose a Gsm based weather sensing and reporting project. The system senses temperature, humidity and light and conveys this to the user wirelessly. Our system uses temperature sensors to detect and record current temperature. It uses a light sensor in order to detect current

Journal of Engineering Sciences

lighting conditions. Also, a humidity sensor is used to detect current humidity conditions. All this data from sensors is conveyed to the microcontroller. The microcontroller now processes this data and passes it on to a gsm modem interfaced to it. The gsm modem now encodes this data as SMS message and sends this message to programmed user. Thus, this puts forward a wireless gsm based weather monitoring system where the person does not need to be near the equipment to constantly monitor weather reports. The data is automatically sent to the user via an SMS.

GSM based Digital weather station has 3 sensors. Temperature, Light and Humidity sensor. The values of all these 3 sensors are sent to the user through SMS via a GSM modem. These values are also displayed on LCD display. SMS is sent after a particular time interval.

HARDWARE REQUIREMENT:

- MICROCONTROLLER
- TEMPERATURE SENSOR
- HUMIDITY SENSOR
- LIGHT SENSOR
- GSM MODULE
- 16x2 LCD DISPLAY

SOFTWARE REQUIREMENT:

- KEIL Micro vision IDE for Programming.
- Proteus Professional for Designing.
- Embedded C Language.

AT89C52 MICROCONTROLLER

Microcontroller is a general-purpose device, which integrates a number of the components of a microprocessor system into a single chip. It has inbuilt CPU, memory and peripherals to make it as a mini computer. A microcontroller combines on to the same microchip:

- The CPU core
- Memory(both ROM and RAM)
- Some parallel digital i/o

Microcontrollers will combine other devices such as:

- A timer module to allow the microcontroller to perform tasks for certain time periods.
- A serial I/O port to allow data to flow between the controller and other devices such as a PIC or another microcontroller.
- An ADC to allow the microcontroller to accept analogue input data for processing.

Microcontrollers are:

- Smaller in size
- Consumes less power
- Inexpensive

Journal of Engineering Sciences

Micro controller is a standalone unit, which can perform functions on its own without any requirement for additional hardware like I/O ports and external memory.

The heart of the microcontroller is the CPU core. In the past, this has traditionally been based on an 8-bit microprocessor unit. For example, Motorola uses a basic 6800 microprocessor core in their 6805/6808 microcontroller devices.

In the recent years, microcontrollers have been developed around specifically designed CPU cores, for example the microchip PIC range of microcontrollers. The AT89S51 is a lowpower, high-performance CMOS 8-bit microcontroller with 4K bytes of in-system programmable Flash memory.

The device is manufactured using Atmel's high-density nonvolatile memory technology and is compatible with the industry-standard 80C51 instruction set and pinout. The on-chip Flash allows the program memory to be reprogrammed in-system or by a conventional nonvolatile memory programmer. By combining a versatile 8-bit CPU with in-system programmable Flash on a monolithic chip, the Atmel AT89S51 is a powerful microcontroller which provides a highlyflexible and cost-effective solution to many embedded control applications.

The AT89S51 provides the following standard features: 4K bytes of Flash, 128 bytes of RAM, 32 I/O lines, Watchdog timer, two data pointers, two 16-bit timer/counters, a five-vector two-level interrupt architecture, a full duplex serial port, on-chip oscillator, and clock circuitry. In addition, the AT89S51 is designed with static logic for operation down to zero frequency and supports two software selectable power saving modes. The Idle Mode stops the CPU while allowing the RAM, timer/counters, serial port, and interrupt system to continue functioning. The Power-down mode saves the RAM contents but freezes the oscillator, disabling all other chip functions until the next external interrupt or hardware reset

AT89C52 is the 40 pins, 8-bit Microcontroller manufactured by Atmel group. It is the flash type reprogrammable memory. The advantage of this flash memory is we can erase the program within a few minutes. It has 4kb on chip ROM and 128 bytes internal RAM and 32 I/O pin as arranged as port 0 to port 3 each has 8 bit bin. Port 0 contain 8 data lines(D0-D7) as well as low order address line(AO-A7).

Port 2 contains a higher order address line (A8-A15). Port 3 contains special purpose register such as serial input receiver register

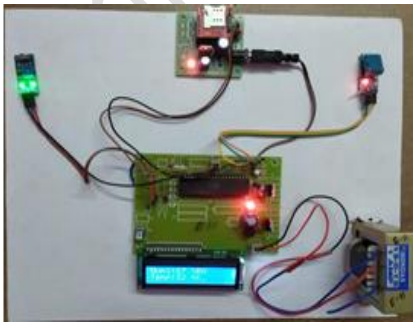
Journal of Engineering Sciences

SBUF, interrupt INT0, INT1 and timers T0 , T1 many of the pins have multi functions which can be used as general purpose I/O pins (or) Special purpose function can be decided by the programmer itself.

RESULT

- Wireless weather monitoring system is a microcontroller based project and can be implemented practically as displayed.
- In this project the temperature sensor (LM 35) is connected to ATMEGA32 microcontroller and temperature result is sent to GSM modem which is simultaneously displayed on LCD.

- Based upon the experimentation and implementation, we came to observe that the temperature can be monitored in an isolated place using LM35 (temperature sensors) and can be sent via SMS to a distant users mobile.



CONCLUSION

- The system senses temperature, humidity and light and conveys this to the user wirelessly.
- The prototype was built with three sensors for temperature , humidity and light.
- It was able to produce result of the weather conditions.
- It has proven to be useful to provide mobile user's knowledge about an environment even if they are not present.
- The project deals with designing a simple and low cost weather monitoring system using LM35, LCD, SIM300 and ATMEGA-32 microcontroller unit to monitor weather conditions of the desired location and transmit it to a a cell phone at distant location through SMS.
- The designed product module is at prelim stage and designed only for temperature monitoring but can be enhanced for monitoring other different type of environmental and climatic behavior of a location, which also can be cost effective.

FUTURE SCOPE

- Adding of more sensors to monitor other environmental parameters such as Soil PH Sensors , CO2 and oxygen Sensor while allowing the replacing of current sensors if a wider range of measurements is desired.
- And also Integration of additional monitoring devices such as a WI-FI camera to monitor growth of agricultural product.
- And also the data can be uploaded to web server continuously.

Journal of Engineering Sciences

- Different other sensors as humidity sensor, light intensity sensor, pressure sensor can also be interfaced with the microcontroller to fetch various information about a location.
- Automatic irrigation control can also be implemented using moisture sensor to fetch data regarding water presence in the farm and do turn on or turn off water pump accordingly.
- Trespassing can be monitored developing surveillance system using infrared sensors and pressure sensors.

Journal of Engineering Sciences