Compressor Air Pressure Monitoring Through Wireless Communication System

Yashika.B L
Department of TCE
GSSSIETW, Mysuru, Karnataka, India

Yogitha S T
Department of TCE
GSSSIETW, Mysuru , Karnataka India

Veena R
Department of TCE
GSSSIETW, Mysuru, Karnataka, India

Avi Kumar R
Department of TCE
GSSSIETW, Mysuru, Karnataka, India

***Abstract*- This paper describes the design of a simple microcontroller based Compressor air pressure monitoring system using wireless communication technique and displaying through LED Display. The air pressure monitoring system using GSM undergoes three stages signal conditioning circuit, analog to digital converter and with GSM Modem the message is send to mobile. GSM modem can be used to send and receive SMS through AT commands. At the transmitter side, the user sends an SMS to the GSM modem using AT commands. The pressure sensors are an integrated circuit sensor that can be used to measure the air pressure with electrical output proportional to the air. The pressure sensor is connected to arduino microcontroller and varying pressure is sent to GSM modem, which is simultaneously displayed in LED**.

Keywords—— GSM, Digital Air pressure sensor, LED display, Arduino.

INTRODUCTION

In many industries there is a need of monitoring some parameters such as temperature, pressure, humidity, flow rate, etc. With respect to the quantities, distribution and detected frequency of monitored objects, there are different monitoring methods to get capture the measurements. It's a decision of the management whether to have a monitoring based on manual or automated basis. In this project is to design and develop a wireless communication link to monitor the compressor air pressure and control that are far away from the user and also develop a high security system to keep a check on them .The pressure is to monitor directly which is Simultaneously displayed in the LED the analog to digital converter and with GSM Modem the message is send to mobile. ADC is used because microcontroller works with digital inputs. GSM modem can be used to send and receive SMS through

AT commands. At the transmitter side, the user sends an SMS to the GSM modem using AT commands. This sensor is a passive type of transducer so it needs an external power supply for its working. The GSM modem acts as operation of sending message to a particular SIM number .GSM technology provides users with high quality signal and speech channels, giving them access to high quality digital communication at very affordable rates. GSM network operators can provide their customers with cheaper calling and text messing options. Based on the sensed pressure the LED shows the current status of the pressure value. The relay of the sensor which is connected to the Arduino, it gives referred voltage as 0v and 5v as the pressure exceeds above 5v or below the set threshold value 0v the GSM gives commands to the Arduino board and turns the Buzzer connected to the board also in the receiving part the LED started to scroll the message.

We are additionally designing a method to know the pressure value by the user , the user can give a call to the transmitter part of the GSM. The real time pressure value is to be send message to the particular user this will make easier to know the status of the compressor in an industries.

I. OBJECTIVES

- In this project we are working on sensors and GSM for the purpose of transmitting the sensor reading to the receiver and display the message on the LED.
- The sensor are used to measure the flowing of the air from the compressor and we fix the value of air 4bar to 7bar.
- The requirement of BEML is to decrease the losses for the company because of air flowing and to read the value of air flow from compressor.

II. LITERATURE REVIEW

In this paper[1] Air Quality Monitoring and Analysis in Qatar using a Wireless Sensor Network.An actual deployment of wireless sensor network is described. The purpose of the sensor network is to monitor and analyze air quality in Doha. Small scale wireless sensor stations communicate with a backend server to relay their measurements in real-time. This paper describes a user friendly computation of an air quality index to disseminate the data to the general public. The system may offer pollutant levels of a particular industry and this estimation may serve as an ready reckoned to the government for allowing or disallowing a particular industry to be set up in a particular area.

In this paper[2] GSM and GPS based vehicle location and tracking system. The main objective of this project is to devise a simple low cost air pollution monitoring system based onCO2,SO,NO,etc and parameters like humidity ,temperature The designed product module is at prelim stage

and designed only for air quality monitoring but can be enhanced for monitoring other different type of environmental and climatic behavior of location, which also can be cost effective. At the transmitter side, the user sends an SMS to the GSM modem using AT commands. The LM35 is an integrated circuit sensor that can be used to measure temperature with electrical output proportional to the temperature. The LM35 sensor is connected to PIC microcontroller and varying temperature is sent to GSM modem, which is simultaneously displayed in LCD.

In this paper[3] Design & Implementation of Wireless Transceiver for Data Acquisition in Wireless Sensor Network Remote Monitoring, and Control is one of the most important and necessary criteria for increasing production and process plant availability. The system GSM modem is a class of wireless modem devices that are designed for communication. There is lot of development in industry and the requirement for industrial monitoring system is getting higher. In addition, this system is based on an industrial PC, thus making it an expensive solution. Interaction with the embedded unit is also an important issue. In, an embedded PC card placed on the Internet allows limited interaction through commands sent through Transmission Control Protocol/IP (TCP/IP) and User Datagram Protocol.

In this paper[4] Design of an Embedded System for Monitoring and Controlling Temperature and Light The design of a simple microcontroller based temperature monitoring system using GSM technique. The temperature monitoring system using GSM undergoes three stages signal conditioning circuit, analog to digital converter and with GSM Modem the message is send to mobile.ADC is used because microcontroller works with digital inputs. Information about how to use the Lab view for real time monitoring through the board. Arduino is a simple microcontroller board which has user defined I/O pins as well as an analog input pins. So this paper proposes a system in which has been interfaced to the thermistor (temperature sensor) through Arduino board. has been interfaced to an Arduino board through the Arduino support palette available in the for various real time monitoring activities.

In this paper[5]A Solution Of LED Large Screen Display Based On Wireless CommunicationOver the last few years, the GSM cellular phone has grown from a luxury item owned by the rich to something so common that one out of five Filipinos already owns one. This is amazing when we look at the fact that our country is a developing one with almost half our population living below the poverty line. By introducing the concept of wireless technology in the field of communication we can make our communication more efficient and faster, with greater efficiency we can display the messages and with less errors and maintenance. Latency involved in using of papers in displaying of notices is avoided and the information can be updated by the authorized persons.

III METHODOLOGY

The Air pressure which is continuously monitored by using pressure sensor varies from a particular level the SMS is sent to particular mobile as an indication for avoiding damage or accidents. This operation is processed by ARDUINO microcontroller in which the program written in. Embedded C is dumped into it Pressure sensor is used to sense the pressure of the air from the environment. The air pressure is received in the output of sensor does not need any further calibration or any other functions and also it draws only 8 Bar of air from its supply. The operating air pressure range is from < 3 BAR to > 7 BAR. The output voltage varies by 10mV in response to rise/fall in ambient air.

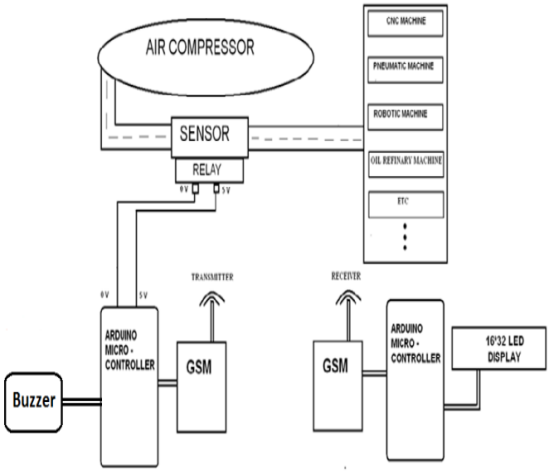

Figure 1: Block Diagram of Air pressure monitoring

Arduino Board:

The Arduino Uno board is a microcontroller based on the ATmega328. It consists of 14 digital input/output pins out of which there are 6 pins that can be used as PWM outputs, a 16 MHz ceramic resonator, an ICSP header, a USB connection, there are 6 analog inputs pins, a power jack and a reset button.

GSM:

Global System for Mobile Communications or GSM (originally from Grouped Special Mobile), is the world's most popular standard for mobile telephone systems. The GSM Association estimate that 80% of the global mobile market

uses the standard A GSM modem is a wireless modem that works with a GSM wireless network.

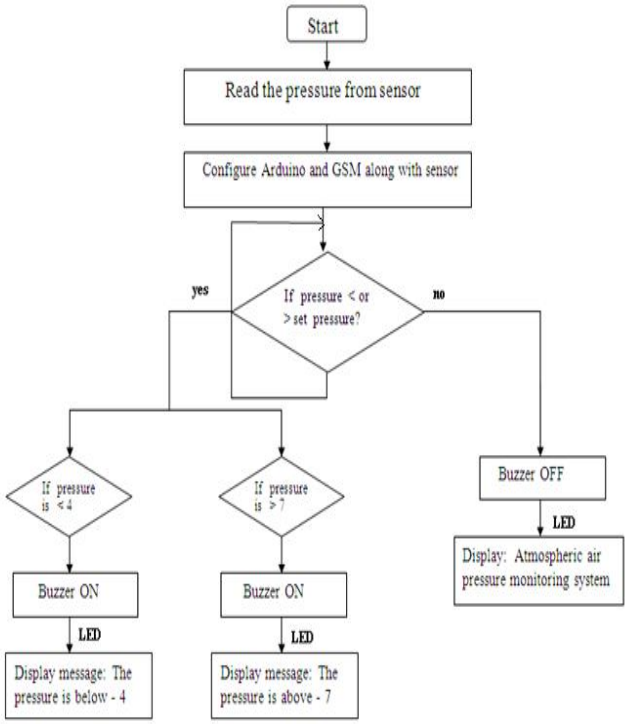

Figure 2. Flow Chart of the implemented system

From the inception of an idea to the commercialization of a widget, National Instruments unique platform-based approach to engineering and science applications has driven progress across a wide variety of industries. Central to this approach is, a development environment designed specifically to accelerate the productivity of engineers and scientists. With a graphical programming syntax that makes it simple to visualize, create, and code engineering systems, is unmatched in helping engineers translate their ideas into reality, reduce test times, and deliver business insights based on collected data.From building smart machines to ensuring the quality of connected devices, has been the preferred solution to create, deploy, and test the Internet of Things for decades.Combine the power of software with modular, reconfigurable hardware to overcome the ever-increasing complexity involved in delivering measurement and control systems on time and under budget. A proportional–integral–derivative controller (PID controller or three term controller) is a control loop feedback mechanism widely used in industrial control systems and a variety of other applications requiring continuously modulated control.

V. APPLICATIONS

- In an industry during certain hazards monitor the parameter through wireless.
- The keypad and LED interface will give flexibility to develop customized applications.
- GSM serial ports can help easily to develop applications

VI . IMPLEMENTATION:

This chapter gives information about the implementation of the proposed system.

6.1 SOFTWARE REQUIREMENTS

ARDUINO IDE:

The Arduino Software Is Provided To You "As Is" And We Make No Express Or Implied Warranties Whatsoever With Respect To Its Functionality, Operability, Or Use, Including, Without Limitation, Any Implied Warranties Of Merchantability, Fitness For A Particular Purpose, Or Infringement.

RESULTS

Following are the snapshots of hardware implementation of proposed system which includes the following steps.

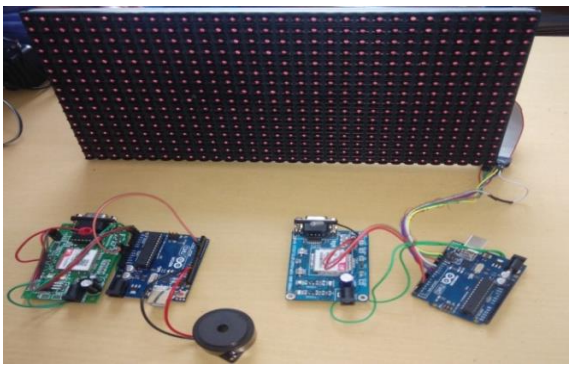

Figure 1: Implementation of Air pressure monitoring system

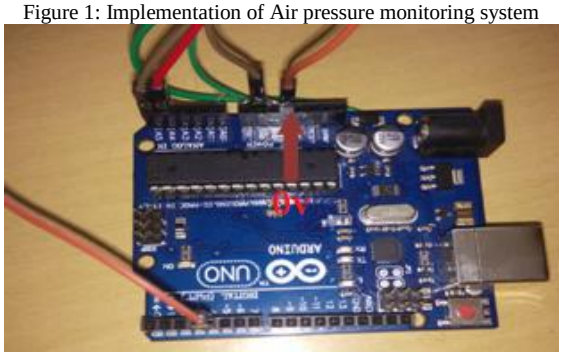

Figure 2: case 1- input from the relay 0v.

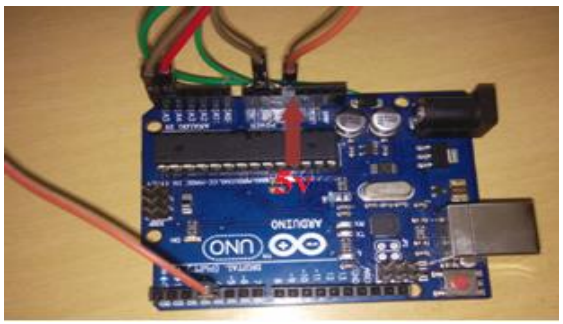

Figure 3: case 2- input from the relay 5v.

VII. CONCLUSION

The project deals with designing a simple and low cost air pressure using pressure sensors, LED,GSM & Arduino to monitor the air pressure from the compressor. In this project we are working on sensors and GSM for the purpose of transmitting the sensor reading to the receiver and display the message on the LED. The proposed design can be possible to send the SMS through the GSM modem. Through this implementation we came to know that the air pressure can be monitored using pressure sensors and can be send as SMS to mobile successfully.

VIII. REFERENCES

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