

Resource and Industrial Safety Management System Using Sensor Network

Juluri Radhika

M.Tech Scholar (Embedded & VLSI),
 Newton's Institute of Engineering (NIE),
 Alugurajupalli (Village), Koppunur (p.o),
 Macherla (M.d), Guntur (d.t), A.P, (India)

G. Lakshma Reddy

Assistant Professor (ECE),
 Newton's Institute of Engineering (NIE),
 Alugurajupalli (Village), Koppunur (p.o),
 Macherla (M.d), Guntur (d.t), A.P, (India)

ABSTRACT:

In this paper, information of Data acquisition system found the long area application in observation and dominant of some physically measurable factor within the industry. In the read of demand in industry, this project is meant to style and develop a data acquisition system (DAQ) that is ready to method the information and show it on the display and send a message through the serial port. the controlling part of any DAQ system is that the microcontroller, that is programmed per the specified demand. This project uses PIC16F877A microcontroller that performs the input and out place information acquisition and information transfer operations. the target of this project is to develop hardware & software system to observe the temperature and gas leak, lighting system detection and controlling system. Then its measuring the initial a voltage signal is generated from the detector then this voltage signal is fed to microcontroller that method the signal to provides the corresponding output in digital type through its inherent analog to digital convertor. This output is then mark and displayed on the display. Then text message can send to licensed person with facilitate of gsm electronic equipment and controller. parallelly controlling and monitoring the lighting system and security alarm in industry.

Keywords— DAQ System, PIC16F877A Microcontroller, LM35 Sensor, MQ-5, LDR S, MAX232, GSM SIM-900, Available Power.

I. INTRODUCTION:

Data acquisition system name implies are designed circuit processes want to collect data to document or analyse some development. within the easy manner it's a technician work the temperature and gas, lightweight

sensing of associate industrial space is activity data acquisition. As technology has progressed, this sort of method has been simplified and created a lot of correct, versatile, and reliable through equipment. instrumentality ranges from easy recorders to classy gsm systems. knowledge acquisition product function a attentiveness during a system, attachment along a large style of product, comparable to sensors that indicate temperature, flow, level, or pressure. gift DAQ systems are supported serial or parallel interface. however, these ports aren't absolute, that the serial communication primarily based DAQ system is required within the contemporary world for higher movability and adaptability. In recent years there has been immense growth of serial communication primarily based applications primarily because of the plug and play nature of DB9 and its low value implementation. The serial communication interface is often with success utilized in many laboratory measure applications by interfacing a DB9 compatible DAQ system. The PIC16F877A microcontroller is employed in each the units for its inbuilt ADC module, low value and better potency in industrial applications and well supported to gsm for text message causing of explicit DAQ data to authorised mobile.

II. PROCESS FLOW:

The three sensors square measure interfaced in numerous analog channels of the PIC16F877A microcontroller. ab initio the output from the sunshine sensing element is zero, at now PIC microcontroller sends a code worth '1' to the semiconductor diode and temperature, gas sensing element unit info via GSM module sim900. GSM module sim900 is connected to the USART channel of the PIC16F877A microcontroller. Whenever a sensing element undergoes a amendment, PIC16F877A microcontroller browse the temperature and gas sensing element info

to the corresponding code. totally different sensors, their corresponding code generation and their corresponding actions performed within the DAQ and dominant of security system unit. The mobile receives the code worth from the DAQ and dominant unit via GSM sim-900. This received code is compared with the quality code. If the codes are becoming mismatched, then the corresponding management action is performed on security alarm through buzzer driver IC.

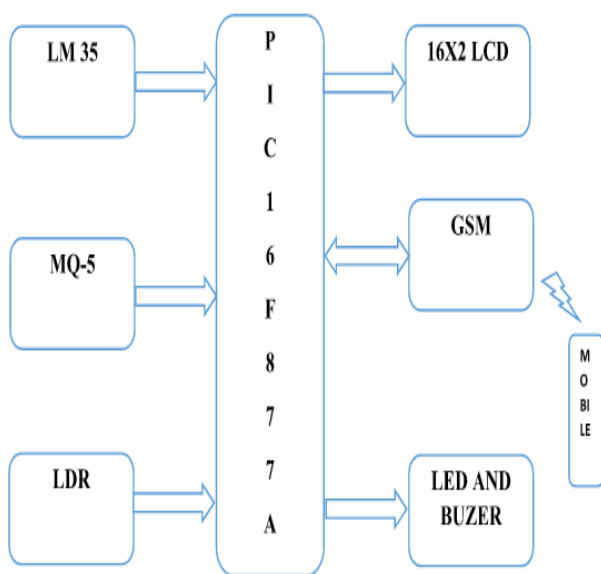


Fig.1. Block Diagram For The Proposed System

III. HARDWARE DESCRIPTION:

In this device unit, PIC16F877A is Associate in Nursing 8-bit microcontroller. it's a forty pin DIP microcontroller and it's supported Harvard design. PIC stands for Peripheral Interface Controller and F for nonvolatile storage. The PIC16F877A features 256 bytes of EEPROM information memory, self-programming, an LCD, two Comparators, eight channels of 10-bit Analogue -to-Digital convertor, 2 capture/compare/PWM functions, the synchronous serial port are often organized as either 3-wire Serial Peripheral Interface for the 2-wire Inter-Integrated Circuit bus and a Universal Asynchronous Receiver Transmitter. All of these options build it ideal for a lot of advanced level A/D applications in automotive, industrial, appliances and consumer applications. thus we've got utilised the MICROCHIP PIC16F877A microcontroller within the project. Lightweight sensors

are wont to determine the sunshine intensity. temperature devices are wont to measure the temperature in industrial area and gas sensor is employed to detective work the outflow of gas. These kinds of device underneath the class of resistive kind. thus whenever the device is bent, the resistance worth get inflated. The resistor circuit is employed to convert the modification in resistance into voltage.

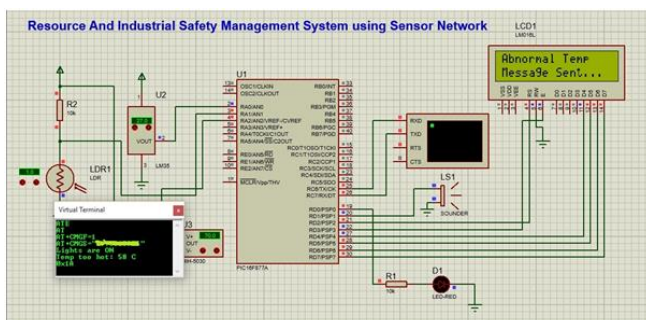
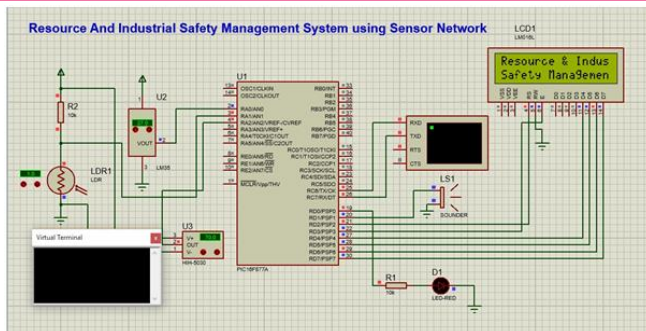
This voltage output of divider circuit is interfaced on to RA0, RA1, RA2, RA3 and RA5 pins of ADC module. equally GSM sim-900 is connected to Tx and Rx pins of USART module. In DAQ and controlling of security unit, LED's and security alarm are connected in OUT1 and OUT2 pins of ULN2003 driver IC. The output voltage of PIC16F877A isn't enough to drive the LED's and security alarm, thus ULN2003 driver IC is employed. The device pin DIRA and DIRB are connected in passage of the PIC microcontroller. ULN2003 pins for the LED and Buzzer pins is given from RD0 and RD2. The GSM Ssim-900 is connected in USART module RC6 and RC7 pins.

IV. ALGORITHM:

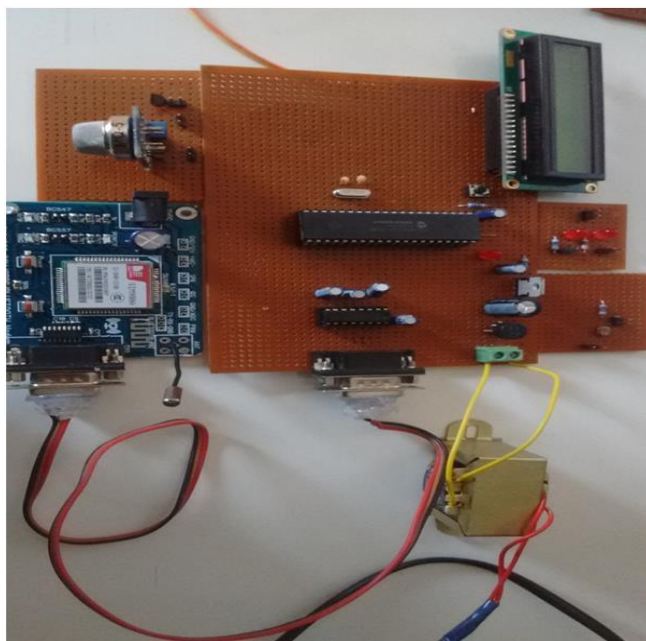
Using MPLAB X IDE the code for PIC16F877A microcontroller is developed and the output is verified through a ProteusV8.0in ISIS simulator. This operation is discussed below in algorithmic form.

- Step1: Initialize the ADC and UART module
- Step2: Convert the light and temperature, gas sensor's output into digital signals
- Step3: Compare the converted value with the static sensor value Compare that converted value with already converted If they are equal jump to step 2
- Step4: Else If the converted value is matched with stored value Then transmit the corresponding sensor code to the mobile unit via UART port
- Step5: Repeat the process from step 2

In the development part the code for the proposed system is developed using MPLAB X IDE and hex file is generated. In Proteus V8.0 in ISIS, the hardware connections are given as per real time system and hex files are loaded to check the output in a developing environment. since the GSM sim-900 are not available in Proteus software, the proposed system is implemented through wireless communication.



V.RESULT:

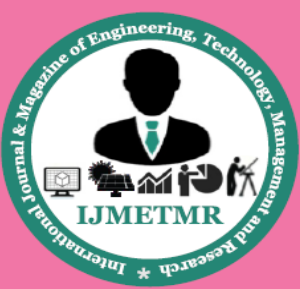


VI. CONCLUSION:

In this proposed Project, resource and industrial safety management system using sensor network is successfully developed and implemented in real time environment. This system is developed at low cost, low power and in time better performance in the experimental setup.

REFERENCES:

- [1]. Fabrication of Microcontroller Based Multipurpose Measuring System with Inbuilt Data acquisition Snehinand, Amit Sen Gupta 2010 IEEE.
- [2]. www.omega.com
- [3]. A Microcontroller Based Data Acquisition System with USB Interface M Popa , M Manu
- [4]. A Platform for Building PIC Applications for Control and Instrumentation Brandon Kuczenski, Philip R. LeDuc, and William, C. Messner 2005 American Control Conference.
- [5]. Modeling and Formal Verification of a Commercial Microcontroller for Embedded System Application, Subhashini, Balakrishnan and Sofi theTahar ICN98 December 14-16 1998
- [6]. Temperature-meter via USB based on PIC 18F2550 for Solar Energy Concentrator System, González Manzanilla F.O., Arízaga Silva J.A, Moreno Barrera. O
- [7]. Design of USB Based Data Acquisition System Manu Mohan, A. Robson Benjamin and N. Mathivanan
- [8]. A Low-cost Microcontroller-based Wireless ECG-Blood Pressure Telemonitor for Home Care Ricardo Isais, Khoi Nguyen, Gabriel Perez, Roberto Rubio, and Homyoun Nazeran IEEE September 17-21 2003
- [9]. Low-Cost and High Sensitive Microcontroller Based Data Acquisition System for Renewable Energy Sources Mehmet Demirtas*, Ibrahim Sefa*, Erdal Irmak*, and İlhami Colak* SPEEDAM 2008
- [10]. Development of a Novel Microcontroller-based Data Logger B. Nkom ,H. Musa* IEEE 2009
- [11]. USB bulk transfers between a PC and a PIC microcontroller for embedded Applications Ruben Posada- Gomez, Jose Jorge Enriquez-Rodriguez, Giner Alor- Hernandez, Albino Martinez-Sibaja ERAMC 2008



[12].Microlink Engineering Solutions. Acquiring Data from the RS232 Serial Port. <http://www.microlink.co.uk/rs232.html>. (2006).

[13].Temperature Monitoring System for Ultrasound Therapy Machine By Mani A/P Chow

[14]. PIC Microcontroller and Embedded System By Muhammad Ali Mazidi2008 ISBN 978-81-317-1675-5