CENTRALIZED WEB BASED MONOTORING AND ALARMING SYSTEM FOR INDUSTRIAL SAFETY.

N.S.Vatkarr and R.R.Mudholkar

Department of Electronics Engineering, D.Y.P.C.E.T,Kasaba bawada,Kolhapur,Maharashtra.

Department of Electronics Shivaji University, Kolhapur,Maharashtra.

ABSTRACT

Now a day the security of costly equipments, buildings and human being are very important aspects. So here a trustworthy, flexible and authenticated security. Project-Work entitled has been presented. For small size, simple architecture PIC 18F microcontroller, our project uses 16*2 LCD display, temperature sensor, smoke detector, humidity sensor, MAX 232 chip, MAX 485 chip, DB9 connector, OP- 07 Amplifier, and MCP3202 ADC.In this work the sudden changes in the parameters are detected by sounding the buzzer. The data is display on the LCD display.The same data is monitor,recorded on the PC and can be transferred to one PC to other PC over long distance using internet. By monitoring these parameters in the rooms, labrotaries of proposed Industry one can restrict these parameters within safety limits.Thus protecting any losses to equipments, building premises and above all avoiding personnel casualties.

The data can be recorded with time and date of access.The PC based software is developed in Visual Basic language (VB.NET) Using this software the monitoring and recording can be done easily.

Keywords

monitoring, alarming,recording,PIC microcontroller,MAX485,Smoke detector

Introduction

We have made a survey of various small-scale industrial sectors. It is found that there is little attention paid towards the centralized monitoring of hazardous factors and take safety measures in the event of adverse situation. One can monitor these parameters, but around the clock and communicate to concerned authority situated far away from recorded place becomes difficult. In case of sudden changes in these parameters as information is not reaching to the authority in time it becomes difficult to take quick action to avoid casualties and losses or at least keep them minimum. The data of such parameters some times need to be recorded for several hours, days, and months for future. Also we can not see these data recorded by number of such data loggers in number of chambers in the industry on internet for given interval of time using existing devices. Also monitoring the industrial safety situations from any where at any time is not possible using existing system. The quick and timely handling of possible hazardous situations and take accordingly safety measures are not obtained using present system. Thus question of labor casualties and property loss remains unsolved.

The System Development

The system is divided into following four main parts-

1) The sensors, Amplifiers, ADCs.
2) The decision making device PIC microcontroller,collection of all data in PC Using RS485 connecter.
3) To observe data regularly and detect random variations in the parameters or exceeding the limit.
4) Establish the link between the Centralized Control Unit and Industry as well as the User PC via to Internet.

1) Sensors: -

For measurement of temperature digital *temperature sensor* is used, as it is more compactable.

TCN75-5.0 MOA (5.0 Supply Voltage, -55 degree to +125 degree Celsius).

Humidity sensors: - SY-HS-220 Model. Models of other sensors are not being selected yet.

Smoke Detector (MQ-135): - Suitable gas sensors will be used for ammonia, oxygen, CO_2, polluted air,

alcohol, sulphide etc.

2) Amplifier: - OP-07 Amplifier is used to amplify the incoming signal from sensors then fed to ADC

and PIC microcontroller.

To monitor these parameters microcontroller is used with supporting electronic circuitry.

It will continuously track the data and will send it to PC so that data can be accessed on the

web from any terminal.

3) ADC: - MCP3202 ADC.

4) Microcontroller: - Selection of microcontrollers will be done from the capacity of program memory,

data memory, on chip ADC, capture mode facility, simple architecture, low power consumption,

speed in MHz, number of port and pins and package. Proposed project work is based on

PIC microcontroller as it fulfills the above requirements. PIC has on chip ADC, capture mode facility,

RISC architecture, low power consumption and hence suitable in the proposed project.

5) LCD Display: - This LCD display is used to display the recorded data of such Parameters.

6) RS 485 Connector: - For long distance transmission.

7) RS-485 to RS-232 converter: - This converter is used to convert the received data in RS-485 connecter

into RS-232 connecter to interface with PC.

8) PC System: - To monitor the data and to transmit the data to other PC.

Fig.1. The functional block diagram of one unit of centralized system.
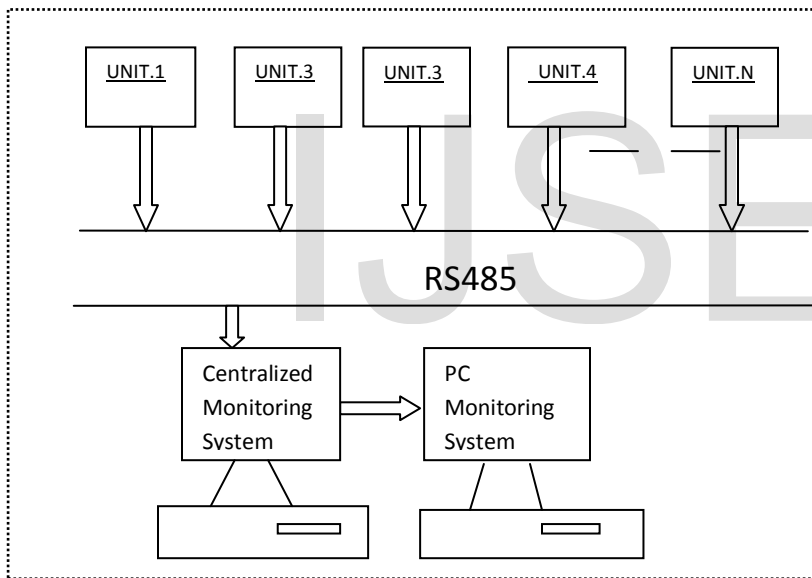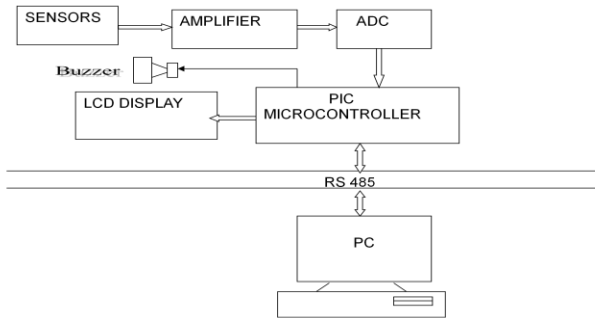

Fig.2: Centralized monitoring system along with PC monitoring system

RESULTS AND DISCUSSION

Sr. no.	Thermometer reading Degree Celsius	Sensor reading U1 Degree Celsius	Sensor readingU2 Degree Celsius
1	0	0	0
2	3	3	3
3	5	4	4
4	10	9	9
5	15	15	15
6	30	31	30
7	40	41	41

8	50	50	51
9	60	60	61
10	70	70	70
11	80	79	81
12	90	90	91

Calibration of Temperature Sensor(TCN-75) for unit 1.

Calibration of Temperature Sensor(TCN-75) for unit 2.
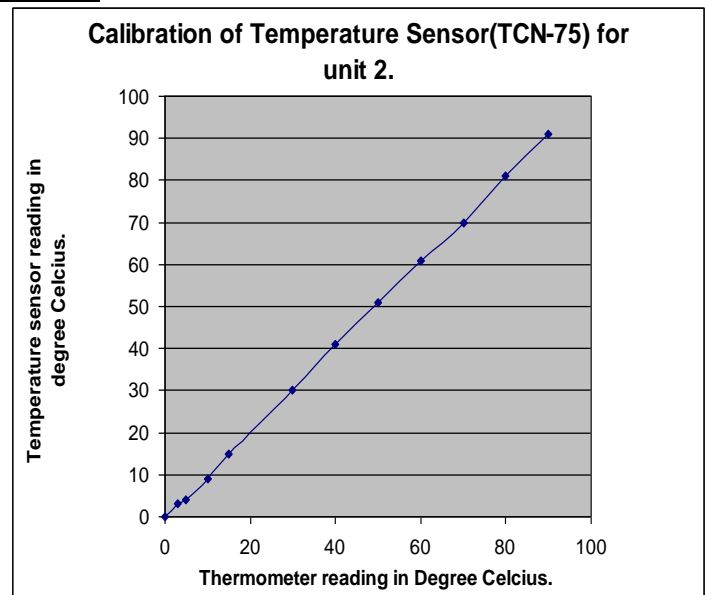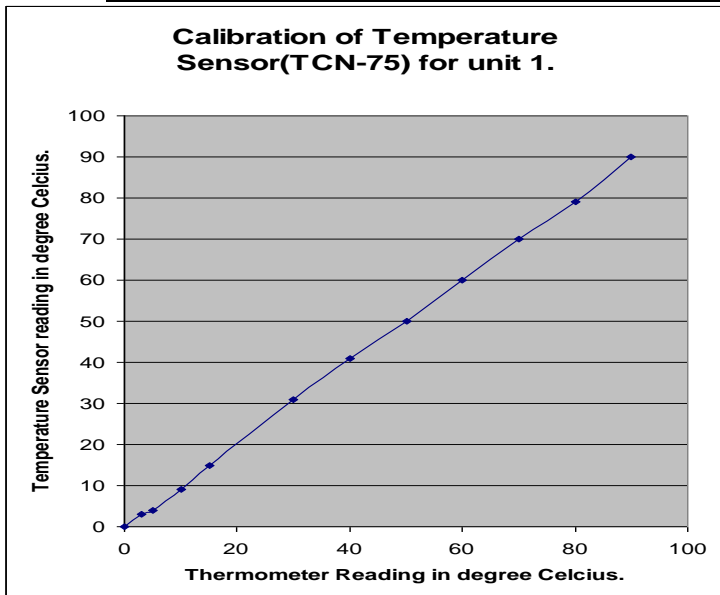
Table 3: Calibration of humidity sensor for unit 1

Sr. no	% Humidity for unit 1	Voltage in volts
1	25	0.85
2	30	1.05
3	40	1.30
4	50	1.72
5	60	2.00
6	65	2.18
7	75	2.53
8	80	2.72
9	85	2.83
10	90	2.99

Calibration of Humidity Sensor SY-HS-220 for unit 1.
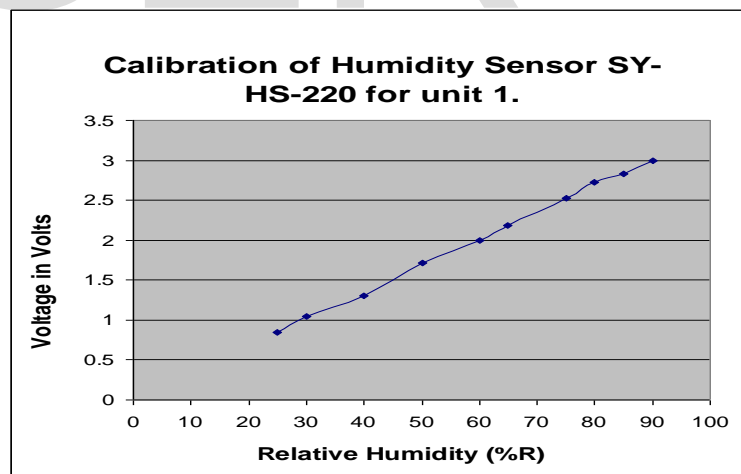
Table 4: Calibration of humidity sensor for unit 2

Sr.no.	% Humidity for unit 2	Voltage in volts
1	25	0.83
2	30	1.01
3	40	1.35
4	45	1.50
5	50	1.68

6	60	2.04
7	65	2.18
8	70	2.36
9	80	2.66
10	90	3.00

Calibration of Humidity Sensor for unit2.
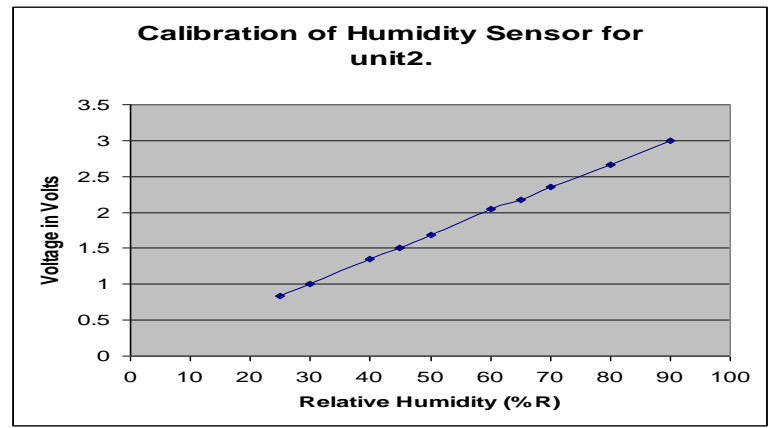
Smoke for unit .1

Sr. No	Low Level (Volts)	Medium Level (Volts)	High Level (Volts)
1.	0.04V	3.66V	4.78V

Smoke for unit .2

Sr. No	Low Level (Volts)	Medium Level (Volts)	High Level (Volts)
1.	0.09V	3.59V	4.88V

CONCLUSION:

Here we have developed "CENTRALIZED WEB BASED MONOTORING AND ALARMING SYSTEM FOR INDUSTRIAL SAFETY". We made a survey and we found that in many industries good attention is paid to the safety of personal and property. Still we noticed that continuous parameters recording is not carried out and also very less attention is paid towards alternative majors in the events of dangerous taking place due to some of the parameters going beyond their safety values. It also happened that worker and other person remains busy in their schedule work and hence immediate attention can not be turn towards possible dangerous accidents. Some time during holidays as there is no body inside the industry some unwanted events may take place which may bring loss to the equipment and creating some other problems.With these kinds of problems we thought of providing a good solution which will be helpful to the industry.

This developed system will be beneficial for the safety of various equipments, apparatus and workers life. The workers are busy in their work so sudden increase in the dangerous gases, atmospheric conditions may found harmful to equipments, rooms, laboratories, workers life and large buildings in the industry.

As in this work the system is developed which is detecting some parameters like humidity, smoke, temperature using specific sensors. The outputs of such sensors are detected in the rooms, laboratories of the said industry. These parameters are then recording, monitoring using PC.The crossing of the set limit of these parameters will be detect by sounding the buzzer. Various such parameters recorded on one PC can be sending to other PC using internet facility by using their IP addresses i.e. Ethernet system.The use of transferring the recorded data from one PC to other PC can be find beneficial when office and industry place are quite long distance from each other. So during holiday one can watch the various conditions in the rooms, labarotories of the said industry. In this system continues monitoring and recording of given parameters and their sudden increases in their values are recorded. So it will protect the costly equipments, apparatus, and workers life from sudden increase in these parameters.

For time beinghere in this work three sensors are used which will detect temperature, humidity and smoke i.e.CO_2, LPG, smoke, alcohol etc.So with this system one can keep the safety limits on various hazardous parameters to the safe value. Thus saving life of equipments, apparatus and workers by detecting, monitoring, recording and transferring various parameters from one PC to other PC using internet system.

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