International Research Journal of Engineering and Technology (IRJET) e-ISSN: 2395-0056
Volume: 07 Issue: 02 | Feb 2020 www.irjet.net p-ISSN: 2395-0072

SMART INDUSTRIAL CONTROL AND SAFETY SYSTEM

Prashant S. Suryawanshi[1], Kaustubh A.Dighe[2], Abhijit B. Deshmukh[3], Prof. Rathod G. G[4](Project Guide)

Department of E&TC diploma Engineering, Amrutvahini Polytechnic, Sangamner, India

---

Abstract- *Now a days the technology is increasing rapidly, that leads to an upgradation in industrial security system. Automation in security sector makes it more authentic. There are many electrical equipment's are available in industry which are in necessity of monitoring from a remote area all at a time. In this paper a smart industry and security system is proposed along with the GSM detection technique. A stand alone system through Internet of Things as a network of communication is implemented. ARM7 is used as controlling unit codded in c language.*

Keywords— Automation, safety; security, sensors, IoT etc.

1. INTRODUCTION

THIS present scenario ensures the safety and smartness has become an inevitably essential. There is a regressive progress in the security system as the influence of modern technology is reaching its peak. When there is a modern industry with minimum human effort, it's well known as modern industry or smart industry. Since there is an advent of wireless and digital technologies, all together it introduces a automated intelligent security and smart system. The automated industrial security system can be designed with the multiple sensors.

1.1 LITERATURE REVIEW

This paper presents the specification, design, and implementation of a Industrial automation system that was designed and built as a final This system was designed to be flexible and generally programmable, extensible such that adding additional features is relatively simple, and modular and forward-compatible, so that new components can be added without redesigning the entire system. To achieve these goals, the system runs a user-defined program on a special-purpose processor, using real-world sensor inputs as operands. The sensors and other input mechanisms along with user-programmable event schedules allow the user to adjust and customize the industrial environment. Using sensors that measure temperature, light level, and infrared commands from a remote control, this system will create a comfortable and safe and smart industrial atmosphere. Design decisions, implementation details, and testing procedures are thoroughly discussed, and the resulting functional system is described.

1.2 IoT SERVICE

The Concepts of Internet of Things (IOT) are applied to a number of applications ranging from home automation to industrial IOT, Where connecting physical things, from anywhere through a network. Let them take an active part in the Internet, exchanging information about themselves and their surroundings. This will give immediate access to information about the physical world and the objects in it leading to innovative services and increase in efficiency and productivity..

1.3 BLOCK DIAGRAM

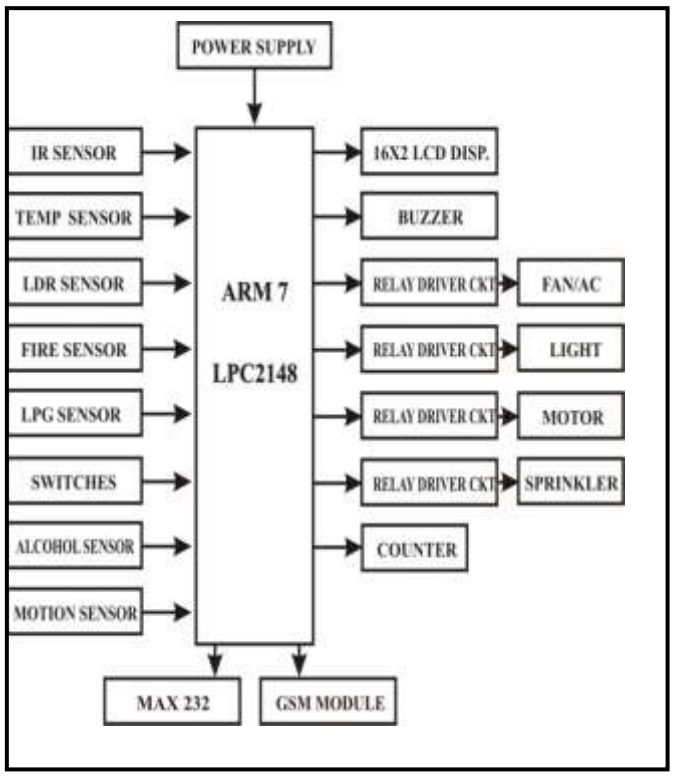

Fig a) Block Diagram of proposed system

1.4 HARDWARE /COMPONENT REQUIREMENT WITH SPECIFICATION

I. Controller -ARM LPC2148

ARM-Advanced RISC Machine is a 32-bit RISC (Reduced Instruction Set Computer) processor architecture developed by ARM Holdings.

Fig 1:- GSM Module

Many beginners sometimes misunderstood that the ARM is microcontroller or processor but in reality, ARM is an architecture which is used in many processors and microcontrollers

II. Module –GSM 800

Fig 2:- GSM Module

This GSM modem has a **SIM800A chip and RS232** interface while enables easy connection with the computer or laptop using the USB to Serial connector or to the microcontroller using the RS232 to TTL converter. Once you connect the SIM800 modem using the USB to RS232 connector,you need to find the correct COM port from the Device Manger of the USB to Serial Adapter Then you can openPuttyor any other terminal software and open an connection to that COM port at 9600 baud rate, which is the default baud rate of this modem. Once a serial connection is open through the computer or your microcontroller you can start sending the AT commands

III. IR Sensor

Fig 3:- IR Sensor

IR sensor basically consist an IR LED and a Photodiode, this pair is generally called IR pair or Photo coupler. IR sensor work on the principal in which IR LED emits IR radiation and Photodiode sense that IR radiation.

IV. PIR SENSOR

Fig 4:- Passive Infrared sensor

PIR sensors are more complicated than many of the other sensors explained in these tutorials (like photocells, FSRs and tilt switches) because there are multiple variables that affect the sensors input and output.

V. ALCOHOL SENSOR

Fig 5:- MQ3 Alcohol Sensor

An alcohol sensor detects the attentiveness of alcohol gas in the air and an analog voltage is an output reading. The sensor can activate at temperatures ranging from -10 to 50℃ with a power supply is less than 150 Ma to 5V. The sensing range is from 0.04 mg/L to 4 mg/L, which is suitable for breathalyzers.

VI. MQ2 LPG GAS SENSOR:

Fig 6:- GSM Module

The Grove - Gas Sensor(MQ2) module is useful for gas leakage detection (home and industry). It is suitable for detecting H2, LPG, CH4, CO, Alcohol, Smoke or Propane. Due to its high sensitivity and fast response time, measurement can be taken as soon as possible**.**

1.5 WORKING PRINCIPLE OF PROJECT

Microcontroller ARM LPC2148 is the controller of our project. System clock plays a significant role in operation of the microcontroller. For sensing the temperature the LM35 IC has been used.This project is to control different industries appliances usingor Laptop.Nowadays, lightening-up of industry is done through HID lamps but, the energy consumption of these lights is high as well as there is no particular mechanism to turn on/off the lights from sunrise to sunset. To overcome this problem, here is an alternative method using LEDs i.e. power conserving of intensity controlled industry lights using LDR In this project we used Temp Sensor (LM35 IC) In the industrial automation,

the Temperature Sensor is used to measure the temperature. The temperature sensor uses the converter to convert the temperature value to an electrical value. To read the temperature correctly & control the temperature in the industrial applications the temperature sensor is used more widely, if the temperature in the industry is above the set point then these sensor and the fan working together that means if the temperature is high then fan is on and if the temperature is low then the fan automatically off Also Gas sensor used in industrial areas to continuously monitor and detect hazardous gases and vapors, and to generate audible and visual alarms to alert personnel to the existence of these hazards. if the gas is spread these sensor quickly alarm and give indication for safety The MQ3 gas sensor has high sensitivity in ammonia, sulfide, benzene steam, smoke and in other harm full gas and Alcohol sensor are use for safety purpose that means if the any one person comes in industry these sensor activate and sense that person and never allows work in the industry and give indication (Motor Turn off means Machine Turn off). The Fire sensor is used to detect the fire similarly if the anywhere fire raising and spread continuously then these sensor give the alarm and indication and automatically activate and sprinkler get turn on immediately and IoT is a new and popular technology that we used in these project which help us to all types of indication in percentages and graphical image using internet server and GSM module the another is 16x2 LCD display which also indicate the parameter and the command in these project and GSM Module is use to notify the industrial owner through the messaging

1.6 ADVANTAGES OF PROJECT

1. Long distance controlling and monitoring is possible
1. Faster production and cheaper labour cost.Can perform the task beyond the human capability.
2. Error probability reduced Ease of access and low cost and power consumption
3. Can reduce human effort
4. Smarter processing and services
5. Can be implemented at any device and automated
6. Alert system is quick in case of an emergency
7. Eliminates the use of PC for automation
8. Simple interface

1.7 DISADVANTAGES OF PROJECT

1. Difficult to maintain.
2. Need Internet access

1.8 APPLICATION OF PROJECT

1. Industries and Office
2. Hospital and labs
3. Home Automation
4. Manufacturing Companies, Robotics
5. Environment Monitoring
6. Steering and stabilization of ships
7. Aircraft, Colleges, Seminar Hall

1.9 OUTPUT

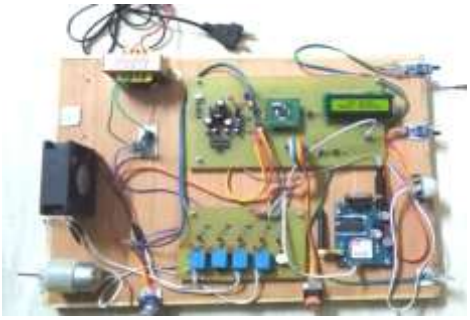

Fig 7:- Photograph of fabricated project Smart Industrial Control and Safety System

1.10 REFERENCES

[1] http://www.irjet.net/
[2] Mohammad Ibrahim, Abdelghafor Elgamri and Ahmed Mohamed,
[3] Internet of Things based Smart Environmental Monitoring using the Raspberry-Pi Computer, ISBN: 978-1-4673-6832-22015 IEEE.Ding, W. and Marchionini, G. 1997
[4] A Study on Video Browsing Strategies.

1.11 BIOGRAPHIES

Suryawanshi Prashant Suresh
Third Year Diploma in E&TC
Amrutvahini
Polytechnic,Sangamner

Dighe Kaustubh Anil
Third Year Diploma in E&TC
Amrutvahini
Polytechnic,Sangamner

Deshmukh Abhijit Balasaheb
Third Year Diploma in E&TC
Amrutvahini
Polytechnic,Sangamner