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OFFICE AUTOMATION AND SECURITY SYSTEM BY USING PLC

Mr. K.S.Wagh[1], Mr. S.K.Patil[2], Mr. M.D.Mande[3], Mr. D.R.Nehete[4]

[1,2,3,4]*Diploma In EE, Guru Gobind Singh Polytechnic, Nashik*

Guru Gobind Singh Polytechnic, Nashik, Maharashtra, (India)

ABSTRACT

Our paper is based on office automation with security system. Basically it is a system which gives comfort and security .we are using a PLC for controlling inputs and outputs like IR sensor, PIR sensor, smoke sensor ,raindrop sensor, sliding windows and door, exhaust fan by interfacing them with PLC. Hence we get automatic controlled windows and doors, exhaust fan, theft motion indicating alarm system

Keywords: PLC SR2A201BD

I.INTRODUCTION

The continues growth of industrial section in India increases no. of industrial as well as official complexes hence to make them smart, secure and time saving, automation is required. By using PLC we are designed a office with those things which takes time if we control them manually and also not secure like operating of windows and doors during 1rainfall, opening and closing of door on entry of a authorized person, exhaust fan on and off in kitchen or smoking zone.

In this project we are designed a office including the following points.

- Automatic control on door and windows during rainfall
- Theft motion detecting system with alarm
- Automatic control on door during entry.
- Exhaust fan ON /OFF kitchen or smoking zone.

II.PLC SYSTEM

Figure 1. PLC SR2A201BD

PLC means programmable logic controller that is used in Automation systems. PLC is program by ladder language there are many manufacturers like Siemens, Schneider, delta and we are using Schneider PLC SR2A201BD of zelio logic series. It operates on 24V DC with 14 inputs and 8 outputs without clock.

2.1 IR SENSOR

Figure 2. IR sensor

IR sensor works on the principle of reflection. IR sensor is having LED and a light sensor. When light emitted by LED of specific wavelength is fall on light sensor it works properly and if wavelength is get different due to some obstacle in LED light ray sensor sense the obstacle and gives signal to system.

2.2 PIR SENSOR

Figure 3. PIR sensor

PIR sensors are more complicated than many of the other sensors because there are multiple variables that affect the sensors input and output. When the sensor is idle, both slots detect the same amount of IR, the ambient amount radiated from the room. When a warm body like a human or animal passes by, it first intercepts one half of the PIR sensor, which causes a positive differential change between the two halves. When the warm body leaves the sensing area, the reverse happens, whereby the sensor generates negative differential change. The changes indicate movement in the area.

2.3 RAINDROP SENSOR

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Figure 4. Rain drop sensor

Raindrop sensor is basically a board on which nickel is coated in the form of lines. It works on the principal of resistance. When there is no rain drop on board. Resistance is high so we gets high voltage according to V=IR. When rain drop present it reduces the resistance because water is conductor of electricity and presence of water connects nickel lines and reduces voltage drop across it. Rain drop sensor is faster than moisture sensor.

2.4 SMOKE SENSOR

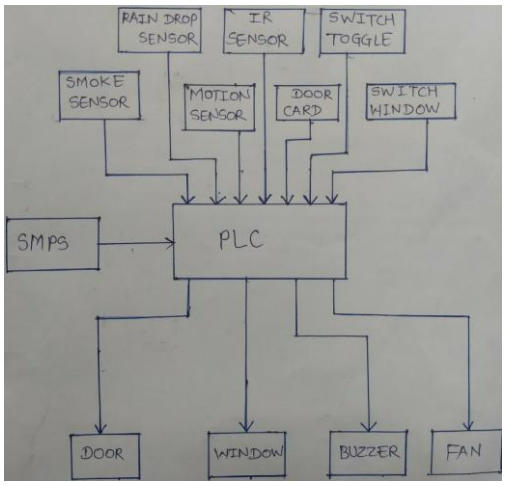

Figure 5.Smoke sensor

The grove gas sensor module is useful for gas leakage detection It is suitable for detecting LPG, CH4, CO, alcohol, smoke. Due to its high sensitivity and fast response time, measurement can be taken as soon as possible. The sensitivity of the sensor can be adjusted by potentiometer

III.SYSTEM CONCEPT

Figure 6. Block diagram

3.1 AUTOMATIC DOOR FOR ENTRY

In this system IR sensor is situated on the inner side wall near the door, whenever the person inside room stand front of the IR sensor door gets open and automatically closes after the person goes outside of the room and to open the door from outside person need a door card. Hence this system is time saving and secure.

3.2 ANTI THEFT SYSTEM

In most of the offices to secure the confidential data a proper security is required for this we are designed a system which consist of a activation switch, sensor and alarm. To activate the system firstly ON the activation switch and leave the room when any movement is happen in the room the alarm gets ON and all doors, windows are get close when we open the door only then alarm will stop.

3.3 AUTOMATIC DOOR AND WINDOW ON RAIN

When rain occurs we close the door and windows manually hence to overcome this problem we are designed this system in which rain drop sensor sense the rain then door and windows will automatically closed and after the rain all doors, windows get open as in previous position.

3.4 AUTOMATIC EXHAUST FAN

This system helps in ventilation of smoking zone when the smoke is detect by smoke sensor exhaust fan get automatically ON hence there is no need of manual operation and energy also get saved

IV.CONCLUSIONS

In official or industrial complexes smart technology is required for making office smart and secure hence we are designed this system in which comfort is also taken into account. It is also increases living standard and quality of a respective industry. PLC is used in system to make it simple and power saving as it required 24v dc supply we are also implementing this system by using RFID system on the entry gate automatic door and window is a new idea in this system, automatic door on entry, anti-theft system, automatic exhaust fan are also innovative and making life comfortable and sensors used are also provided with high sensitivity to make system errorless.

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BIOGRAPHICS

	Mr. Ketan S. Wagh Diploma in Electrical Engineering, Guru Gobind Singh Polytechnic, Nashik, MH, India.
	Mr. Saurabh K. Patil Diploma in Electrical Engineering, Guru Gobind Singh Polytechnic, Nashik, MH, India.
	Mr. Mayur D. Mande Diploma in Electrical Engineering, Guru Gobind Singh Polytechnic, Nashik, MH, India.
	Mr. Darshan R. Nehete Diploma in Electrical Engineering, Guru Gobind Singh Polytechnic, Nashik, MH, India.