



# Industrial Security System

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## Abstract:

The project presents a versatile **security** and alarm **system** which can be used by individuals, corporations and establishments which require a cheap but reliable **security system**. The idea behind this project is to provide its users with a simple, fast and reliable way to get help during emergency situations. This type of security system is quite useful in the small scale industries, different sensors can be implemented to make the system more versatile. This security system is very much useful product for remote surveillance and one can monitor the office, home, industrial premise etc from the remote place.

**KEYWORDS:** Micro controller core processor, LED INDICATOR, RELAY

## INTRODUCTION:

The security system is one of the major focus areas in the present social and industrial environment. In the industries society security system is one of the important part. The growth and economy all depends on this. The traditional security system is not at all full proof and also very much expensive. To safe guard the industrial area, the most important aspect to be considered is the trace passing. It is also required to safe guard the industry from fire and flood. In certain industries it is required to protect the raw material from rain and icefall. In this project the care is taken to design a general purpose security system for general application, this can be installed at small office home and general areas, in which a security against over voltage, over current, over temp, Gas sensor provided. The over temperature due to fire or electrical panel heating etc. There are four sensors connected to the system if there is a security detection at any of the channel the automatically the system detect the same and gives indication to the local indicators and alarms. This type of security system is quit useful in the small office, home, industries the different sensors can be implemented to make the system more versatile

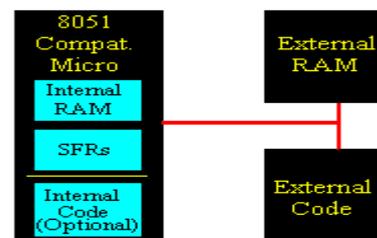
This type of devices are designed and marketed by the different multinational companies. This type of devices are designed and marketed by the different multinational companies. In the present scenario technological environment the embedded system is getting first choice for designer for its flexibility and miniature size. This telecom interfaced security system is very much useful product for remote surveillance and one can monitor the office, home, industrial premise etc from the remote place.

## COMPONENTS USED:

### Micro controller core processor:

Despite it's relatively old age, the 89C51 is one of the most popular Micro controller in use today. Many derivatives Micro controllers have since been developed that are based on--and compatible with--the 8051. Thus, the ability to program an 89C51 is an important skill for anyone who plans to develop products that will take advantage of Micro controller. Many web pages, books, and tools are available for the 89C51

developer. The 89C51 has three very general types of memory. To effectively program the 8051 it is necessary to have a basic understanding of these memory types. The memory types are illustrated in the following graphic. They are: On-Chip Memory, External Code Memory, and External RAM.



### PIEZO ELECR TIC BUZZER:

It is a device that converts electrical signal to an audible signal (sound signal).

The Microcontroller cannot drive directly to the buzzer, because the Microcontroller cannot give sufficient current to drive the buzzer for that we need a driver transistor (BC547), which will give sufficient current to the buzzer. Whenever a signal received to the base of the transistor through a base resistance (1.5k) is high, the transistor comes to saturation condition i.e. ON condition thus the buzzer comes to on condition with a audible sound. Similarly, whenever the signal is not received to the base of the transistor, thus the transistor is in cut-off state i.e. is in OFF state thus the buzzer does not gets activated.

### RELAY:

Here in this section, to activate/deactivate the load a solid state device is used to drive the load but the load is an AC load for that we have to isolate that for that we have used an opto-isolator (MOC3201) as a driver. It is an electronics device which isolates between input to output, that device is consisting of a LED and a DIAC which is fabricated on a single chip. Whenever a high voltage is given as input to the LED the LED gets forward biased which in turn ON the LED, the light falls on the DIAC which in turn the DIAC thus gets a sufficient current to drive the gate of the TRIAC to make turn ON the LOAD.

### TRANSFORMER:

- Electrical power transformer is a static device which transforms electrical energy from one circuit to another without any direct electrical connection and with the help of mutual induction between two windings. It transforms power from one circuit to another without changing its frequency but may be in different voltage level. This is a very short and simple definition of transformer, as we will go through this portion of tutorial related to electrical power transformer, we will understand more clearly and deeply "what is transformer ?" and basic theory of transformer.

#### Working Principle of Transformer

- The working principle of transformer is very simple. It depends upon Faraday's law of electromagnetic induction. Actually, mutual induction between two or more winding is responsible for transformation action in an electrical transformer.
- Faraday's Laws of Electromagnetic Induction
- According to these Faraday's laws, "Rate of change of flux linkage with respect to time is directly proportional to the induced EMF in a conductor or coil".

### VOLTAGE REGULATOR:

A voltage regulator is an electronic circuit that provides a stable DC voltage independent of the load current, temperature and AC line voltage variations. A voltage regulator may use a simple feed-forward design or may include negative feedback. It may use an electromechanical mechanism, or electronic components. Depending on the design, it may be used to regulate one or more AC or DC voltages.

Electronic voltage regulators are found in devices such as computer power supplies where they stabilize the DC voltages used by the processor and other elements. In automobile alternators and central power station generator plants, voltage regulators control the output of the plant. In an electric power distribution system, voltage regulators may be installed at a substation or along distribution lines so that all customers receive steady voltage independent of how much power is drawn from the line.

The circuit consists of following four parts.

- Reference voltage circuit
- Error amplifier
- Series pass transistor
- Feedback network

### LED INDICATOR:

The indicator section consists of a light emitting diode and its driver circuit is designed on the basis of current required to glow the light emitting diode. Here the driver circuit is required for the following functionality.

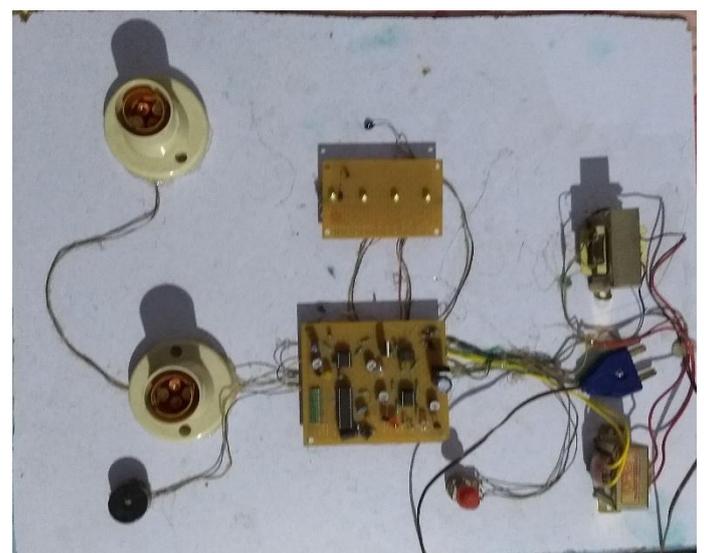
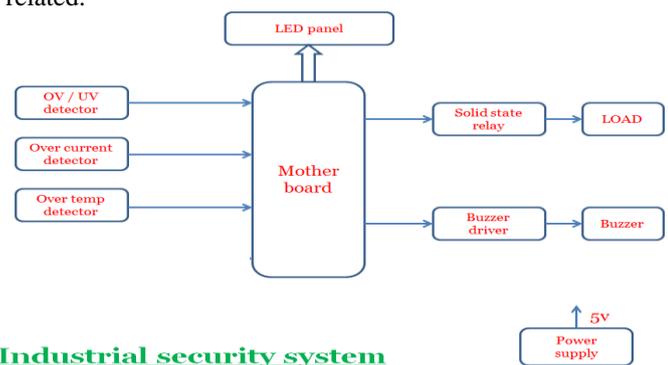
- 1) The Microcontroller cannot provide adequate current for glowing the LED. The LEDs requires a current between 10mA to 20mA of current to glow.
- 2) The driver circuit provides current to the load from a separate source, so the load current used not pass through the Microcontroller.
- 3) The driver circuit activates the load on receipt of a logic signal from the Microcontroller and of the load in the absence of the signal as he current requirement is very less to glow a LED a single stage driver is

sufficient to drive the load. The driver circuit is nothing other than a perfect a transistor switch. The driver transistor goes in to saturation on receipt of base signal and drives into cut-off region, in absence of base signal.

The driver designs around a BC548/BC547 transistor and designed for a working voltage of +5 V dc and 10mA current.

### DESIGN PRINCIPLE:

This type of protection system is quite useful in the small office, home, industries the different sensors can be implemented to make the system more versatile. If any time any of the sensors is occurred fault, the microcontroller activate the protection relay and monitor the status on LRD panel. The relay gets activated & and starts alarming and it continues until tripping occurs. The temperature relays have two contacts points in series. One is connected to alarm relay & other is connected to tripping relay. This embedded protective device is designed for 4-channels. Whenever the controller receives a logic high signal at any of the input channel, it indicates the type of fault or tripping on the display board .At the same time the device trips the required protective relay. This protective device works on the principle of digital logic and the controller is designed to function on receipt of logic signals. Each channels of the controller assigned for specific task so the input terminals are marked for connecting because input and output both are interconnected or related.



### FUTURE EXPANSION:

This device is basically a four Channel Programmable Logic controller. This acts and operates according the program loaded on the microcontroller. The microcontroller is a smart

device so many functions can be incorporated without much change of hardware.

1. As the central device is a micro controller the status of different channels can network so an ether net enabled protection system or PLC can be developed. Also the inter networked PLC s can be used in cascaded format to increase device compatibility and dependability.
2. The Present device is designed for 4 channels, where as this can be expanded up to 256 channels without much modification in hardware and software.
3. This programmable Logic Controller operates with only digital input and digital outputs. Where as in the same principle, by using external ADC And DAC or by changing the processor to one having internal. ADC and DAC built-in, analog input and output channels can be added up.
4. The present days micro controllers are very powerful and they have a option of In System Programming (ISP). Which indicates that using this option this PLC can be made field Programmable.

### **CONCLUSION:**

This project is working satisfactorily in the laboratory condition and with the simulated faults. The performance of the relay can be improved by using better quality current Transformer (CT).

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