Smart Home

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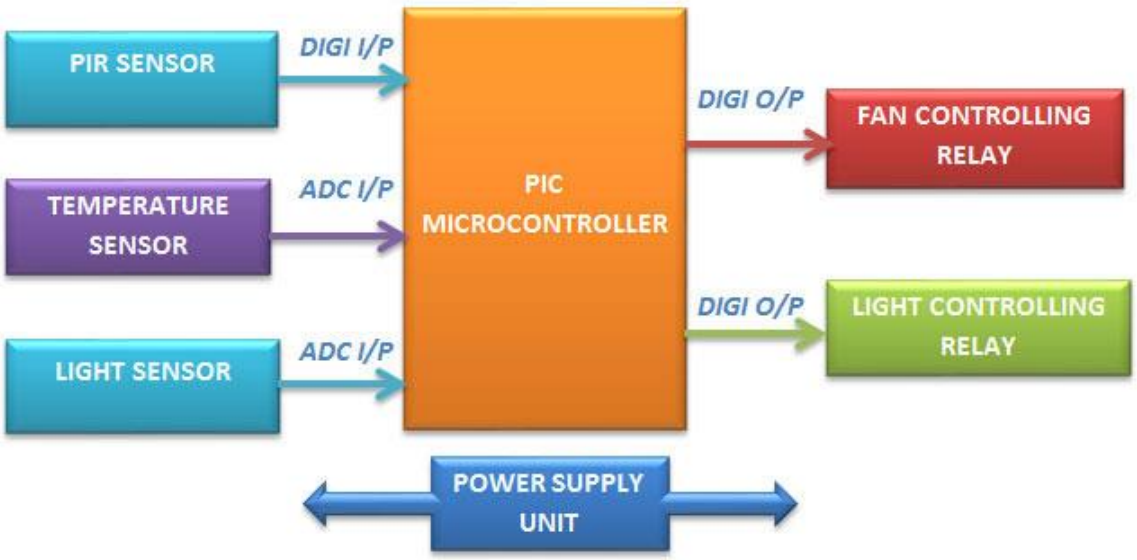
Introduction:

Home Automation Project Using Embedded System discuss about a profitable and powerful solution for preserving electrical energy by optimizing electrical appliances such as lights, fans, tube lights etc., It depends upon occupants in the house or hall with the help of embedded system like PIC microcontroller. Home Automation Project Using Embedded System using PIC Microcontroller provides an intelligent Energy preserving system for home, schools, malls, rooms, conference halls etc. This Home Automation Project Using Embedded System saves energy by a profitable energy management of rooms or hall which utilizes certain predominant mechanisms managed by an embedded system - PIC microcontroller.

Design:

Block diagram:



Component Requirement:

Operating principle of PIR Sensor:

Usually, any object with temperature greater than absolute zero, starts emitting heat energy in the form of radiations of IR waves, also these radiations will not be visible by human eyes. The Passive Infrared Sensor used in the Home Automation Project will perceive these IR Radiations and will give some digital output to the PIC Microcontroller. The controller performs the corresponding actions according to the programs and controls the corresponding home electrical appliances, such as, if a person enters the room, PIR Sensor detect the presence of that person and it will provide some output voltage to the PIC Microcontroller and the controller automatically turns ON the light and fan by virtue of light and fan controlling relay. One of the most important advantages of this home automation project part 2 is that, even though the Passive Infrared (PIR) Sensor detects the presence of a person, the fan and light will be switched ON according to the temperature and light intensity levels of the rooms.

LM35 Temperature Sensor:

LM35 IC is used to measure the temperature of a room. Temperature sensor LM35 is a precision IC with its output voltage proportional to the measured temperature level of a room in degree Celsius. The LM35 temperature sensor provides high accuracy than a thermistor for measuring temperature. Also compared to the thermocouple, the output voltage level of LM35 temperature sensor is in an accurate high voltage level, there is no need of output voltage amplifiers.

Features of LM35 Temperature Sensor:

- Operating Temperature Range: -550°C to 1500°C
- Low-Impedance Output
- Self-Heating is very low
- Low cost

- Not affected by oxidation and any other process.

When the PIR sensor detects the presence of a person, the controller compares the room temperature measured by the LM35 temperature sensor with a predefined value and according to that, controller will control the fan.

LDR (Light Dependent Resistor) or Photoresistor:

LDR (Light Dependent Resistor) or Photoresistor is a light Controlled Variable Resistor. The resistance of the LDR will vary in accordance with the incident light intensity. The resistance of the LDR will decrease with increase in the light intensity that incident on the photoresistor. Here in the Home Automation Project, these LDR is used to detect the Light intensity level of a room and give signals or outputs to the PIC Microcontroller and according to the readings from the LDR; the Microcontroller controls the operations like, switch ON the light or any other activities.

Advantages:

- Energy saving
- Convenience
- Security

Disadvantages:

- Installation
- Complex Technology
- System Compatibility
- cost

Conclusion:

Home Automation Project Using Embedded System is a recommended one in these conditions. By installing this project in your house, office or anywhere else, you can save energy and can reduce the electricity

bill. In this project, if there is no one in the room or house, then the fan and light will be in switched OFF condition and when any person infiltrates the room, the fan and light will be switched ON. But the point should be noted that, the fan will be switched ON according to the room temperature. Similarly, the light also gets switched ON corresponding to the light intensity level of the room.