RF BASED INDUSTRIAL AUTOMATION SYSTEM

ABSTRACT

The project is aimed to design an industrial automation system by using wireless communication technology of RF using which the manual operations can be completely eliminated.

In industries, there will be various machinery to be operated on the basis of the status of other machinery. For this purpose, a person should be employed to monitor the status of loads. But there may be chances that the person may forget to operate. And also it is not an easy task for a person to operate manually as these machines run with high currents and high power consumption. This project gives the best solution for those situations and also the manual operation will be completely eliminated. This application will be developed by using a wireless concept. Here we consider, one of the wireless communication systems, that is RF (Radio frequency) communication system as it is very cheap and very easy to implement.

In this project, we will provide the automation for an industry by monitoring boiler temperature and boiler water level. Here the wireless communication between the remote areas can be achieved by using the RF modules called RF transmitter and RF receiver. The project is designed in such a way that we will interface a temperature sensor and three water level sensors to an 8 bit microcontroller 8051, on the transmitter side. Three water level sensors will be arranged at 3 different levels of boiler and the temperature sensor will be interfaced to the controller through an ADC to convert the analog value sensed into the digital value. And the RF transmitter is also interfaced to the controller through an RF encoder to encode the data received by the controller. Hence the encoded data will be transmitted by the transmitter over the medium and will be received by the RF receiver which will be interfaced to the controller through an RF decoder, on the receiver side. The RF decoder is used to decode the received data into a 4 bit digital data which will be fed to the controller. So now the controller will perform the predefined tasks by monitoring the received decoded data. It turns ON the coolent fan, if the sensed temperature crosses the set temperature value, and the pumping motor will be turned ON and OFF based on the water level of the boiler. An LCD will also be provided on the transmitter side to display the status of the sensors.

This project is not only limited to industrial applications but can also be extended to domestic purposes as home appliances controlling using RF. The home appliances can be switched on/off using this RF concept without actually going near the switch boards or regulators.

This project uses regulated 5V, 500mA power supply. Unregulated 12V DC is used for relay. 7805 three terminal voltage regulator is used for voltage regulation. Full wave bridge rectifier is used to rectify the ac output of secondary of 230/12V step down transformer.
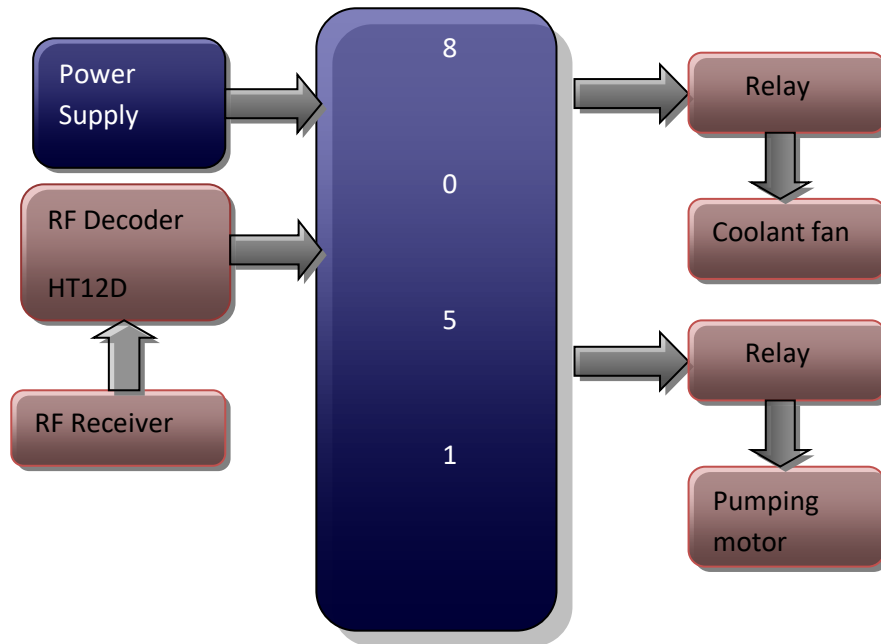
APPLICATIONS:

➢ Industrial applications

➢ Household applications

BLOCK DIAGRAM:

TRNSMITTER SECTION:
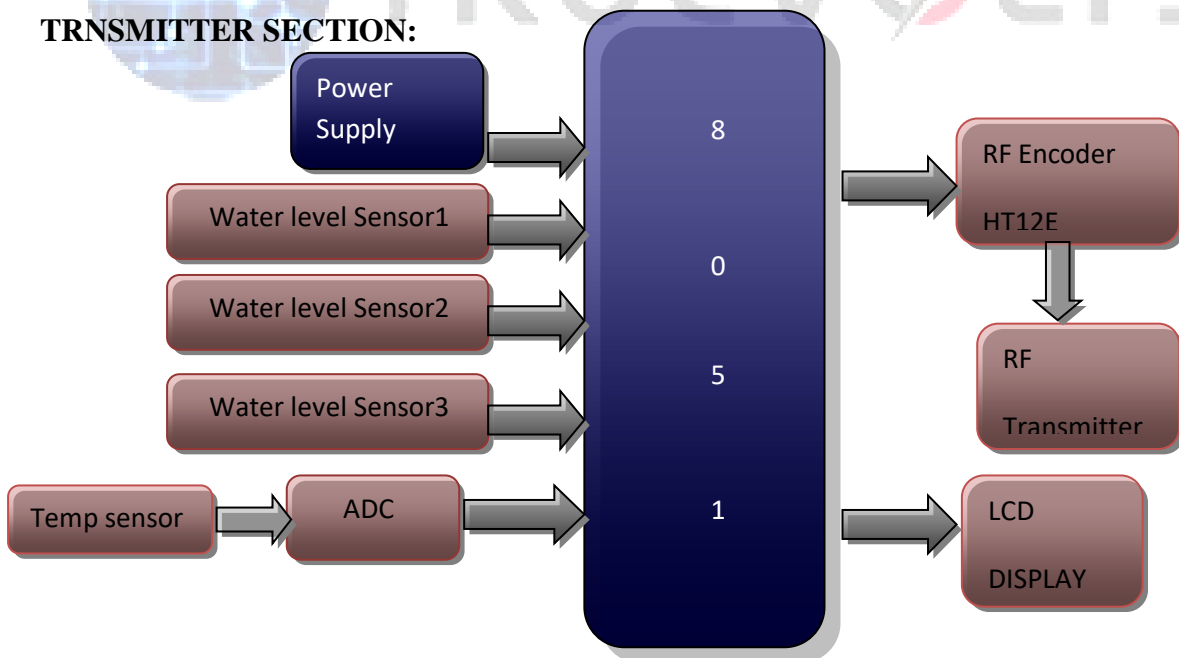
RECEIVER SECTION:

POWER SUPPLY BLOCK DIAGRAM: