PC BASED WIRELESS ROBOT CONTROL SYSTEM

ABSTRACT

The main aim of the project is to design a robot which can be controlled through PC and by using wireless RF communication. Here the front end application will also be developed on C# .NET platform for the visual effects so that the application can be easily accessed.

The RF modules used here are STT-433 MHz Transmitter along with an RF encoder HT12E, STR-433 MHz Receiver along with an RF decoder HT12D.

The project is designed in such a way that a PC will be interfaced to the controller through serial communication, using which we will input the predefined commands to the controller by using the hyper terminal of PC, to control the robot in different directions. Here we will use a serial line driver IC MAX232 to interface the PC with controller. The RF transmitter is also interfaced to the controller through an RF encoder to encode the data received by the controller and to transmit the data. Hence the encoded data will be transmitted by the transmitter over the wireless 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. And a physical structure which is designed by two motors and which mimics the robot will also be interfaced to the controller. Now, it is the job of the controller to read the data received from the decoder and to perform the predefined task of moving the robot in different directions.

For the visual effects, the front end will also be developed by using a good user interface software C#.NET to input the data to the controller through serial communication, on transmitter side. Here we will design 4 buttons with labels front, back, left, right and stop. By clicking on these buttons the corresponding data will be passed to the controller serially.
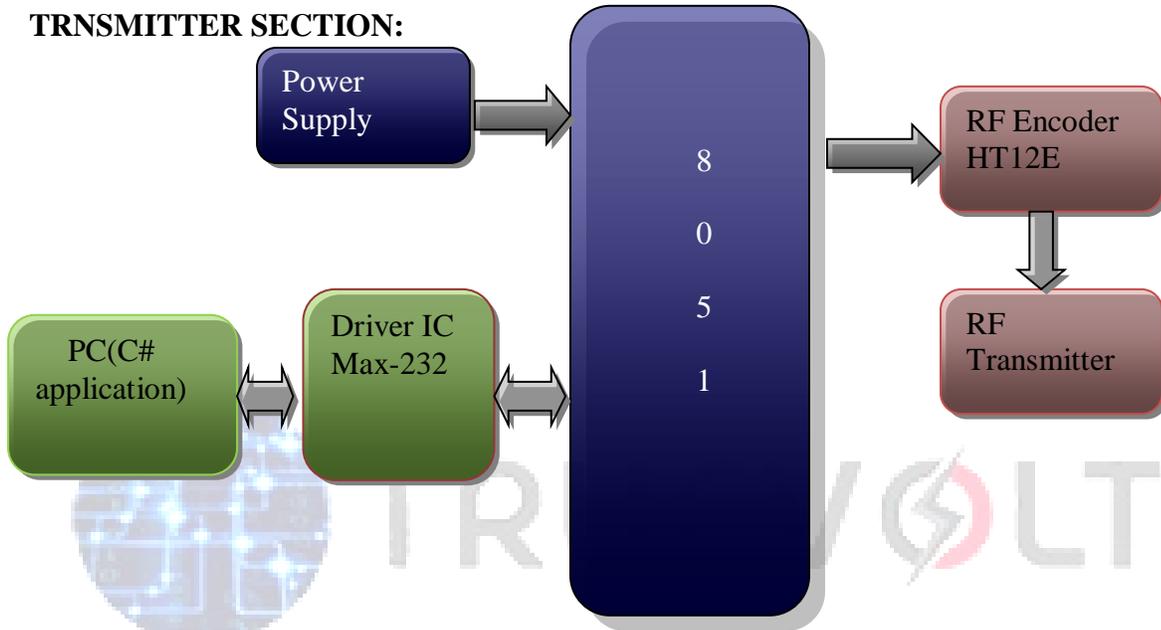
This project uses regulated 5V, 500mA power supply. 7805 three terminal voltage regulator is used for voltage regulation. Bridge type full wave rectifier is used to rectify the ac output of secondary of 230/12V step down transformer.
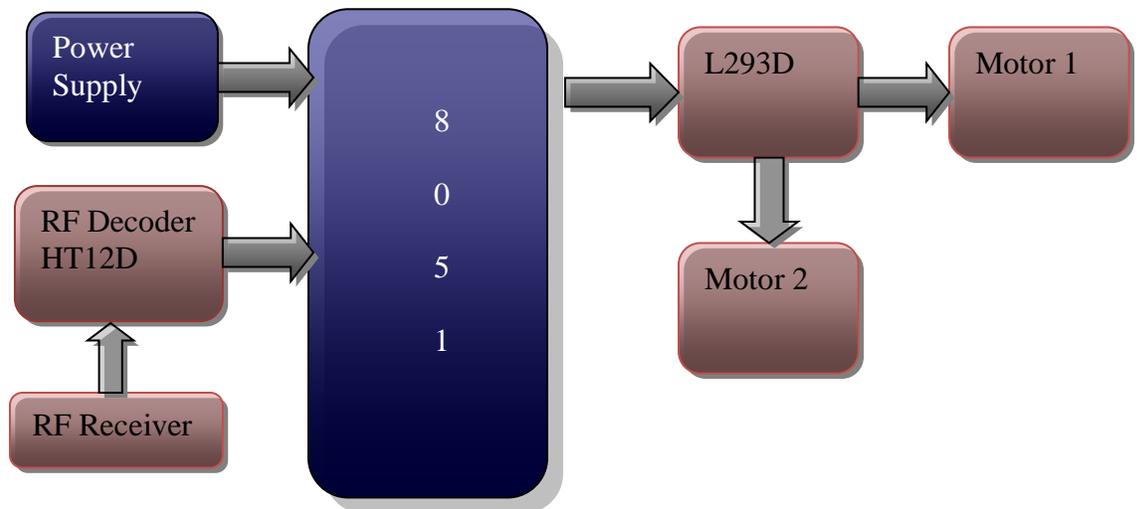
APPLICATIONS:

- ➢ Industrial applications
- ➢ Robotic applications
- ➢ military

BLOCK DIAGRAM:

TRNSMITTER SECTION:

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Power Supply ──▶ [8051] ──▶ RF Encoder HT12E
                              │
                              ▼
PC(C# application) ◀──▶ Driver IC Max-232 ◀──▶ [8051]     RF Transmitter
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Power Supply → 8051 → RF Encoder HT12E → RF Transmitter

PC(C# application) ↔ Driver IC Max-232 ↔ 8051

RECEIVER SECTION:

Power Supply → 8051 → L293D → Motor 1

L293D → Motor 2

RF Decoder HT12D → 8051

RF Receiver → RF Decoder HT12D

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POWER SUPPLY BLOCK DIAGRAM:

Step down Transformer	⇨	Bridge Rectifier	⇨	Filter	⇨	Regulator	⇨	Output