**STEPPER MOTOR SPEED AND DIRECTION CONTROL USING IR**

**DESCRIPTION:**

The main aim of the project is to design a versatile device that can control stepper motor by using IR technology of wireless communication.

The project is built around an 8051 microcontroller, IR remote and an IR receiver. A stepper motor will be interfaced to the controller through a driver IC ULN2003A. IR remote acts as the transmitter in this project. When a button is pressed in the remote, the signal will be passed and received by the IR receiver i.e TSOP Receiver. This signal is sent to the microcontroller which decodes the signal and performs the corresponding action in accordance with the button pressed in the remote. In the remote, 4 buttons are being dedicated to control the motor. Now, it is the job of the controller to read the data received from the receiver and to perform the predefined task of controlling i.e. increasing , decreasing the speed of the motor and changing the direction of the motor. Here the speed of the motor will be controlled by using PWM technique. The average voltage supplied to the load should be varied to obtain different speeds, which can be achieved by setting an appropriate duty cycle. The term [duty cycle](http://en.wikipedia.org/wiki/Duty_cycle) describes the proportion of 'ON' time to the regular interval or 'period' of time. A low duty cycle corresponds to low power, because the power is OFF for most of the time. Duty cycle is expressed in percent, 100% being fully ON. The main advantage of PWM is that power loss in the switching devices is very low. When a switch is off there is practically no current, and when it is on, there is almost no voltage drop across the switch. Power loss, being the product of voltage and current, is thus in both cases close to zero. Here an LCD will also be provided to display the status of motor.

This project uses regulated 5V, 500mA power supply. 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.

# TECHNICAL SPECIFICATIONS:

**HARDWARE:**

Micro controller : AT89S52

Crystal : 11.0592 MHz

LCD : HD44780

IR receiver : TSOP 1738

IR transmitter : Remote

Stepper motor

Driver IC : ULN2003A

Power supply

Transformer : 12V step down

Filter : 1000uf/25V

Voltage Regulator : 7805

**SOFTWARE :**

Keil microvision

proteus

UC flash

**APPLICATIONS:**

* Industrial applications
* Automatic control systems

# BLOCK DIAGRAM:

**TRNSMITTER SECTION:**

IR remote

**RECEIVER SECTION:**

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LCD

DISPLAY

Power Supply

TSOP1738 (IR receiver)

ULN2003A

Stepper motor

**POWER SUPPLY BLOCK DIAGRAM:**

Step down Transformer

Filter

Regulator

Output

Bridge Rectifier