

Traffic Signal Control by Barrier System

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ABSTRACT

Vehicular traffic at intersecting streets is typically controlled by traffic control lights. The function of **traffic lights** requires sophisticated **control and coordination** to ensure that traffic moves as smoothly and safely as possible.

This project is developed to meet the requirements of solid state traffic light controller by adopting microcontroller as the main controlling element, and led's as the indication of light. A micro controller is interfaced to led's provide for centralized control of the traffic signals. Microcontroller is programmed in such a way to adjust their timing and phasing to meet changing traffic conditions. The circuit besides being reliable and compact is also cost effective.

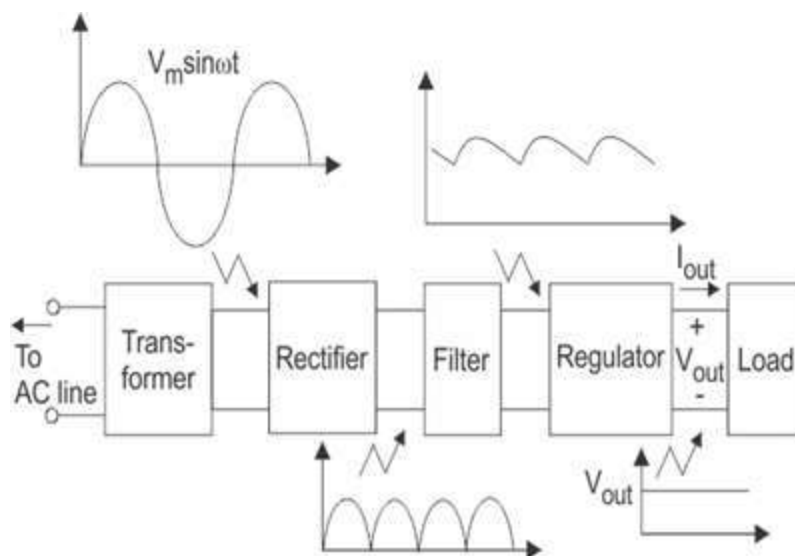
INTRODUCTION

Traffic light which is one of the vital public facilities that plays an important role to the road users. Traffic lights were first installed in 1868 in London, United Kingdom, outside the British Houses of Parliament in London, by the railway engineer J. P. Knight and constructed by the railway signal engineers of Saxby & Farmer. The design combined three semaphore arms with red and green gas lamps for night-time use, on a pillar, operated by a police constable. The gas lantern was turned with a lever at its base so that the appropriate light faced traffic. Although it was said to be successful at controlling traffic, its operational life was brief. It exploded on 2 January 1869, as a result of a leak in one of the gas lines underneath the pavement, injuring and killing the policeman who was operating it. With doubts about its safety, the concept was abandoned until electric signals became available. In India also traffic light is used from many years. But in presses of traffic light also many times accidents are occur. The reason behind that is don't following to rules. To solve this problem this project is introduced, 'Traffic Signal Barrier System'.

II.BLOCK DIAGRAM



Power Supply



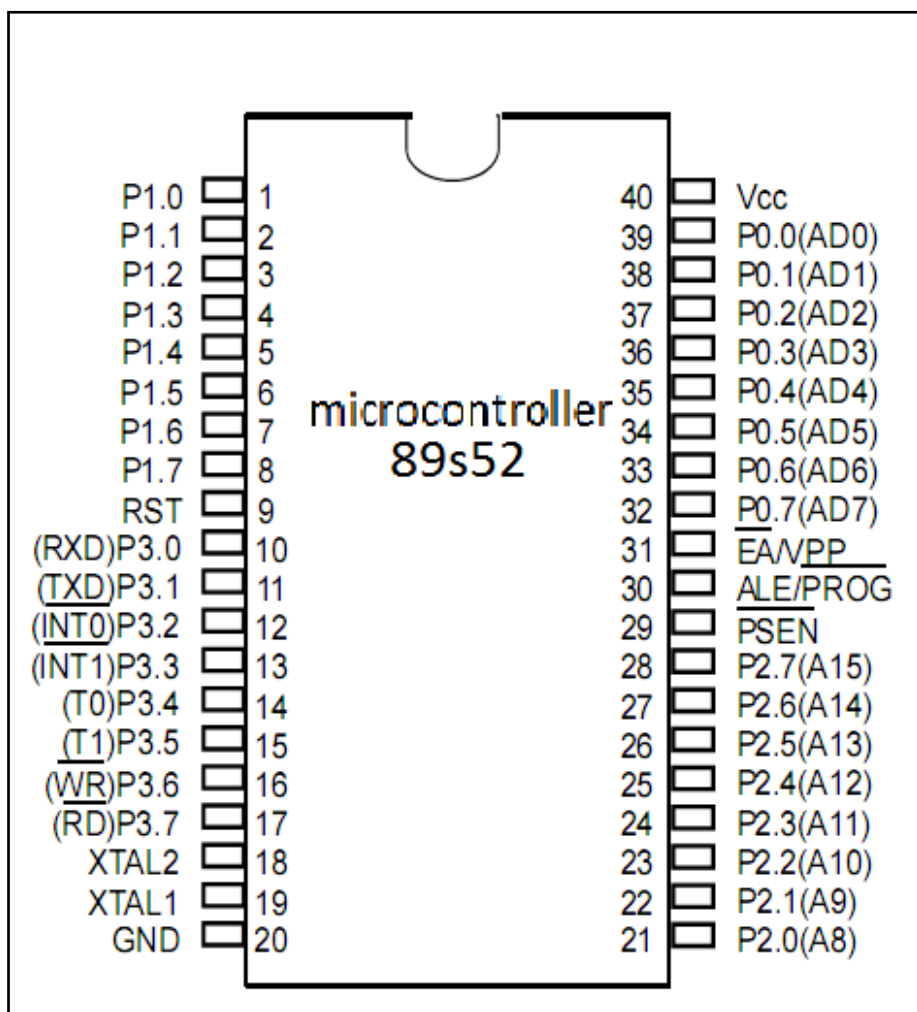
Generally power is generated, transmitted and distributed in the form of AC due to the economical condition. But most of the electronic and electrical devices require dc supply. Transformer is the devise which is used to step down the generated supply voltage as per the requirement of equipment. Rectifier is used to convert AC supply into pulsating DC supply.

1) **Microcontroller:** -

The 8051 is a low-power, high-performance CMOS 8-bit microcontroller with 8K bytes of in-system programmable Flash memory. The device is manufactured using Atmel’s high density non volatile memory technology and is compatible with the Industry-standard 89s52 instruction set and pin out. The on-chip Flash

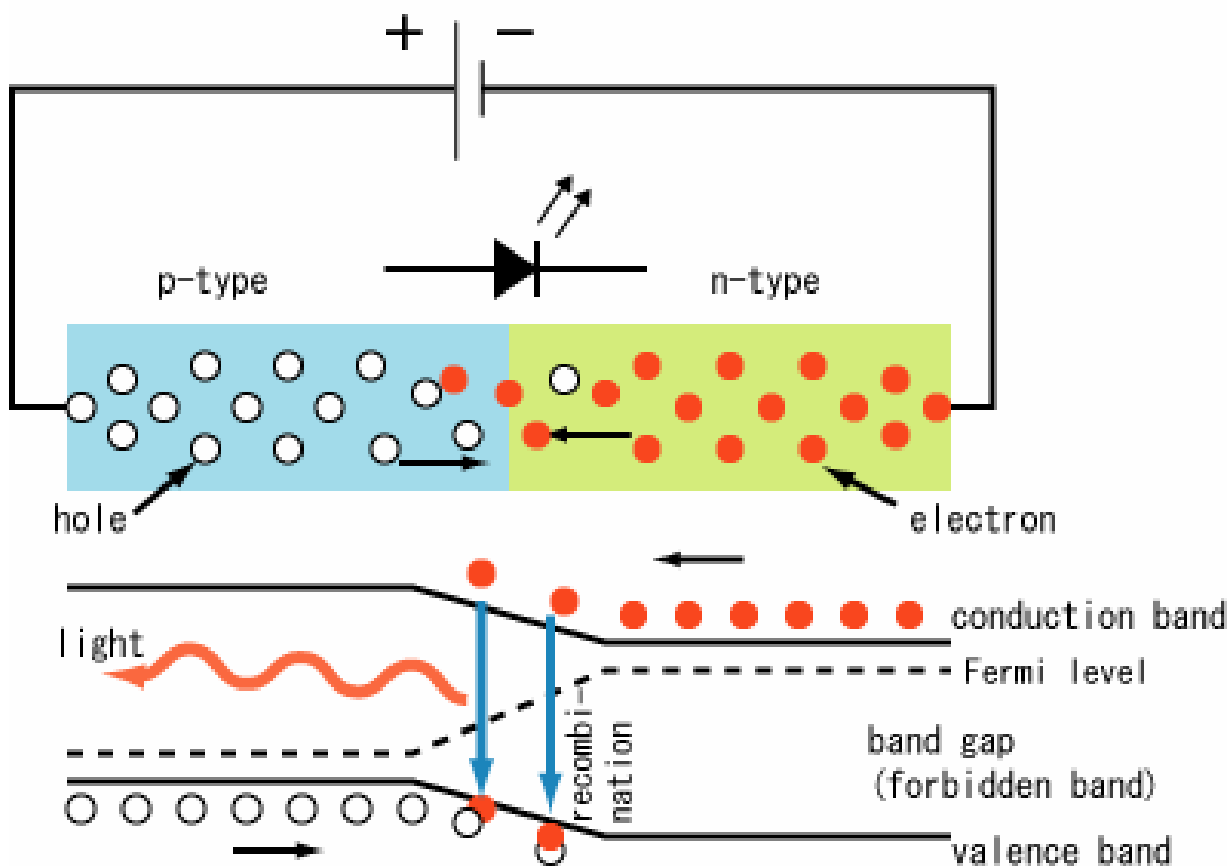
allows the program memory to be reprogrammed in-system or by a conventional non volatile memory programmer. By combining a versatile 8-bit CPU with in-system programmable Flash on a monolithic chip, the Atmel AT89S52 is a powerful microcontroller which provides a highly-flexible and cost-effective solution to many embedded control applications

➤ Pin Diagram of the 89s52

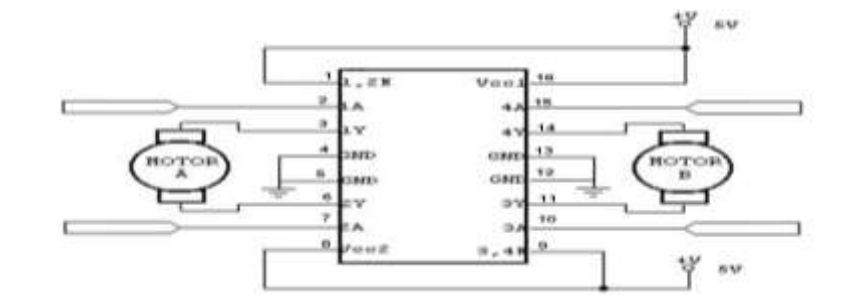


PRINCIPLE of LED:-

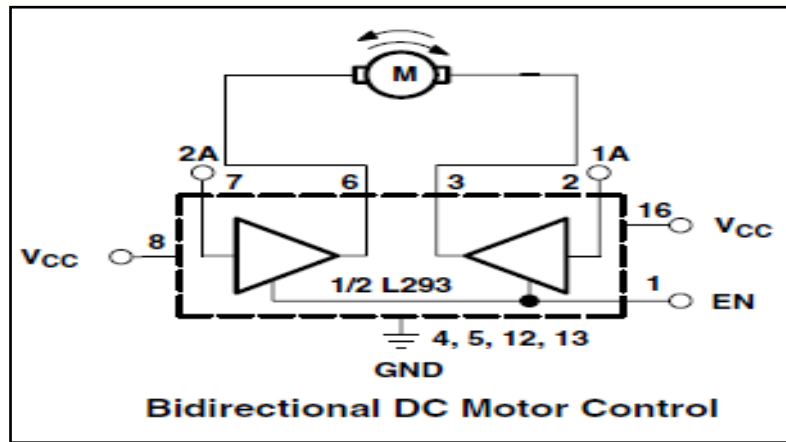
When a light-emitting diode is forward biased electrons are able to recombine with electron holes within the device, releasing energy in the form of photons. This effect is called Electroluminescence. **Electroluminescence (EL)** is an optical and electrical phenomenon in which a material emits light in response to the passage of an electric current or to a strong electric field. The wavelength of the light emitted, and thus its color depends on the band gap energy of the materials forming the *p-n junction*. The materials used for the LED have a direct band gap with energies corresponding to near-infrared, visible or near-ultraviolet light



IC L293D:



The L293D motor driver is available for providing User with ease and user friendly interfacing for embedded application. L293D motor driver is mounted on a good



EN	1A	2A	FUNCTION
H	L	H	Turn right
H	H	L	Turn left
H	L	L	Fast motor stop
H	H	H	Fast motor stop
L	X	X	Fast motor stop

L = low, H = high, X = don't care

Features:

- ✓ Easily compatible with any of the system
- ✓ Easy interfacing through FRC (Flat Ribbon Cable)
- ✓ External Power supply pin for Motors supported
- ✓ Onboard PWM (Pulse Width Modulation) selection switch
- ✓ 2pin Terminal Block (Phoenix Connectors) for easy Motors Connection
- ✓ Onboard H-Bridge base Motor Driver IC (L293D)

Technical Specification:

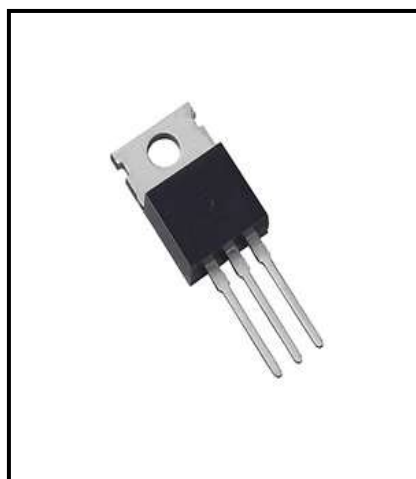
- ✓ Power Supply : Over FRC connector 5V DC
- ✓ External Power 9V to 24V DC
- ✓ Dimensional Size : 44mm x 37mm x 14mm (l x b x h)

Gear motor:

Almost every mechanical movement that we see around us is accomplished by an electric motor. Electric machines are a means of converting energy. Motors take electrical energy and produce mechanical energy. Electric motors are used to power hundreds of devices we use in everyday life. Motors come in various sizes. Huge motors that can take loads of 1000's of Horsepower are typically used in the industry. Some examples of large motor applications include elevators, electric trains, hoists, and heavy metal rolling mills. Examples of small motor applications include motors used in automobiles, robots, hand power tools and food blenders. Micro-machines are electric machines with parts the size of red blood cells, and find many applications in medicine.



LM7805 (Voltage Regulator)



Description: The KA78XX/KA78XXA series of three-terminal positive regulator are available in the TO-220/D-PAK package and with several fixed output voltages, making Each type employs internal current limiting, thermal shut down and safe operating area protection, making it essentially indestructible. If adequate heat sinking is provided, they can deliver over 1A output current. Although designed primarily as fixed voltage regulators, these devices can be used with external components to obtain adjustable voltages and currents

✓ Resistor:



It is a passive component having two terminals that are used to manage the current flow in the circuit. A current that flows via a resistor is directly proportional to the voltage that appeared into the resistor.

❖ Resistors are of two types :

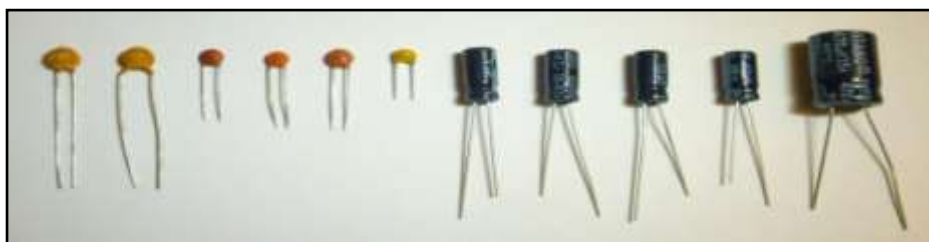
i) Fixed Resistor:

Having a fixed value of resistance

ii) Variable Resistor:

Whose value of resistance can be changed for example if we have a resistor of 5K then the value of resistance will vary from 0 to 5K Ω Value of resistance can be calculated with the help of multimeter or with the color code that is visible on the resistor.

✓ Capacitor:



It is a passive component with two terminals and used to store charges. Capacitors are made up of two conductors which are separated by the dielectric medium flows in between. It works when potential difference applied across the conductors polarize the dipole ions to store the charge in the dielectric medium

❖ There are two types of capacitors :

1) Polarized:

They have polarity means + and- sign marked on it. It is mainly used to store the charges. Before troubleshooting the circuit capacitors must be fully discharged as they have charges store in it.

2) Non-polarized:

They don't have a polarity and can be mounted in any of the way. They are generally used to remove the noises present during the conversion of AC into DC.

III.CONCLUSION

APPLICATIONS:-

1. This can be used on the roads where there happen a lot of accidents.
2. This can used where there a lot of traffic problems etc.



ADVANTAGES:-

1. Minimize conflicting movement
2. Provide orderly movement of traffic
3. Provide orderly movement of traffic.

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