



# Traffic Light Spike Control System

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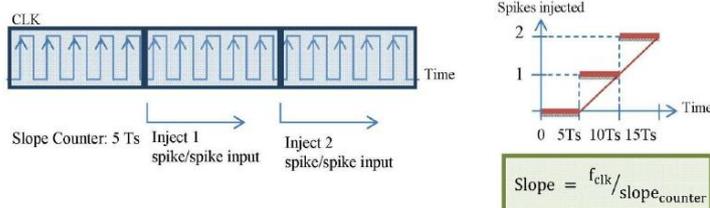
**Abstract**— In this project, as the civilian violate traffic rules , which causes unnecessary accidents. So moto of our project is to install spikes on road near traffic signals due to which civilians can't disobey the traffic rules and will reduce accidents. Our spike system will work according to the signal timing. And if an ambulance arrives with siren our spike system will be deactivated.

**Key Words:** Road spike system, Traffic Controlling, one way road.

## I. INTRODUCTION

The introduction of our project is the traffic congestion problems are increasing day by day because of becoming greater in size of vehicles with limited infrastructure. Under this situation, the existing traffic light systems which are timer based are unable to control traffic. To solve this problem, a real time traffic control system is required which will control the traffic signal according to traffic density. To minimize accidents and traffic congestion the road blocker using IOT mechanism is been implemented. This mechanism is called automatic road spike system

### Block diagram of Spike System



In this example, the slope counter is fixed to five clock periods; every time the count is reached one more spike will be injected. This way, and considering the firing rate, the discrete solid line is performed, and we were looking for the thinner line behavior.

**A. Construction and Working** - It consists of following parts: Synchronous Motor, Microswitches, Shaft, Cam, Follower(Bearing), Spikes, Support structure(Horizontal and vertical plates, C-sections)The working of the circuit has been done using normally open switches, for ease of demonstration. In actual practice it would be actuated using a micro controller AT89S51 which controls the traffic signal.



## II. METHODOLOGY

A spike screw is operated by turning a lead screw. The height of the spikes is adjusted by turning the lead screw. This can be done either manually or by integrating an electric motor with it. This integration is our project Main frame is constructed to the required dimension .DC geared motor mounted at one end of the lead screw of the micro controller operates the dc motor according to the requirements .Battery is required for the power supply which is connected to the dc motor and the micro controller When the signal is red the interfaced barrier gate closes the spikes open up and a buzzer notifies the closing of gate, thereby blocking the traffic but when the signal is green the same barrier opens and allows a proper flow of vehicles to avoid traffic jam. The density of traffic is detected using sensor and the output is given to the Microcontroller for action.



EXPERIMENTAL SETUP

The given fig .shown experimental setup which consist various element like spike system, microcontroller, stepper motor .As shown in fig if red signal then microprocessor command to the stepper motor which rotate at specified angle then open the spike .If green and yellow signal is on then microprocessor command to the stepper motor and it will come back to the original position.

### III. DETAILS OF REQUIRED SETUP

#### 1)SPIKE:

It mounted on shaft for quick reaction it provided with spring .it will operated by motor according o input motion provided t it. Spikes are made from high graded steel.



The common objective of all these classification techniques is to develop a function, which can accurately separate the binary data.

#### 2)MICROCONTROLLER:

A microcontroller is a small computer on a single integrated circuit. In modern terminology, it is similar to, but less sophisticated than, a system on a chip; a may include a microcontroller as one of its components.

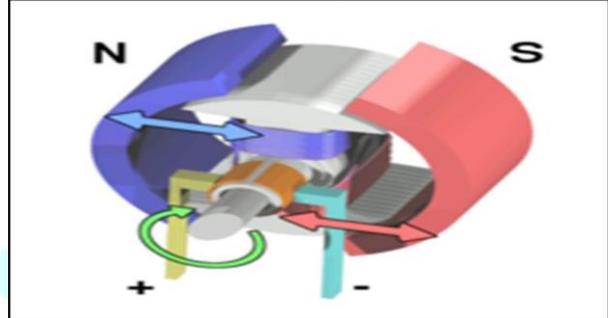


Microcontrollers are used in automatically controlled products and devices, such as automobile engine control systems, implantable medical devices, remote controls, office machines, appliances, power tools, toys and other embedded systems. By reducing the size and cost compared to a design that uses a separate microprocessor, memory, and input output devices, microcontrollers make it

economical to digitally control even more devices and processes

#### 3)DC MOTOR.:

A DC motor is any of a class of rotary electrical machines that converts direct current electrical energy into mechanical energy. The most common types rely on the forces produced by magnetic fields. Nearly all types of DC motors have some internal mechanism, either electromechanical or electronic; to periodically change the direction of current flow in part of the motor.



DC motors were the first type widely used, since they could be powered from existing direct-current lighting power distribution systems. A DC motor's speed can be controlled over a wide range, using either a variable supply voltage or by changing the strength of current in its field windings. DC motor is used to operate the spikes.

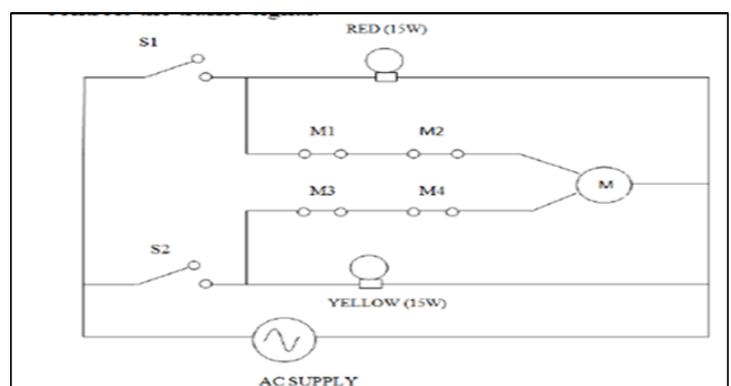
### IV. FEATURES

1. Selective high security and safety mode.
2. Spike sector can move independently.
3. Manual operation in case of power failure
4. High torque DC motor for greater rehabilitee.
5. External limit switches provide fail safe operation.
6. Robust construction builds to with stand greater impact.
7. Emergency lowering or up possible in case of threat fire
8. Electronic forces can be adjusted through programming levels.
9. Indirect drive modal can operate independently of traffic barrier unit.

### V. APPLICATIONS

#### 1. Traffic controlling on road:

For controlling traffic on road & to obey traffic system road spike system is used. For automatic controlling vehicle density sensor used in this according to the presence of vehicle on road the signal get changes and system operated given below.



It consists of following parts: Synchronous Motor, Micro switches, Shaft, Spikes, spring .The working of the circuit has been done using normally open switches, for ease of demonstration. IN actual practice it would be actuated using a micro controller AT89C51 which controls the traffic signal.

**Case 1:** When the signal changes to red

When the red switch is pressed, it closes the switch S1 while switch S2 remains open. When switch S1 is activated it simulates a red signal which runs two parallel circuits one which switches on the red light and the other which activates the motor , the motor circuit has limit switches M1 and M2 (normally closed ) in series with the motor. When the red light is ON the motor rotates in a anticlockwise direction (when viewed from the motor to the model). The spike will move up.

**Case2:** When the signal changes to orange

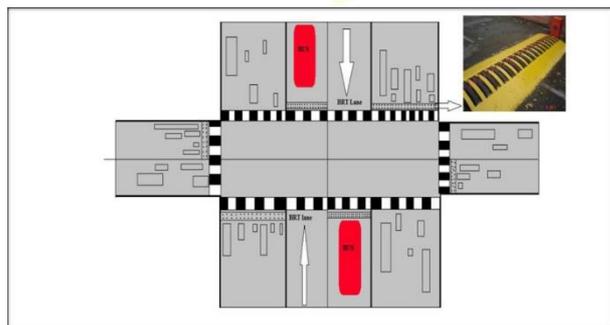
When the amber switch is pressed, it closes the switch S2while switch S1 remains open. When switch S2 is activated, it simulates amber signal, which runs two parallel circuits, one, which switches on the amber light and the other, which activates the motor. The motor circuit has limit switches M3and M4 (normally closed) in series with the motor. When the amber light is ON the motor rotates in a clockwise direction (when viewed from the motor to the mode). The spike moves down.

**Case 3:** When the signal changes to green

During the red signal the spikes rises above the road surface and during the amber signal the spikes lowers below the road surface and stays stable throughout during the green signal. Hence, during the green signal there would be no change in the system that is both the witches S1 & S2 remain open during the green signal.

**2) For BRT (BUS RAPID TRANSIT):**

As BRT only use for government vehicle & ambulance only, but lot of other vehicles are pass through BRT so to avoid this the road spike system is used as shown in below diagram



system operation done by providing RFID tag to the all government vehicle (buses), ambulance, Police jeeps . The RFID reader sense the when vehicle pass close through it and pass signal to microcontroller. The microcontroller controls the motor and up down movement of spike can be done. Radio Frequency Identification Sensor (RFID): Radio-frequency identification (RFID) uses electromagnetic fields to automatically identify and track tags attached to objects.



**RFID**

These tags contain electronically stored information. Passive tags collect energy from a nearby RFID reader's

interrogating radio waves. Active tags have a local power source (such as a battery) and may operate hundreds of meters from the RFID reader. Unlike a barcode, the tag need not be within the line of sight of the reader, so it may be embedded in the tracked object. RFID is one method for Automatic Identification and Data Capture (AIDC).

**3. ONE WAY ROAD:**

For on way road the vehicle goes only on one directional only.so,to obey this rule the spike system can operated on only direction in which vehicle has permeation in this when vehicle goes on the spike will move downward direction due to spring and when vehicle goes wrong direction then it kill tires.



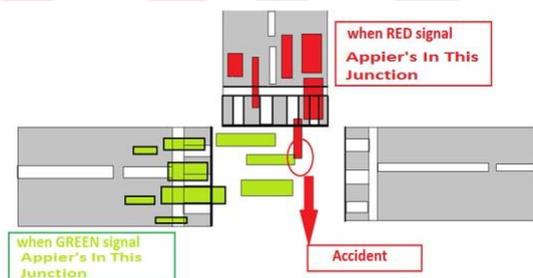
**One Way Mechanism**

**4) Security system :**

For industries and office this type of system is very useful to permitted to only those vehicle that the industries want.in this the system will similar to operate on RRFID the vehicle which have perdition to come that vehicle provided RFID tag and RFID redder read when vehicle come across and pull down spike.

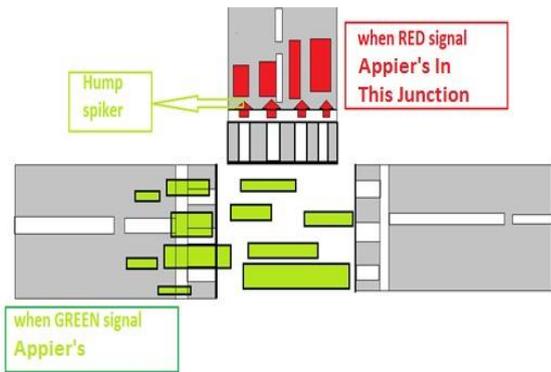
**VI. PRESENT PROBLEM**

When Red light is on in the traffic signal civilians won't wait till the green signal appears they tend to jump the signals occur accidents at regular intervals. Accidents will occur and rules will not be able to follow by them.



VII. HOW TO OVER COME

To overcome from this situation civilans have to obey the traffic signals and not tend to bump the signals.If they try to bump the red signal automatically the spikes will puncture the tires of the vehicles.So, that the occuring of accidents will reduce and rules will be followed by them.



In this modern country no even urban city eventually town in our nation sarcasm hit by trafficking, due to sustainable economic development, our project work virtually focus on traffic signals, in that humps place virtual roll to avoid signal jerk traffic in signals.

Our mechanism really focusing on studs in humps, which make vehicles unnecessarily crossing the humps even though in signals.

Once signal is ON, in the humps stud (spikes) emerges and stop vehicles, for this mechanism requires motor to supply power for spike to emerge spike housing on the chain pulley, at the time when the timer is integrates to the signal lamp. This work model type of pro type and in the future some progress work can be achieved.

VIII. ADVANTAGES

- Simple mechanism.
- Cost effective equipment.
- It controls the accidents.
- High precision timer over traffic signals.
- Maintain the traffic signal

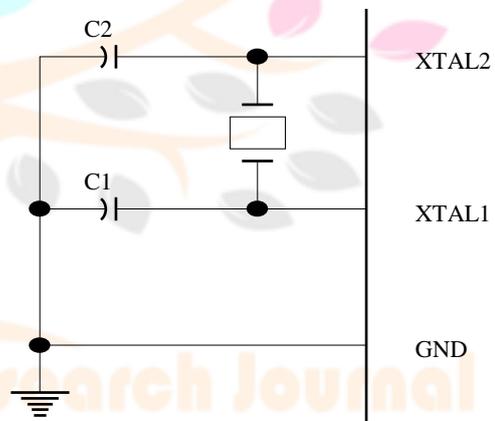
IX. OSCILLATOR CHARACTERISTICS

XTAL1 and XTAL2 are the input and output, respectively, of an inverting amplifier, which can be configured for use as an on-chip oscillator. Either a quartz crystal or ceramic resonator may be used. To drive the device from an external clock source, XTAL2 should be left unconnected while XTAL1 is driven . There are no requirements on the duty cycle of the external clock signal, since the input to the internal clocking circuitry is through a divide-by-two flip-flop, but minimum and maximum voltage high and low time specifications must be observed.

X. IDLE MODE

In idle mode, the CPU puts itself to sleep while all the on chip peripherals remain active. The mode is involved by software. The content of the on-chip RAM and all the special functions registers remain unchanged during this mode. The idle mode can be terminated by any enabled interrupt or by a hardware reset.

It should be noted that when idle is terminated by a hardware reset, the device normally resumes program execution, from where it left off, up to two machine cycles before the internal reset algorithm takes control.

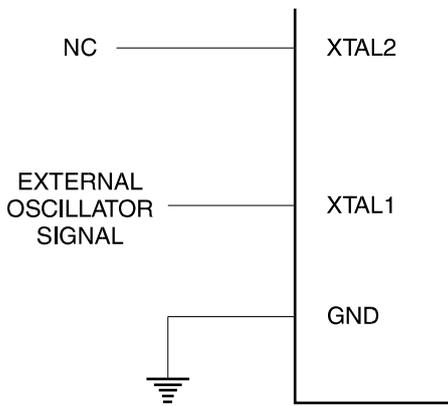


Notes: C1, C2 = 30 pF ± 10 pF for Crystals

= 40 pF ± 10 pF for Ceramic Resonators

Status of External Pins During Idle and Power Down

Mode	Program Memory	ALE	PSEN	PORT0	PORT1	PORT2	PORT3
Idle	Internal	1	1	Data	Data	Data	Data
Idle	External	1	1	Float	Data	Address	Data
Power Down	Internal	0	0	Data	Data	Data	Data
Power Down	External	0	0	Float	Data	Data	Data



On chip, hardware inhibits access to internal RAM in this event, but access to the port pins is not inhibited. To eliminate the possibility of an unexpected write to a port pin when Idle is terminated by reset, the instruction following the one that invokes Idle should not be one that writes to a port pin or to external memory.

## XI. POWER DOWN MODE

In the power down mode the oscillator is stopped, and the instruction that invokes power down is the last instruction executed.

## XII. PROGRAMMING THE FLASH

The AT89C51 is normally shipped with the on-chip Flash memory array in the erased state (that is, contents = FFH) and ready to be programmed. The programming interface accepts either a high-voltage (12-volt) or a low-voltage (VCC) program enable signal. The low voltage programming mode provides a convenient way to program the AT89C51 inside the user's system, while the high-voltage programming mode is compatible with conventional third party Flash or EPROM programmers.

The AT89C51 is shipped with either the high-voltage or low-voltage programming mode enabled. The respective topside marking and device signature codes are listed in the following table. The only exit from power down is a hardware reset. Reset redefines the SFRs but does not change the on chip RAM. The reset should not be activated before VCC.

### Lock Bit Protection Modes:

It is restored to its normal operating level and must be held active long enough to allow the oscillator to restart and stabilize.

### Program Memory Lock Bits:

On the chip are three lock bits which can be left unprogrammed (U) or can be programmed (P) to obtain the additional features listed in the table below:

	VPP = 12 V	VPP = 5 V
Top-Side Mark	AT89C51	AT89C51 xxxx-5
Signature	(030H)=1EH (031H)=51H (032H)=FFH	(030H)=1EH (031H)=51H (032H)=05H

When lock bit 1 is programmed, the logic level at the EA pin is sampled and latched during reset. If the device is powered up without a reset, the latch initializes to a random value, and holds that value until reset is activated. It is necessary that the latched value of EA be in agreement with the current logic level at that pin in order for the device to function properly.

The AT89C51 code memory array is programmed byte-by-byte in either programming mode. To program any non-blank byte in the on-chip Flash Memory, the entire memory must be erased using the Chip Erase Mode.

### Programming Algorithm:

Before programming the AT89C51, the address, data and control signals should be set up according to the Flash programming mode table. To program the AT89C51, take the following steps.

- Input the desired memory location on the addresslines.
- Input the appropriate data byte on the data lines.
- Activate the correct combination of control signals.
- Raise EA/VPP to 12 V for the high-voltage programming mode.
- ALE/PROG once to program a byte in the Flash array or the lock bits. The byte-write cycle is self-timed and typically takes no more than 1.5 ms. Repeat steps 1 through 5, changing the address and data for the entire array or until the end of the object file is reached.

**Data Polling:** The AT89C51 features Data Polling to indicate the end of a write cycle. During a write cycle an attempted read of the last byte written will result in the complement of the written datum on PO.7. Once the write cycle has been completed, true data are valid on all outputs, and the next cycle may begin. Data Polling may begin any time after a write cycle has been initiated

### Ready/Busy:

The progress of byte programming can also be monitored by the RDY/BSY output signal. P3.4 is pulled low after ALE goes high during programming to indicate BUSY. P3.4 is pulled high again when programming is done to indicate READY.

### Program Verify:

If lock bits LB1 and LB2 have not been programmed, the programmed code data can be read back via the address and data lines for verification. The lock bits cannot be verified directly. Verification of the lock bits is achieved by observing that their features are enabled.

### Chip Erase.

The entire Flash array is erased electrically by using the proper combination of control signals and by holding ALE/PROG low for 10 ms. The code array is written with all "1"s. The chip erase operation must be executed before the code memory can be re-programmed.

### CONCLUSION

In this modern country no even urban city eventually town in our nation hit by trafficking, due to sustainable economic development, our project work virtually focus on traffic signals, in that humps place virtual roll to avoid signal jerk traffic in signals. Our mechanism really focusing on studs in humps, which make vehicles unnecessarily crossing the humps even though in signals.

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