

# ELECTRONIC CIRCUIT BREAKER

## INTRODUCTION

An circuit breaker is an automatically-operated electrical switch designed to protect an electrical circuit from damage caused by overload or short circuit. Its basic function is to detect a fault condition and, by interrupting continuity, to immediately discontinue electrical flow. Unlike a fuse, which operates once and then has to be replaced, a circuit breaker can be reset (either manually or automatically) to resume normal operation. Circuit breakers are made in varying sizes, from small devices that protect an individual household appliance up to large switchgear designed to protect high voltage circuits feeding an entire city.

This project is the related with the automation of currently available circuit breakers.

## SCOPE OF PROJECT

This device is very useful to protect any electrical appliance from breakdown caused by over current (or voltage).The overall system of electronics circuit breaker is more dynamic than other circuit breaker as a current can be controlled according to the need of the system.

The electronic circuit breaker is vastly used in:-

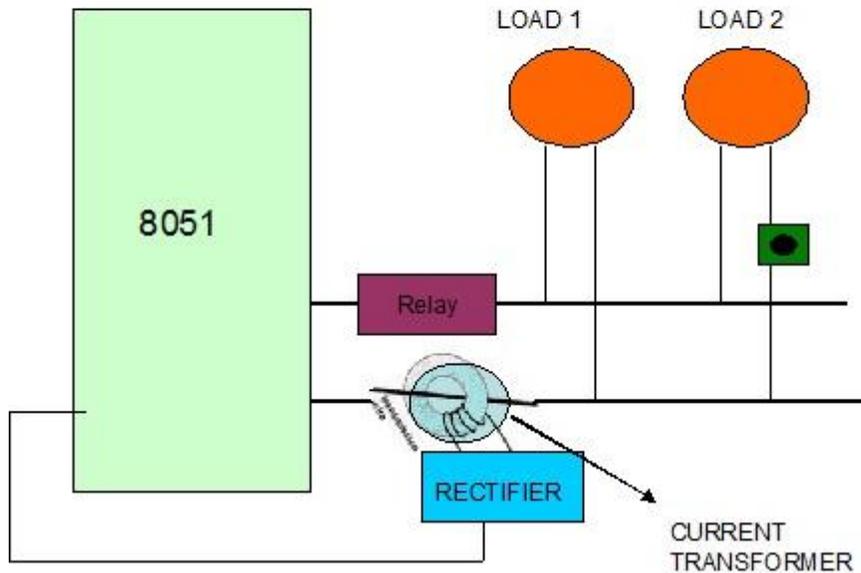
- Power bus circuit breaker
- Regulator over current protection
- Battery shut circuit protection
- Sensitive system power interrupt

## A BRIEF INTRODUCTION TO 8051 MICROCONTROLLER

When we have to learn about a new computer we have to familiarize about the machine capability we are using, and we can do it by studying the internal hardware design (devices architecture), and also to know about the size, number and the size of the registers.

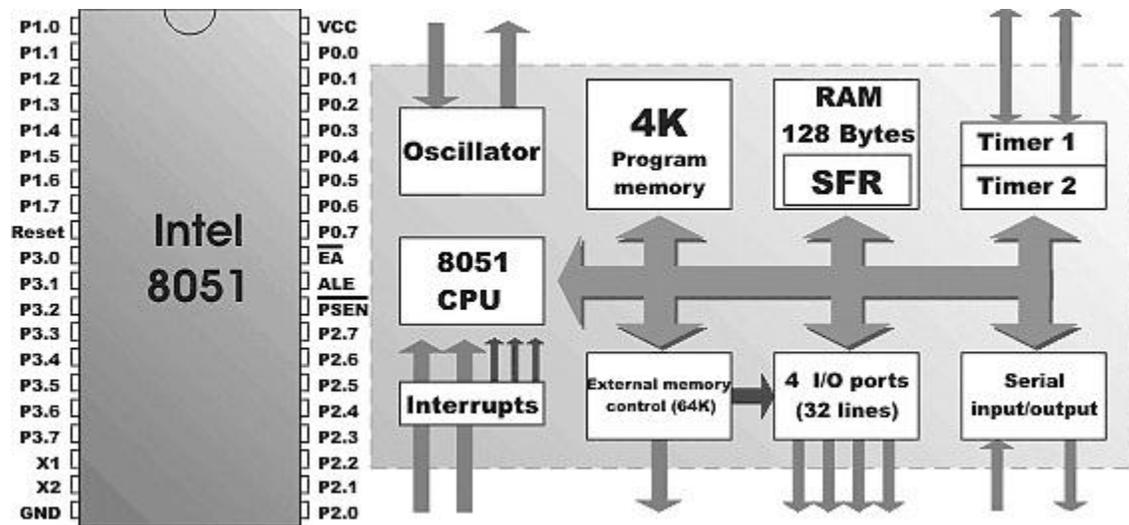
A microcontroller is a single chip that contains the processor (the CPU), non-volatile memory for the program (ROM or flash), volatile memory for input and output (RAM), a clock and an I/O control unit. Also called a "computer on a chip," billions of microcontroller units (MCUs) are embedded each year in a myriad of products from toys to appliances to automobiles. For example, a single vehicle can use 70 or more microcontrollers. The following picture describes a general block diagram of microcontroller.

## BLOCK DIAGRAM OF CIRCUIT BREAKER



**89s52:** The AT89S52 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 nonvolatile memory technology and is compatible with the industry-standard 80C51 instruction set and pinout. The on-chip Flash allows the program memory to be reprogrammed in-system or by a conventional nonvolatile memory programmer. By combining a versatile 8-bit CPU with in-system programmable Flash on a monolithic chip, the Atmel's AT89S52 is a powerful microcontroller which provides a highly-flexible and cost-effective solution to many embedded control applications. The AT89S52 provides the following standard features: 8K bytes of Flash, 256 bytes of RAM, 32 I/O lines, Watchdog timer, two data pointers, three 16-bit timer/counters, a six-vector two-level interrupt architecture, a full duplex serial port, on-chip oscillator, and clock circuitry. In addition, the AT89S52 is designed with static logic for operation down to zero frequency and supports two software selectable power saving modes. The Idle Mode stops the CPU while allowing the RAM, timer/counters, serial port, and interrupt system to continue functioning. The Power-down mode saves the RAM contents but freezes the oscillator, disabling all other chip functions until the next interrupt. The hardware is driven by a set of program instructions, or software. Once familiar with hardware and software, the user can then apply the microcontroller to the problems easily.

The pin diagram of the 8051 shows all of the input/output pins unique to microcontrollers:



The following are some of the capabilities of 8051 microcontroller.

- Internal ROM and RAM
- I/O ports with programmable pins
- Timers and counters
- Serial data communication

The 8051 architecture consists of these specific features:

- 16 bit PC & data pointer (DPTR)
- 8 bit program status word (PSW)
- 8 bit stack pointer (SP)
- Internal ROM 4k
- Internal RAM of 128 bytes.
- 4 register banks, each containing 8 registers
- 80 bits of general purpose data memory
- 32 input/output pins arranged as four 8 bit ports: P0-P3
- Two 16 bit timer/counters: T0-T1
- Two external and three internal interrupt sources
- Oscillator and clock circuits

For any electronics project the power supply plays a very important role in its proper functioning.

In this project we are using external A.C supply (220 v) as input, this high voltage is converted into 12 Volts A.C by step down transformer, then we use voltage regulators and filters with bridge rectifier to convert the A.C into D.C voltage.

For voltage regulation we are using LM 7805 and 7812 to produce ripple free 5 and 12 volts D.C constant supply.

Source: <http://www.botskool.com/tutorials/fourth-year-projects/electronic-circuit-breaker>