PIC MICROCONTROLLERS

(Programmable Interface Controllers)

This mobile revision pdf is based on detailed work found in the 'MICROCONTROLLER' section. Tap on the green link button below to go to the website.

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PIC MICROCONTROLLERS

(Programmable Interface Controllers)

1. WHAT IS A PIC MICROCONTROLLER? WHAT CAN IT DO?

2. INPUTS, PROCESS, OUTPUTS

3. EXAMPLES – MICROCONTROLLER SETUPS

IMPORTANT

IT IS RECOMMENDED THAT YOU READ THROUGH THE
PIC- MICROCONTROLLER SECTION OF
www.technologystudent.com

WHAT IS A PIC MICROCONTROLLER? WHAT CAN IT DO?

PIC microcontrollers (Programmable Interface Controllers), are electronic circuits that can be programmed to carry out a vast range of tasks. They can be programmed to be timers or to control a production line and much more. They are found in most electronic devices such as alarm systems, computer control systems, phones, in fact almost any electronic device.

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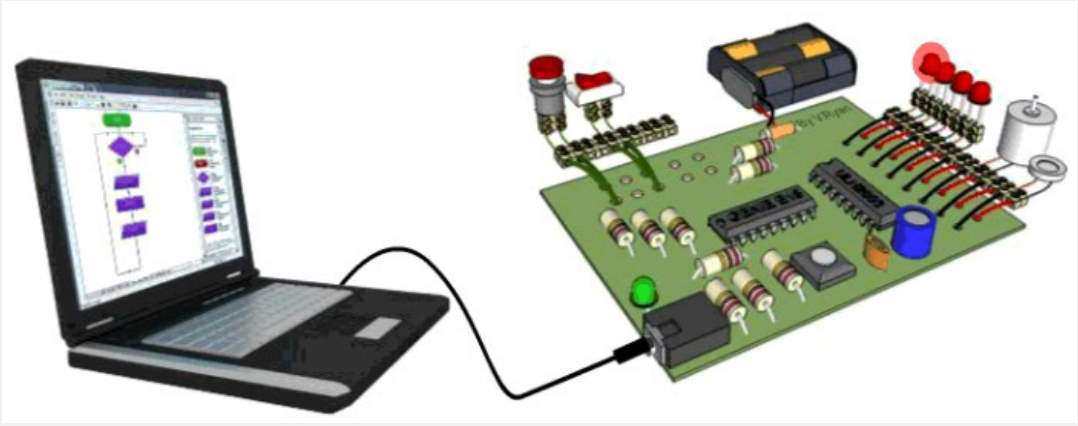

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MICROCONTROLLERS - SOFTWARE

You will need a computer to run software, such as Circuit Wizard, allowing you to program a PIC microcontroller circuit. A fairly cheap, low specification computer should run the software with ease. The computer will need a serial port or a USB port. This is used to connect the computer to the microcontroller circuit.

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MICROCONTROLLERS - SOFTWARE

The microcontroller circuit is programmed using software such as Circuit Wizard. The flowchart layout makes this relatively easy.

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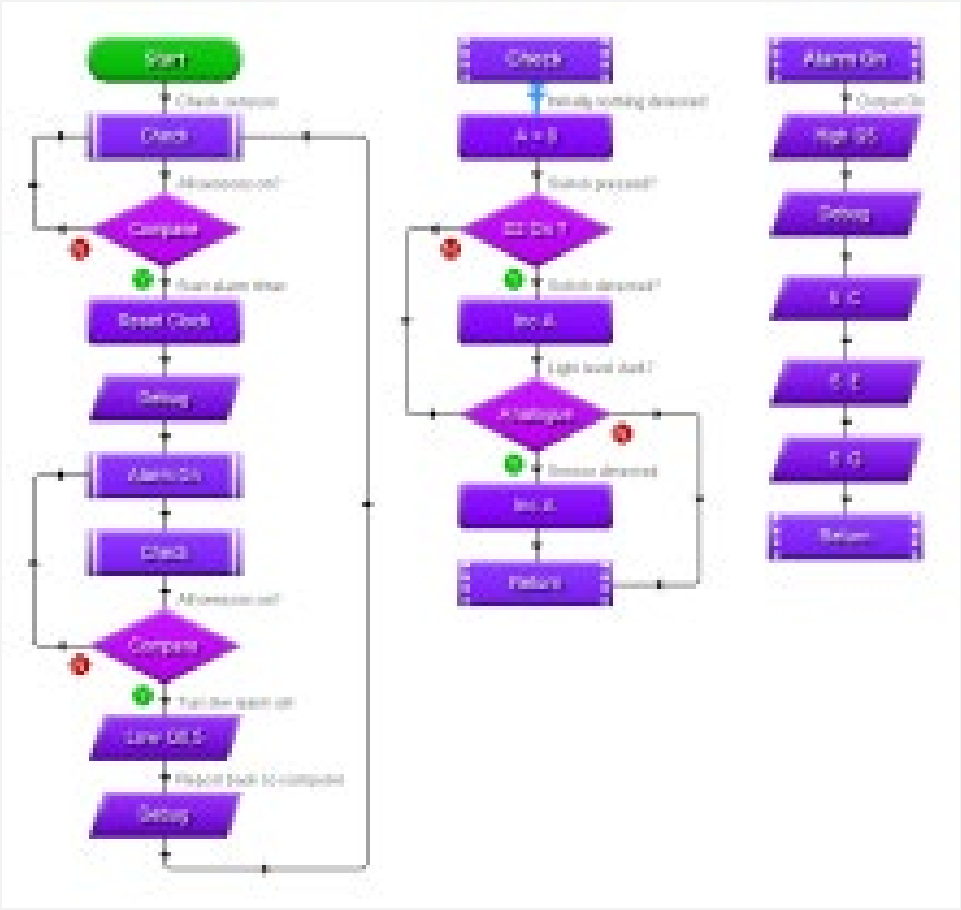

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MICROCONTROLLERS - SOFTWARE

The program can be simulated and tested on screen. When finished, it is downloaded to the PIC microcontroller circuit, via a USB lead. The diagram below, shows a GENIE Project Board being programmed by Circuit Wizard software (recommended software for programming microcontroller circuits).

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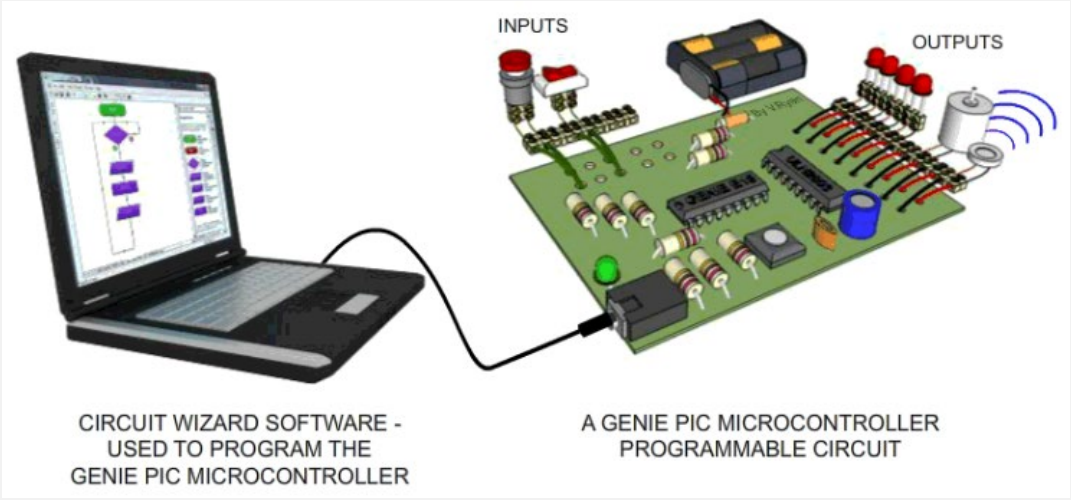

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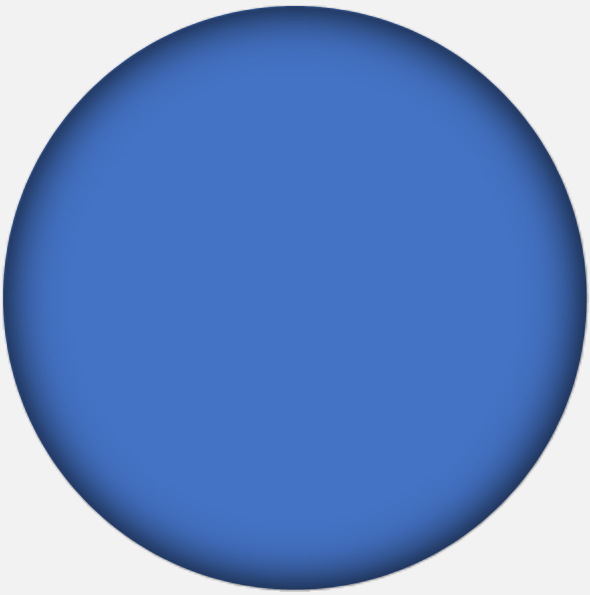
Tap the link button for detailed information and exercises on PIC-Microcontrollers



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EXAMPLES OF INPUTS

Microcontrollers are controlled initially by **INPUTS**. These can be connected to the microcontroller circuit.

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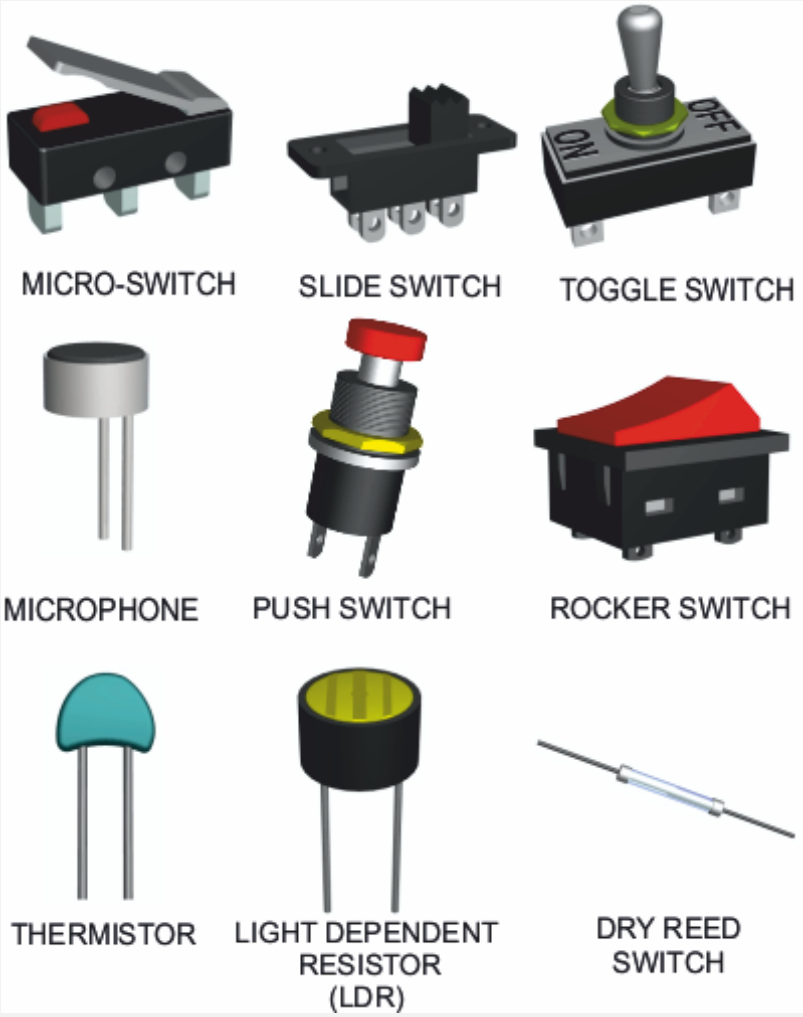

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EXAMPLES OF OUTPUTS

Here are some OUTPUTS for circuits including microcontroller circuits

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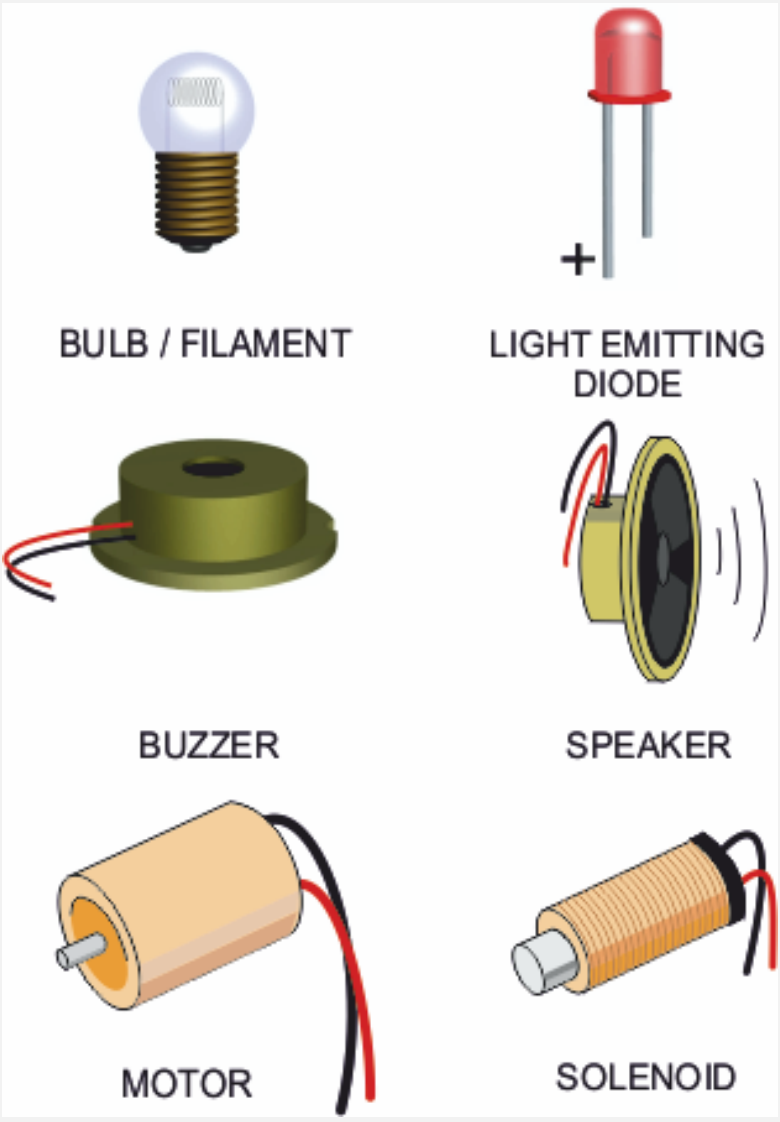

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EXAMPLES OF PROCESSING

PIC Microcontrollers are quickly replacing computers when it comes to programming robotic devices. These microcontrollers are small and can be programmed to carry out a number of tasks and are ideal for school and industrial projects. A simple program is written using a computer, it is then downloaded to a microcontroller which in turn can control a robotic device.

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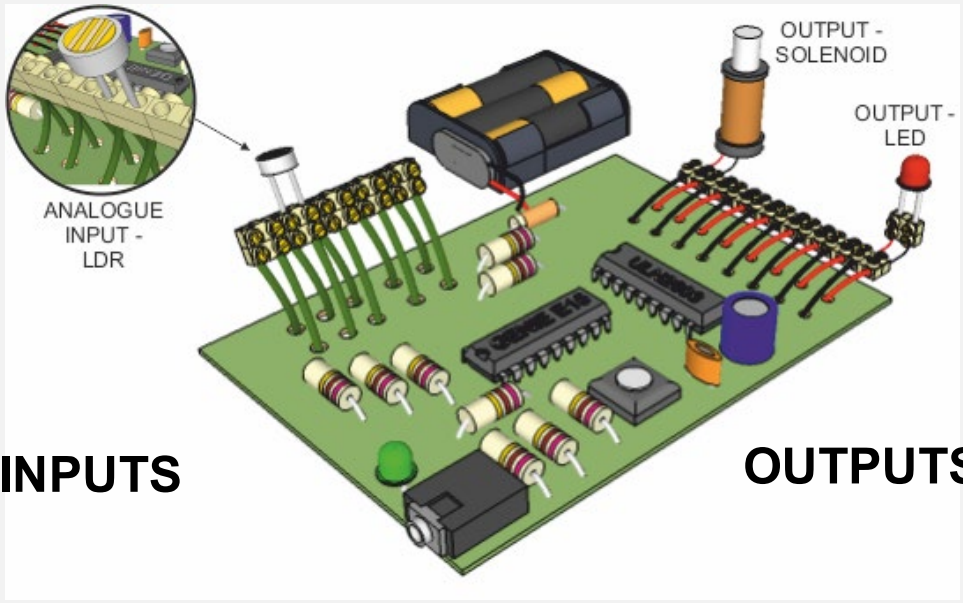
MICROCONTROLLER



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CONNECTING INPUTS

Sensors / switches are connected to the inputs of the microcontroller circuit. The drawing below shows a homemade light/dark sensor, being used as an input to the microcontroller circuit.

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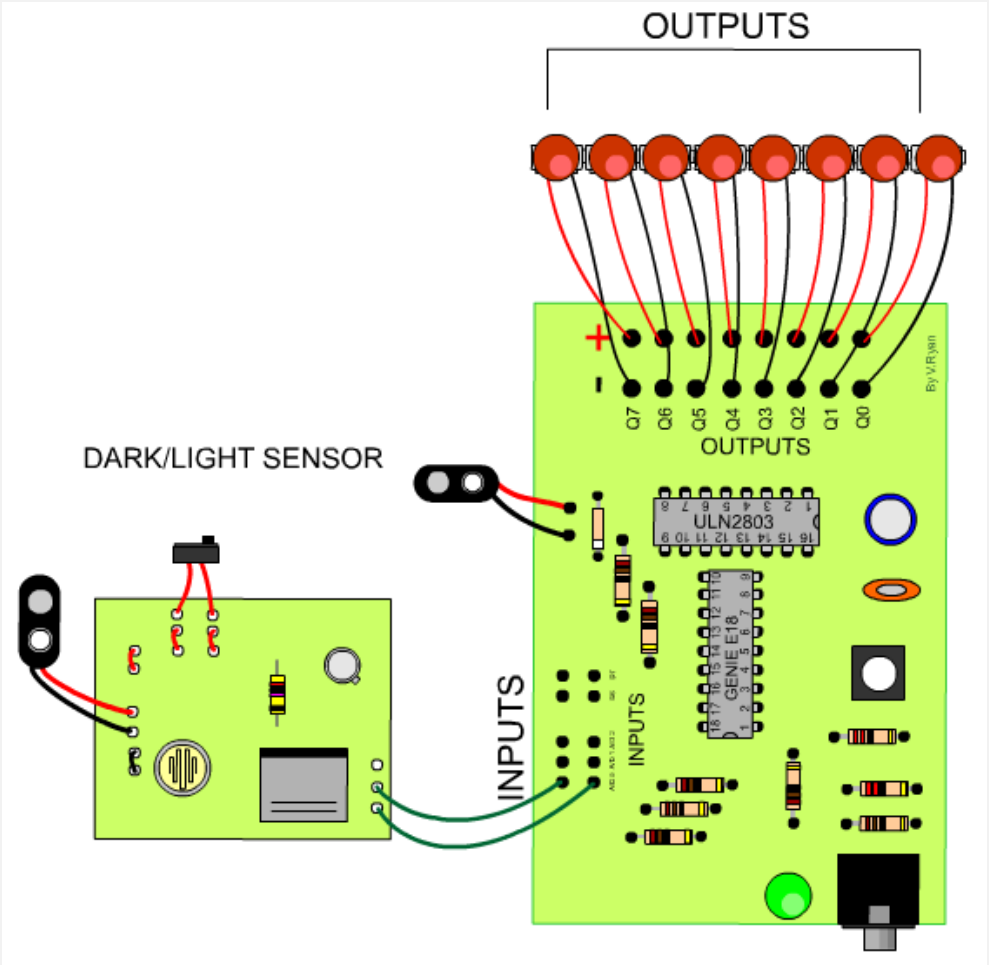

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A SELECTION OF INPUTS

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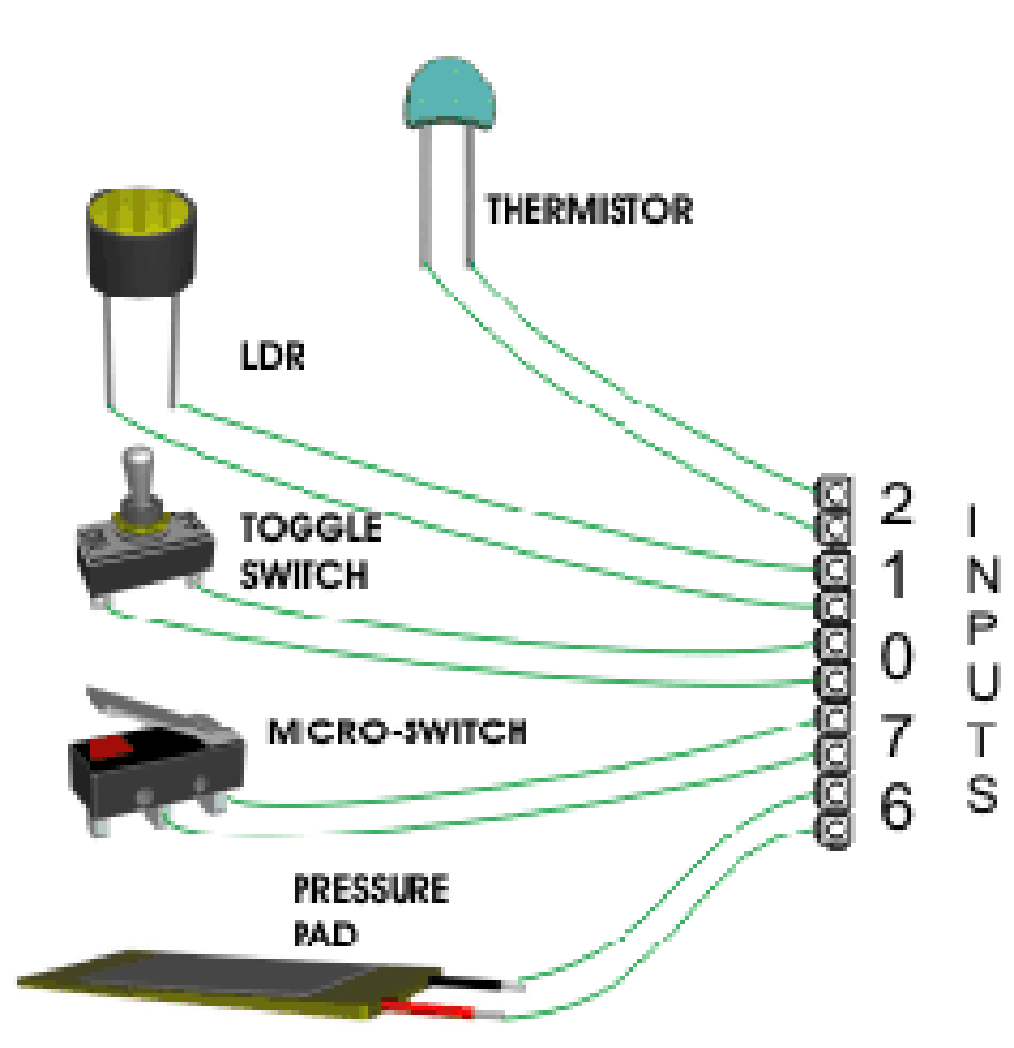

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CONNECTING OUTPUTS

OUTPUTS are connected to the output side of the microcontroller

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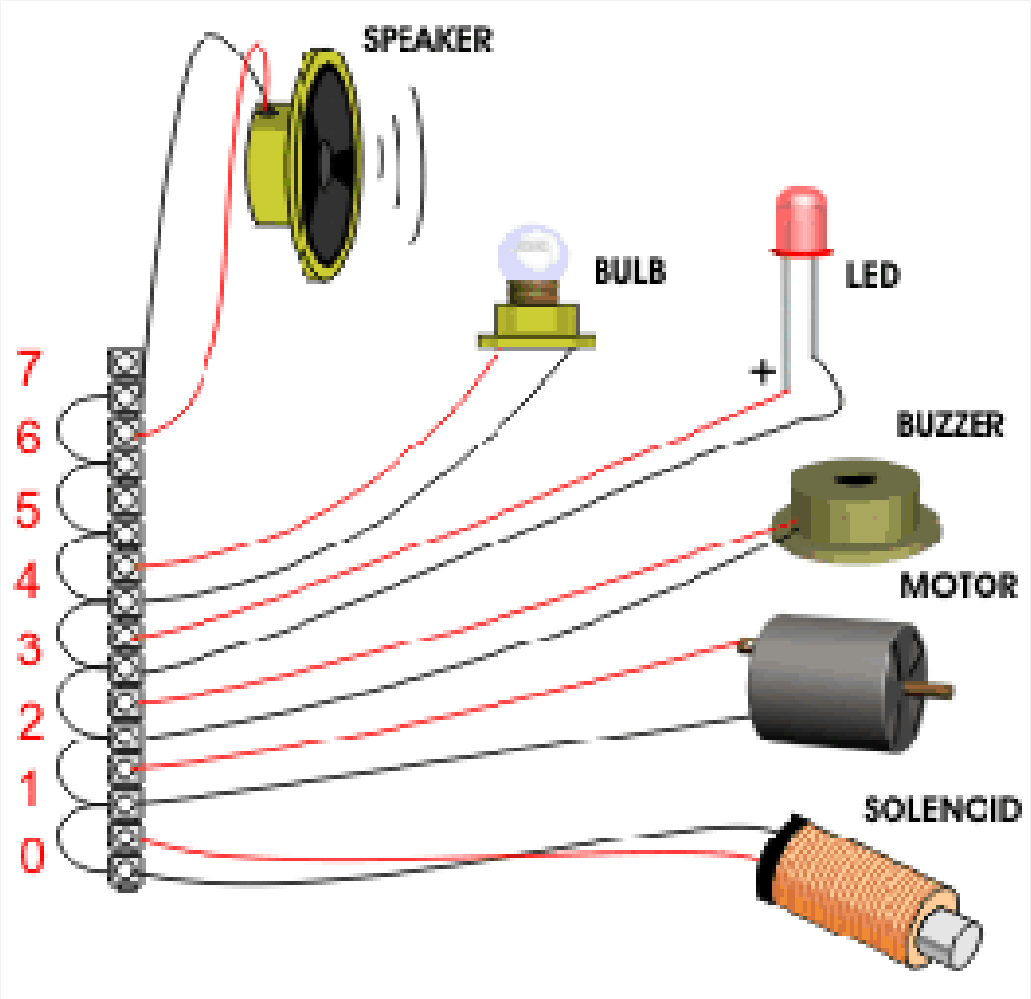

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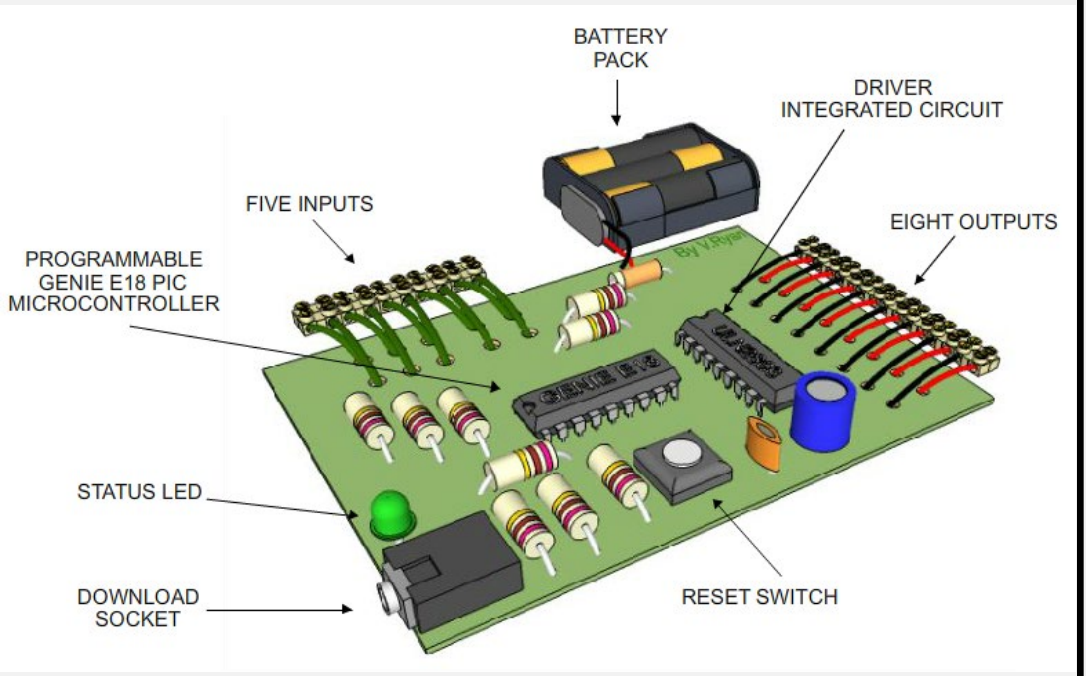
LAYOUT OF A TYPICAL MICROCONTROLLER CIRCUIT

The diagram below shows the typical layout, which includes connections for inputs and outputs. ZOOM IN on the image.

Tap the image for information / an exercise



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SYSTEMS DIAGRAM - MICROCONTROLLER

A microcontroller circuit is part of a system. The inputs are the switches and sensors. The microcontroller circuit stores and runs the programme (flowchart). AND the outputs are devices such as buzzers, sirens, motors, solenoids, LEDs etc……ZOOM IN on the diagram below for the entire system.

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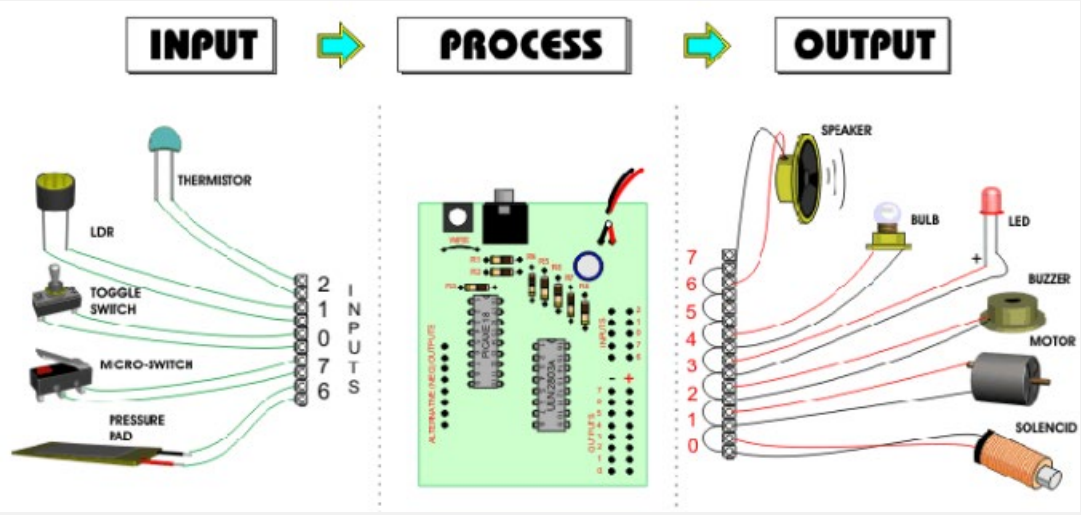

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USING ANALOGUE INPUT - LIGHT DEPENDENT RESISTOR

A digital input device such as a push switch, is either on or off. It has two states and is called a DIGITAL input. An analogue signal, is a constant signal that varies in 'strength / weakness'. Light dependent resistors, are useful as analogue sensors.

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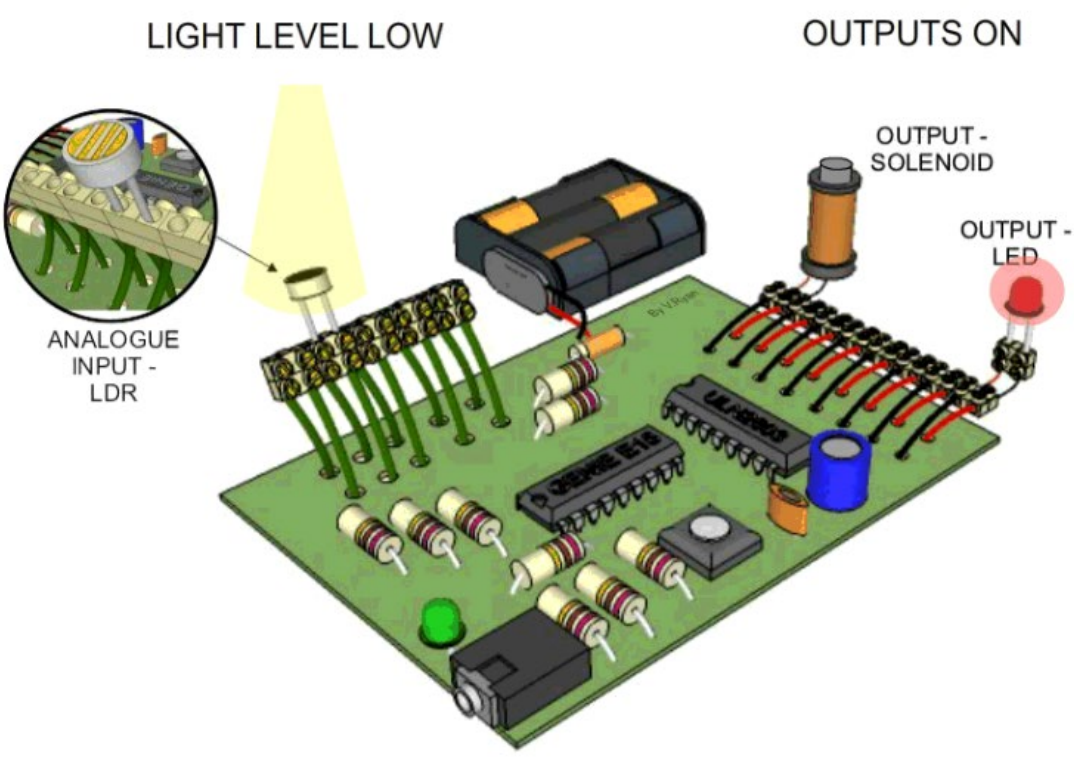

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ANALOGUE INPUT – A VARIABLE RESISTOR

A potentiometer is another analogue device, that can be used as an input to a microcontroller circuit . A potentiometer's resistance varies, being determined by turning a long handle

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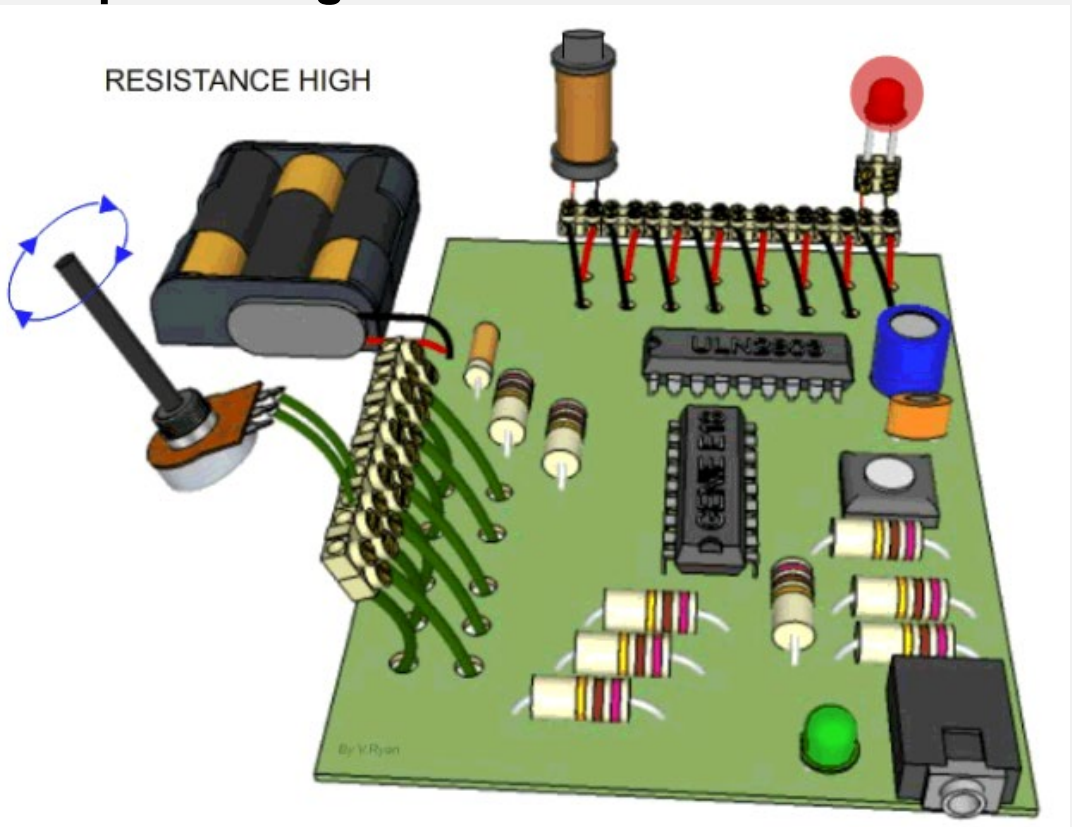

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ANALOGUE INPUT - THERMISTOR

A thermistor is another analogue device, that can be used as an input to a microcontroller circuit . A thermistor's resistance varies, determined by temperature. A 30R @ 25oC thermistor, will have a range of resistance, from 37.13 ohms to 3.26 kilo ohms.

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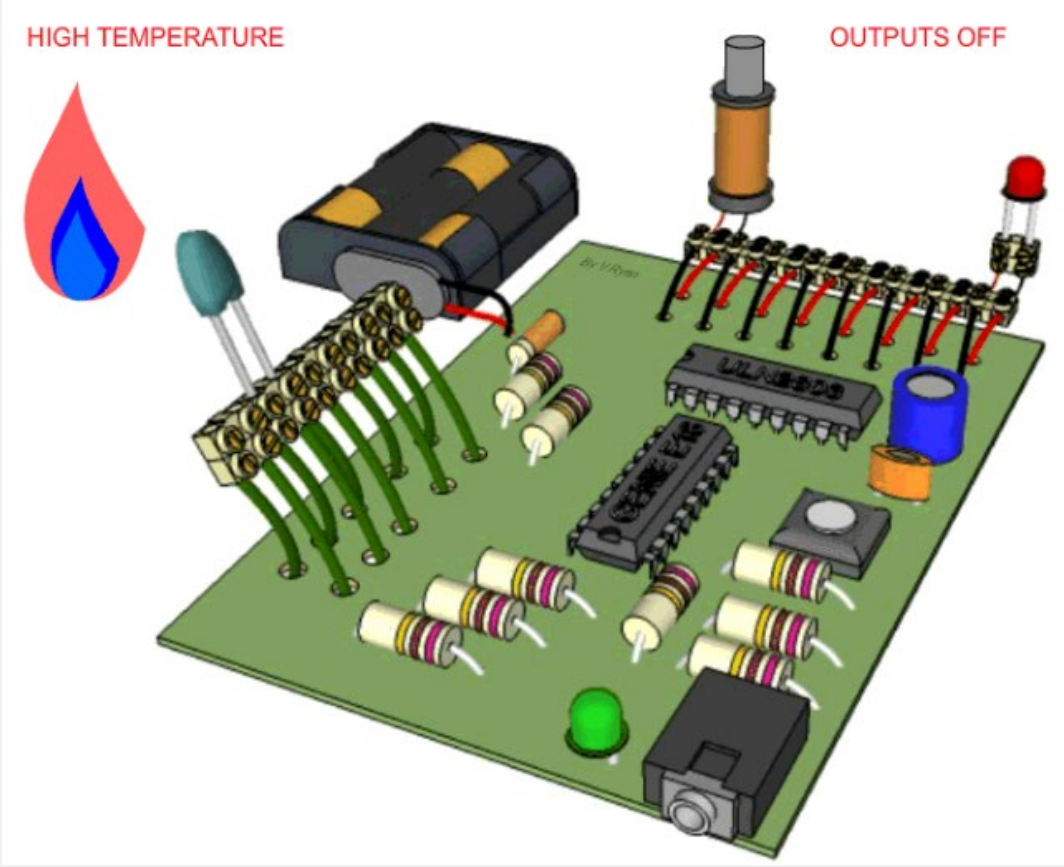

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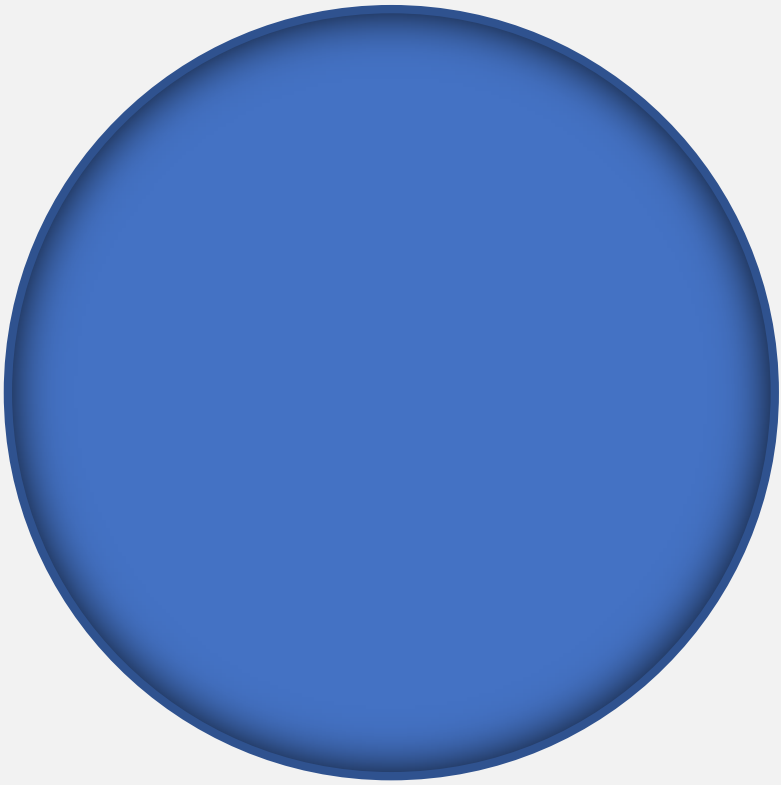

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