

Introduction to Arduino kit

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Abstract

You can implement small and big projects using your Arduino kit. In this e-book, you will be introduced to the Arduino hardware.

1 Introduction

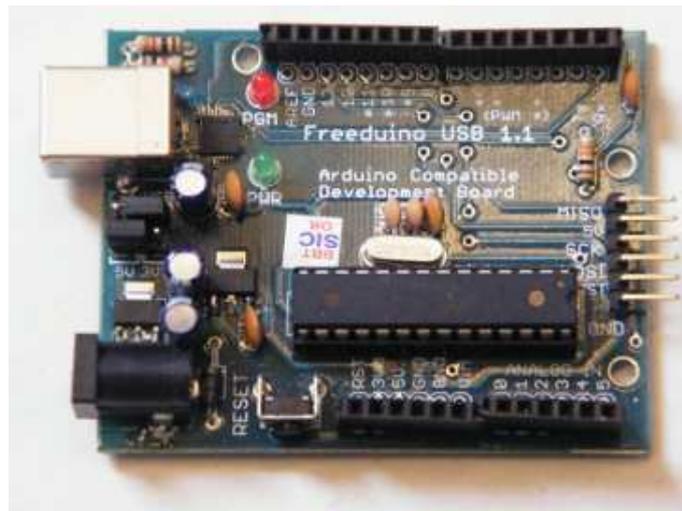


Figure 1: Arduino Hardware

Techno e-School provides you the Arduino kit to complete the Micro Junior Course. Arduino is a world famous free hardware design. Your kit is 100 % compatible with the latest version of Arduino. It can be used as the brain for an electro-mechanical system, like a robot, or an electronic system like a remote control, data logger, timer etc. There is practically no limit for its use.

In this e-book you will know the Arduino hardware.

2 Board Components

Arduino has six main sections on printed circuit board.

2.1 USB connection

Look at the photograph in figure 1. On the top left corner, see a white rectangle. This is the socket for usb cable (provided to you by Techno e-School). You can connect your Arduino board to your computer using this cable. The usb connection is useful to do the following:

1. Dump your programme in the cpu chip of your board.
2. Serial communication with your computer to find faults (if any) in your programme.
3. Sometimes, you may use the usb power to power-up your board.

2.2 Power supply

1. The power supply socket at the bottom corner (see the photograph in figure 1) of Arduino pcb receives 9V DC power. Plug and 9V battery is provided in the Techno e-School kit.
2. Alternatively you may use computer usb power as the power supply to Arduino.

2.3 CPU

A 28 pin chip Atmega328 works as the CPU of Arduino. Atmega328 is an 8 bit micro controller. It runs on 16MHz clock. It has 32 kilo bytes of programme memory and 4 kilo bytes of data memory.

2.4 Input Output

See the photograph in figure 1.

1. Near the left bottom edge, is a 6 pin connector. It is used for power supply connections.
2. Near the right bottom edge, is another 6 pin connector for Analog signal inputs. You can also use these pins as general purpose digital pins (as digital pin 14 to digital 19.)

3. Near the right top edge, is an 8 pin connector. It has digital pin connections (Digital pin 0 to Digital pin 7 from right to left).
4. Near the left top edge, is another 8 pin connector. It has digital pin connections. (From right to left, digital pin 8 to digital pin 13). Digital pin 13 is connected to red led.
5. Any digital pin can be configured as input pin or output pin.

2.5 Indications

1. The green LED on the Arduino board is the power ON indication. When this LED lights up, it indicates that the power is ON.
2. The red LED is connected to digital pin 13 and can be used by the programmer in his/her programme to indicate progress of some process.

2.6 Reset key

See the photograph in figure 1. A key appears ear the power supply socket. This is the reset key. While running your sketch on the hardware, you may want to interrupt it in the middle of the process and start again. Reset key, when pressed, does the same.

3 Pin configuration

Arduino can be used for various purposes. Some of the 20 analog and digital pins can be used for some special purposes. You can use them for:

1. Connecting it to your computer using serial communication. (pins D0 & D1)
2. Putting out analog voltage, or controlling motor speeds using PWM pins.
3. For fast communication with other semiconductor devices using SPI. (miso, mosi etc)
4. Interfacing with many other ICs simultaneously using IIC protocol. e.g. Real time calendar ic DS1307 or PCF8563. (SDA and SCL)

