

Electronics Basics#1

Multimeter measures voltage, current and resistance. It's black prob goes to the common socket; red probe only changes for current.

Resistance measurement : Connect probes across a resistor. If we measure in live circuits, reading can be inaccurate due to current path. OL= Over Limit (Resistance is beyond limits of the meter to register. The meter will beep whenever there is almost zero resistance between the two probes which is a great way to check cable breaks.

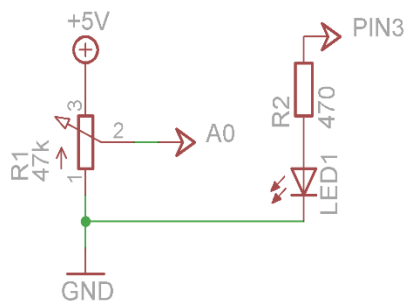
Voltage measurement : Measure voltage in parallel. Red probe goes to positive and black probe goes to negative of power source.

Current measurement : Measure current in series. For this, we need to open the circuit first and then measure current.

Electronics Basics#2

PWM stands for Pulse Width Modulation, allows for dimming by switching the LED on and off rapidly.

- By using potentiometer in series, we can dim the LED but for high current it is inefficient.
- We can utilize Arduino to generate PWN signals with analogWrite to control LED where 0 means 0V and 255 means 5V.



- 555 timer chip which is easy to wire and can control the duty cycle again with a potentiometer.

- For higher power applications, we should use a MOSFET to handle greater currents and voltages. Here, PWM signal goes to Gate, Negative side of LED to Drain and Ground to source.

Electronics Basics#3

Use Attiny for dimming LED

Electronics Basics#4

Use Arduino nano and Bluetooth module and receive signal from a android through Bluetooth module to light up a RGB LED in the written color in android.

Electronics Basics#5

Control a huge amount of LEDs inside a matrix cube with only a few I/O pins of Arduino nano. Also use MOSFET.

Electronics Basics#6

Use a Atmega32 without an Arduino board

Electronics Basics#7

7 segment display is an electronic display device used to show numerical outputs of clocks, temperature sensors etc. Each display has 8 LEDs (7 segments + decimal point) in a

common anode configuration. SI1064 can control four digits by multiplexing two digits at a time and we can connect 4 of those together which means 16 digits maximum. Also, we can use I²C protocol for efficient control and necessary connections for transistors and resistors.

Electronics Basics#9