

Lead Acid Battery Voltage Monitor

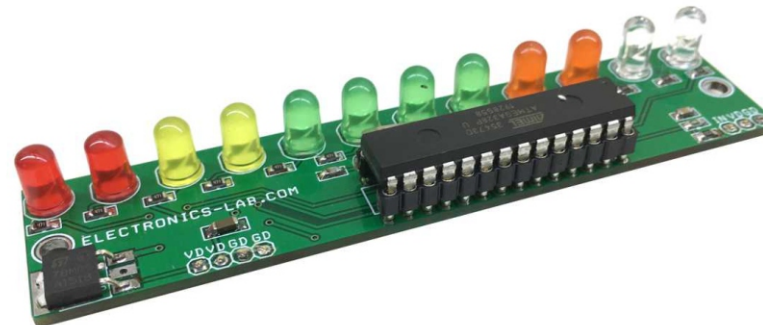
Monitoring the voltage level of a 12V Lead Acid Battery (SLA) is easy and simple with this project. The board is made using an ATMEGA328 micro-controller and 12 x 5mm LEDs. The ATMEGA328 microcontroller senses the analog voltage on A3 Analog pin and drives 12 LEDs connected to digital I/O pins of the chip. Input voltage from the battery is dropped using divider resistors. Different colors of LEDs used for easy visualization of battery voltage level. The operating supply of the circuit is 7-15V DC. The battery voltage measuring range is 9.75V to 14.5V. LED Vs voltage level can be changed by modifying the Arduino code.

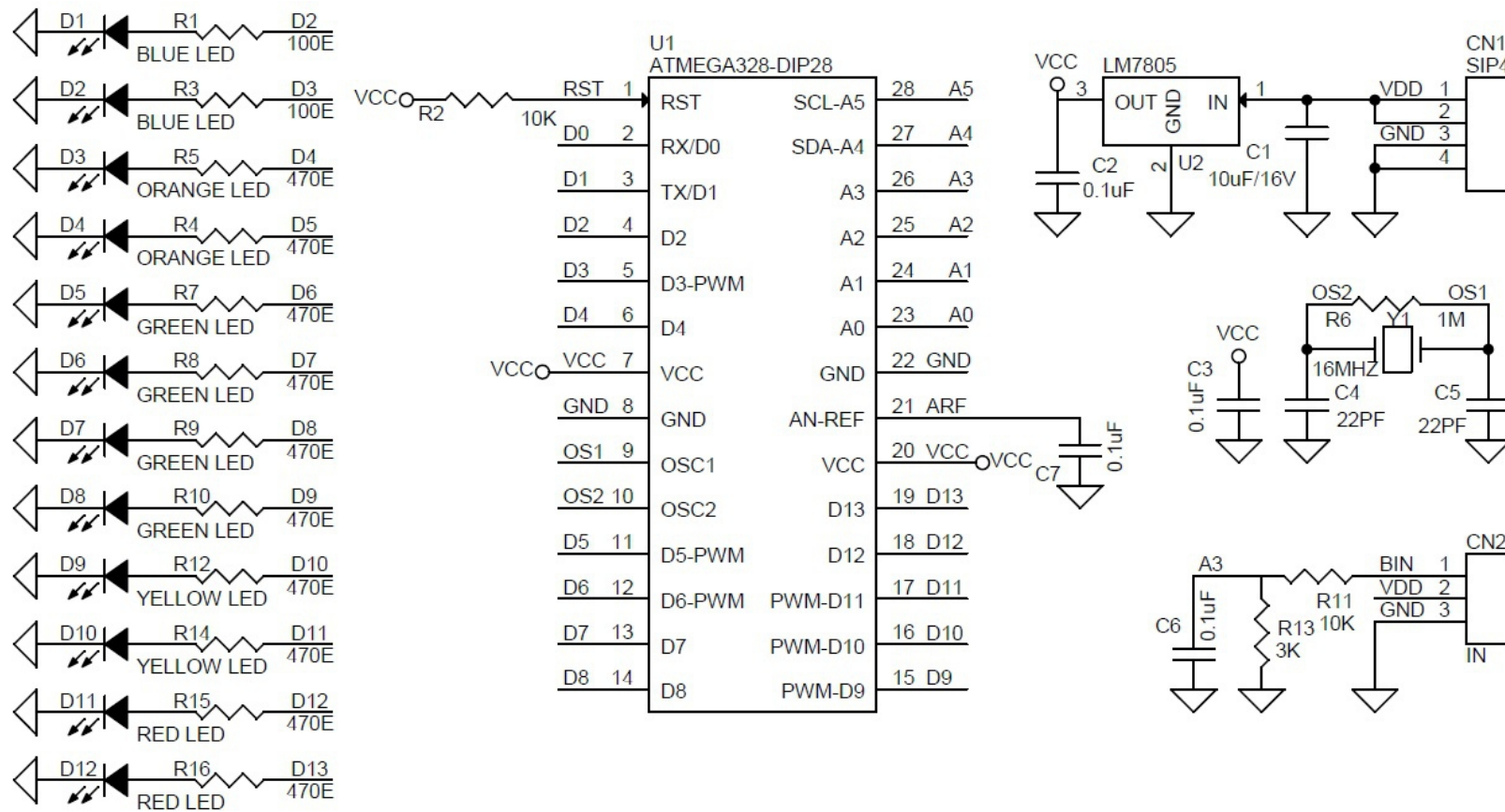
Example Code is available, check on downloads below. This Code is written with the help of Arduino IDE, so new ATMEGA328 chip requires bootloader burning and code uploading, more info on programming the chip is available here:

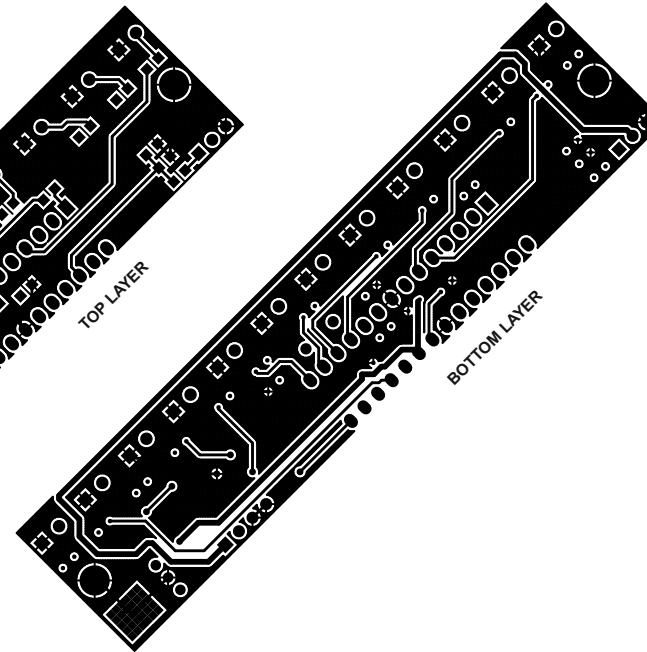
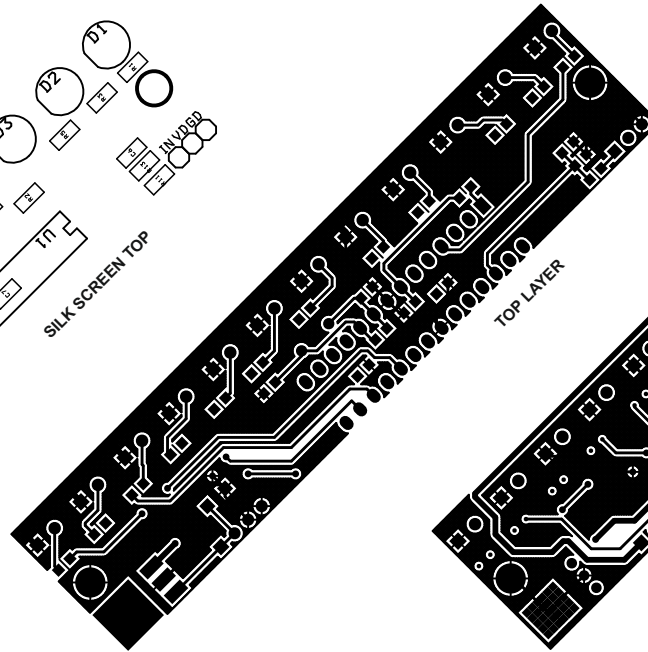
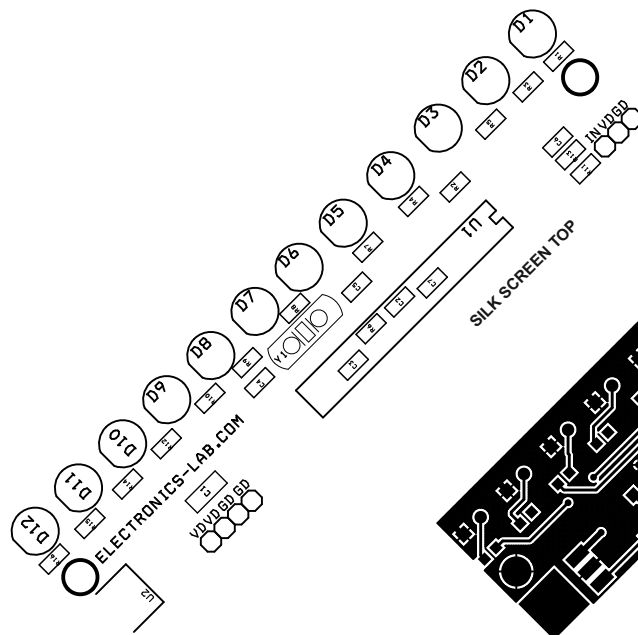
<https://www.arduino.cc/en/Tutorial/BuiltInExamples/ArduinoToBreadboard>

Features

- Supply 7-15V (Advisable to use 9V PP3 Battery) @ 80mA
- Measuring Range 9.75V to 14.5V
- Blue LED = Fully Discharged or Faulty Battery
- Green LEDs = Healthy Battery
- Yellow/Red= Over Charged Battery







BATTERY VOLTAGE VS LED			
Arduino Pin	ATmega328 Pin	LED Colour	Battery Voltage
D2	PIN 4	BLUE	09.75V
D3	PIN 5	BLUE	10.25V
D4	PIN 6	ORANGE	10.50V
D5	PIN 11	ORANGE	11.50V
D6	PIN 12	GREEN	12.00V
D7	PIN 13	GREEN	12.25V
D8	PIN 14	GREEN	12.50V
D9	PIN 15	GREEN	12.75V
D10	PIN 16	YELLOW	13.00V
D11	PIN 17	YELLOW	14.00V
D12	PIN 18	RED	14.25V
D13	PIN 19	RED	14.50V

BOM				
SR.	QNTY.	REF.	DESC.	VENDOR/DIGIKEY/Mouser
1	1	CN1	4 PIN MALE HEADER 2.54 MM PITCH	DIGIKEY S1011EC-40-ND
2	1	CN2	3 PIN MALE HEADER 2.54 MM PITCH	DIGIKEY S1011EC-40-ND
3	1	C1	10uF/16V SMD SIZE 1206	YAGEO
4	4	C2,C3,C6,C7	0.1uF/50V SMD SIZE 0805	YAGEO
5	2	C4,C5	22PF/50V SMD SIZE 0805	YAGEO
6	2	D1,D2	BLUE LED 5MM THT	5MM THT BLUE LED
7	2	D3,D4	ORANGE LED 5MM THT	5MM THT ORANGE LED
8	4	D5,D6,D7,D8	GREEN LED 5MM THT	5MM THT GREEN LED
9	2	D9,D10	YELLOW LED 5MM THT	5MM THT YELLOW LED
10	2	D11,D12	RED LED 5MM THT	5MM THT RED LED
11	2	R1,R3	100E 5% SMD SIZE 0805	YAGEO
12	2	R2,R11	10K 1% SMD SIZE 0805	YAGEO
13	10	R4,R5,R7,R8,R9,R10,R12,R14,R15,R16	470E 5% SMD 0805	YAGEO
14	1	R6	1M 5% SMD SIZE	YAGEO
15	1	R13	3K 1% SMD SIZE 0805	YAGEO
16	1	U1	ATMEGA328-DIP28	DIGIKEY ATMEGA328P-PU-ND
17	1	U2	LM7805/MC78M05	DIGIKEY MC78M05CDTRKOSCT-ND
18	1	Y1	16MHZ	DIGIKEY X1103-ND
19	1	IC SOCKET	14X2 FEMALE IC SOCKET	DIGIKEY ED4764-64-ND



