POV (Persistence of Vision) - Open-Source Arduino Nano Hardware

This is an easy and simple hardware to create a POV display. The hardware consists of a Hall sensor, Arduino Nano, 17 x 5mm LEDS of various colors, etc. The Hall Sensor is connected to analog pin A5 with a pull-up resistor. The circuit works with 3.7V to 5V DC and a 3.7V battery is ideal to use. The user may use as many LEDS as required. This project can also be used to create many applications such as Bar-Graph display, LED light effects. A large 8.5 mm hole is provided to mount the motor coupling. Refer to the diagram for mounting the hall sensor, motor, and magnet.

POV or persistence of vision refers to the optical illusion that occurs when visual perception of an object does not cease for some time after the rays of light proceeding from it have ceased to enter the eye. The illusion has also been described as “retinal persistence”, “persistence of impressions”, simply “persistence” and other variations.

More Information available here: http://electronoobs.com/eng_arduino_tut21.php

Arduino Nano Pins

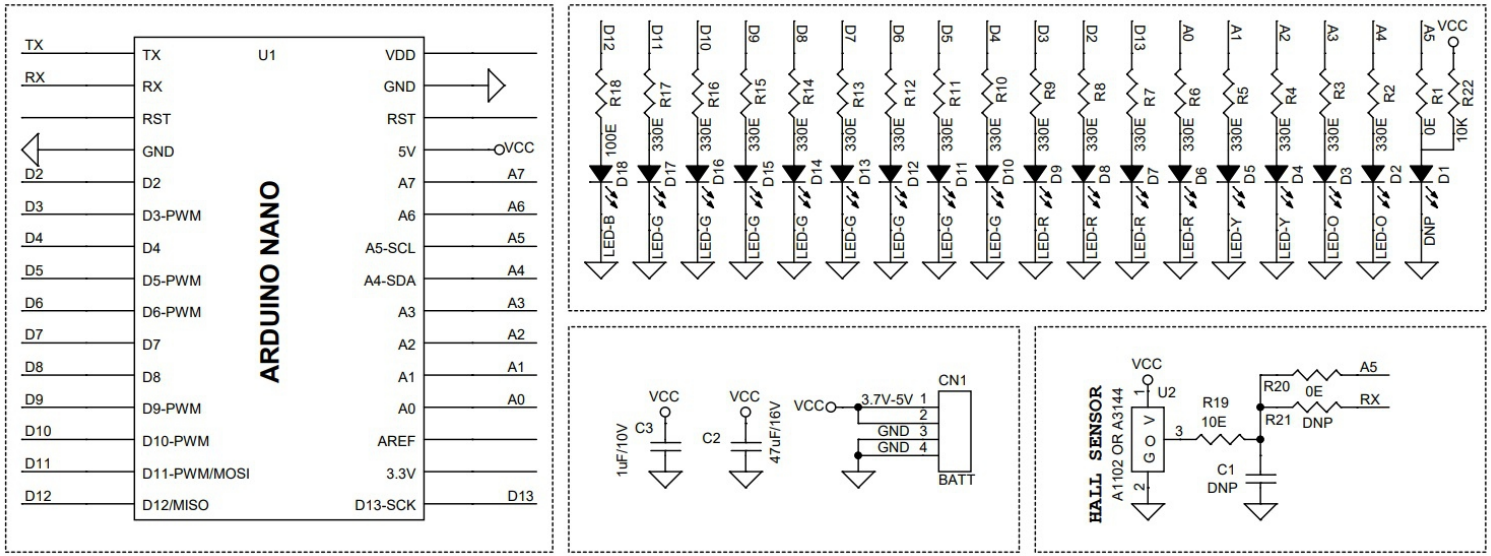
- **Hall Sensor:** Analog Pin A5 with Pull Up resistor, Normally High goes low when magnet is near to the sensor.
- **LED D2 to D18:** Arduino Pin A4, A3, A2, A1, A0, D13, D2, D3, D4, D5, D6, D7, D8, D9, D10, D11, D12
- **LED D1 :** This LED is optional and not installed, user may assemble this LED if the board is used for other application.

Arduino code is available to test the board. The code makes use of 6 LEDs, refer to the diagram to mount the PCB on the motor shaft, Magnet, and Hall sensor potion.

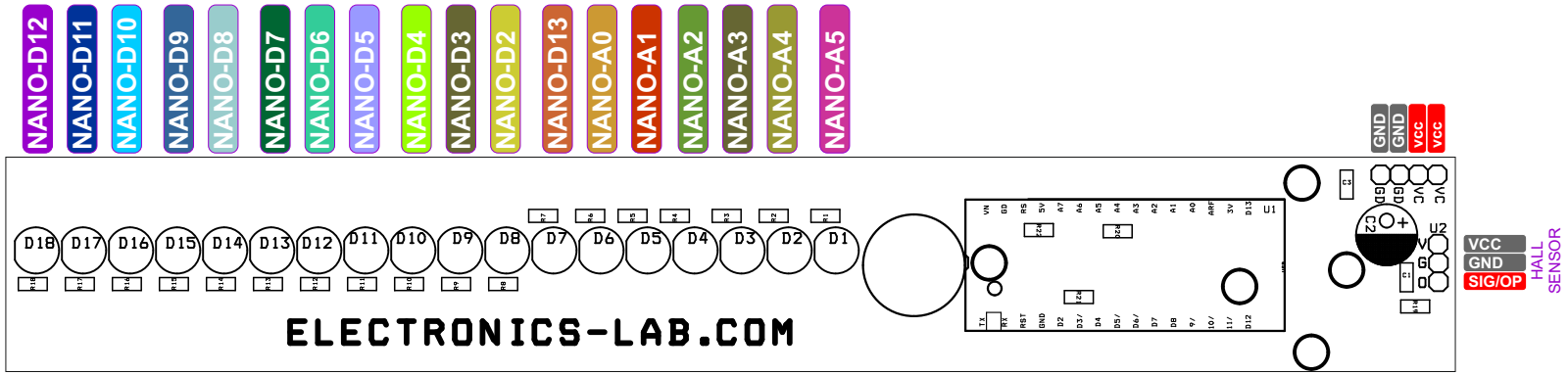
Courtesy: Original Author of the Arduino Code is Palak Mehta.

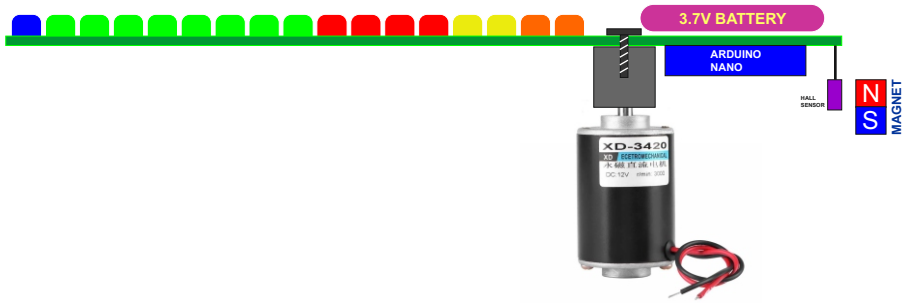
Features

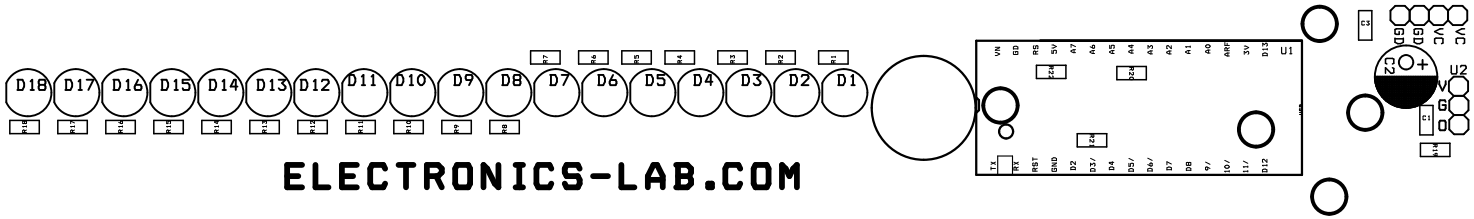
- Supply 3.7V to 5V DC
- On Board 17X LEDs – Various Colours
- On Board Hall Sensor
- Multiple Mounting Holes for Mounting the battery
- 8.5MM Mounting Hole for Motor Shaft
- PCB Dimensions 194.95MM X 29.37MM


ARDUINO NANO
U1
TX
RX
RST
GND
D2
D3-PWM
D4
D5-PWM
D6-PWM
D7
D8
D9-PWM
D10-PWM
D11-PWM/MOSI
D12/MISO
VDD
GND
RST
5V
A7
A6
A5-SCL
A4-SDA
A3
A2
A1
A0
AREF
3.3V
D13-SCK
D13
VCC
LED-B D18 100E R18
LED-G D17 330E R17
LED-G D16 330E R16
LED-G D15 330E R15
LED-G D14 330E R14
LED-G D13 330E R13
LED-G D12 330E R12
LED-G D11 330E R11
LED-G D10 330E R10
LED-R D9 330E R9
LED-R D8 330E R8
LED-R D7 330E R7
LED-R D6 330E R6
LED-Y D5 330E R5
LED-Y D4 330E R4
LED-O D3 330E R3
LED-O D2 330E R2
DNP D1 0E R1
10K R22
C3 1uF/10V
C2 47uF/16V
CN1
3.7V-5V
GND
GND
BATT
HALL SENSOR
A1102 OR A3144
U2
G O V
R19 10E
C1 DNP
R20 0E
R21 DNP
A5
RX

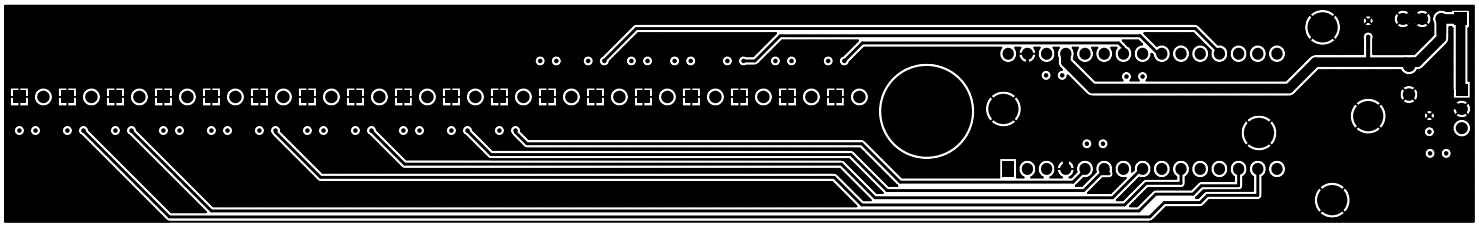
BOM						
NO	QNTY	REF	DESC	MANUFACTURER	SUPPLIER	SUPPLIER PART NO
1	1	CN1	4 PIN MALE HEADER PITCH 2.54MM	WURTH	DIGIKEY	732-5317-ND
2	3	D1,C1,R21	DNP			
3	1	C2	47uF/25V	NICHICON	DIGIKEY	493-15345-3-ND
4	1	C3	1uF/10V SMD SIZE 0805	MURATA/YAGEO	DIGIKEY	
5	2	D2,D3	LED-ORANGE 5MM THT	WURTH	DIGIKEY	732-5018-ND
6	2	D4,D5	LED-YELLOW 5MM THT	BROADCOM	DIGIKEY	516-3193-2-ND
7	4	D6,D7,D8,D9	LED-RED 5MM THT	SUN LED	DIGIKEY	1497-1031-ND
8	8	D10,D11,D12,D13,D14,D15,D16,D17	LED-GREEN 5MM THT	CREE	DIGIKEY	C503B-GCN-CY0C0791-ND
9	1	D18	LED-BLUE 5MM THT	TT	DIGIKEY	365-1180-ND
10	2	R1,R20	0E SMD SIZE 0805	MURATA/YAGEO	DIGIKEY	
11	16	R2 TO R17	330E 5% SMD SIZE 0805	MURATA/YAGEO	DIGIKEY	
12	1	R18	100E 5% SMD SIZE 0805	MURATA/YAGEO	DIGIKEY	
13	1	R19	10E 5% SMD SIZE 0805	MURATA/YAGEO	DIGIKEY	
14	1	R22	10K 5% SMD SIZE 0805	MURATA/YAGEO	DIGIKEY	
15	1	U1	ARDUINO NANO	ARDUINO	DIGIKEY	1050-1001-ND
16	1	U2	A1102LUA-T OR A3144	ALLEGRO	DIGIKEY	620-1003-ND


NANO-D12
NANO-D11
NANO-D10
NANO-D9
NANO-D8
NANO-D7
NANO-D6
NANO-D5
NANO-D4
NANO-D3
NANO-D2
NANO-D13
NANO-A0
NANO-A1
NANO-A2
NANO-A3
NANO-A4
NANO-A5
D18 D17 D16 D15 D14 D13 D12 D11 D10 D9 D8 D7 D6 D5 D4 D3 D2 D1
ELECTRONICS-LAB.COM
GND
GND
VCC
VCC
VCC
GND
SIG/OP
HALL SENSOR

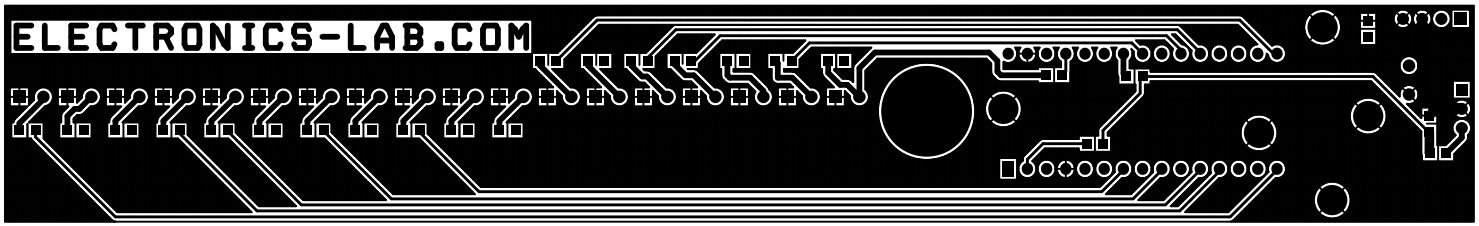

3.7V BATTERY
ARDUINO NANO
HALL SENSOR
N
S
MAGNET
XD-3420



SILK SCREEN TOP



BOTTOM LAYER



TOP LAYER

PCB DIMENSIONS 194.95MM X 29.37MM