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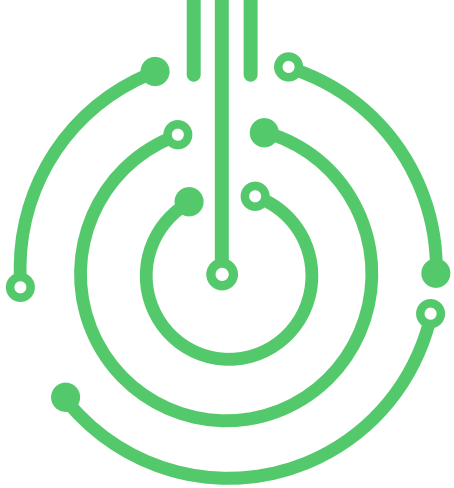


Inclinometer with 17 Segment BarGraph Display

SKU: EL153948

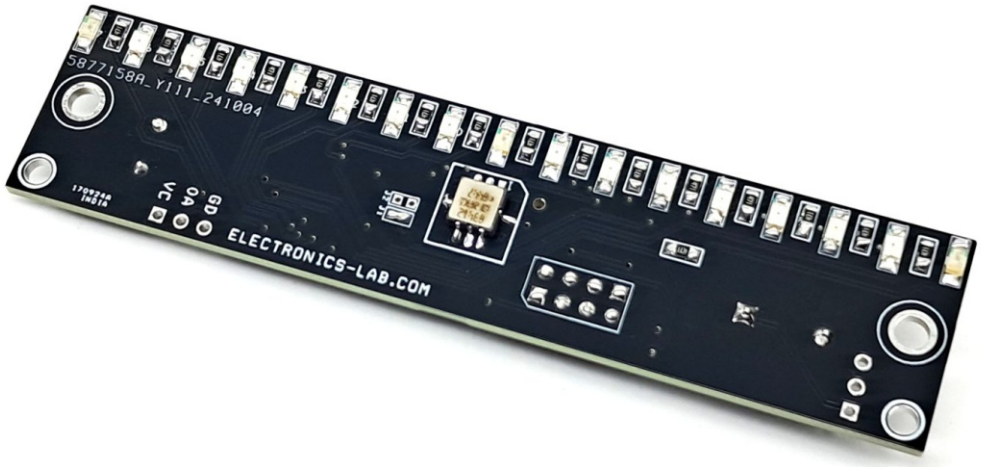
Inclinometer with 17 Segment BarGraph Display

This project is an inclinometer based on the ADXL203/ADXL103 accelerometer chip and the Arduino microcontroller ATMEGA328. The device measures tilt and displays it on a 17-segment bar graph display. The ADXL203 provides an analog value, which is read by the ATMEGA328's ADC A0 and displayed on the LED bar graph. The project also includes an optional on-board buzzer and driver circuit, which can be used to create an alarm at a certain degree of tilt. This feature is not populated on the board by default but can be added if required. On-board solder jumpers J1 and J2 are provided to select the X-Axis or Y-Axis of the ADXL chip since the chip has 2 axes. Users may additionally use single-axis chip ADXL103 instead of ADXL203 dual axis.

The buzzer circuit can be connected to either the D3 or D11 pin of the microcontroller, using a 2.2K 5% SMD resistor (R22 for D3 or R13 for D11). The recommended buzzer is a 12mm – 5V type, and the transistor Q1 is a BC847 SOT23-3.

FEATURES

- Power supply: 5V DC @ 100mA
- On-board tilt sensor
- 17 LED bar graph display
- 4X2 Pin Connector for Arduino programming
- Easy mounting with 2x3mm mounting holes
- 3 blue LEDs, 6 red LEDs, and 8 green LEDs
- PCB Dimensions 94.93X22.38MM



Arduino Programming

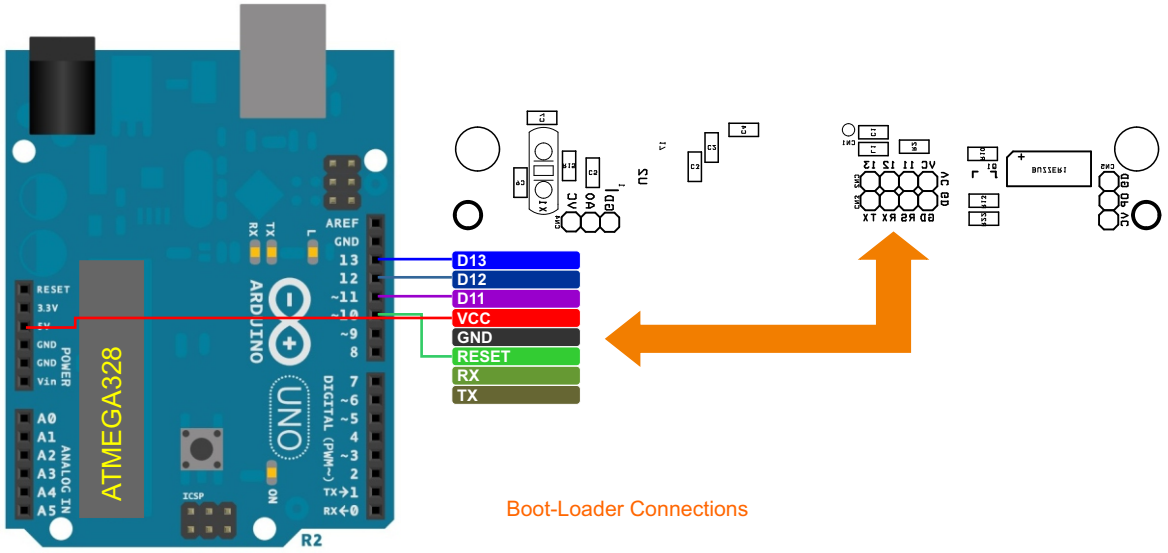
The board features a 4 x 2 pin connector for bootloader and Arduino programming. Users can refer to the provided link for more information on Arduino programming and bootloader installation for the ATMEGA328 chip.

https://docs.arduino.cc/built-in-examples/arduino-isp/ArduinoToBreadboard/

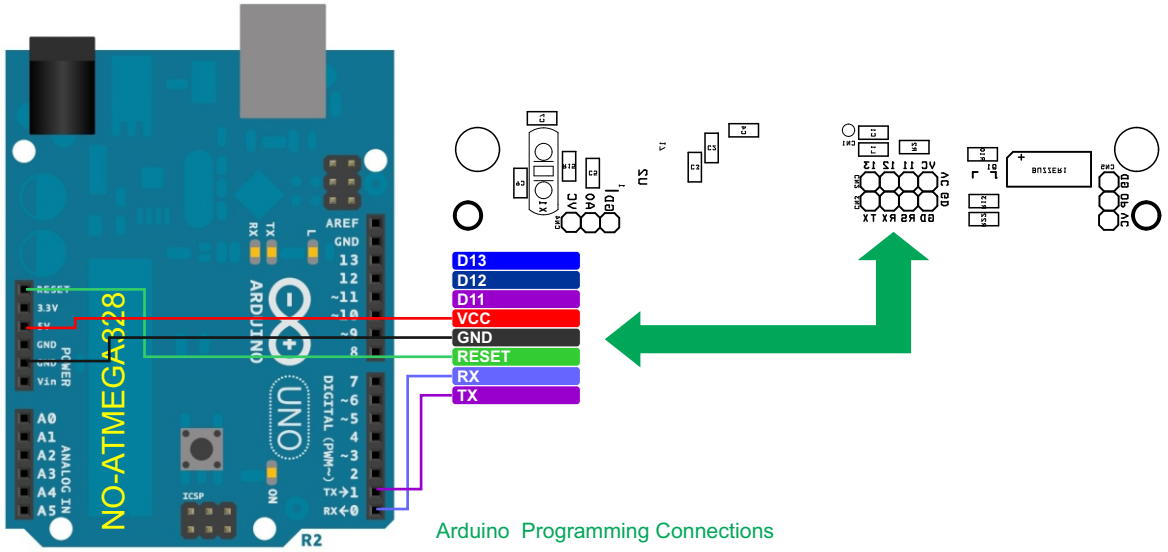
Arduino code is available for testing the board, although it is noted that the code may not be entirely accurate. Users are encouraged to experiment and modify the code to suit their specific application requirements.

When the board is kept at a zero-level position, the D9 blue LED is turned on. As the PCB is tilted, 8 LEDs follow the tilt in one direction, and 8 LEDs follow the tilt in the other direction.

Overall, this project appears to be a simple and effective inclinometer solution, suitable for applications such as vehicle leveling (e.g., RVs, motorhomes, and platforms). The optional buzzer feature adds another layer of functionality, allowing users to set alarms at specific tilt angles.

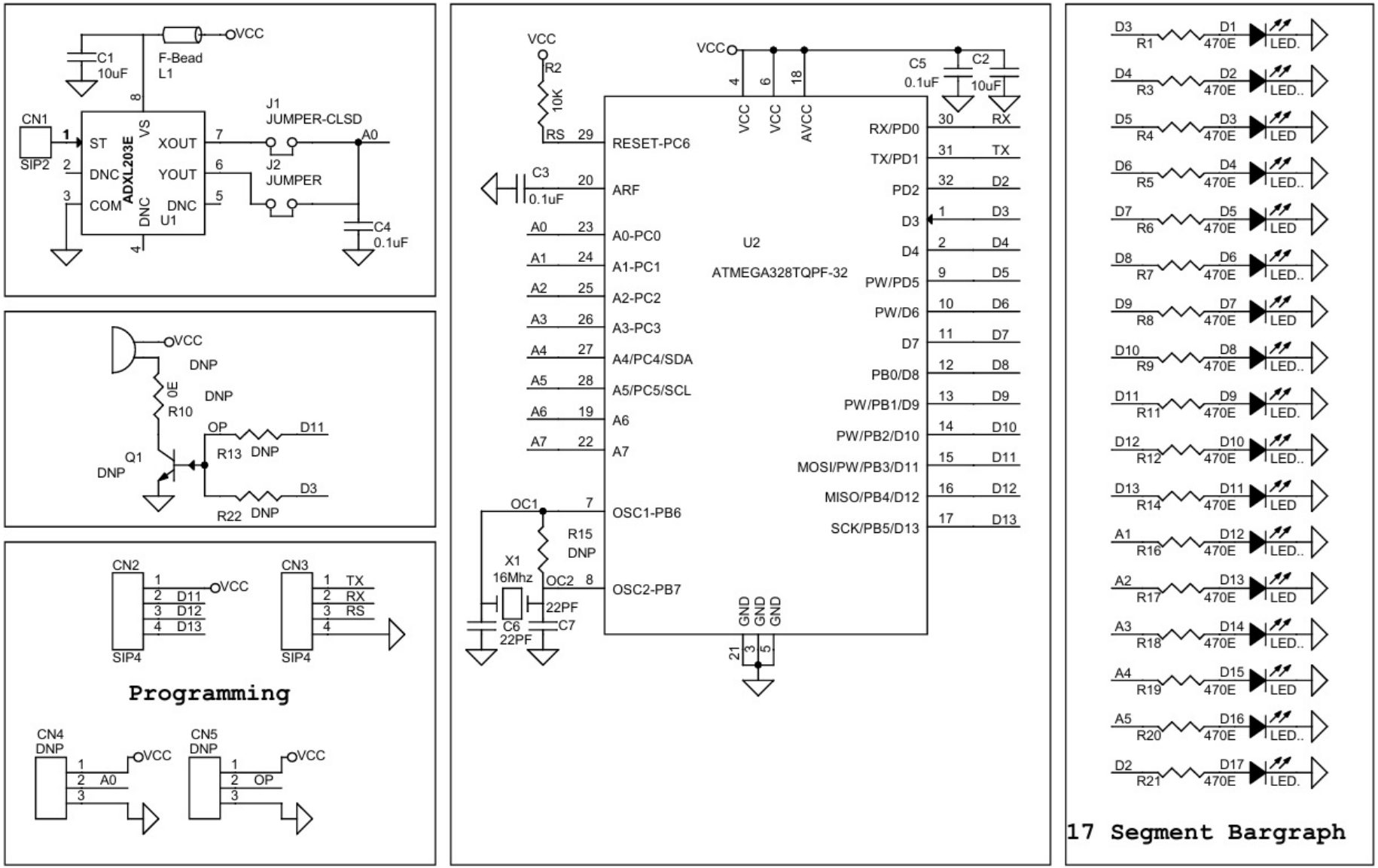


Boot-Loader Connections

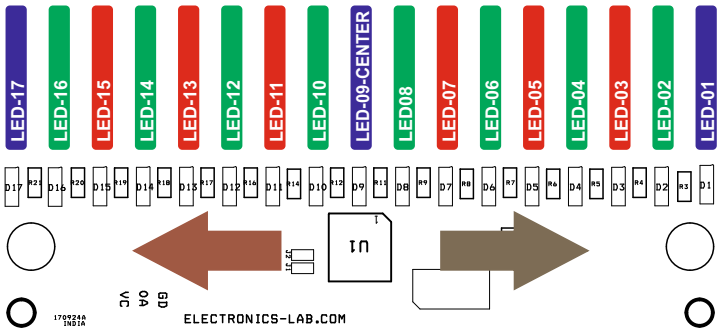


Arduino Programming Connections

Schematic


VCC
C1
10uF
F-Bead
L1
CN1
SIP2
ST
DNC
COM
ADXL203E
VS
XOUT
YOUT
DNC
DNC
U1
J1
JUMPER-CLSD
J2
JUMPER
A0
C4
0.1uF
DNP
R10
0E
Q1
OP
D11
R13
D3
R22
CN2
CN3
SIP4
TX
RX
RS
Programming
CN4
CN5
R2
10K
RESET-PC6
ARF
C3
0.1uF
A0-PC0
A1-PC1
A2-PC2
A3-PC3
A4/PC4/SDA
A5/PC5/SCL
A6
A7
U2
ATMEGA328TQPF-32
OSC1-PB6
OSC2-PB7
X1
16Mhz
22PF
C6
C7
R15
C5
C2
RX/PD0
TX/PD1
PD2
PW/PD5
PW/D6
D7
PB0/D8
PW/PB1/D9
PW/PB2/D10
MOSI/PW/PB3/D11
MISO/PB4/D12
SCK/PB5/D13
GND
AVCC
17 Segment Bargraph
LED

Connections



Connections

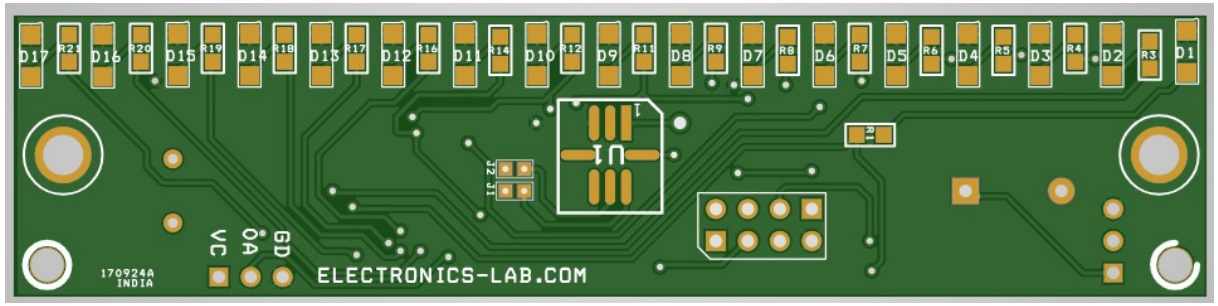
- CN1: No Use
- CN2 Programming Connector: Pin 1 = VCC, Pin 2 = D11, Pin 3 = D12, Pin 4 = D13
- CN3 Programming Connector: Pin 1 TX, Pin 2 = RX, Pin 3 = Reset, Pin 4 = GND
- CN4: Optional - No Use
- CN5: Optional- No Use
- Power Input: Pin 1 of CN2 = VCC, Pin 4 of CN1 = GND can be used to power the board or use CN4 or CN5 to power the board

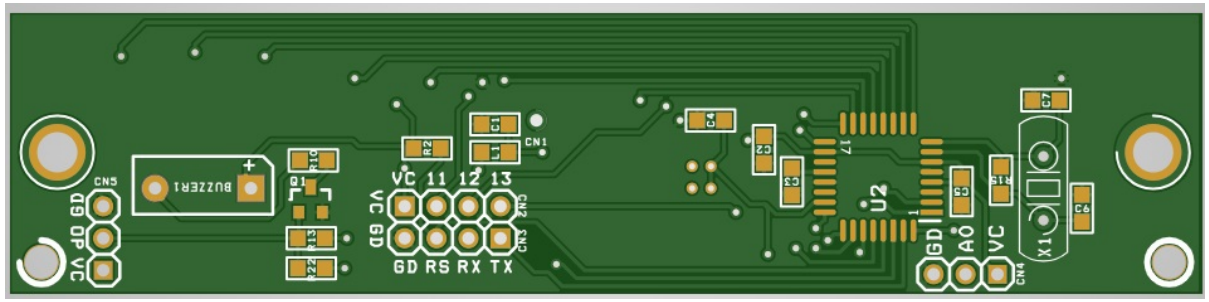
Arduino Pins

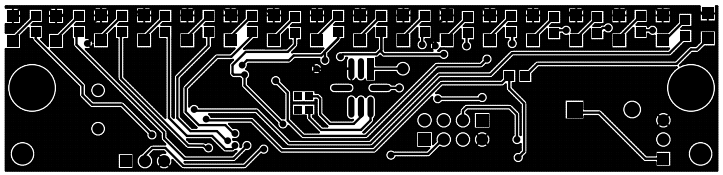
D3=LED01, D3=LED02, D5=LED03, D6=LED04, D7=LED05, D8=LED06, D9=LED07, D10=LED08, D11=LED09, D12=LED10, D13=LED11, A1=LED12, A2=LED13, A3=LED14, A4=LED15, A5-LED16, D2=LED17

PCB

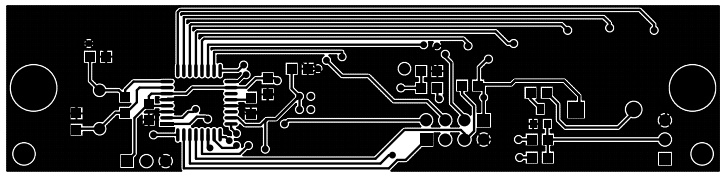
PCB GERBER FILES AVAILABLE



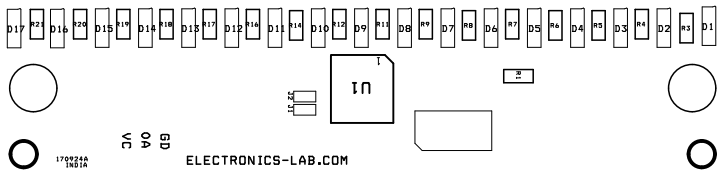




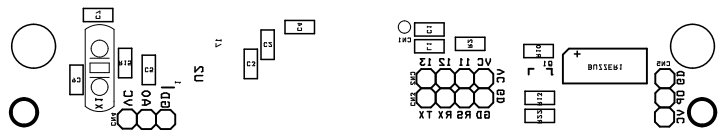
TOP LAYER



BOTTOM LAYER



SILK SCREEN TOP



SILK SCREEN BOTTOM LAYER

PCB DIMENSIONS 94.93X22.38MM

Parts List

BOM						
NO.	QNTY	REF	DESC	MANUFACTURER	SUPPLIER	SUPPLIER PART NO
1	2	CN2,CN3	4 PIN MALE HEADER PITCH 2.54MM	WURTH	DIGIKEY	732-5317-ND
2	8	Q1,CN4,CN5,R13,R15,R22,DNP, CN1	DNP			
3	2	C1,C2	10uF/16V CERAMIC SMD SIZE 0805	YAGEO/MURATA	DIGIKEY	
4	3	C3,C4,C5	0.1uF/50V CERAMIC SMD SIZE 0805	YAGEO/MURATA	DIGIKEY	
5	2	C6,C7	22PF/50V CERAMIC SMD SIZE 0805	YAGEO/MURATA	DIGIKEY	
6	3	D1,D9,D17	LED BLUE SMD SIZE 1206	WURTH	DIGIKEY	732-4989-1-ND
7	8	D2,D4,D6,D8,D10,D12,D14,D16	LED GREEN SMD SIZE 1206	WURTH	DIGIKEY	732-4993-1-ND
8	6	D3,D5,D7,D11,D13,D15	LED RED SMD SIZE 1206	WURTH	DIGIKEY	732-4991-1-ND
9	1	J1	SOLDER/JUMPER-CLSD			
10	1	J2	SOLDER JUMPER			
11	1	L1	FERRITE BEAD LI0805G301R-10	LAIRD	DIGIKEY	240-2382-1-ND
12	17	R1,R3,R4,R5,R6,R7,R8,R9,R11,R12,R14,R16,R17,R18,R19,R20,R21	470E 5% SMD SIZE 0805	YAGEO/MURATA	DIGIKEY	
13	1	R2	10K 5% SMD SIZE 0805	YAGEO/MURATA	DIGIKEY	
14	1	R10	0E SMD SIZE 0805	YAGEO/MURATA	DIGIKEY	
15	1	U1	ADXL203CE	ANALOG DEVICE	DIGIKEY	505-ADXL203CE-ND
16	1	U2	ATMEGA328TQPF-32	MICROCHIP	DIGIKEY	
17	1	X1	16Mhz	ECS INC	DIGIKEY	

Notes

APP

Android App

DOWNLOAD

Android App launched in 2017 and has 100k+ downloads - rated with 4.5 stars.

SCAN QR CODE

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