Seneca

HSI255
PROJECT REPORT

OPTICAL SENSOR ALARM
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Abstract

The project examined data acquisition and control hardware to connect the physical world to your computer. in detail to project interface of an Optical Sensor Alarm with Buzzer and LED. An Optical sensors, such as the transmissive photointerrupter is interrupted by an object alarm ring of sound -emitting devices know as buzzer and turn on a Light-Emitting Diode (or LED) this works opposite when Optical sensors in not interrupted. In addition to project Interface a LabJack data acquisition unit using hardware connections and software programming. Program applications in C language to send and receive signals via hardware LabJack ports.

Introduction

The purpose of project is when optical sensor interrupted a piezoelectric buzzer to sound on and LED to turn on but when sensor is not interrupter buzzer and LED remain off. Apply circuit-building and design techniques PADS Mentor Graphics provides intuitive printed circuit board (PCB) design, providing tools for schematic, layout, and rapid prototyping, Which help to munfacture PCB.

In the project Optical Sensor Alarm, You will find interfacing of hardware and software with the help of data acquisition device know as Lab Jack U3. In design setup will explore circuit design and munfacturing. In Hardware setup find how circuit design will help to get an output from photointerrupter, buzzer, and LED. In Software will write a program to read an analog input channel that triggers a pulsed signal output (PWM) to a buzzer,LED and tranistor.
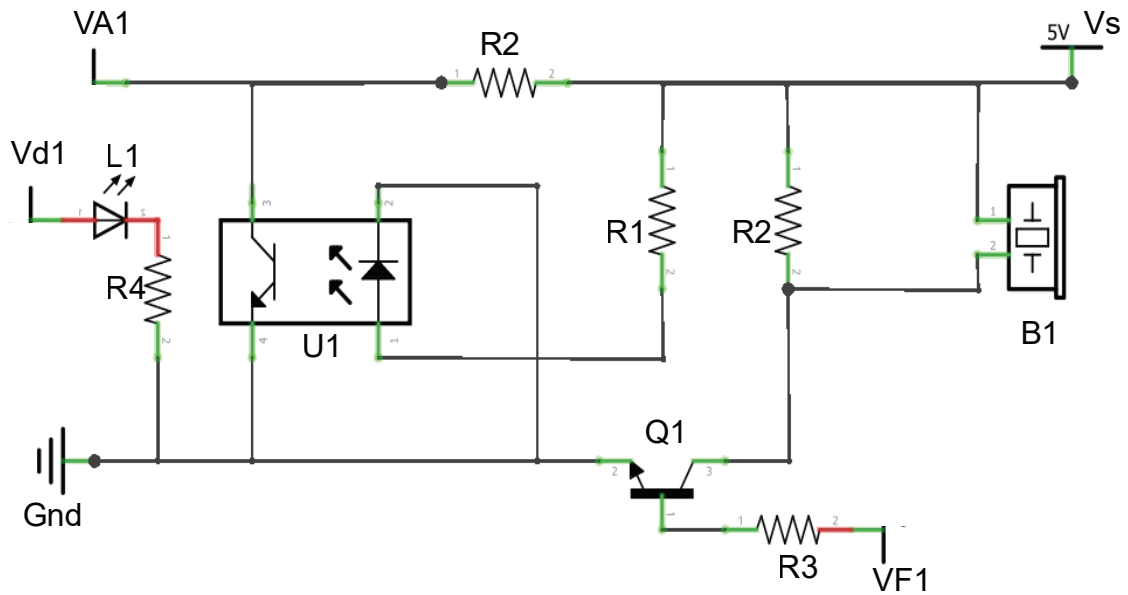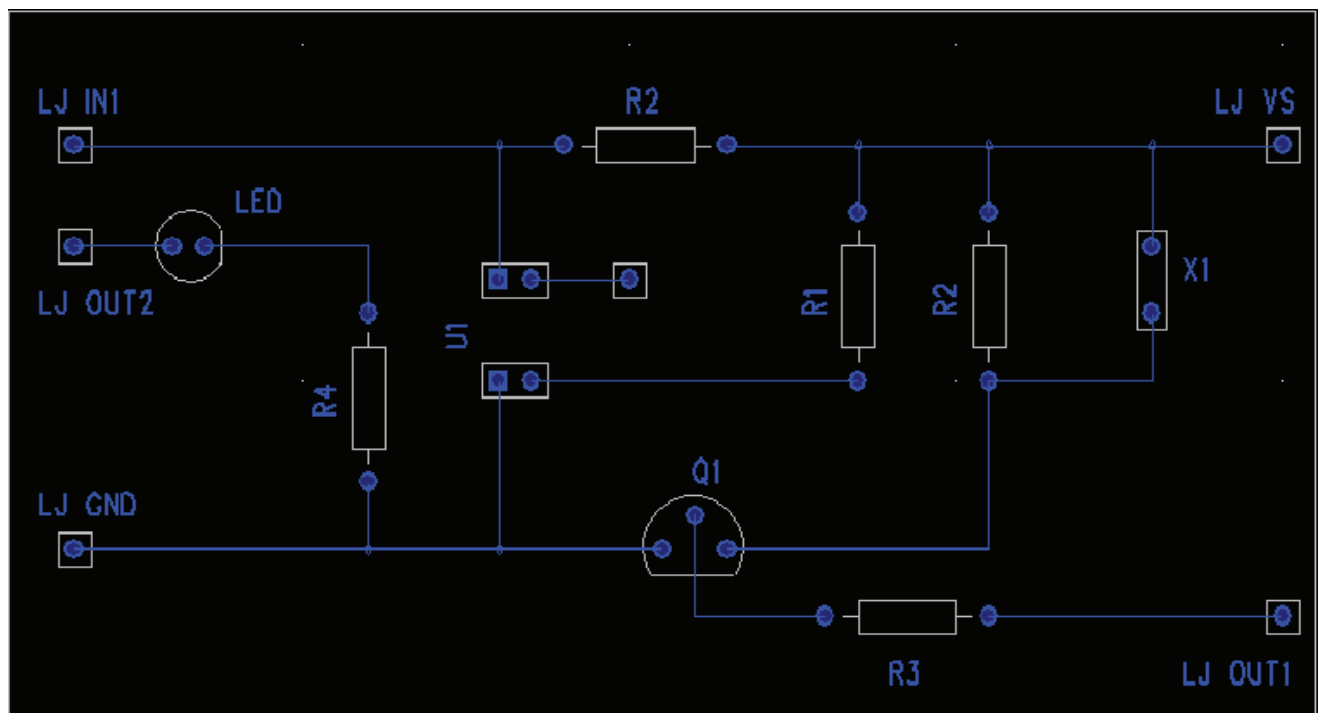
Schematic

Figure 1

PCB Design

PCB design brings your electronic circuits to life in the physical form. Using layout Mentor graphic PADS, the PCB design process combines component placement and routing to define electrical connectivity on a manufactured circuit board.

Hardware

Breadboard was used before PCB design. Figure 1 was constru-ct on Breadboard. Let U1=LTH-301-05, R1= 330Ω, R2=10kΩ, R3=470Ω, R4=330Ω, Q1= 2N3904, L1=Green LED B1= Buzzer

Photointerrupter
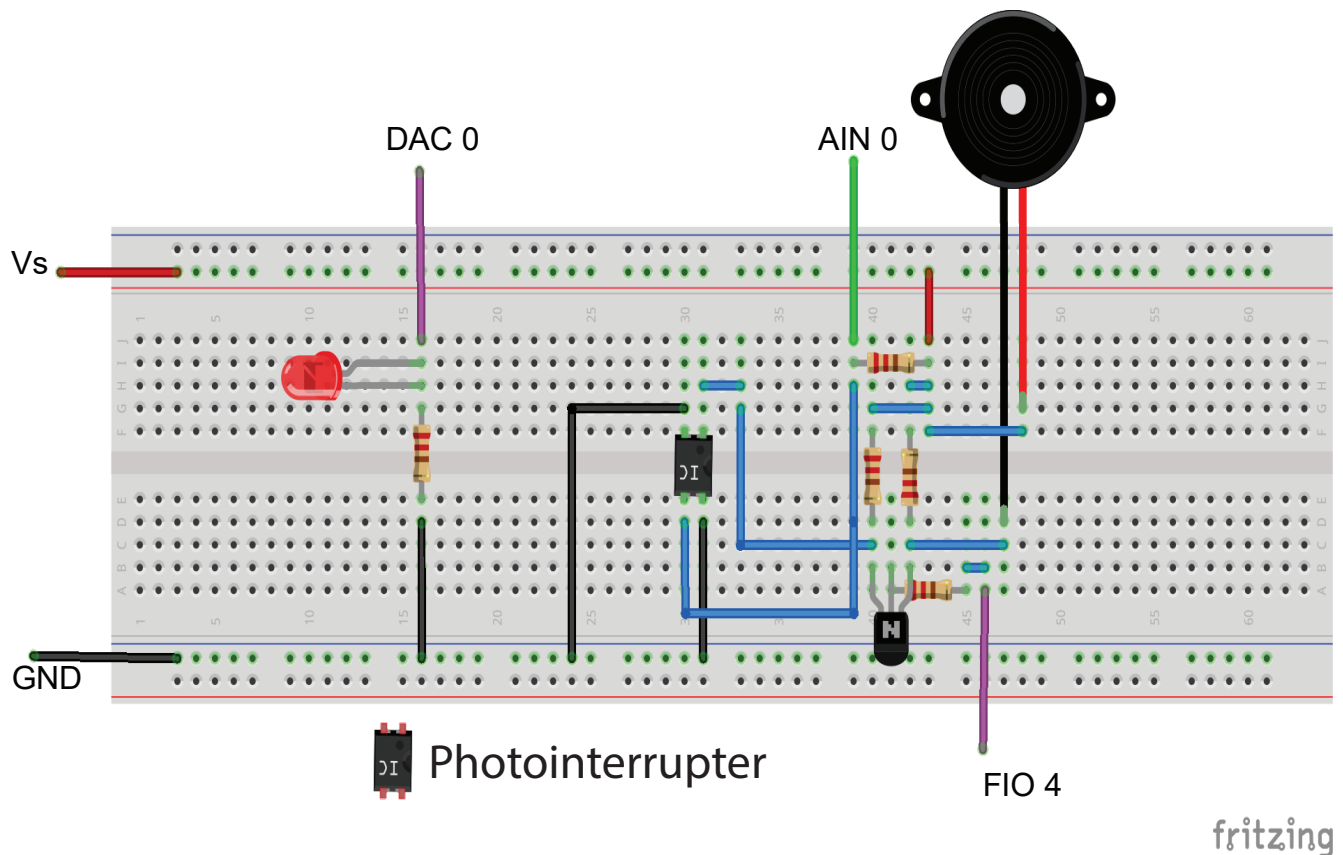
PCB design were solder and Lab Jack U3 was connected with Vs terminal and GND terminal. The PCB must be next to thr labJack device. PWM output signal on FIO4 In LJ Control Panel was set up Using Frequency

Software

A PWM signal was set up on FIO4, then in each iteration of the while loop,the input voltage and displayed in console. C program when optical Sensor is triggered. If the sensor is normal, the output of LED and Buzzer remain normal if sensor interrupted, then LED flash and Buzzer Sound. At the end FIO4 was turn back into input and an input to turn off its PWM output.

Cost Summary

Part	Supplier Name	Part Code	Value	Specs	Quantity	Cost/	Cost
Resistor	Digi-key	470QBK-ND	470Ω	5% 1/4W	1	0.15	0.15
Resistor	Digi-key	330QBK-ND	330Ω	5% 1/4W	2	0.30	0.30
Resistor	Digi-key	10.0kxbk-ND	10KΩ	5% 1/4W	1	0.15	0.15
GREEN LED	Digi-key	C503B-GCN-CY0C0791-ND	GREEN	5mm 3.2V	1	0.3	0.3
Transistor	Digi-Key	2N3904FS-ND	2N3904	40V 0.2A	1	0.4	0.4
Buzzer	Digi-key	445-2525-1-ND	Piezo trans	Single tone	1	2.46	2.46
Optical Slot Sensor	Digi-Key	1855-1031-ND			1	3.22	3.22
Subtotal							6.98
Tax:(13%)							1.373
Total							**8.29**

Conclusion

To conclude, the buzzer can triggerd along LED when Optical sensors interrutted.The frequency of sound depends on certain factor like duty cycle, timer clock base and timer value.