Barcode Reader

EP 315

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Guidance

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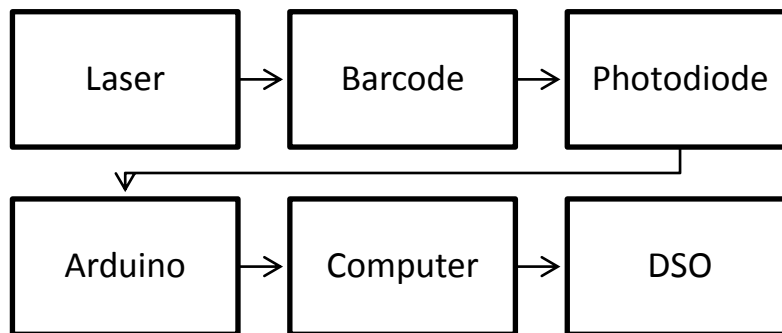
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Schematic Diagram

Concept

A barcode reader consists of a scanner, a decoder and a cable used to connect the reader with a computer. A barcode reader captures and translates the barcode into numbers and/or letters. A barcode reader works by directing a beam of light across the bar code and measuring the amount of light that is reflected back. The dark bars on a barcode reflect less light than the white spaces between them. The photodiode converts the light energy into electrical energy, which is then converted into data by the computer

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┌─────────┐   ┌─────────┐   ┌───────────┐
│  Laser  │──>│ Barcode │──>│ Photodiode│
└─────────┘   └─────────┘   └───────────┘
     ┌──────────────────────────┘
     v
┌─────────┐   ┌─────────┐   ┌───────────┐
│ Arduino │──>│Computer │──>│    DSO    │
└─────────┘   └─────────┘   └───────────┘
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Hardware

1. Scanner: it consists of two parts. When the laser is shined on the bar code the white region reflects more than the black regions.

    a. Laser: The laser is connected to the stepper motor so that it can sweep across the barcode. The reflected light will fall on the glass plate.

    b. Glass plate: the glass plate is silver foiled, with a slit on one side to allow for the laser light falling on it and a small pinhole for the photodiode. Due to internal reflection the light from the slit will exit from the pinhole.

    c. Photodiode: it will convert the intensity of light that it receives into its corresponding voltage

2. Arduino Board: it reads the corresponding analogue signal and converts it into a digital output. This will be sent to the DSO and given out as a binary signal.

Software

1.Arduino Program:

Arduino program is used to control the motor, laser and receiving and transmitting the signal to the computer. The barcode consists of dark and white vertical strips. All the strips have the width which is the integral multiple of the predefined minimum width (unit width).

One part of the program controls the step size of the of the stepper motor, which is connected to the laser. The other one reads the analogue signal from the photodiode and gives the corresponding digital output.

Work Done by Team Members

1.Smarak : Stepper motor connections and code.

2. Parul Purwar : Setting of laser, photo diode, glass piece and code.

3. Ajinkya Suryawanshi: Circuit of photodiode

4. Shivram Motukari :Barcodes.