

Laser Distance Meter

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Abstract: A TOF laser extend discoverer comprises of a laser transmitter, maybe a couple collectors and timing discriminators, and a period estimating unit. Keeping in mind the end goal to enhance single-shot accuracy the huge number rate of the estimation heartbeat ought to be expanded, so the optical beat of the laser transmitter ought to be smaller and all the more effective and the transfer speed of the collector ought to be higher without expanding. The optical distance meters are regularly called LADARs or LIDARs (LADAR = laser identification and going and LIDAR = light recognition and going) or with the term laser run discoverer. The term laser radar incorporates both laser go discoverers and the gadgets estimating the retention or diffusing of light of the air. In this proposition the term laser go discoverer is utilized for laser remove meters. The optical separation estimation techniques can be isolated from numerous points of view, one of them being the characterization to aloof and dynamic strategies. The passive methods do not need their own light source, but they use the ambient light for gathering the distance information from the target. This information fetches into DATABASE and we can get it from desktop App anytime.

Keywords: Controller, LASER, Time of flight, LCD.

I. INTRODUCTION

A laser distance meter is a rangefinder which utilizes a laser shaft to decide the distance to a object. The most widely recognized type of laser rangefinder works on the time of flight rule by sending a laser beat in a limited shaft towards the object and estimating the time taken by the beat to be reflected off the objective and came back to the sender. Because of the fast of light, this system isn't fitting for high accuracy sub-millimetre estimation where triangulation and different strategies are frequently utilized. A portion of the laser light may reflect off leaves or branches which are nearer than the protest, giving an early return and a perusing which is too low, caused by temperature slopes noticeable all around in vicinity to the warmed surface twisting the laser light. Every one of these impacts must be considered. Time of flight-this measures the time taken for a light pulse to movement to the objective and back. With the speed of light known, and an exact estimation of the time taken, the distance can be computed. Numerous pulses are terminated consecutively and the normal reaction is most usually utilized. This strategy requires exceptionally precise sub-nanosecond timing circuitry. Multiple recurrence stage move this measures the stage move of numerous frequencies on reflection at that point understands some concurrent conditions to give a last measure.

II. PROPOSED SYSTEM

The laser pulse time-of-flight TOF! distance measuring technique was originally used in military and surveying applications. It refers to the time it takes for a pulse of energy to travel from its transmitter to an observed object and then back to the receiver (td). If light is used as energy source, the relevant parameter involved in range counting is the speed of light roughly. A TOF system measures the round trip time between a light pulse emission and the return of the pulse echo resulting from its reflectance off an object. Using elementary physics, distance is determined by multiplying the velocity of light by the time light takes to travel the distance. In this case, the measured time is representative of must, therefore, being reduced by half to give the actual range to the target.

Since a solitary pulse is sufficient for the unequivocal assurance of distance with centimeter exactness and precision depends just feebly on remove, this strategy is especially suitable, for instance, in applications including distances longer than 1 m, applications where reflectors are not utilized and quick estimation applications, for example, checking. Also, averaging empowers millimeter or even sub millimeter exactness to be accomplished. The upside of the TOF framework emerges from the immediate idea of its detecting as both the transmitted and returned signals take after basically the same direct way to a protest and back to the beneficiary. Some new applications, for example, sensors in mechanical technology, self-ruling vehicles and meet and docking, alongside against crash and nearness sensors and sensors utilized as a part of ensuring a region before a machine request confinements on instrument size, mass and power utilization. To accomplish these objectives, the fundamental building pieces of a TOF extend discoverer must be acknowledged as elite incorporated circuits.

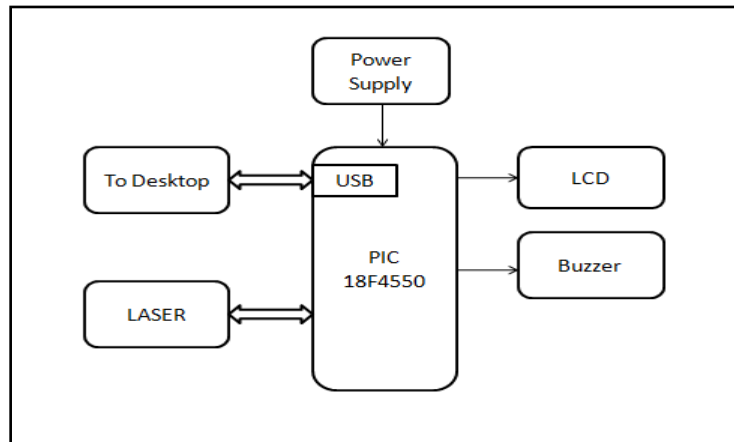


Figure 1: Block diagram of proposed system

1. MICROCONTROLLER

PIC18F4550 is a 8-bit microcontroller of PIC18 family. PIC18F family depends on 16-bit instruction set design. PIC18F4550 comprises of 32 KB flash memory, 2 KB SRAM and 256 Bytes EEPROM.

This is a 40 pin PIC Microcontroller comprising of 5 I/O ports (PORTA, PORTB, PORTC, PORTD and PORTE). PORTB and PORTD have 8 pins to get/transmit 8-bit I/O information. The rest of the ports have diverse quantities of pins for I/O information correspondences.

PIC18F4550 can take a shot at various interior and outside clock sources. It can deal with a shifted scope of recurrence from 31 KHz to 48MHz. PIC18F4550 has four in-fabricated clocks. There are different inbuilt peripherals like ADC, comparators and so forth in this controller.

PIC18F4550 is a progressed microcontroller which is outfitted with improved correspondence conventions like EUSART, SPI, I2C, USB and so forth.

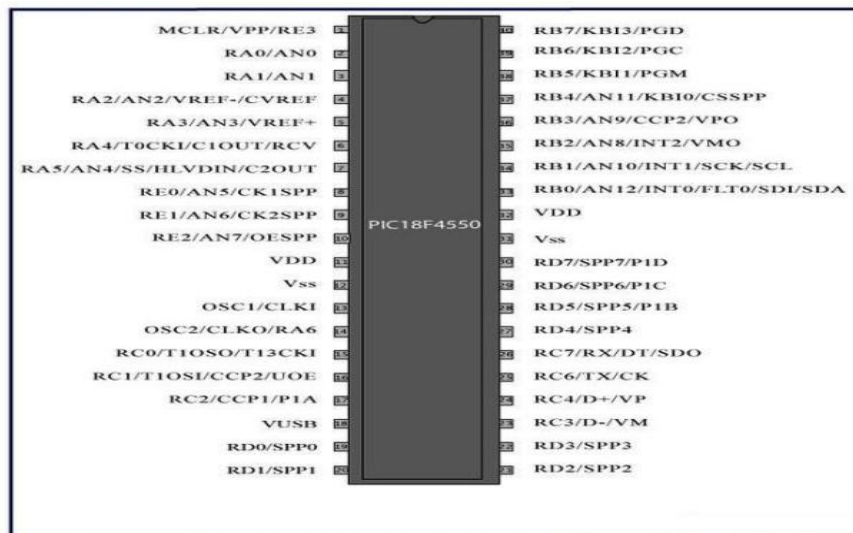


Figure 2: PIC18f4550

2. LCD

LCD A liquid-crystal display (LCD) is a level board show or other electronic visual show that uses the light-balancing properties of liquid-crystals. Liquid-crystals don't produce light straightforwardly. A 16x2 LCD implies it can show 16 characters for each line and there are 2 such lines. In this LCD each character is shown in 5x7 pixel network. This LCD has two registers, to be specific, Command and Data. An order is a direction given to LCD to complete a predefined undertaking like introducing it, clearing its screen, setting the cursor position, controlling showcase and so forth. The information enroll stores the information to be shown on the LCD. The information is the ASCII estimation of the character to be shown on the LCD.

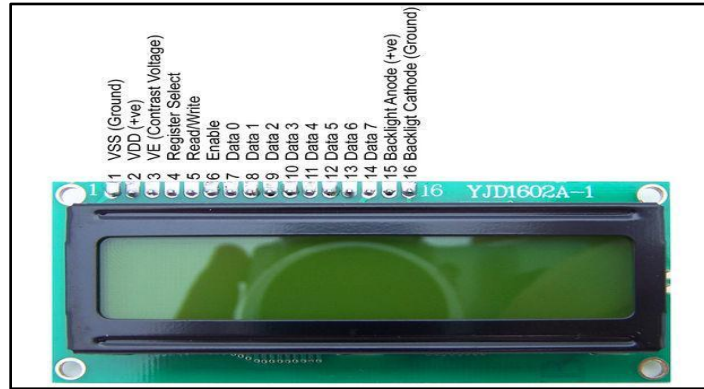


Figure 3: LCD

3. TF MINI MICRO LIDAR DISTANCE SENSOR

The TF Mini LiDAR Laser Range Finder sensor has its unique optical, structural, and electronic designs, the product possesses 3 major advantages, low cost, tiny volume and low power consumption. The built-in algorithm adapted to indoor and outdoor environments can guarantee an excellent ranging performance at a low cost and in a tiny volume, which highly expands the application fields and scenarios of LiDAR and lays a solid foundation for future “eyes” in the smart era.



Figure 4: LIDR Sensor

- Measurement range : 12 m.
- Operating Voltage : 5V.
- Power : 0.12w.
- Weight : 6 gm.
- Precision : cm.
- Frequency : 100Hz

III. SYSTEM IMPLEMENTATION

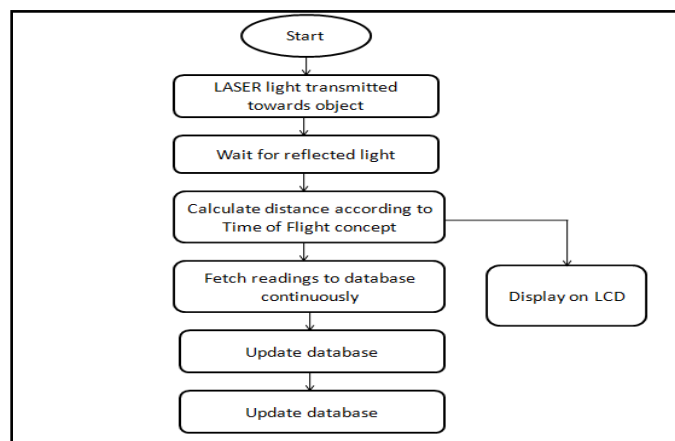


Figure 5: Flowchart of Implemented System

IV. ADVANTAGES

- Time saving
- Accuracy
- Ability to obtain difficult measurement

V. APPLICATIONS

- Military
- 3D Modelling.
- Sports
- Industry Production Process

VI. CONCLUSION

This implementation of laser extends discovering procedures holds out the guarantee of an energizing future for customary and new mechanical applications. The idea of this system in view of the Time of Flight idea. This can give legitimate separation amongst source and goal. Consequently it completed with the sensor discovering which is valuable for the transmitting and accepting activity. The ability to detect the distance to an object has emerged as an increasingly important feature for a growing number of applications. For many of these applications, reduced design footprint, cost, and power consumption outweigh the need to achieve very fine resolution and/or short-range distance measurement. For these applications, engineers can find integrated ToF devices able to meet specific combinations of requirements. While the TF Mini LiDAR Laser Range Finder sensor simplifies ToF designs based on specialized transmitter and receiver stages and it can detect approximately 10 to 12m distance.

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