LiDAR

Light Detection And Ranging

Independent Project-Part-II :

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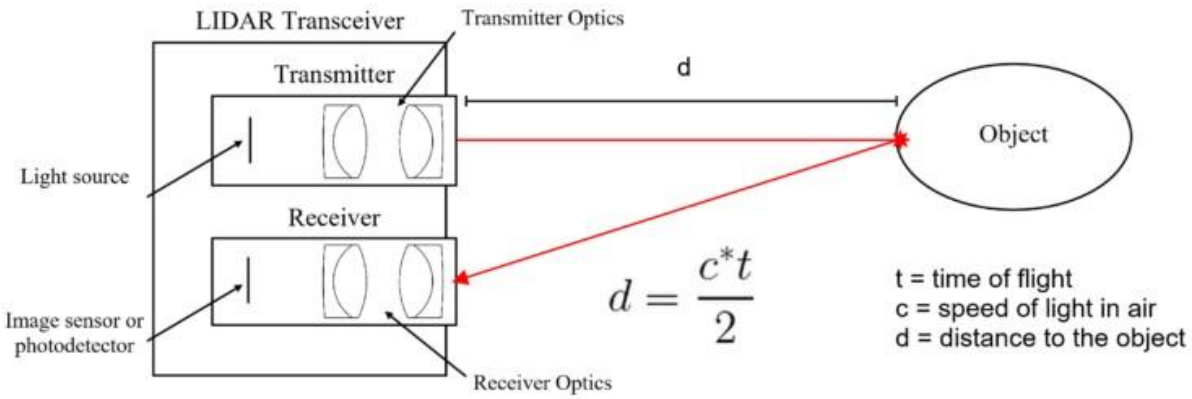
Overview

LiDAR is an active remote sensing technique that is similar to RADAR but, instead of using radio waves as a radiation source, it uses laser pulses. In this technique, a laser source emits pulses that are directed towards the target of interest, such as a terrain landscape. The pulses encounter the terrain and a portion of the laser energy is reflected back to a sensor located near the source. By measuring the round-trip travel time of the emitted laser pulses, the LiDAR system can determine the distance between the sensor and the mapped terrain. LiDAR directly measures the height and density of vegetation on the ground making it an ideal tool for scientists studying vegetation over large areas.

Specifications

LiDAR follows a simple principle — throw laser light at an object on the earth's surface and calculate the time it takes to return to the LiDAR source. Given the speed at which the light travels (approximately 186,000 miles per second), the process of measuring the exact distance through LiDAR appears to be incredibly fast. However, it's very technical.



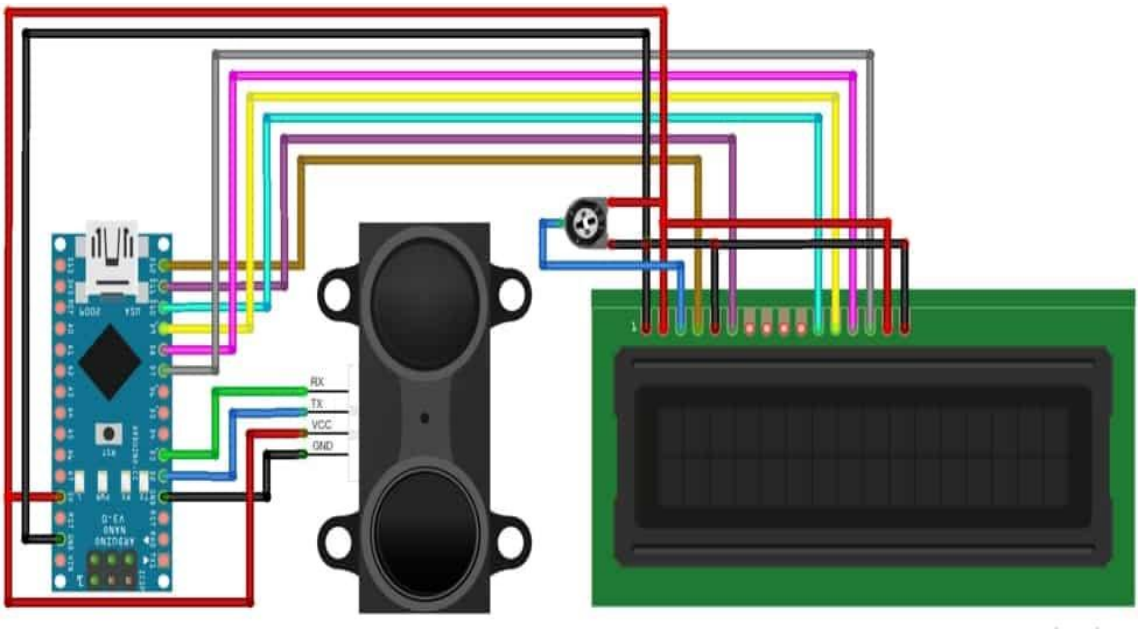
The formula that analysts use to arrive at the precise distance of the object is as follows :

Distance = (Speed of Light x Time of Flight) / 2

Uses :

1. Assisted landing. (Flights)
2. Terrain following. (Drone geographical measurements)
3. Vehicle position sensing. (Parkings, Auto-Pilots)
4. High-precision & High-speed measurement. (Cameras)
5. Obstacles avoidance system. (Automated Robots)

PIN DIAGRAM OF LIDAR CONNECTIONS



Result