An Overview of Laser Ranging

Laser ranging simply refers to a method of distance measurement with the help of laser technology. Laser ranging technology doubtlessly brings about great revolution in laser product, and laser rangefinder stands out in the field of laser distance measurement. Unlike traditional method of distance measurement that waste both labor force and time, laser rangefinder has the advantage of far, fast and accurate detection. Furthermore, with the constant rise of new industries and the rapid development of existing industries, laser rangefinder has been adapting it self into various applications, which include outdoor activities like golf, hunting, shooting, and scientific surveys such as mapping in forestry and geology.


Above all, this article aims at illustrating the working principle/ method of laser ranging in a concise but professional way according to knowledge of technical engineers in Eyoung Tech.

What is the working principle of laser ranging?

Laser range finder is composed of complex circuit and optical system. Whatever complicated it is, the two major components are respectively the laser transmitter, and

the laser photodetector. When the device is powered on, the transmitter, under the driving of control and information processing circuits, it emits pulsed laser which runs through the optical lens to the target being detected.
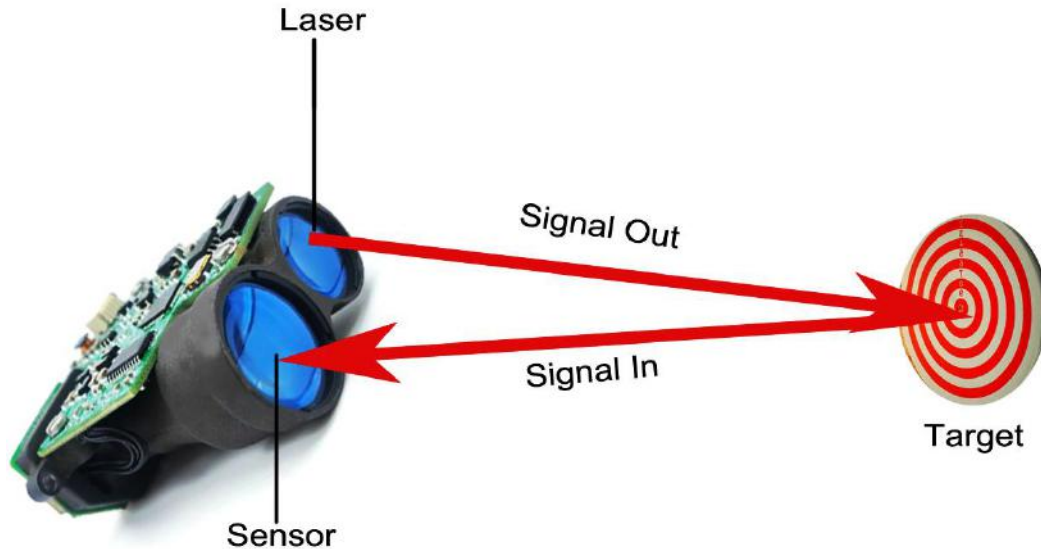
The laser reflected by the measured target passes through the receiving antenna of the optical system and converges to the photodetector, where it is converted into an electrical signal. The control and information processing circuit processes the transmitted laser pulse signal and the echo laser pulse signal to obtain the distance information of the measured target, which is transmitted to the host computer through the communication interface to complete the laser ranging.

The formula of the ultimate distance value is as follow:

$$L = c \cdot t / 2$$

"L" is the distance to be measured and "c" is the velocity of laser propagation in the air. "t" is the round-trip time of the laser over the distance to be measured. In this formula, "c" is taken as a known quantity and "t" as to be measured.