acphotonics

Case Study:

LiDAR SUB SYSTEM DESIGN

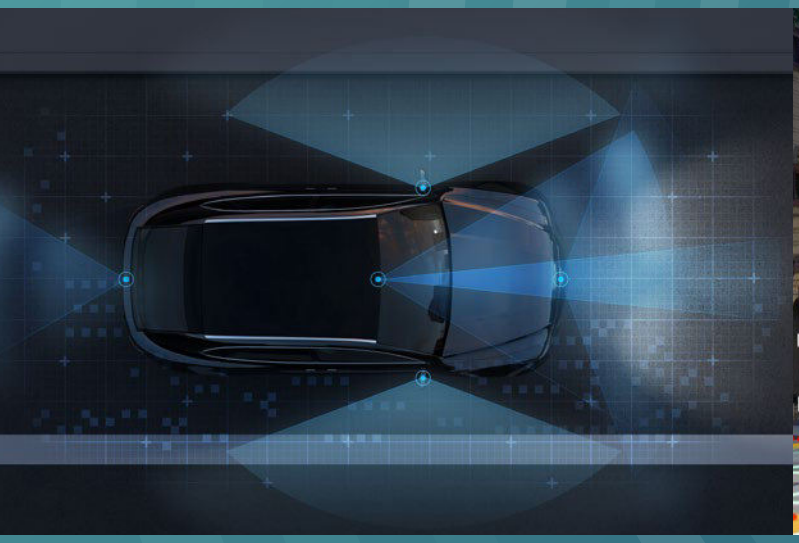
acphotonics.com

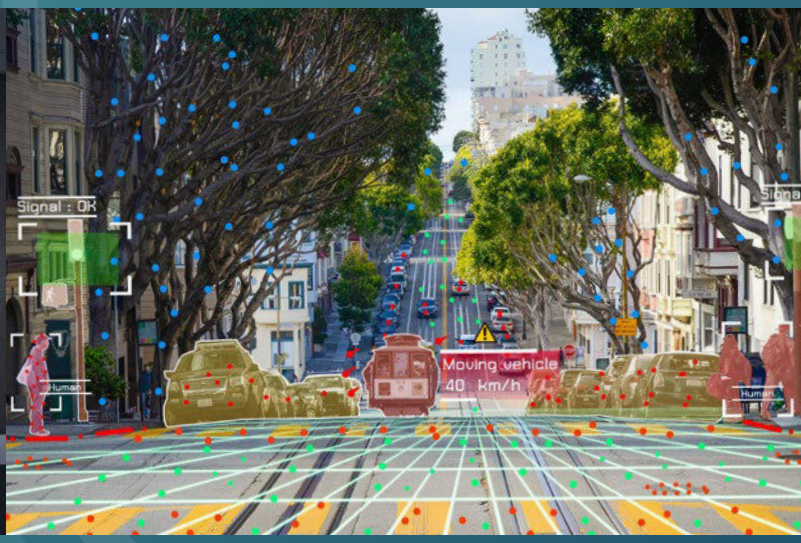
Introduction

Technology is transforming the automobile industry in ways never seen since Henry Ford created the first moving production line. The entire industry is abuzz with technology to enable cleaner, safer, more comfortable, and more connected experiences while travelling.

At the forefront of this technological shift and one of the most talked about subjects in automotive today is Light Detection and Ranging—more commonly referred to as LiDAR. LiDAR was developed shortly after the laser was discovered to make accurate distance estimates for military targets. For its first four decades, it was essentially used for a single point in space. It's only when microprocessors grew exponentially, became more capable, and significantly cheaper that LiDAR for 3-dimensional real-time mapping became viable.

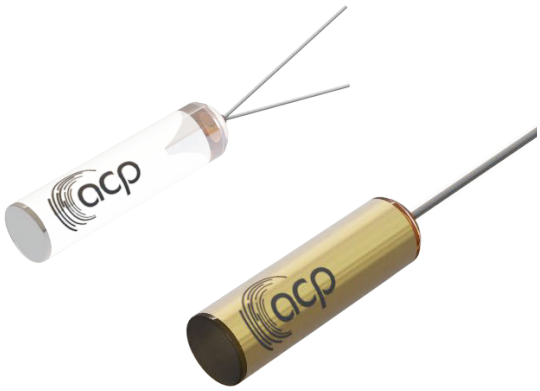
Today, experimental vehicles equipped with LiDAR emit millions of laser pulses per minute in a 360 degree pattern around the vehicle. They then reconstitute the reflected laser light pulses from objects around the vehicle and reconstruct the massive amounts of data to form a 3-dimensional image of the surroundings. If that is not mind twisting already, this process is repeated multiple times per second, nonstop in real-time while the vehicle is running.





Where does AC fit into this

For this technology to be possible, the laser beam has to be powerful and well collimated (basically, a sharp well defined and straight laser beam). Without this, the reflected light will not be detected and objects will be missed or mischaracterized — either of these negative outcomes would result in accidents and injuries, or potentially loss of life.



As a leading designer and manufacturer of optical components, acp produces some of the world's highest performing collimators. These devices contain the required technology that enables a well-defined laser beam to accurately and almost instantaneously reach objects more than 300 meters away (900 feet). Furthermore, since most items are naturally not highly reflective, the laser beam has to be high power such that even a small percentage of the light that is reflected can be detected at the sensor. Here again acp plays a major role in enabling this technology adoption as laser beams need to be amplified before entering the LIDAR and acp is also a global supplier of high performance optical amplifiers as well as singular components used to build amplifiers.

The outcome

Acp is creating custom solutions throughout the autonomous vehicle and LiDAR spaces by offering a varied range of both standard and custom solutions for some of the industry's biggest and most advanced companies. It is our flexibility through owning the entire product value-chain that give us advantages in partnering with our clients so this advanced technology can be deployed safely and thus ensuring that we play a critical role in vehicular safety.

Contact our team to have your challenge solved today:

Every acp solution is backed by 25 years of unparalleled success in providing photonic solutions for global OEMs coupled with our uncompromising pursuit of excellence.

Call us at: (408) 986-9838
Fax: (408) 986-0188
Email: sales@acphotonics.com

Follow us online