

Open-Path/Free Space Optical Communication System Using Reflected or Back Scattered Light

Researchers at the University of South Florida have developed a free space optical (UV, visible, IR) communication system that is ideal for indoor and outdoor communication between two or more locations that can not “see” each other directly due to line-of-sight interfering objects.

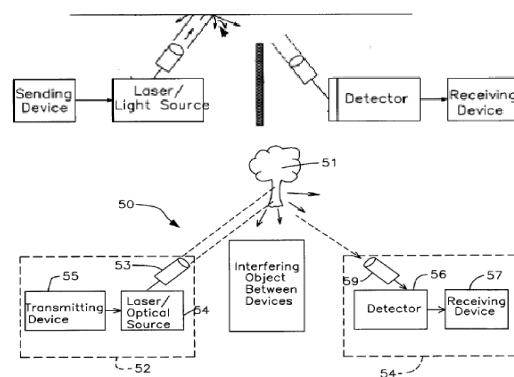
Open-path, or free space optics, is a line-of-sight technology that enables optical transmission of data, voice, and video communications through the air, thereby providing optical connectivity without the need for expensive fiber-optic cable. Free-Space optical systems can operate over a distance of several kilometers, provided the transmitting laser and the receiver are in a direct line-of-sight relationship. However, in many instances a clear line of sight between the source and destination does not exist. This is often attributed to physical objects positioned in the line-of-sight path, that easily block communication.

The system detects backscattered light reflected from surrounding walls or ceilings in a room, or for outdoor applications, light backscattered from trees, buildings, clouds, or the air itself. In addition, specific target areas can be selected by using a telescope to enhance communication security for outdoor applications, or for indoor applications the use of a wide solid angle field-of-view transmitter and receiver greatly reduces the need for optical alignment of the system.

ADVANTAGES:

- Eliminates direct line-of-sight optical communication blockages due to large objects
- Uses open path/free space optical beams reflected from walls, trees, or clouds

Improved Free-Space Optical Communication System



The above illustrations embody the novel laser communication system