

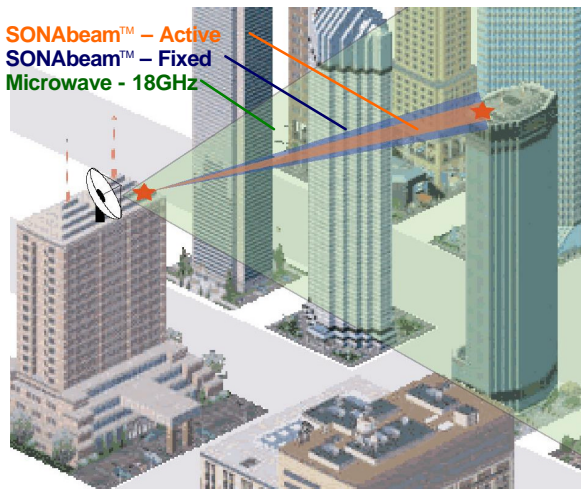
Application Brief - Security



Have you been wondering who might be listening in on your communications? The vulnerabilities of RF systems have led many people to wrongly conclude that all wireless transmissions are highly vulnerable to interception. What can you do to protect your data while still enjoying the benefits of high-speed wireless connectivity?

Your answer for exceptional wireless transmission security is SONAbeam™ Free-Space Optical communications.

SONAbeam™ Free-Space Optics (FSO) are among the most secure of all wide-area connectivity solutions due to their inherent low probability of intercept (LPI) and anti-jam (AJ) characteristics. Eavesdropping and physical intercept are extraordinarily difficult and the chance of an attempted intercept being discovered is very high. For these reasons, government and military organizations that value security have deployed free space laser communication systems for voice, video and broadband data communications.



Traditional Wireless Security

Many RF systems, like cellular phones, police radios, and wireless LANs intentionally radiate signals in all directions making the signal accessible to anyone with a receiver. Instead of radiating in all directions, Point-to-point (PTP) microwave systems transmit a highly-directional, cone-shaped beam that minimizes off-axis radiation thereby reducing the potential for security breaches. However, the divergent transmit beam is still vulnerable to intercept and jamming within a fairly wide footprint - from the entire side of a building to an entire city block.

PTP microwave systems also have sidelobes and a backlobe radiating off-axis energy that are vulnerable to intercept. In addition, reflected energy from buildings within or near the fresnel zone can be exploited. As a result, an unauthorized receiver can be located well off-axis to the main beam and be quite discreet.

SONAbeam™ Free Space Optics – Secure Wireless Communications

SONAbeam™ FSO systems are extremely secure due to their very narrow beamwidth and lack of off-axis sidelobe emissions. There are a number of challenges that must be overcome by any potential eavesdroppers that make intercepting a SONAbeam™ FSO link not feasible in the conventional sense.

» Physical Challenge

In order to intercept an FSO link, an adversary needs to intercept a portion of the transmitted beam - without exposing himself and his equipment. This optical intercept equipment must be placed in the very narrow beam and pointed at the originating transceiver. Because the transceivers are normally installed high above street level such efforts are extraordinarily difficult and the chance of discovery very high. Even detecting the presence of a SONAbeam™ link is a daunting challenge; The 1550 nm wavelength of the SONAbeam™ is undetectable to conventional optical instruments, video cameras or night vision goggles.

» Signal Challenge

The second challenge that must be overcome is how to intercept the laser beam without altering the signal reception. Although it is possible to intercept the beam without bringing down the link, any attempt would be discerned as an anomalous power loss at the receiver, which could be used to send an alarm to the user via SONAbeam™ NMS management software.

» Overshoot Challenge

Theoretically, an intercept could occur by placing an intercept receiver directly behind the receiver to intercept the energy that overshoots. This approach is easily foiled by placing the equipment indoors, behind a window, or by placing a wall behind the SONAbeam™. Overshoot intercept is further thwarted by the SONAbeam adaptive laser power control feature.

Conclusion

In conclusion, while there is no wireless communication system that can guarantee transmission security, the SONAbeam™ laser transmission equipment operating at 1550 nm offers an excellent wireless transmission solution for the highest possible level of physical layer security.

For further information, please contact your fSONA sales representative.

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