Application Brief – SONAbeam™ with RF Diversity

Do you need high-bandwidth wireless communications? Do your applications require "Five 9's" availability, regardless of weather conditions? Are your links mission-critical, where you can't afford even a minute of downtime?

Introducing SONAbeam™ with RF Diversity

fSONA Communications offers a full line of Free Space Optic (FSO) transceivers that provide high-speed connectivity up to Gigabit Ethernet speeds over distances from 75m to 5km. Our patented, award-winning SONAbeam™ technology provides the greatest system power and highest link margins in the industry; however, in some applications even that isn't enough. In these instances "Five 9's" availability is achieved by combining the SONAbeam™ with an alternate path RF solution; the SONAbeam™ provides high-bandwidth connectivity the majority of the time, while the RF path maintains critical network connectivity during extreme weather events that are detrimental to the FSO link, such as thick fog.

Before SONAbeam™

Until now, unlicensed wireless technologies have proven to be unable to deliver the required combination of high-bandwidth, low cost and high availability, at link distances beyond 1km. Unlicensed RF technologies in the 2.4 to 5.8 GHz bands offer limited throughput and suffer from ever increasing levels of interference due to frequency saturation; the 60GHz band, although it provides higher bandwidth, suffers from a problem with oxygen absorption and rain fade, prohibiting reliable deployments beyond 400-800 meters, depending on the rain region.

Early Free Space Optic solutions promised a high-bandwidth alternative, but suffered from attenuation issues in rain, fog and snow due largely to their low power transmitters. Several of these systems have evolved into hybrid systems combining FSO with RF, but such systems are high priced and are still constrained by the low power of the laser component. The problem with this solution is that it requires the lower bandwidth RF path to be active more often and for longer periods of time. With 2.4GHz hybrid systems, throughput falls by an order of magnitude when the system reverts to RF backup. Although 5.x Ghz solutions offer higher bandwidths and have less interference, as more wireless networks and cordless phones are deployed at 5.x Ghz these systems will experience increased interference. 60 GHz hybrid systems, which are available as unlicensed technology in the United States, have better characteristics in fog; however, since neither low-power laser equipment nor 60 GHz RF equipment has sufficient power to drive through heavy rain, range is limited to a few hundred meters in many locations for these solutions.

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The SONAbeam™ Solution

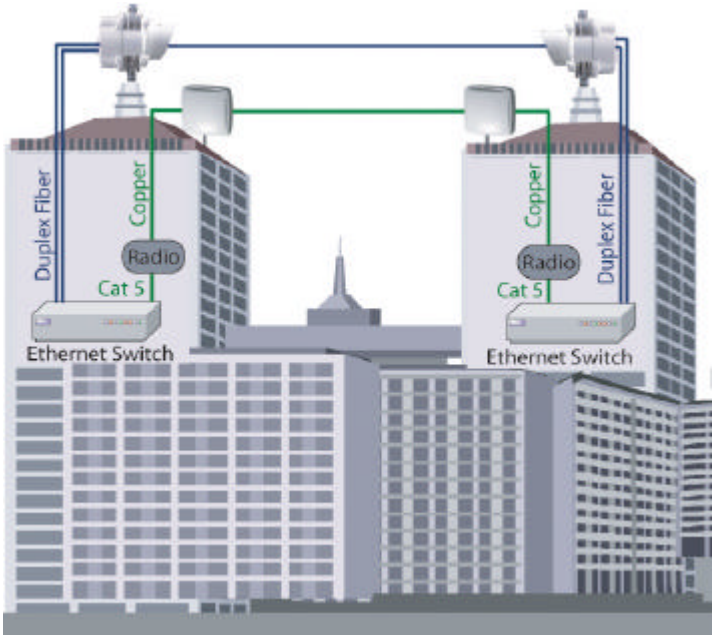
In 2001, fSONA Communications established the new benchmark for Free Space Optic systems with the introduction of SONAbeam™ technology. The SONAbeam's superior transceiver is a combination of advanced receiver technology and high-powered 1550 nm lasers coupled with custom laser drivers, delivering ***20 to 30x more laser power than any competing system***. This higher transmission power translates into longer link distances and significantly greater availability during times of inclement weather, when the signal experiences greater attenuation.

Integrating SONAbeam™ with RF Redundancy for "Five 9's" Availability

Even longer link distances can be achieved by combining SONAbeam™ transceivers with off-the-shelf RF solutions. The SONAbeam's superior transceiver technology coupled with unlicensed 802.11x radio solutions delivers 5*9's availability at distances of up to 5km. RF solutions designed for use in an Ethernet environment are commercially available, offer rated throughput of up to 100 Mbps, and can reliably backup the SONAbeam™ at speeds up to Gigabit Ethernet.

Network Design

A redundant Ethernet bridge can be set up by establishing a parallel path between routers on the local and far end of a link. Redundant link management technologies such as EIGRP/HSRP, BGP, OSPF or Fast Convergence Spanning Tree (or even load balancing) are readily available in most of today's commercial switches and routers. Should the FSO link go down due to a severe fog or snow event, the network sees the link failure and automatically redirects traffic over the radio path. Once the environmental disturbance passes, the router shifts the traffic back to the high capacity FSO link.



Contact your local fSONA representative for a list of industry partners, as well as more details on how you can take advantage of the SONAbeam™ network transport solution.

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