

Making the Public Safer... With Motorola Point-to-Point Broadband Wireless Solutions

When it comes to public safety, fast and super-reliable connectivity is an absolute necessity.



Customers

In emergency situations, military and security officers, first-responders, firefighters and police all need high-bandwidth, ultra-reliable connectivity as they communicate with each other, government officials, hospitals and more.

In preparing for such situations, local, state and federal government departments and agencies, along with local and national law enforcement entities, have a host of emergency management and Homeland Security initiatives that require expanded, super-reliable emergency response systems.

When it comes to public safety, everyone becomes a "customer" seeking the one absolute necessity: fast, reliable communications.

Situations and Challenges

In any given area, the challenge to provide such communications varies. Voice, video and data transmissions may have to travel through crowded metropolitan areas, between remote locations, over long distances, in adverse weather conditions, even across large expanses of water.

Broadband wireless can tackle even the most challenging environments. Motorola's OS-Gemini and OS-Spectra (formerly Orthogon Systems OS-Gemini and OS-Spectra) point-to-point wireless Ethernet bridges, have delivered carrier-class broadband wireless communications in the most urgent situations around the world, providing Voice-over-IP, on-scene streaming video, Internet and database access, large-file transfers such

as maps, blueprints, medical files and missing-person images, as well as backhaul for wireless networks and temporary fixed point-to-point links.

In the US, where the 4.9 GHz band has been allocated by the Federal Communications Commission as the public safety spectrum, Motorola radios have enabled broadband capabilities in a wide variety of applications. For example, with a Motorola OS-Gemini 4.9 GHz radio connected to a short-range LAN, first-responders can monitor life-critical functions – pulse, heartbeat, blood pressure, oxygen level. Within communities, OS-Gemini systems can help develop hotspots – and connect them within a wider area network – for video surveillance and other remote safety management activities.

Regardless of the application, Motorola point-to-point wireless solutions meet the stringent requirements of public safety:

- Up to 99.999% availability – even in non-line-of-sight and long-distance line-of-sight environments, over water and in high-interference areas
- High data throughput – up to 35 Mbps for high-bandwidth voice and data traffic
- Security – proprietary over-air interface and optional FIPS-197-compliant AES encryption
- Quality of Service – VLAN tagging of high-priority traffic, self-selecting clear channel with intelligent Dynamic Frequency Selection
- Rapid deployment – with easy audio alignment and software-defined remote management

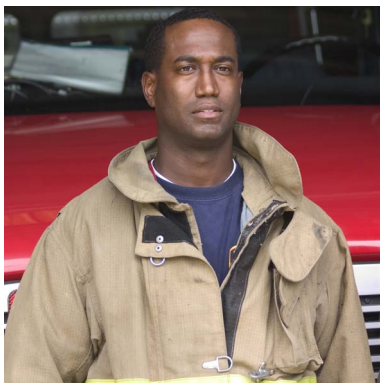
The examples provided here are real-life cases where deployment of Motorola OS-Gemini and OS-Spectra radios has solved difficult public safety issues.



With Motorola's acquisition of Orthogon Systems, Orthogon's products have been renamed and integrated into the **MOTOwi4™** product line:

Old Name	New Name
OS-Gemini	Point-to-Point Bridge - 400 Series
OS-Spectra	Point-to-Point Bridge - 600 Series

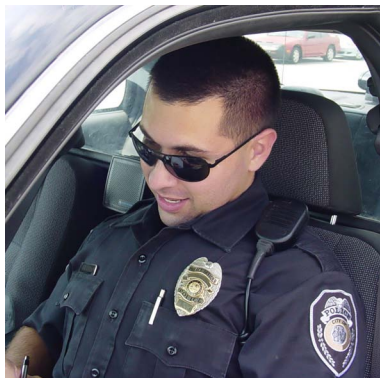
Motorola's **MOTOwi4** portfolio of innovative wireless broadband solutions create, complement and complete IP networks. Delivering IP coverage to virtually all spaces, the **MOTOwi4** portfolio includes Fixed Broadband, WiMAX, Mesh, and Broadband over Powerline solutions for private and public networks.



Deployments

The Motorola OS-Gemini and OS-Spectra links have been deployed throughout the world, establishing emergency networks and providing adjuncts to existing networks to meet a vast array of public safety needs. The examples sketched here are real-life cases where implementation of the Motorola OS-Gemini and OS-Spectra radios has solved difficult public safety issues. For further details on these case studies and others, visit www.orthogonsystems.com.

In less than three hours, the service provider, ROOTS Communications, had installed an OS-Gemini system with integrated antennas. It was the first time the solution provider had been able to achieve the reliability and bandwidth needed to backhaul T1 traffic in an NLoS environment. The OS-Gemini's on-board software made deployment quick and easy, and not having to install additional antennas saved time and money. The fast, effective Guomai installation demonstrates OS-Gemini's usefulness in emergency situations to establish high-bandwidth, reliable connectivity in a matter of hours rather than days or weeks.



High Bandwidth for Central Scotland Fire and Rescue Services

In this high-risk fire area, Central Scotland Fire and Rescue Services responds to 10,000 emergency calls per year. Seven OS-Gemini integrated links, placed from a few meters apart to more than 21 km (13 miles), provide a network that operates reliably in a high-interference wireless environment with plenty of bandwidth for VoIP emergency calls and administrative data. Offering the required redundancy, the robust network is easy-to-manage and cost-effective, eliminating the need for leased lines.

Emergency Services and More for Remote Resort Area

Genesis Wireless installed an OS-Gemini link between its Point-of-Presence in Mora, Minnesota, to the remote Mille Lacs town and resort area, carrying voice and data communications over 20 miles (32 km) across a fully obstructed fresnel zone and partially obstructed path with dense tree growth as high as 80 feet (24.4 meters). The link delivers a carrier-class, highly secure broadband wireless connection at an affordable cost, running at an average of 28 Mbps to backhaul traffic to its POP – a link that was impossible to achieve with other broadband wireless platforms. In addition to transporting business services to the area, the OS-Gemini system ensures reliable communications for emergency response teams,

Fast NLoS Deployment for Guomai Communications in China

Guomai needed a solution in Shanghai that could backhaul multiple T1 connections from Xu Jing to Feng Xi, a distance of 4.8 miles (7.8 km), across an environment obstructed by tall buildings.

OS-Gemini streams high-resolution video from an undersea laboratory to a land-side office, crossing an ever-moving body of water.

hospital personnel and public safety organizations, including fire, police and rescue, in an area where such services were previously difficult to provide.

Scientific Research Under the Ocean for US Government Agency

The National Oceanic and Atmospheric Administration (NOAA), part of the US Department of Commerce, conducts research and gathers data about the oceans, atmosphere, space and sun, applying this knowledge to science and services that touch the lives of all Americans. Officially formed in 1970, NOAA consolidated several different organizations that were among the oldest US institutions, committed to “scientific accuracy and precision, stewardship of resources, and protection of life and property.” Its undersea laboratory, Aquarius, is located nine miles (14.5 km) offshore in the Florida Keys at a depth of 62 feet (nearly 19 meters). The OS-Gemini Integrated link streams high-resolution video from Aquarius to a land-side office in Key Largo, establishing a high-performance, high-availability solution from a moving buoy to a stationary endpoint, over water. In addition to research data, the system delivers real-time information about hurricanes, lightning strikes, projected storm paths and other weather-related threats that can affect the safety of citizens around the hemisphere.

Future Growth for a Small City in New York State

Poughkeepsie, New York (pop. 30,000), is an aging city set among hills and forests in upstate New York. When the municipal officials tested their new OS-Gemini system, connecting the Water Treatment Center, Department of Public Works and Fire Department with the main data center, they were immediately impressed by the speed and reliability of the data connections. They tested the links with high-demand VoIP calls, streaming video, video conferencing

and a 2-Gigabit download. The links passed all tests: QoS settings kept the voice as priority, handled the video without any frame loss and transferred files as if they were on the local LAN. For Poughkeepsie, that means a fast, reliable wireless backbone that carries instant information about dangers such as forest fires and potential flooding along the Hudson River, with the ability to capably handle future communications, including collaborative messaging and enhanced police video surveillance to protect city residents.

Reliable Network in a Harsh, Tropical Environment

Tropico Telephone & Internet (TTI), a broadband Internet and licensed Honduran telephone company based in the Caribbean seacoast town of La Ceiba, built a reliable network in an environment that is highly corrosive due to salt water, and subject to the strong winds of seasonal hurricanes and tropical storms. Using five OS-Spectra Lite and OS-Gemini point-to-point links spaced from 6 to 69 miles apart (10 to 111 km), TTI provides a minimum of 20 Mbps symmetric on each link, with the ability to increase speed over time. In addition, the radios offer robust, low-profile form factors and low jitter for VoIP call quality. To protect its citizens, Honduran officials rely on up-to-the-minute information about storms, tsunamis and other threats from the sea. The Motorola system stands up to environmental rigors and continually transmits data with carrier-class reliability.

Speedy Municipal Services for California City

The City of Torrance, California, is the municipal organization that governs all aspects of public safety and services within this city of 147,000, including transportation, fire, police and government. In Los Angeles County, known for both its camping areas with abundant wildlife, and its higher-than-average tornado activity, Torrance officials keep busy protecting the public

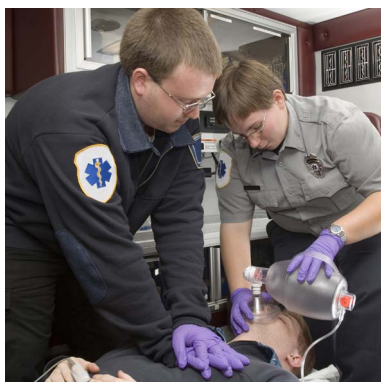


Motorola point-to-point broadband wireless solutions* present a strong business case – allowing an easy upgrade path, minimizing up-front costs and maximizing ROI.

from, and alerting it to, potential dangers. When leased-line T1 connectivity proved too costly and provided limited bandwidth, the city turned to broadband wireless for VoIP, e-mail and Internet access, as well as network access to two police sub-stations and two Animal Control facilities, one located in a remote park. The OS-Gemini radio offers a solution that even works around a courthouse obstructing the three-mile (4.8 km) path. Running at 33 Mbps, the OS-Gemini link is highly secure and expected to pay for itself in less than three years.

Critical Medical Services for Vacation Community

Crescent Bar Resort, a secluded vacation community in central Washington State, had no Internet access or cell phone service. Even more critical, when the closest medical facility, Quincy Valley Hospital, responded to emergencies at Crescent Bar, the paramedics couldn't communicate with hospital medical personnel unless they could find a land line along the route. The solution proved unique: Three solar-powered OS-Spectra links connect fiber optic VLANs – one located at the hospital – supporting VoIP and high-definition video, and delivering high throughput. Their rugged construction enables them to operate in exposed areas and maintain 99.999% availability. Via the wireless system, EMT personnel now use VoIP phones from ambulances enroute to the hospital, enabling them to transmit patient information to doctors and receive life-saving treatment directives instantly.



The Results

From paramedics to hospitals, from video cameras to police stations, the OS-Gemini and OS-Spectra solutions help strengthen the capabilities and effectiveness of public safety agencies. Frequently, the systems replace T1 leased lines, boosting throughput from 1.5 Mbps to previously unimaginable speeds which allow for fast transmission of extremely high-bandwidth applications such as medical imaging and streaming video, along with high-quality voice calls. In many cases, Motorola links provide service in environments where connectivity was previously not possible due to long distances, path obstructions or water challenges.

Complementing their carrier-class reliability and throughput speed, essential for delivering public service communications, Motorola point-to-point wireless solutions present a strong business rationale by:

- Allowing an easy upgrade path for bandwidth growth
- Minimizing the up-front investment
- Maximizing the return-on-investment



MOTOROLA

For more information about the Motorola Point-to-Point Solutions:

Outside of North America:

Sales: +44 1364 655500

Tech Support: +44 1364 655656

Sales and Tech Support in North America:

+1 877 515-0400

www.orthogonsystems.com

**formerly*

Orthogon Systems

OS-Gemini & OS-Spectra

MOTOROLA, the stylized M Logo and all other trademarks indicated as such herein are trademarks of Motorola, Inc. © Reg. US Pat & Tm. Office. All other product or service names are the property of their respective owners. © 2006 Motorola, Inc. All rights reserved.

MOTOROLA CASE STUDY: PUBLIC SAFETY US 2-Aug-06