CASE STUDY

COVERAGE SYSTEMS

Active DAS for Large Commercial Skyscraper

Powerwave and Leading Global Operator Deliver Enhanced Cellular Coverage

Challenge	To improve access to wireless signals within a 36-story office building with reception challenges for higher level floors.
Solution	An active indoor distributed antenna system (DAS) devised by Powerwave's Global Wireless Solutions team.
Result	Ubiquitous access to GSM900, DCS1800 and UMTS wireless services inside office tower.

Active Indoor Distributed Antenna System Supports GSM900, DCS1800 and UMTS Services at Large Commercial Tower

A leading global wireless network operator commissioned Powerwave Technologies to deliver enhanced cellular coverage for a large, 36-story office tower in Europe. Housing many leading international financial services, banking, legal and IT firms, the property is in the heart of a dense urban environment. Due to the height of the tower, a large number of cellular signals coming from macro sites were able to provide relatively high signal strength to the upper floors. However, due to multiple signals, unnecessary handovers were frequent while the lower levels lacked sufficient wireless coverage.

Wanting to provide its customers with improved access to wireless voice and data services inside the building, the wireless network operator—a division of one of the leading mobile telecommunications company in the world—approached Powerwave's Global Wireless Solutions team in late summer 2004 to design a multi-operator indoor coverage system. It needed to support up to eight GSM900 carriers, five DCS1800 carriers, and two UMTS carriers, and be capable of adding more carriers in the future.

Rising Above the Competition with a Dual-Cell Solution

Powerwave and the carrier faced one major challenge when it came to designing and implementing an indoor DAS at the site – the height of the building. Never before had the carrier dealt with the specific issues associated with outfitting such a tall building with wireless voice and data services.

After assessing the situation, a dual-cell site solution was implemented, dividing the building into two regions – one serving the underground floors and the first three floors, and the other serving the fourth through the 35th floors. The second region includes a handover zone where both cells are present near the central elevators on the second through the fifth floors. The dual-cell site ensures that access to wireless voice and data services throughout the building is secured without compromising capacity and performance of the outdoor cells surrounding the building.

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A Portrait of Flexibility and Scalability

Powerwave's indoor DAS converges multiple wireless services onto a single cost-effective, flexible and scalable wireless network platform. The indoor DAS is comprised of a designated number of base stations and Node Bs, co-located within a small space in the basement of the building. A repeater system is used to distribute signals from the base stations and Node B's throughout the building.

The repeater system consists of a Base station Master Unit (BMU); a fiber-optic distribution system; fiber-optic Wideband Radio Heads (WHR); and a passive antenna system connected to the WRHs. The WRH covers all required bands in a single unit making it the most efficient solution from both a coverage and cost perspective.

Each WRH is connected to an indoor antenna system with the antennas evenly distributed on every floor. Powerwave's design of the antenna system is key to ensuring that the signals distributed are of optimal levels for maximized coverage and capacity, while minimizing any unnecessary radiation.

Initial Savings with an Eye Toward the Future

The flexibility of Powerwave's indoor DAS systems gave the customer an opportunity to delay some of its initial hardware investment. Powerwave's hardware is easy to install and maintain, and offers smooth technology upgrades. As a result the coverage system installed supports the carrier's current technological and capacity requirements, while providing for future upgrades with minimal effort and expense.

Conclusion

In April 2006, Powerwave completed the commissioning of the indoor DAS.

"Powerwave's multi-technology platform is specifically designed to be a very reliable and cost-effective method of providing access to wireless communications services in an indoor environment. With the design and implementation phase of the indoor distributed antenna system now complete, commercial subscribers can experience seamless connectivity anytime, anywhere throughout the coverage areas," said Kristian Kotta, Project Manager and Systems Engineer, Global Wireless Solutions, Powerwave Technologies.

About Powerwave

Powerwave Technologies is a leading source for end-to-end wireless solutions for wireless communications networks. Powerwave designs, manufactures and markets antennas, boosters, combiners, filters, repeaters, multi-carrier RF power amplifiers, tower-mounted amplifiers and advanced coverage solutions, all for use in cellular, PCS and 3G networks throughout the world. Corporate headquarters are located at 1801 E. St. Andrew Place, Santa Ana, CA 92705. Telephone (714) 466-1000. For more information on advanced wireless coverage and capacity solutions, please call (888)-PWR-WAVE (797-9283) or visit our web site at www.powerwave.com. Powerwave, Powerwave Technologies and the Powerwave logo are registered trademarks of Powerwave Technologies, Inc.

Powerwave Wideband Coverage System (WCS) product line is a flexible platform for wireless enhancement of a base station signal remotely. This line of products can be connected via coax or fiber cable to provide capacity to underserved areas of the network. Applications for this versatile product are indoor distributed antenna systems (DAS) and outdoor coverage challenges. Future expansion and upgrading is made easy using a modular design. Same reliable, field proven technology as Powerwave's Repeater products, as well as the same O&M software for complete NetWay Manager (NWM) and OM-Online compatibility.

Key Benefits

- Ultimate flexibility
- Proven technology
- Fiber or Coaxial feed
- Ease of installation
- Output Power options
- Standard O&M platform

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