SpectraSite

SpectraSite Communications Leverages Opto 22 SNAP-IT™ Technology

For Comprehensive Remote Management of Wireless Site Assets

As one of the largest operators of wireless towers in the United States and an industry leader in providing multi-faceted wireless equipment sites, SpectraSite Communications, Inc. is also an innovator in managing remote real-world assets. Headquartered in Cary, North Carolina, SpectraSite owns or manages more than 15,000 sites, including more than 3,000 towers spread across the top 100 wireless markets in the United States. SpectraSite has also been a driving force in creating and managing leased wireless sites within existing buildings and facilities, such as major nationwide hotel chains. In addition to its leadership role in wireless sites and towers, SpectraSite's broadcast division owns or manages large AM/FM/TV transmitting towers in markets across the nation.

By partnering with Opto 22 for standards-based SNAP-IT monitoring and control solutions, SpectraSite has significantly improved cost-effective management of its widely dispersed and rapidly growing asset base and proactively expanded its ability to offer enhanced onsite services to its customers.

Consolidation Trends Toward Leased, Multi-service Towers

Over the past few years, the wireless industry has dramatically shifted from an environment in which carriers purchase and manage the towers that house their antennas and equipment, to a more cost-effective business model in which they lease tower space from third parties such as SpectraSite. With the average cell tower costing approximately $250,000 to build and a nationwide service footprint requiring 10,000 or more sites, most carriers have discovered that owning and managing such a large capital investment base is not the best use of their financial resources.

Besides greatly improving economic leverage for individual carriers, the transition to leasing is also benefiting the industry as a whole by opening up opportunities for multi-tenant sites in which several carriers can lease space for their antennas on the same tower. Such multi-user leasing arrangements not only offer the advantage of amortizing overall site costs among multiple carriers; they also allow for maximum geographic coverage while minimizing the negative environmental impact that would result if all carriers established separate tower sites.

By acquiring thousands of existing towers from carriers as well as aggressively building out new tower locations, SpectraSite has been able to quickly establish a solid national presence in the rapidly growing wireless site leasing market. In addition, SpectraSite has taken a leadership role in contracting for management of leased sites within buildings, such as hotels in metropolitan areas, where it is more cost effective to utilize existing space rather than to acquire high-cost sites and construct new towers.

The First Objective: Keeping the Tower Lights On

Initially, SpectraSite's most pressing need was for a reliable and cost-effective method to manage the aircraft warning lights that mark the top of every tower. Due to the inherent danger to aircraft, Federal Aviation Administration (FAA) regulations require lights on every tower over two hundred feet high and on all towers in proximity to an airport. The FAA further requires that all tower lights be monitored for continuous operation and that any outage be reported to the local FAA flight service center within 30 minutes. Strict adherence to these requirements is considered imperative, not just because of possible regulatory sanctions but also due to the potential for huge liabilities if an aircraft mishap were to result from non-compliance.

As the geographic reach and large numbers of towers continue to increase, it has quickly become impractical and cost prohibitive to rely on human means to monitor and report tower light outages. Previously, carriers often linked monitoring of tower lights into the same systems they used for managing their wireless equipment. As a third-party site manager, however, SpectraSite needed a robust and totally independent mechanism for remotely monitoring tower light conditions.

The Broader Goal: Evolving Comprehensive Remote Monitoring Systems

According to Brian Dietrich, SpectraSite's Chief Information Officer, "Although our most pressing goal was to reliably and cost-effectively monitor each tower's lights, we also quickly recognized the opportunity to leverage the same technology to monitor and manage a variety of other functions. For example, with multiple carriers maintaining equipment shelters on the same site, the ability to remotely monitor each tenant's access can be a very useful tool for ensuring site security."

Comprehensive remote monitoring and control mechanisms could also offer new possibilities for enhancing service to the wireless carriers using the site. For instance, carriers have routinely installed and maintained individual backup power generators as part of every equipment shelter. Now, with multiple tenants at the same tower location, SpectraSite could offer the added benefits of a single, remotely monitored, shared generator to meet all tenants' backup power requirements. Not only would such an arrangement save precious space at the site by eliminating redundant generators, it would also reduce overall costs for each tenant while adding an incremental revenue stream for SpectraSite.

While specific possibilities such as site access and backup power monitoring came immediately to mind, the SpectraSite team also soon realized that opportunities for enhancement would continue to evolve and present themselves. As a result, it was determined that remote monitoring was too important to outsource and that an internal system would need to be able to grow and evolve to address changing requirements. With the need to provide a stable and extensible environment for leases that typically run as long as 30 years each, SpectraSite sought to institute a monitoring and control system that would not incur the expense of forklift changeovers to meet future requirements.

Advantages of Using Opto 22 SNAP-IT Solutions

After evaluating the alternatives, SpectraSite selected Opto 22's SNAP-IT family of standards-based management solutions as the optimal fit for their immediate monitoring needs. SNAP-IT technology also offered the most scalable solution for handling future requirements.

Some of SpectraSite's critical specifications included:

- Flexibility to handle and process a large number of inputs for monitoring a wide range of real-world conditions
- Ability to locally aggregate a variety of data at the site and to trigger actions/alerts according to preset criteria
- Ease of programming to enable the device to operate independently at the remote site under a variety of conditions
- High degree of flexibility to accommodate a wide range of transport mechanisms for data transfer.

"Essentially, we needed a self-contained, remote solution that could adapt to a variety of local monitoring requirements while also giving us a wide range of options for back-hauling the data to our centralized locations," states Dietrich. "For instance, satellite communications are generally accessible from anywhere on the planet and charges for transporting data via satellite are typically on a per-byte-used basis, making it fairly economical for infrequent movements of small amounts of data, such as alerts regarding tower light outages. On the other hand, for newly evolving applications that must transport higher levels of recurring data, such as constantly updating access lists or automatically checking and starting generators, the cost of using satellite bandwidth can be prohibitive. The standards-based communications interfaces inherent to Opto 22's SNAP-IT devices enable us to easily adapt to our current and anticipated data transport and bandwidth requirements."

Centralized Analysis and Management of Remote Sites

At the same time that SpectraSite engineers were evaluating remote monitoring solutions, they were also developing a comprehensive centralized system for managing the full range of technical and business issues associated with remote sites. Because SpectraSite was already considering Computer Associates' Unicenter TNG® software to monitor business issues, Opto 22's pre-established relationship with CA to tightly integrate SNAP-IT with Unicenter TNG provided a solid basis to build a seamless system for managing the full spectrum of technical and business factors.

After initial pilot testing of tower lighting and remote access management applications, the decision was made to invest in a combination of SNAP-IT and Unicenter TNG solutions to manage all SpectraSite towers nationwide. Less than six weeks after that decision, the Network Operating Center and first SNAP-IT monitored tower were fully operational. By leveraging SNAP-IT's ease of installation and modularity, SpectraSite is currently on pace to have more than 1,000 towers successfully converted to the new system by Q2, 2001.

Future Directions and Opportunities

Building on their SNAP-IT and Unicenter TNG solution, SpectraSite can now offer a much wider range of options to their customers. With a growing variety of service providers requiring varying amounts of physical space and technical support, many wireless sites are moving to a co-location model that combines multiple customers' equipment within shared shelters. Similarly, in SpectraSite's Buildings Group, sites located within existing hotel or convention facilities often consist of shared rooms or even shared racks of equipment. For these situations, SpectraSite can readily leverage SNAP-IT's programmability and configurability to seamlessly monitor critical factors such as heating, air conditioning and ventilation; power; security; and even rack-level access, if required.

SpectraSite's standardization on SNAP-IT devices has laid a solid foundation of remote monitoring, management, and control solutions for SpectraSite and their customers. More importantly, as business requirements grow and change, the installed SNAP-IT technology can readily adapt to any new monitoring or communication requirements without requiring a wholesale hardware upgrade or removal of existing equipment.

About Opto 22

Opto 22 manufactures and develops hardware and software products for applications in industrial automation, remote monitoring, and enterprise data acquisition. Using standard, commercially available Internet, networking, and computer technologies, Opto 22's SNAP systems allow customers to monitor, control, and acquire data from all of the mechanical, electrical, or electronic assets that are key to their business operations. Opto 22's products and services support automation end users, OEMs, and information technology and operations personnel. Founded in 1974 and with over 85 million Opto 22-connected devices deployed worldwide, the company has an established reputation for quality and reliability. Opto 22 products are sold through a worldwide network of distributors, partners, and system integrators. For more information, contact Opto 22 headquarters at 800-321-OPTO or visit our Web site at www.opto22.com.

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