

Dynamic Battery Rack Solutions

The Best Systems Combine Configurability and Durability for Critical Backup Power

Backup power has never been more significant in communications networks. Several key factors have converged in recent years to increase the importance of backup power in telecommunications, wireless and data network applications.

While little has changed in the batteries that often supply backup power to critical equipment, the method for housing these batteries has evolved. Today, significant advances in equipment rack technology and a broadened product offering present end users with dynamic solutions for handling a variety of backup power challenges.

Background – The Significance

As mentioned above, long-term trends and recent occurrences have contributed to the increasing demand for reliable and cost-effective backup power solutions.

Critical Data

Ever-increasing bandwidth in today's network applications means that even the briefest amount of downtime can be devastating. Therefore, creating reliable backup power systems not only protects service for customers, but it also helps to ensure the reliable delivery of data – and, ultimately, revenue – throughout the network.

Network Expansion

The migration of technology outward from the central office means that active, intelligent equipment is being installed in what once were non-traditional locations – remote sites, cellular towers, huts, and elsewhere. These network elements, obviously, require power.

Power failures, therefore, can affect critical equipment in more difficult to isolate locations; that is, not all critical equipment is located in the central office anymore, so providing backup power in a broad range of environments is a challenge that most network architects face.

Recent Regulations

Stemming from the aftermath of Hurricane Katrina, the FCC now requires telecom and wireless carriers to provide backup power in cell sites and remote locations. The new regulations demand eight hours of runtime in wireless and remote sites, while central offices must be able to operate for 24 hours without grid power.

While most facilities have infrastructure already in place to address these requirements, the issuing of the new regulations further emphasizes the significance of backup power. Catastrophic events such as Hurricane Katrina lead to much greater challenges than simply restoring power; however, the federal requirement for backup power in cell sites means that service providers must find the most reliable, durable and cost-effective solutions for this specific application.



Figure 1: Example of a fully loaded five-shelf battery rack. This configuration holds a total of 20 batteries, providing a high-density, high-capacity solution for large-scale applications.

Going Forward – The Right Choice

While the basic requirements for backup power are fairly straightforward, the variety of environments found in today's networks leads to a broad range of specific requirements for applications. The requirements for cell sites may vary significantly from what's needed in a central office, or for that matter, from cell site to cell site.

As in all network applications, the system designer benefits from repeatable solutions. In the case of backup power, having a single system that can be configured to the specifics of the application is advantageous. This approach simplifies ordering and in-field training, while at the same time improving reliability through a repeatable installation process.

Choosing batteries for backup power can be relatively simple. Most system designers make choices based on specifications and brand. When selecting the rack to hold the batteries, however, several features are key:

Flexibility in Design

While a battery rack serves the same purpose in all installations, the specifics required for the environment can vary. Configurable rack systems are available that feature three, four or five battery shelves – along with additional shelves for expansion as required. This presents a significant advantage in that a single system can handle a variety of applications based on capacity requirements.

Battery Compatibility

Several different manufacturers provide batteries engineered for backup power applications. The ideal battery rack can accommodate them all, including a variety of sizes and weights. This way, if your battery selection changes based on the application, you can still utilize the same rack.

Universal Voltage

Voltage requirements are different in wireless and wire-line networks. Choose a rack system that can adapt to 24 VDC or 48 VDC networks based on the configuration. Installation of the rack and components will be the same; only the operating voltage will change.

Heavy Duty Design

A rack that meets Zone 4 Seismic standards ensures performance in the most rigorous settings. While not all geographical areas demand these stringent requirements, selecting a rack built to these standards definitely helps to guarantee that the rack will not fail when conditions worsen – and after all, the ultimate goal of the backup power system is to function seamlessly in bad conditions.

Additionally, a robust design helps the rack withstand the weight of batteries in standard applications as well. A five-shelf rack, for example, with four batteries on each shelf, can result in a total system weight upwards of 2,000 pounds. Choosing a rack system engineered specifically for durability is a simple step toward eliminating doubt in overall performance.

Telect's heavy duty battery rack is independently certified to safely and securely hold up to 2,600 lbs. of equipment in Zone 4 Seismic applications.

Standard Footprint

By coupling configurability with an overall standard footprint (23 inches wide x 7 feet tall), the end user will gain a rack system that not only fits a variety of outside plant environments, but also is a good fit for the central office. Again, this presents several advantages, including simplifying system deployment through a repeatable design.

Conclusion

Battery rack systems are available that combine all of the features listed above to present network engineers with simple, flexible, and reliable solutions for the critical application of backup power. Whether you're configuring a system for a cell site, a remote location or a central office, standardizing on a single system presents significant advantages that will increase reliability, simplify deployment, and enhance overall efficiencies.