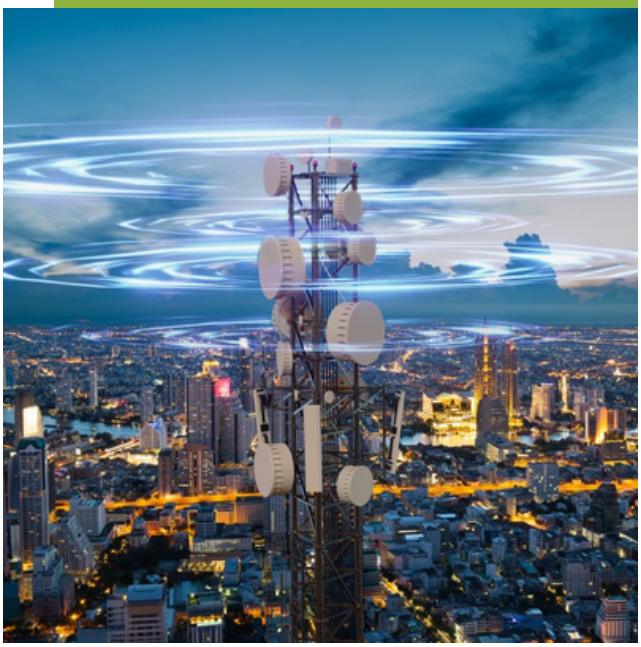
Telecommunications DESIGNS

WHITEPAPER

Cellular Signal Testing in Multi-Location Environments: How to Pick the Best Carrier for Each Site



Abstract

In today's modern retail technology landscape, cellular services are increasingly integrated into overall network plans. With rapidly advancing technology and growing competition, retailers must adopt a future-ready mindset. Cellular connectivity often plays a crucial role in these network plans, but signal strength can vary significantly based on site location, carrier (Verizon, AT&T, T-Mobile), and 4G or 5G application requirements. Onsite cellular testing is vital for making informed decisions about the best carrier for each site, ensuring the robust functionality of devices connected to cellular modems.

Cellular Signal Testing Applications:

- IoT sensors and devices
- Network backup in case of ISP outage
- Fire and Burglar alarm panels and Elevator communications
- Cellular POTS lines for phone systems and other analog devices abandoning old copper lines.
- Improve cellular phone signals in buildings for both employees and customers.

What is Cellular Signal Testing?

To conduct an onsite survey effectively, a sophisticated cellular signal meter is required. This is achieved with a professional handheld device that detects and displays signal frequency, bandwidth, and strength with certainty. The device reads the signal level for all frequency ranges and bands, allowing testing for any carrier to ensure a working signal for each site.

Our test equipment gathers various data points, including RSSI, RSRP, RSRQ, and SINR, providing a comprehensive cell signal report.

- RSSI (Received Signal Strength Indicator): Signal strength received at the device's antennas.
- RSRP (Received Signal Reference Power): Power of the signal received from the base cell tower.
- RSRQ (Received Signal Reference): Quality of the signal received from the cell tower.
- SINR (Signal to Interference + Noise Ratio): Another measure of signal quality received from the base station.

Our cellular test equipment goes beyond standard signal meters, providing details about nearby cell towers critical for some system designs.

Visit the website to download sample reports.

How to Read a Signal Meter

Cellular signal strength is accurately measured in decibel milliwatts (dBm). Signal strength is expressed as a negative number, typically ranging from -30 dBm to -110 dBm. Numbers closer to zero indicate stronger signals, with signals better than -85 dBm considered usable and strong. A signal weaker than -100 dBm is likely to be problematic resulting in dropped calls and incomplete data transmissions. Additional factors beyond signal strength should be considered.

Can You Use a Cell Phone for Cellular Signal Testing?

A basic analysis can be done using a cell phone by looking at the number of bars of strength. However, these bars are unreliable, lacking a standard representation and the ability to measure 4G data or 3G voice performance. Additionally, the number of bars can vary based on how you hold your phone, your phone manufacturer, your carrier, and several other variables.

Can a Signal Meter Detect Signals for Multiple Carriers?

Yes, signal meters are carrier-agnostic and can detect frequency and signal compatibility with any carrier. The common carriers are Verizon, AT&T, and T-Mobile, with U.S. Cellular available in some parts of the country.

Can Cellular Signals Be Boosted?

Yes, buildings with signal strength weaker than -85 dBm can benefit from a passive distributed antenna system (DAS) that captures and amplifies existing cellular signals. These systems can improve signal strength to -70 dBm or better, providing a cost-effective solution for better connectivity in large buildings, including commercial spaces.

Picking the best cellular carrier for each site

Recognizing the variability in cellular signal strength across store locations and carriers, the study emphasizes the need for a tailored approach. Drawing parallels with personal cellular experiences, we all know that our phones work better in some areas and not at all in other areas. This paper underscores the importance of selecting the best carrier for each specific site to optimize signal strength and performance.

Acknowledging the complexity of establishing relationships with multiple carriers for large-scale retail store deployments, the study introduces a multicarrier solution. After on-site cellular testing, a tailored cellular plan covering Verizon, AT&T, and T-Mobile is devised. This approach streamlines services under a single monthly invoice, simplifying management and providing a managed service provider for oversight and issue resolution.

Conclusion

In conclusion, we want to emphasize the pivotal role of signal meters in cellular signal testing, especially in commercial settings as it highlights the ability to choose the best carrier for each site based on data requirements. Visit the website to download sample reports.

Contact us and let us show you how we can help your organization facilitate successful cell signal testing for a single location, or hundreds.

About Us

Telecom Designs has over 30 years of Retail Network Management experience in delivering and supporting on time and on budget technology deployments for new store openings, closings, renovations and technology migrations, for supermarket, pharmacy, big box, department, convenience, discount, warehouse, and specialty store customers. Our national network of field service technicians allows us to go above and beyond with exceptional service and attention to detail for our clients and partners throughout North America.

Give us a call today, or contact us at sales@telecomdesigns.com. We look forward to sharing our knowledge and 30+ years of experience in the space.