



White Paper | In-Building Wireless Systems for Data Centers

An Educational Guide for General Contractors & Electrical Contractors
Understanding ERCES & Cellular DAS Integration in Mission-Critical Builds

Executive Summary

Constructing a mission-critical data center is a monumental undertaking, measured not just by milestones and budgets, but by the delivery of a facility that is safe, compliant, and operationally resilient from day one. Among the specialized systems that underpin this success, Emergency Responder Communication Enhancement Systems (ERCES) and Cellular Distributed Antenna Systems (DAS) play a crucial, yet often misunderstood, role.

For the seasoned general and electrical contractors leading these builds, these systems present a unique challenge. They exist at the intersection of complex radio frequency (RF) engineering, stringent code compliance with Authorities Having Jurisdiction (AHJs), and precise coordination across multiple trades. When managed without specialized expertise, in-building wireless systems can quickly become late-stage project crises, leading to failed inspections, delayed occupancy, and costly rework.

This white paper serves as an educational guide for the project managers and construction leaders responsible for integrating ERCES and DAS into data center construction. It moves beyond the basic "what" to explore the "why" and "how"—detailing the specialized knowledge required, the common pitfalls to avoid when using inexperienced subcontractors, and the strategic value of partnering with a certified expert.

It is designed to empower you with the knowledge to de-risk this critical scope and ensure your project remains compliant, coordinated, and on schedule.

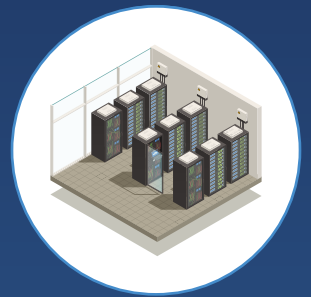


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Data center construction demands a specialized wireless integration partner capable of navigating RF-hostile materials, high electromagnetic interference, and overlapping compliance standards to ensure every system meets code and passes inspection.



For project managers and construction executives, success depends on selecting a partner with true RF engineering expertise—one who can deliver code-compliant ERCES and DAS solutions without disrupting critical data center operations.



Audience & Scope

This guide is written for the project managers, construction executives, and superintendents at the helm of large-scale data center projects.

Whether overseeing a new build, a multi-phase expansion, or a complex retrofit, these leaders are ultimately accountable for delivering every system to code and ensuring it passes inspection.

Here, you will gain a deeper understanding of how to evaluate potential wireless system integrators, what challenges to anticipate during the construction lifecycle, and how to mitigate project risks that can impact both budget and reputation.

The insights within are designed to help you select the right partner—and *avoid the missteps that too often result in late-stage emergencies and red-tagged systems.*

The Unique Data Center Construction Environment

Data centers stand apart as some of the most complex facilities ever constructed. They are a fusion of high-density electrical systems, critical cooling infrastructure, and uncompromising uptime requirements—all housed within structures that are inherently hostile to the radio frequency signals upon which wireless systems depend.

A successful integration requires a partner who understands how to navigate this challenging environment.

Key factors include:

- **RF-Hostile Materials:** Reinforced concrete, steel framing, low-E glass, and dense cable trays form formidable barriers that block or degrade both public safety radio and commercial cellular signals.
- **High Electromagnetic Interference (EMI):** The very equipment that powers a data center—UPS systems, switchgear, and power distribution units (PDUs)—creates significant electrical "noise" that can disrupt wireless performance if the system is not engineered correctly.
- **Live Operational Environments:** Many data center expansions or retrofits occur in partially live facilities. This demands a partner capable of adhering to strict Methods of Procedure (MOPs) and performing work with surgical precision to prevent any disruption to ongoing operations.
- **Overlapping Compliance Standards:** Data center projects are governed by a web of standards, including those from the Uptime Institute, NFPA, IBC, IFC, and local AHJ fire codes. Each of these requires meticulous documentation, rigorous testing, and formal certification.

For project managers, the key takeaway is that standard trade experience is insufficient for this scope. ERCES and DAS require levels of RF engineering, system design, and specialized licensing that fall outside the capabilities of most general and electrical contracting firms.

Why ERCES & DAS Demand Specialized Expertise

As a project manager at a leading general or electrical contracting firm, you already recognize the importance of these systems. The challenge lies not in understanding that they are needed, but in executing their deployment to code while mitigating RF interference—a task for which most firms are not certified. Your team excels at managing complex builds, but ERCES and DAS require a different kind of specialist.

Here are some things that distinguish a true wireless integrator from a typical subcontractor:

- **Certified RF Engineering:** Reliable wireless coverage is not achieved by simply running conduit and pulling wire. It is the product of predictive modeling, on-site RF mapping, and advanced frequency analysis performed by certified engineers. This scientific approach is essential to overcome signal loss and interference.
- **Regulatory and Code Mastery:** Fire and building codes evolve, and their interpretation varies between jurisdictions. A specialized firm maintains current FCC, NICET, and OEM certifications and possesses deep, established relationships with local AHJs, ensuring designs meet precise local requirements.
- **Complex System Commissioning:** A successful deployment concludes with a rigorous commissioning process. This includes system "sweeps" to test cable integrity, grid testing to validate coverage levels, and generating detailed DAQ (Data Acquisition) reports—all non-negotiable deliverables for passing final inspection.

Choosing an unspecialized partner introduces significant risk. The consequences often manifest as failed inspections that delay the Certificate of Occupancy, poor RF coverage that requires costly post-occupancy remediation, and unresolved scope gaps that lead to change orders and disputes between trades.

Overcoming Inevitable Integration Challenges

If you have managed a project involving these systems, you likely know the challenges that arise from hiring a subcontractor who isn't up to the task. Enlisting a knowledgeable third-party integrator ensures skilled engineering and design that accounts for these complexities from the start, preventing them from becoming your problems to solve.

Common Challenges an Expert Partner Mitigates:

- **Pathway and Trade Conflicts:** An experienced integrator uses BIM to model pathways and antenna placements early, preventing clashes with crowded MEP infrastructure in ceilings and corridors.
- **Evolving RF Environment:** In a multi-phase build, a specialist plans for system continuity, ensuring the new deployment does not interfere with active systems in an operational facility.
- **Undefined Scopes:** A professional integrator clarifies all responsibilities upfront—from power drops and firestopping to core drilling—in a detailed scope of work, preventing the finger-pointing that causes delays.

A proactive general contractor brings the wireless integrator into the design process early, treating them as a primary system partner, not an accessory added during the punch list phase. This foresight is the foundation of a smooth and successful integration.



ERCES and DAS systems require certified RF engineers—not just electricians—with the technical expertise, regulatory mastery, and commissioning precision to deliver code-compliant coverage in complex environments.



By engaging a specialized wireless integrator early in the design phase, general contractors can prevent trade conflicts, avoid costly inspection failures, and ensure seamless, on-time system integration.





MCA partners with leading general and electrical contractors to deliver fully compliant, first-pass wireless system integrations—combining certified RF expertise, construction fluency, and proactive project management to protect schedules, budgets, and reputations.



By engaging MCA early, contractors transform ERCES and DAS from potential project risks into predictable successes, ensuring every system passes inspection and every build meets the highest standards of performance and compliance.



Your Ally in Wireless Systems Success: The MCA Approach

For decades, MCA has served as the trusted partner for the nation's leading general and electrical contractors, delivering in-building wireless systems for their most critical projects. We operate as an extension of your team, bringing a level of expertise and professionalism that protects your project's schedule, budget, and reputation.

What Sets MCA Apart:

- **Dedicated Project Management:** We assign a construction-savvy project manager who speaks your language. Our PM integrates directly with your site teams, participates in all relevant meetings, and manages our scope autonomously, freeing you to focus on the overall project.
- **Certified and Proven Expertise:** Our engineers and technicians hold the highest manufacturer, code, and safety certifications required to perform work in any jurisdiction and within any mission-critical environment.
- **Mastery of Coordination:** From BIM and RFI closeouts to seamless coordination with MEP and life safety trades, we pride ourselves on being a collaborative and low-friction partner on the job site. Our goal is to solve problems, not create them.
- **Guaranteed First-Pass Inspection Success:** Our meticulous engineering process and deep relationships with AHJs and wireless carriers are foundational to our record of first-pass acceptance. We de-risk the closeout process, ensuring your schedule stays on track.

Partnering with MCA means gaining a team that understands your world: uncompromising standards, tight schedules, and zero tolerance for rework. We are committed to our shared success, proving that we are truly better together.

Conclusion

While ERCES and Cellular DAS may constitute a small fraction of a data center's total construction budget, they carry a disproportionate amount of risk when mismanaged.

The key to mitigating this risk is selecting an integration partner who understands not only the specialized science of RF engineering but also the demanding rhythm of the construction process. By engaging early with a proven, certified expert, you transform a potential liability into a predictable success.

You don't just meet a code requirement—you demonstrate complete command of every critical system within your build. It is this commitment to excellence that elevates a project from good to great.

Contact MCA today to discuss your upcoming projects and learn how our dedicated team can help you deliver a fully compliant, operationally ready facility—*on time, on budget, and ready for inspection.*

About MCA

We believe every workplace should be safe, secure, and efficient. As trusted advisors, we deliver integrated communication, connectivity, and security solutions with a **Service First mindset** – *driven by a team that cares deeply about our customers and each other.*

Why MCA? At MCA, we help solve critical communication, connectivity, and security challenges with turnkey, integrated system solutions—from *two-way radios and in-building wireless to video surveillance, access control, and more.* MCA is built from **over 50 companies** with deep technical expertise and strong local roots. **And we're still growing**—*expanding our capabilities, our reach, and our team.*

Our **100+ Solution Centers** bring together sales, installation, service, and customer operations teams to deliver seamless, nationwide support. **Guided by our Service First value**, we don't just connect the wires and walk away—we *provide customized solutions backed by deep expertise and lifecycle support.*

MCA Headquarters

📍 135 N Church St #310
Spartanburg, SC 29306

📞 800.596.8205

✉️ info@callmc.com

💻 www.callmc.com

The MCA logo is displayed in a large, white, sans-serif font. The letter 'C' is stylized with a blue circular graphic element inside it, resembling a signal or a network node. The background of the entire page is a dark blue gradient with abstract, glowing white and light blue geometric patterns, including a complex network of lines and dots in the upper right corner.