



In-building wireless professional services

COMMSCOPE®

In-building wireless professional services from CommScope

Implementing a successful in-building wireless solution involves more than choosing the right distributed antenna system. You need the project management experience and engineering expertise to complete it on time and within budget. For a facility like a stadium, airport or skyscraper, the challenge is exponentially more complex.

So many moving pieces: contractors, engineers, technicians and installers; dozens of process steps and hundreds of individual tasks; and the diverse expectations of the project's stakeholders. Overlook one detail, take one step out of sequence and—like a trapeze artist without a net—there's a lot that can go wrong.

With CommScope's In-building wireless professional services, your DAS implementation—regardless of size or complexity—is in the most capable and experienced hands.



Total project management—complete peace of mind

You already know CommScope as a trusted provider of DAS hardware for many of the world's most challenging venues, but we also handle the engineering and project management services that keep large In-building wireless projects on schedule and within budget. CommScope-managed deployments include NFL Super Bowl stadiums, international airports, university campuses and major high-rises.

With CommScope's In-building wireless professional services, all the moving parts are seamlessly orchestrated by one very experienced and accountable point of contact.

As the global leader in DAS deployments, CommScope can handle any or all aspects of your In-building wireless project—RF design and engineering, installation, resource scheduling and coordination, materials management, commissioning, optimization, customer acceptance and even on-going monitoring and maintenance. We coordinate efforts between you, building management, other carriers and all subcontractors to keep the entire project moving forward.

With CommScope's In-building wireless professional services, all the moving parts are orchestrated by an experienced, certified and accountable project manager. Our services are available globally, with presence on all six continents and professionals who speak the local language.

Since 2012, annual spending on DAS services such as installation have accounted for more than half of all DAS revenue—a trend that is expected to continue through at least 2021.

Source: Global DAS Forecast, Mobile Experts LLC, 2016.

SALES SUPPORT

- Product positioning and education
- Rough order of magnitude (ROM)

ENGINEERING SERVICES

- Site survey
- Radio frequency design
- Continuous wave testing
- Benchmark testing
- Commissioning
- Optimization and acceptance testing

PROJECT MANAGEMENT

- Resource and construction management
- Cross-functional coordination
- Installation
- Documentation

OPERATION AND MAINTENANCE

- Remote monitoring and management
- Training
- Certification

In-building wireless professional services

CommScope provides a broad range of In-building wireless professional services

Sales support

Your CommScope In-building wireless professional services team is there from the very beginning to answer your questions and provide the information stakeholders need to feel confident and assured of the project's success.

Product positioning and education

CommScope can help you determine which solution is right for a specific customer and project, explain the features and benefits of CommScope's DAS solutions and how they match the customer's needs. Our broad range of DAS and C-RAN antenna system solutions allows us to select the optimal product line and configuration for each deployment.

Rough order of magnitude (ROM)

CommScope helps you create a ROM, an estimate of the anticipated effort and cost needed to complete the project based on the project requirements. The ROM includes major parameters such as square footage, participating carriers and coverage strength targets throughout the facility, as well as major solution components such as materials needed and project duration. The estimate helps the stakeholders evaluate their options to ensure a successful business case. CommScope's experience in early stage estimation helps drive more accurate project budgeting.

With extensive experience designing solutions that exceed the stringent expectations of customer carriers, CommScope rises to meet the toughest capacity challenges and deliver excellent results that consistently outperform expectations.



Engineering services

Let CommScope put our more than 40 years of network design and engineering experience to work for you. We'll take care of the RF-related services you need to design, install, test and optimize your In-building wireless system.

Site survey

Our site surveys are broad and deep. We analyze and document building floor plans, wall and ceiling construction materials and the impact of the neighboring macro RF environment. In the process, we identify potential antenna locations, cable pathways and construction obstacles.

CommScope RF designs include:

- An accurate 3D model of the facility
- A list of potential locations for required equipment
- Preliminary cable routing design
- RF parameters, including: signal strength, signal quality and link budget calculations

Radio frequency (RF) design

Even small RF modeling errors can lead to higher costs later, so modeling accuracy is critical. CommScope RF designs are guided by our extensive experience and built using industry-standard tools like iBwave. We consider the building characteristics determined in the site survey as well as the customer's current and anticipated in-building wireless requirements. We verify signal dominance, integrate continuous wave test results, and build accurate 3D models for spaces ranging from small offices to large airports and campuses. We apply creative "out-of-the-box" thinking to make sure that the final design is as affordable as possible.

Engineering services (continued)

Continuous wave (CW) testing

Once the preliminary design is complete, we verify its accuracy and fine-tune its propagation characteristics by creating a test set-up scenario with the selected antenna, location, and power levels. This enables us to accurately measure and verify design predictions for signal strength, quality, and coverage, to check for sector overlaps. Based on the results, we make any necessary modifications in antenna positioning and orientation to bring the entire system up to stated performance requirements. CommScope provides full documentation of the test setup, procedure and results. We guarantee the performance of our design commitments and ensure the system meets carrier requirements.

Benchmark testing

Prior to system installation, CommScope conducts an initial benchmark test of the RF environment. We measure the strength and quality of voice and data signals—throughout the facility and in the immediate area—to establish a baseline. Then we repeat the process, post-installation, to verify that the performance meets customer expectations and solves the coverage gap.

Commissioning

During commissioning, we establish connectivity between all system components, including specialized installation of active headend elements and connection to the carrier's RF signal source. We configure and balance the power and system parameters of each channel and specific frequency band to ensure the system operates alarm free. Thorough testing ensures all equipment and connections are functioning properly and that key outputs like power and gain are set to the proper levels.

Optimization and acceptance testing

DAS performance is tested and fine-tuned to meet the requirements for capacity, coverage, connectivity, power levels, interference management, reporting and more. Power is balanced across sectors to minimize interference and maximize performance and capacity for greater network accessibility. CommScope even provides recommendations for optimizing surrounding macro sites to minimize potential interference.

After commissioning and optimization have been completed, CommScope engineers test voice, data and signal level qualities in all major areas of the building to verify that the system performance meets your expectations, as well as those of the building owner and any other stakeholders.

Project management

CommScope assigns an experienced project manager to every project. Many of our project managers have engineering degrees and Project Management Professional (PMP) certification. Throughout the project, we manage the details and day-to-day interactions between everyone involved while providing you and other project stakeholders with regular updates.

“DAS performance is tested and fine-tuned to meet the requirements for capacity, coverage, connectivity, power levels, interference management, reporting and more.”

Resource and construction management

We procure and manage all necessary construction contractors throughout the job; identifying, ordering and accounting for all required materials; and managing the project schedule, from start to finish.

Cross-functional coordination

As project lead, CommScope coordinates communications, schedules, efforts and expectations between you, building management, other participating carriers, construction contractors, installers and any other project teams who may be involved.

Installation

CommScope, through our global network of certified installation partners, provides comprehensive installation services while minimizing the impact on a facility's day-to-day operations. They include installing head-end equipment, all remotes and antennas, cabling and related system elements. All work complies with customer requirements, local and national building codes and regulations, and industry best practices. And, of course, when it comes to installing our products, nobody knows them better than our installers. Installation by CommScope-trained and certified installers reduces the potential for errors and alarms, saving time and resources while bringing the system online as quickly as possible.

Documentation

At the end of the project, CommScope provides complete documentation to those responsible for maintaining the DAS installation. Documentation includes all physical system elements and locations, frequency bands, and system configuration parameters.



Driven by progress.
Delivered by experience.

CommScope's In-building wireless professional services are born out of a commitment to be more than a supplier of the world's best network infrastructure solutions. Our promise begins by creating services that complement our products, with you in mind. We're continually asking the questions—What do you need? How can we help you add more value to your customers?—that result in meaningful solutions, like our In-building wireless professional services. Solving customer challenges is what drives us every day.

Together, we're building partnerships that build the world's smartest networks.



Operation and maintenance

Remote monitoring and management

Once your In-building wireless system is up and running, CommScope offers ongoing monitoring and remote support services, governed by a service level agreement (SLA) to ensure it continues to function at the highest possible level.

From one of our local network operations centers (NOCs), CommScope monitors DAS-related software and hardware 24/7. In each state-of-the-art NOC, expert technicians use advanced A.I.M.O.S. management software to notify, analyze and resolve alarms and perform remote troubleshooting. From here, we can also keep your equipment software up to date, coordinate with local teams to make repairs, and generate KPI reports for network alarms and equipment uptime.

Training and certification

Through our DAS and Small Cell Institute, CommScope offers classroom and eLearning courses on a wide range of topics, including: RF principles, PIM avoidance, and installation and commissioning for individual product lines. Many of the industry's experts were trained by CommScope.

CommScope pushes the boundaries of communications technology with game-changing ideas and ground-breaking discoveries that spark profound human achievement. We collaborate with our customers and partners to design, create and build the world's most advanced networks. It is our passion and commitment to identify the next opportunity and realize a better tomorrow. Discover more at [commscope.com](https://www.commscope.com)

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