



Microwave backhaul solutions

From a partner you can count on for the long haul

COMMScope®

Count on CommScope for proven, practical microwave backhaul solutions

Backhaul is the backbone of the wireless network and demand for backhaul throughput continues to grow. Increased traffic is straining capacity and spectrum availability, with interlink interference becoming more common. Even a minor backhaul problem—signal interference, network disruption—can have a major impact on customer satisfaction.

To handle the increased demand and traffic, mobile operators are expanding their networks by increasing density with more cells in a given area, increasing capacity at existing sites, and expanding networks to provide service to those living in or traveling through remote “zero-coverage” areas.

Regardless of which strategy is followed, the cell sites must be connected to the rest of the network via backhaul—and microwave backhaul antennas offer the most cost-effective solution. Quick and inexpensive to deploy, microwave technology offers the capacity to connect individual or small numbers of aggregated sites back to the core fiber network.

Denser networks require many microwave links that must operate without interference, and must be able to reuse limited spectrum repeatedly.

Increased site capacity puts higher traffic demands on backhaul, with higher modulation schemes calling for high-performance antennas that offer protection from interference, and wider radio channels that make spectrum reuse essential.

Building new towers to expand coverage to remote communities is relatively easy; the issue is backhaul, and—since fiber deployment is cost-prohibitive in these areas—the only solution is microwave.

In almost every case, the most practical backhaul solution is microwave—and the best way to build out your microwave backhaul network is with CommScope antennas.

Meeting the challenges of microwave backhaul deployment

While your network customers perceive dropped calls to be caused by an inferior signal at the handset, the problem often lies in the radio backhaul links. But solving the backhaul problem has its own challenges and considerations.



Cost

Basing backhaul infrastructure decisions on purchase cost alone may prove to be a long-term liability. Bargain antennas are often inefficient and unreliable, leading to dropped calls or disappointing throughput results, resulting in higher TCO as well as loss of customers.



Capacity

Some microwave antennas may not support the desired availability at the higher modulation schemes that are offered in many of today's microwave radios, limiting their ability to meet network throughput demand. The right solution must offer sufficient capacity to move traffic and ensure that quality of service is sustained.



Complexity

Industry competition has brought many new components and technologies into the mix, which have increased network complexity. Multisourcing components or using untested technology can threaten network performance and reliability and require complex diagnostic and remedial work.



Because each challenge can directly impact the others, your microwave backhaul strategy must be carefully balanced and prioritized to perform against all three.

CommScope microwave backhaul antennas

CommScope's microwave backhaul solutions portfolio includes antennas designed to meet any network challenge and environmental condition. Choose from our wide range of Class 4 and Class 3 antennas to meet your specific size, cost, performance and survivability requirements.

Sentinel® Class 4 antennas

With their extremely low side lobes, allowing very tight RPEs, Sentinel Class 4 microwave antennas provide superior interference discrimination, delivering 40 percent better spectrum utilization and yielding a 40 percent improvement in link density. Sentinel offers 10 dB or more off-axis interference discrimination, compared to a similar Class 3 antenna, so you can potentially use smaller antennas that reduce tower lease costs as well as tower loading.

Sentinel's SHP(X) antennas come with the durability to withstand winds up to 250 km/h (155 mph) and are designed to integrate with radio outdoor units to provide a versatile solution for every backhaul challenge. Most important to TCO, Sentinel provides insurance against future interference issues for a reliable long-term backhaul solution.

Sentinel USX antennas bring all the benefits of Class 4 performance to long-haul microwave. With better pattern performance than the legendary UHX antenna range, they allow links to be added in even the most frequency-congested areas.



ValuLine® Class 3 antennas

ValuLine® Class 3 microwave antennas deliver exceptional RF performance, reliability, durability and value in total cost of ownership.

ValuLine VHLP(X) antennas are available in a range of sizes from 0.2 meters (8 inches) to 1.8 meters (6 feet) in diameter, in single- and dual-polarized configurations, and are ideal for systems operating between 5.925 GHz and 86.0 GHz. Their low-profile design makes them easy to install and align, while reducing windloading and improving aesthetics. They are available in most industry-standard EIA and IEC flange types, or can integrate directly with radio outdoor units from leading manufacturers.

ValuLine dual band antennas offer the resilience of traditional microwave bands coupled with the high capacity of E-band in a single antenna platform which can allow extended link lengths with increased capacity, reduced loading on infrastructure and lower TCO.

ValuLine HX antennas provide a cost-effective Class 3 option in larger antenna sizes. Covering the 4.4-13.25 GHz frequency bands in antenna diameters 1.8-3.7 meters, they provide an ideal solution for areas where frequency congestion is not a significant issue.



Interference Protection. Maximise link throughput by minimising interference risk using Sentinel antennas

Antenna classifications explained

Class 4? Category A? Antenna classifications vary from region to region, and sorting them out can be confusing. But it all comes down to the interference caused by an antenna's **radiation pattern envelope**, or **RPE**.

An antenna radiates signal energy in different directions, taking the shape of lobes—elongated areas of higher radiation. The lower the lobes relative to the main beam, the better the antenna and the less likely that it will cause or receive interference.

Since the RF spectrum is regulated, national or regional regulatory bodies such

as ETSI and the FCC publish standards that antennas must meet. For example, antennas compliant to ETSI Class 4 standards have lower side lobes and are therefore higher performing than those compliant to Class 3.

Higher-quality antennas with lower side lobes and tighter RPE characteristics deliver better performance and better total cost

of ownership (TCO)—making CommScope the best choice for high-performance microwave backhaul.

Check out our eBook to learn more: [Microwave Communication Basics](#).



CommScope microwave backhaul powers the world's longest mobile network link

A case study partnership with Aviat Networks and CommScope.

Read the full story [here](#)

Beyond compliance, to proven quality

While an antenna's compliance with ETSI or FCC requirements is important, its quality is critical. For a link to perform as designed with maximum throughput, it is essential that the antenna meets high quality standards. Poor-performing antennas can allow interfering signals to affect the link, resulting in increased noise and reduced performance that can limit traffic throughput and ultimately impact customer satisfaction.

That's why CommScope puts our microwave antennas through a series of rigorous tests for performance, interference and durability before they leave the factory. Each is designed to the highest engineering standards and guaranteed to work seamlessly across your network. CommScope has a highly meticulous and systematic way of testing performance. We're always raising the bar for quality standards, and we want to be sure your system has staying power long after installation.

Microwave backhaul accessories

CommScope offers a complete selection of microwave connectivity accessories to optimize your backhaul installation and performance.

Elliptical waveguide

This is the recommended transmission line for microwave systems operating between 1.7 GHz and 23.6 GHz, with an elliptical cross section ideal for minimizing VSWR and eliminating signal distortion. Optimized for the lowest loss in significant user bands, with significantly lower attenuation than standard rectangular waveguide, which provides efficient signal transfer and optimum system performance. CommScope offers waveguide in two forms:



Flexible-twistable waveguide

Also called “flex twists,” designed to isolate vibration and eliminate installation difficulties caused by misalignment and also to help in positioning and aligning the microwave antenna by adding enough “slack” to allow sufficient adjustment.



Rectangular (rigid) waveguide components

Built with a rectangular cross section, rigid waveguide is most commonly used as a final assembly point in the equipment rooms, connecting to the radios.



Waveguide connectors

Waveguide connectors are tapered through multistep transitions that adjust their shape in stages from elliptical to the rectangular shape of industry-standard waveguide flanges. Each connector has a pressure inlet to allow the connection of pressurization equipment. Made of brass to provide long service life and compatibility with metals used in the waveguide itself.



Additional components

Waveguide-to-coaxial cable transitions

Used to connect a rectangular waveguide interface to a coaxial cable flange interface.



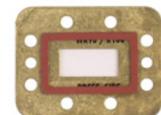
Termination loads

Used when one or the other polarization ports of a polarized antenna are not currently in use; made of ferrite material for terrestrial, long-haul microwave antennas, or rubber absorber material for small loads on short-haul antennas.



Pressure windows

Provide separation between components that require pressurization from those that do not require it; typically installed at the equipment room end of the feeder line in a controlled environment.



Pressurisation Equipment

Dehydrators ensure waveguide runs are kept moisture free by maintain a positive pressure inside the waveguide using dry air. Manifolds allow multiple waveguide runs to be operated from a single dehydrator.



CommScope delivers, with industry-leading expertise

PartnerPRO[®] N E T W O R K

CommScope PartnerPRO[®] Network

The CommScope [PartnerPRO[®] Network](#) matches our customers with the best solutions and certified design and deployment partners. The network includes independent consultants, integrators, installers, distributors and industry alliances—all trained and certified to deliver CommScope wireless network solutions with superior service.

COMMSCOPE[®] INFRASTRUCTURE ACADEMY

CommScope Infrastructure Academy

The [CommScope Infrastructure Academy](#) offers specialized courses covering the whole spectrum of network infrastructure, including the critical role of microwave backhaul. From senior engineers to beginning installers, CommScope training can keep your team up to date with the latest knowledge and best practices. And, as an online resource, the CommScope Infrastructure Academy is available whenever you are. Visit CommScopeTraining.com to enroll.

Partner with a proven innovator

CommScope doesn't just participate in trends—we pioneer them. You can rely on us to help you upgrade your mobile network with proven microwave backhaul solutions. Our 40 years of experience means we can be trusted to anticipate any need, solve any challenge and pursue any opportunity.

Contact us today
to learn more.

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

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