

CAMBIUM POINT-TO-MULTIPOINT SOLUTIONS

# CONNECT YOUR WORLD



# CONNECT EVERYONE EVERYWHERE

Whatever your world looks like, you need high-speed voice, data and video communications serving multiple people in multiple locations. What's the optimal solution? A growing number of organizations like yours are turning to Cambium point-to-multipoint (PMP) wireless broadband solutions to deliver the anywhere, anytime access you need. They're fast. They're reliable. They're cost-effective. And they can connect everyone in your world...everywhere in your world.

# DATA, VOICE AND VIDEO ANYTIME, ANYWHERE

High-speed communications technologies have dramatically and permanently changed the way we communicate. Constant connectivity to voice, video and data is essential for living and working today.

Throughout your organization, whether enterprise or government, people rely more and more on the information-based business tools of the digital age. At Cambium, we've designed our point-to-multipoint (PMP) networks to provide reliable, rapidly deployable, cost effective wireless distribution and access of information.

## ANYWHERE ACCESS

Workforces are more mobile. To maximize productivity, workers must have access to the communications and information they rely on, not just *when* they need it, but *where* they need it. Our PMP wireless technologies combine field-proven reliability with high-speed performance data, voice and video communications that help you empower your workforce wherever they are.

## TRUSTED SECURITY

Employees aren't the only ones interested in your proprietary business information. Cyber crime is increasing, and along with it, the need for high-level network security. PMP networks provide multiple layers of encryption that ensure information is protected throughout the system. They also provide advanced authentication solutions,

helping you safeguard information by restricting access to your data. In addition, Cambium solutions provide for centralized management and remote troubleshooting that help you maintain peak network performance.

## COST REDUCTION

PMP wireless networks will enable your organization to deploy and extend high-speed communications faster and much more cost-effectively than fiber or wired solutions. Our networks significantly reduce the cost of deployment and speed time to market, allowing for installation in a matter of days or weeks as opposed to months or years for wired solutions. The platform's exceptionally low acquisition, installation, operation and maintenance costs result in substantially lower total cost of ownership (TCO), as well as delivery of ROI in just six to twelve months.

## PMP FAMILY OF PRODUCTS



PMP 100



PMP 320



PMP 400



PMP 430



PMP 450

# THE FLEXIBILITY TO DELIVER MULTIPLE APPLICATIONS

Our PMP networks offer organizations a broad range of wireless connectivity solutions that help enhance productivity, improve security and reduce operating costs.



## WIRELESS CONNECTIVITY

Acquisition of a portfolio of small companies leaves an enterprise with a number of new, geographically dispersed facilities. The cost of connecting these remote facilities to the company's fiber network was prohibitive, yet the locations needed access to the enterprise network and data. Deploying a Cambium PMP system enabled the company to provide each new location with reliable, high-speed wireless access in a matter of days and at a fraction of the cost of extending wired network connectivity.

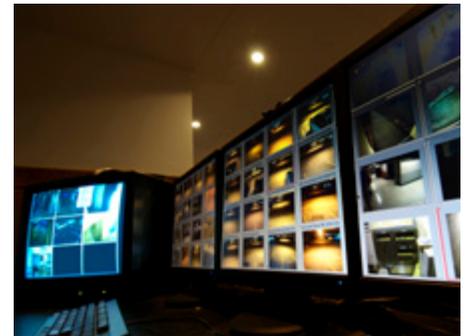
PMP networks make broadband access to multiple locations extremely cost-effective. There are no major equipment or software investments needed to deliver scalable, interference-resistant, high-speed connectivity to multiple locations, whether across the street or across town. PMP solutions are ideal for connecting educational and corporate campuses and municipal or government facilities, as well as the residential or business customers of service providers.



## LEASED LINE REPLACEMENT

A mid-size municipality found itself paying significant amounts of money in recurring monthly lease costs for T1 connectivity to a number of its facilities, including city hall, the courthouse and jail, police department, public works department, department of transportation and others. By installing a Cambium PMP network, the municipal IT department was able to significantly reduce monthly costs, while providing reliable, high-performance wireless connectivity.

If your organization uses E1/T1 leased lines for high-speed connectivity, how high are your monthly lease costs? Chances are, as your bandwidth demands grow and the number of lease lines increase, you're already seeing costs climb higher and higher. Our wireless PMP solutions help eliminate these monthly lease expenses, while at the same time improving control and overall network performance to meet the rising demand for real-time, bandwidth-intensive applications.



## VIDEO SURVEILLANCE

On a large community college campus, continuing education classes are held until 10 p.m. or later five nights a week. For the safety of the thousands of students enrolled in night classes, the school installed a Cambium wireless video surveillance system that monitors classroom buildings, parking lots, walkways and remote sections of the campus, delivering the video over the PMP network in real time to a command center. As soon as a potential incident is captured on live video, campus security is able to respond immediately.

A growing number of corporate and education campuses are trusting our PMP networks to deliver safety- and security-enhancing video monitoring of potentially dangerous areas of the campus. Municipalities use video surveillance over PMP networks to provide 24/7 monitoring of remote facilities, such as bridges, power stations and recreational facilities. Public safety departments use video surveillance cameras to help reduce crime rates by monitoring violence-prone neighborhoods and streets.

# CONNECTIVITY THAT ENHANCES YOUR BUSINESS CASE

Our wireless broadband PMP solutions allow network operators to provide their end users with the communications and applications they need to maximize productivity. Streaming live video of a fire scene to public safety officers. Transmitting modified work orders to workers already on the job. Delivering high-speed interactive gaming for commercial subscribers on multiple devices. Our PMP networks' robust performance and extremely low latency make these and countless other in-demand applications highly efficient and exceptionally cost-effective. Among the reasons is a wide range of benefits that help you enable and sustain your business case.

## CHOICE

Cambium's PMP solutions offer wireless broadband access in a wide variety of spectrum choices — including licensed 3.65, 3.3 - 3.8, 4.9 GHz and unlicensed 900 MHz, 2.4, 5.1, 5.2, 5.4, 5.7 and 5.9 GHz — helping ensure exceptional performance no matter which spectrum is best for your network. In addition, they provide robust performance not only in Line-of-Sight (LOS) environments, but in near-Line-of-Sight (nLOS) locations using equipment based on our OFDM (Orthogonal Frequency Division Multiplexing) technology.

## INTERFERENCE RESISTANCE

Our PMP networks excel at interference mitigation. Our solutions' unique and powerful modulation scheme significantly improves the quality of data delivery and effectively mitigates interference from other systems of virtually every shape and spectrum. The system avoids self-interference by synchronizing all transmit and receive signals in the network via the Global Positioning System or GPS.

## OPERATING RANGES

Our platform offers superior broadband access for PMP networks of various sizes and coverage areas, delivering excellent performance for even those users located at network edges. Because operating ranges are highly dependent on power levels, many of our components support adjustable power to meet your operation's specific network and regulatory requirements.

## SCALABILITY

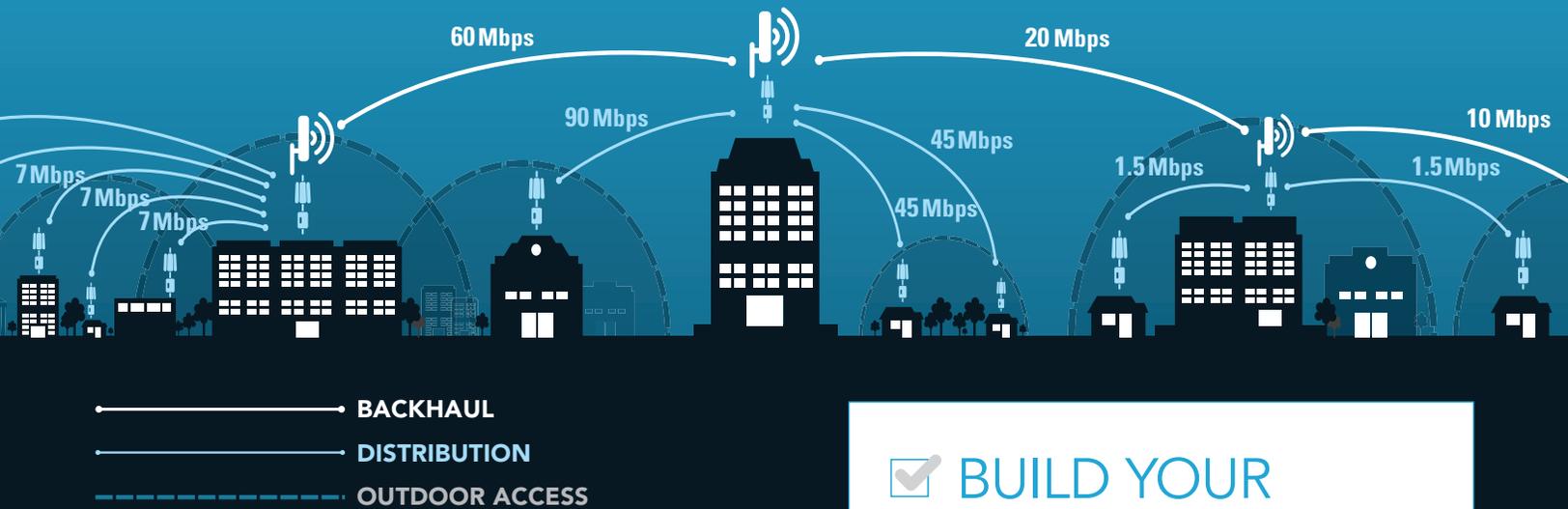
Cambium PMP solutions offer advanced scalability that allows you to quickly accommodate changing needs, wider geographical areas, larger populations and higher traffic volumes. In addition, our networks' high tolerance for interference combines with our directional antennas to ensure that adding additional transmitters increases capacity without degradation of performance.

## ENHANCED EXPERIENCES

Enhanced user experiences are one of our PMP solutions' strengths, providing the fast upload and download speeds your workforce needs: up to 90 Mbps (aggregate data rates). Of course, speeds on any network are affected by several factors so actual upload/download speeds may vary, but the ability to offer an incredible broadband experience is inherent in the system.



# DELIVER HIGH-SPEED CONNECTIVITY TO MULTIPLE LOCATIONS



Cambium's PMP network solutions enable you to build your distribution and access networks your way, selecting from our complete technology portfolio that enables you to choose licensed or unlicensed spectrum in LOS and nLOS environments.

## BUILD YOUR NETWORK YOUR WAY

**FREQUENCY**  Licensed  Unlicensed

**TERRAIN**  Line-of-sight  Near-line-of-sight

**NETWORK**  Access  Distribution

**SECURITY**  DES (56 bit)  AES (128 bit)  FIPS 197

**THROUGHPUT**  4  7  14  20  23  45  90 Mbps

**STANDARDS**  802.16e  Proprietary

**LATENCY**  3.5  7.5  25 ms

**CHANNEL WIDTH**  5  7  8  10  20 MHz

**SECTOR**  60°  90°



# PMP CONNECTIVITY AROUND THE WORLD

A small municipality in Italy needs to make its small police force more effective. An Internet Service Provider in the Australian Outback needs to connect people in town and in remote stations. A railroad company serving the coalfields of interior China needs to upgrade security along its entire route. A growing university in the suburbs of Chicago needs reliable e-learning connectivity in classrooms, dorms and outdoor campus environments. A service provider's residential customers need broadband speeds for applications from social networking to interactive gaming.

**SERGNANO, ITALY**  
Enabling a small municipality to cost-effectively monitor local streets and areas to help reduce crime.

**OKLAHOMA, USA**  
Helping a state electric utility deploy smart grid solutions that monitor customer usage, reduce energy consumption and save money.

**ILLINOIS, USA**  
Deploying a university's campus-wide wireless broadband network with the reliability and the coverage that significantly increases network use by students and faculty.

**PERU**  
Providing remote locations with high-speed communications for emergency first responders such as police and firefighters.

**MACEDONIA**  
Quickly deploying the country's first wireless backbone network to deliver high-speed connectivity in both rural and urban areas nationwide.

**CHINA**  
Providing the Heart of China Railway Bureau with upgraded station security in three coal-rich interior provinces.

**NOVA SCOTIA, CANADA**  
Enabling wireless broadband connectivity for 40,000 rural customers over 24,000 square miles.

**KENYA**  
Empowering corporate ISP AccessKenya to quadruple its business in just two years.

**RAJASTHAN, INDIA**  
Installing a wireless backbone network for connecting more than 10,000 local self-governing councils.

**AUSTRALIA**  
Helping ISP Ocean Broadband provide high performance wireless broadband connectivity to communities in Australia.

## ABOUT CAMBIUM NETWORKS

Cambium Networks provides world-class wireless broadband and microwave solutions for military, government, municipal and enterprise customers around the world. It currently has more than 3.5 million products deployed in thousands of networks in over 150 countries, with its breakthrough technologies providing reliable, secure, cost-effective connectivity that's easy to deploy and proven to deliver outstanding metrics. Cambium's ecosystem of partners, development engineers, and support teams work together to design and deliver innovative, forward-looking solutions that provide data, voice and video connectivity when and where it's needed.