



Cambium Networks

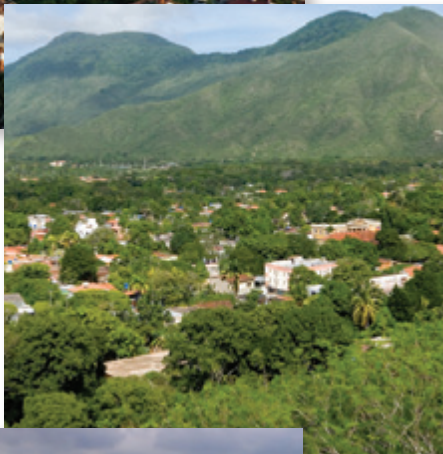
CAMBIUM POINT-TO-MULTIPOINT 320

# FAST, AFFORDABLE OUTDOOR CONNECTIVITY

WIRELESS BROADBAND AND ACCESS NETWORK SOLUTIONS



# FIXED OUTDOOR SOLUTIONS FOR LICENSED BROADBAND NETWORKS



The Cambium Networks wireless broadband Point-to-Multipoint (PMP) 320 is a low-cost fixed licensed outdoor distribution and access solution that delivers fast, affordable connectivity in a variety of environments and applications.

Around the world, service providers and enterprises that hold licensed spectrum in the 3 GHz band are investigating deploying 802.16e WiMAX to provide reliable, cost-effective data, voice and video connectivity for business and residential customers. There is a significant investment required for equipment and installation of a

full mobile WiMAX network, with many providers finding it difficult to build a business case for reaching subscribers in low-density locations at the edge of their networks or for building a new network in a low-density greenfield environment that only requires reliable fixed connectivity. The Cambium PMP 320 changes all that. The PMP 320 offers a fixed, outdoor solution that is easy to deploy and does not require the significant investment in core network equipment associated with mobile connectivity.

## LOW COST INFRASTRUCTURE

Because the PMP 320 is optimized for fixed, outdoor applications, infrastructure costs are kept to a minimum. There is no need for specialized gateways, routers or servers.

## RAPID DEPLOYMENT

Installation of the PMP 320 is quick and simple, with all-outdoor integrated radios and standards-based servers, yielding a faster time to market, lower costs and excellent return on investment.

## LICENSED SPECTRUM

The fixed outdoor PMP 320 solution is designed to allow service providers around the globe to combine the reliability of licensed bands and standards based equipment with an overall low total cost of ownership. The PMP 320 delivers low-cost, high-performance solutions for operators holding licenses in three different frequency ranges: 3.3-3.4 GHz, 3.4-3.6 GHz and 3.6-3.8 GHz. The PMP 320 supports standard WiMAX QoS profiles.

## STANDARDS BASED

The PMP 320 is interoperable with WiMAX 802.16e CPEs, supports all of the WiMAX QoS profiles, and uses standard AAA/RADIUS servers for authentication.

## PERFORMANCE

With 2x2 MIMO, 10 MHz channels, and 802.16e coding/error correction the PMP 320 delivers high throughput with excellent coverage and link budgets.

# HELPING OPERATORS GET MORE MILEAGE

The PMP 320 complements 802.16e WiMAX networks with an outdoor fixed solution that delivers maximum performance, coverage, security and ROI.



CAMBIUM PMP 320  
SUBSCRIBER MODULE & ACCESS POINT

Leveraging Cambium's worldwide wireless leadership, the PMP 320 combines low-cost connectivity with exceptional performance. This helps ensure not only extended service at the network edge, but also a competitive edge in customer satisfaction and return on investment. PMP 320 connectorized Access Points (APs) and integrated Subscriber Modules (SMs) provide a low cost, simple, low maintenance infrastructure that offers an attractive business case for getting maximum coverage and revenue from 802.16e WiMAX networks. The PMP 320 offers high reliability based on field-proven toughness, performance, scalability and ease-of-use.

- **PERFORMANCE.** The PMP 320 delivers high throughput for optimized performance, serving up to 200 subscribers per sector with a typical aggregate bandwidth of up to 45 Mbps (10 MHz channel) and even higher throughput with Multiple Input/Multiple Output (MIMO) technology. That means a typical four-sector tower can provide a maximum capacity of up to 180 Mbps across up to 800 subscribers. The PMP 320 also supports 65,000 packets per second. GPS synchronization, supported by the Cluster Management Module, helps reduce self-interference and maximize signal and throughput reliability. OFDMA (Orthogonal Frequency Division Multiple Access) and MIMO technologies provide maximum throughput in multipath environments.
- **RANGE.** Because the PMP 320 is a licensed spectrum solution, it is not subject to the system output power restrictions of unlicensed products, allowing it to provide higher throughput at longer range. The solution also uses 802.16e features such as turbocoding and higher levels of error correction to maximize range.
- **COVERAGE.** The PMP 320 utilizes 802.16e OFDMA technology that enables signals to perform in difficult multipath RF locations, providing line of sight (LOS) and near line of sight (nLOS) coverage in rugged, hard-to-reach terrain. In addition, the solution supports MIMO multiple antenna techniques, including MIMO Matrix A and B to enhance coverage and capacity.

## PMP 320 PERFORMANCE\*

<b>CHANNEL WIDTH</b>	5 MHz	7 MHz	10 MHz
<b>MAXIMUM DOWNLINK THROUGHPUT</b>	21 Mbps	26 Mbps	43 Mbps
<b>MAXIMUM UPLINK THROUGHPUT</b>	2.4 Mbps	3.3 Mbps	5 Mbps
<b>MAXIMUM LINE OF SIGHT RANGE</b>	Up to 40 km with extended range feature		

Based on example configuration: Matrix A mode, 75% Downlink, 25% Uplink  
NOTE: Range and throughput limited by environment and topography

- **SECURITY.** With FIPS 197 Certified 128-bit AES encryption, EAP-TTLS authentication and standard AAA/RADIUS authentication for tiers of service, the PMP 320 offers powerful security proven to safeguard data, voice and video transmissions against network intrusion and identity theft.

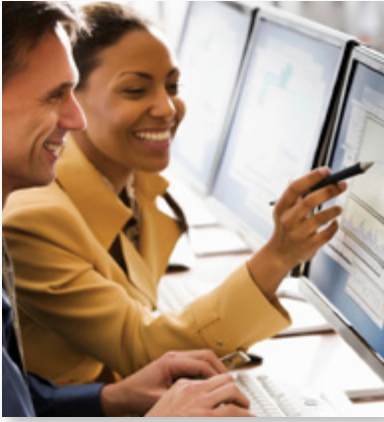
## DESIGNED FOR RELIABILITY

By design, the PMP 320 is optimized for fixed outdoor applications to meet the connectivity needs of 3 GHz license holders. It is part of the Cambium Wireless Broadband Point-to-Multipoint portfolio, and designed to be deployed as either a standalone system or as a complement to WiMAX networks and network expansions by interoperating with fixed WiMAX CPEs.

Today, there are currently more than 3 million Cambium Wireless Point-to-Multipoint modules working successfully and profitably in thousands of networks around the globe. Our PMP solutions are proven in virtually every type of environment: dense urban areas, sprawling suburban areas and outlying communities located in rugged and difficult terrain in more than 130 countries.

## MIMO PERFORMANCE

The PMP 320 uses Multiple Input Multiple Output (MIMO) technology to optimize performance. With two transmitters at the AP location and two receivers at the SM location, the system is able to use multipath technology to improve reliable connectivity (this is commonly referred to as "MIMO Matrix A"). If the radio conditions are sufficiently good, the PMP 320 will automatically shift to MIMO Matrix B, where multipath is used to send two independent data streams across each link, potentially doubling the useable throughput.



# MAXIMIZING THE VALUE OF LICENSED BROADBAND NETWORKS

For wireless service providers, Cambium's PMP 320 offers a reliable, cost-effective solution for maximizing performance, range and return on investment.

## GREENFIELD NETWORKS

License holding operators can use the PMP 320 to deploy low-cost fixed networks in unserved areas, providing customers with the high-speed access they need, and operators with excellent ROI.

## NETWORK EDGE

At the edge of existing mobile WiMAX networks there are often low-density population areas that cannot justify the expense of extending the mobile network. Using the PMP 320, operators can extend a fixed solution to these

areas much faster and much more cost-effectively. The result is broadband connectivity to customers who want and need it, as well as new operator revenues that deliver substantial return on investment.

## PRIVATE NETWORK

A license holding enterprise or government agency seeking a cost effective alternative to leased lines will find that the PMP 320 provides reliable, secure wireless broadband connectivity for data, video or voice applications.

## ABOUT CAMBIUM NETWORKS

Cambium Networks provides world-class wireless broadband and microwave solutions and services for customers around the world. Our products are deployed in thousands of networks in over 150 countries, with its innovative technologies providing reliable, secure, cost-effective connectivity that's easy to deploy and proven to deliver outstanding metrics. Our 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 is needed.

## CAMBIUM'S POINT-TO-MULTIPOINT SOLUTIONS PORTFOLIO

The Cambium PMP equipment portfolio provides a range of solutions in both licensed and unlicensed frequencies. Our solutions meet the bandwidth demands of business and residential subscribers, providing high throughput services such as video and high-speed data. The portfolio includes the Cambium PMP 320, the PMP 400 series, the PMP 430 and the PMP 100 series, allowing deployment of equipment designed to meet specific business case requirements.

CAMBIUM PMP SOLUTIONS		
	Speed Mbps*	nLOS
<b>PMP 320</b>	45	✓
<b>PMP 400</b>	20	✓
<b>PMP 430</b>	40	✓
<b>PMP 100</b>	7 / 14	

\*Total usable throughput per sector

For more information on how the PMP 320 can help you deploy reliable, licensed band solutions to provide high throughput and rapid ROI, contact your Cambium representative, or visit [www.cambiumnetworks.com](http://www.cambiumnetworks.com).