



Point-to-Multipoint 320

Wireless Broadband and Access Network Solutions



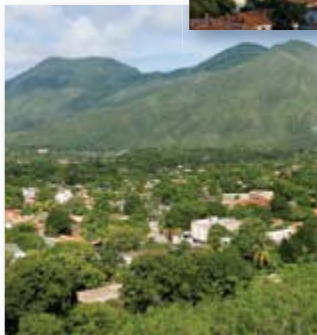
FIXED OUTDOOR SOLUTIONS FOR LICENSED BAND NETWORKS



The Motorola 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 Motorola 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.

WHY 802.16e FOR FIXED APPLICATIONS?

The number of deployments using mobile WiMAX (based on the IEEE 802.16e-2005 global standard) is growing rapidly. There is a broad selection of attractive devices in the ecosystem. This reduces investment risk and leads to lower-cost customer acquisition, which in turn improves the business case. Although the 802.16e standard is attractive for large networks, the investment required for fully mobile deployments is difficult to justify for fixed applications.

The 802.16e standard is attractive for fixed only deployments because it is:

- **A SUPERIOR BUSINESS CASE.** 802.16e has a better Total Cost of Ownership (TCO) because it requires fewer towers and delivers better throughput and coverage.
- **LOWER RISK.** 802.16e is a growing market with more device selection and more investment by service providers.
- **A GROWING FUTURE.** Because most equipment manufacturers are focusing their R&D dollars on the 802.16e standard, it is both future proof and the standard for innovation.

The PMP 320 provides 802.16e interoperability for these fixed outdoor applications, allowing deployment in new geography or to complement existing mobile WiMAX networks.

- **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 FROM THEIR LICENSED BROADBAND NETWORKS

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

Leveraging Motorola'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.

- **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.

PMP 320 PERFORMANCE*

CHANNEL WIDTH	5 MHz	7 MHz	10 MHz
MAXIMUM DOWNLINK THROUGHPUT	21 Mbps	26 Mbps	43 Mbps
MAXIMUM UPLINK THROUGHPUT	2.4 Mbps	3.3 Mbps	5 Mbps
MAXIMUM LINE OF SIGHT RANGE	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

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 Motorola 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 2.5 million Motorola 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 120 countries.



MOTOROLA PMP 320
SUBSCRIBER MODULE
& ACCESS POINT

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.

HOW THE PMP 320 IS HELPING MAXIMIZE THE VALUE OF LICENSED BROADBAND NETWORKS

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



WIRELESS AGILITY FOR NETWORK OPERATORS

Broadband networks need to provide reliable data, video and voice connectivity wherever it is needed. Motorola's Wireless Broadband and our WLAN solutions provide and extend coverage both indoors and outdoors. The Motorola Wireless Broadband portfolio offers high-speed Point-to-Point, Point-to-Multipoint, Mesh Wide Area Networks, WiFi and WiMAX networks that support data, voice and video communications, enabling fixed and mobile applications for public and private systems.

- **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.

Motorola's Point-to-Multipoint Solutions Portfolio

The Motorola 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 Motorola 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.

MOTOROLA PMP SOLUTIONS

	Speed Mbps	nLOS
PMP 320	45	✓
PMP 400	20	✓
PMP 430	40	✓
PMP 100	7/14	

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 Motorola representative, or visit www.motorola.com/pmp.



MOTOROLA

Motorola, Inc. 1301 E. Algonquin Road, Schaumburg, Illinois 60196 U.S.A. www.motorola.com/pmp

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