

# PMP 450 Subscriber Module

## VERTICAL MARKETS AND SOLUTIONS

### WIRELESS SERVICE PROVIDERS (WISPs)

- Rural connectivity
- Municipal connectivity
- Remote office connectivity
- Primary or redundant connectivity

### GOVERNMENT PUBLIC SAFETY SECTOR

- Data Connectivity and Video Surveillance for Public Safety
- Disaster Recovery for Public Service
- Data Network for Public Works

### ENTERPRISES

- Video surveillance backhaul
- Device/site monitoring
- LAN extension
- Leased line replacement



PMP 450 Subscriber Module

## Introduction

The Cambium Networks PMP 450 is our industry-leading wireless access network platform. Our solution is ideal for industry verticals such as WISPs (Wireless Service Providers), Enterprises and the Government Public Safety Sector. Designed for fixed outdoor applications, the PMP 450 platform is optimized for rate, reach, reliability and throughput. It features the most resilient and effective set of wireless broadband technologies in the marketplace.

Now available in most popular global bands, 2.4, 3.5, 3.65 and 5 GHz, the Cambium Networks Point-to-Multipoint (PMP) 450 Subscriber Module (SM) supports tiered service models. Software defined upgrades allow throughput from 4 Mbps to over 100 Mbps and as a result improve revenue optimization.

From the innovative GPS Synchronization options to interoperability with existing portfolio modules, the PMP 450 provides flexible deployment options that make it an excellent fit for high capacity, high reliability networks.

## Main Differentiators

» **MAXIMIZED SPECTRAL EFFICIENCY IN DENSE SERVICES AREAS** is enabled by our innovative GPS Sync Technology in combination with long range and high density coverage. This allows for configuration of more subscribers utilizing fewer access points, while preserving quality of service in spectrum-constrained environments. By lowering installation costs and maintenance, GPS Sync reduces operating expenses and improves growth and profitability.

» **OPTIMAL TRIPLE PLAY BACKHAUL** empowered by effective Quality of Service (QoS) management allows providers to confidently offer triple play services – VoIP (Voice over IP), video and data. Providing customers with excellent service ensures their continued loyalty and transforms them into advocates, helping WISPs and enterprises expand their business.

» **CARRIER-GRADE RELIABLE HARDWARE** by Cambium Networks is constructed from high quality industrial components; it is outdoor-rated and rigorously tested to satisfy the most difficult environmental conditions. With 40-year MTBF, our equipment standards are unsurpassed in industries requiring fixed wireless broadband.

## Powerful Features

The Cambium Networks PMP 450 platform is designed for growth. It allows service providers to efficiently and cost-effectively offer popular multi-media services that maximize their revenue - high-speed data and cloud access, video on demand, reliable fixed voice and VoIP. The PMP 450 solution provides reliable coverage across large service areas in urban, suburban, rural and remote locations.

**2x2 MIMO-OFDM** technology allows dual stream operation for most channel conditions, guaranteeing successful deployment of wireless networks in challenging environments.

**Low latency of 3 - 5 ms** effectively supports video and VoIP services. **Flexible channel width** (5, 7, 10, 15, 20 or 30 MHz) allows users to select the most effective channel width for the current network environment. **256-QAM** modulation rate offers the unique ability to use the PMP 450 platform for services requiring fast and reliable transmission. **System performance** is ensured by vigorous testing with a compatible set of radios, guaranteeing predictable link budget results. Cambium Networks specifications are consistent with real life conditions.

| PRODUCT                                                |                                                                                            |                              |                                                |                              |                              |
|--------------------------------------------------------|--------------------------------------------------------------------------------------------|------------------------------|------------------------------------------------|------------------------------|------------------------------|
| MODEL NUMBERS<br>(-005 THROUGH -008 ARE CONNECTORIZED) |                                                                                            | 4 Mbps                       | 10 Mbps                                        | 20 Mbps                      | UNCAPPED                     |
|                                                        | 5 GHz                                                                                      | C054045C001B<br>C054045C005B | C054045C002B<br>C054045C006B                   | C054045C003B<br>C054045C007B | C054045C004B<br>C054045C008B |
|                                                        | 2.4 GHz                                                                                    | C024045C001A<br>C024045C005A | C024045C002A<br>C024045C006A                   | C024045C003A<br>C024045C007A | C024045C004A<br>C024045C008A |
|                                                        | 3.3-3.6 GHz                                                                                | C035045C001A<br>C035045C005A | C035045C002A<br>C035045C006A                   | C035045C003A<br>C035045C007A | C035045C004A<br>C035045C008A |
|                                                        | 3.55-3.8 GHz                                                                               | C036045C001A<br>C036045C005A | C036045C002A<br>C036045C006A                   | C036045C003A<br>C036045C007A | C036045C004A<br>C036045C008A |
| SPECTRUM                                               |                                                                                            |                              |                                                |                              |                              |
| FREQUENCY RANGE                                        | 5470 - 5875 MHz<br>2400 - 2483.5 MHz                                                       |                              | 3300 – 3600 MHz<br>3550 – 3800 MHz             |                              |                              |
| CHANNEL WIDTH                                          | 5 MHz, 10 MHz, 15 MHz, 20 MHz or 30 MHz                                                    |                              | 5 MHz, 7 MHz, 10 MHz, 15 MHz, 20 MHz or 30 MHz |                              |                              |
| CHANNEL SPACING                                        | Selectable on 2.5 MHz increments                                                           |                              | Configurable to 50 KHz                         |                              |                              |
| INTERFACE                                              |                                                                                            |                              |                                                |                              |                              |
| MAC (MEDIA ACCESS CONTROL) LAYER                       | Cambium Networks proprietary                                                               |                              |                                                |                              |                              |
| PHYSICAL LAYER                                         | 2x2 MIMO OFDM                                                                              |                              |                                                |                              |                              |
| ETHERNET INTERFACE                                     | 10/100/BaseT, half/full duplex, rate auto negotiated (802.3 compliant)                     |                              |                                                |                              |                              |
| PROTOCOLS USED                                         | IPv4, UDP, TCP, IP, ICMP, Telnet, SNMP, HTTP, FTP                                          |                              |                                                |                              |                              |
| NETWORK MANAGEMENT                                     | HTTP, HTTPS, Telnet, FTP, SNMP v3                                                          |                              |                                                |                              |                              |
| VLAN                                                   | 802.1ad (DVLAN Q-inQ), 802.1Q with 802.1p priority, dynamic port VID                       |                              |                                                |                              |                              |
| PERFORMANCE                                            |                                                                                            |                              |                                                |                              |                              |
| ARQ                                                    | YES                                                                                        |                              |                                                |                              |                              |
| MODULATION LEVELS (ADAPTIVE)                           | MODULATION                                                                                 |                              | SIGNAL TO NOISE REQUIRED (SNR, in dB)          |                              |                              |
| 2X                                                     | QPSK                                                                                       |                              | 10                                             |                              |                              |
| 4X                                                     | 16-QAM                                                                                     |                              | 17                                             |                              |                              |
| 6X                                                     | 64-QAM                                                                                     |                              | 24                                             |                              |                              |
| 8X                                                     | 256-QAM                                                                                    |                              | 32                                             |                              |                              |
| MODULATION MODES (DYNAMIC)                             | Dual Payload (higher throughput) MIMO-8 or Single Payload (polarity diversity) MIMO-A      |                              |                                                |                              |                              |
| MAXIMUM DEPLOYMENT RANGE                               | Up to 40 miles                                                                             |                              |                                                |                              |                              |
| LATENCY                                                | 3 - 5 ms, typical                                                                          |                              |                                                |                              |                              |
| GPS SYNCHRONIZATION                                    | Yes, via Autosync (CMM3, CMM4, uGPS, iGPS)                                                 |                              |                                                |                              |                              |
| QUALITY OF SERVICE                                     | Diffserv QoS                                                                               |                              |                                                |                              |                              |
| LINK BUDGET                                            |                                                                                            |                              |                                                |                              |                              |
| ANTENNA BEAM WIDTH                                     | 55° Azimuth, 55° Elevation (both polarizations)                                            |                              |                                                |                              |                              |
| ANTENNA GAIN                                           | 9 dBi H+V, Integrated Patch (5 GHz)<br>8 dBi Dual Slant, Integrated Patch (2.4 GHz, 3 GHz) |                              |                                                |                              |                              |
| TRANSMIT POWER RANGE                                   | -30 TO +22 dBm (combined, to EIRP limit by region) (1 dB interval) (+25 dBm FOR 3 GHz)     |                              |                                                |                              |                              |
| MAXIMUM TRANSMIT POWER                                 | +22 dBm combined (+25 dBm combined for 3 GHz)                                              |                              |                                                |                              |                              |
| REFLECTOR GAIN                                         | +16 dBi for 5 GHz, +12 dBi for 2.4 GHz and 3 GHz                                           |                              |                                                |                              |                              |
| CLIP GAIN                                              | +8 dBi (with CLIP (Cassegrain Lens for Improved Performance), for 5 GHz only)              |                              |                                                |                              |                              |

| PHYSICAL                  |                                                                                                                                      |
|---------------------------|--------------------------------------------------------------------------------------------------------------------------------------|
| ANTENNA CONNECTION        | Integrated patch antenna, connectorized versions available                                                                           |
| SURGE SUPPRESSION         | IEC 61000-4-2 (ESD) 15kV (AIR), 8kV (contact)<br>IEC 61000-4-4 (EFT) 40A (5/50 ns)<br>IEC 61000-4-5 (LIGHTNING) 100A (8/20 $\mu$ s ) |
| MEAN TIME BETWEEN FAILURE | > 40 Years                                                                                                                           |
| ENVIRONMENTAL             | IP55                                                                                                                                 |
| TEMPERATURE               | -40°C TO +60°C (-40°F TO 140°F), 0-95% non-condensing                                                                                |
| WEIGHT                    | 0.45 kg (1 lb.)                                                                                                                      |
| DIMENSIONS (HxWxD)        | 30 x 9 x 9 cm (11.75" x 3.4" x 3.4")                                                                                                 |
| TYPICAL POWER CONSUMPTION | 9 W (5 GHz AND 2.4 GHz), 12 W (3 GHz)                                                                                                |
| MAXIMUM POWER CONSUMPTION | 12 W (5 GHz AND 2.4 GHz), 15 W (3 GHz)                                                                                               |
| INPUT VOLTAGE             | 20 TO 32 V                                                                                                                           |
| SECURITY                  |                                                                                                                                      |
| ENCRYPTION                | 56-bit DES, FIPS-197 128-bit AES                                                                                                     |
| CERTIFICATIONS            |                                                                                                                                      |
| INDUSTRY CANADA           | 109W-0001 (5.4, 5.8 GHz)<br>109W-0003 (2.4 GHz)<br>109W-0007 (3.5 GHz)<br>109W-0009 (3.65 GHz)                                       |
| FCC ID                    | Z8H89FT0001 (5.4, 5.8 GHz)<br>Z8H89FT0003 (2.4 GHz)<br>Z8H89FT0009 (3.65 GHz)                                                        |
| CE                        | EN 301 893 V1.7.1 (5.4 GHz)<br>EN 302 502 V1.2.1 (5.8 GHz)<br>EN 302 326-2 V1.2.2 (3 GHz)<br>EN 302 326-3 V1.3.1 (3 GHz)             |