

# PTP 45700 Fixed Wireless Backhaul

## QUICK LOOK:

National defense, border security, industrial communications, and critical infrastructure operators have experienced massive growth in bandwidth demands for reliable and secure broadband connectivity and backhaul.

- Single radio covers 4.4 GHz to 5.875 GHz compatible with NTIA Redbook / NATO Band IV and FCC/ETSI requirements
- Single radio can be deployed with integrated panel antenna or larger gain dishes using N-type connectors
- High-capacity multipoint (HCMP) or point-to-point (PTP) architectures in same hardware
- Dynamic Spectrum Optimization™ (DSO)



## ONE RADIO – MULTIPLE MISSIONS

Whether deploying in first-responder tactical situations, over water to oil platforms, in urban canyons to video cameras and hot-spots, or along remote stretches of national borders for defense and situational awareness, the requirements for high-speed connectivity intersect with constraints on available spectrum, line of sight and non-line of sight topologies, IT/ Enterprise integration, cyber-security threat prevention, and harsh environmental conditions.

The dynamic nature and complexity of these missions means that spectrum managers, network operators, and implementation managers need flexibility and adaptability while staying within the constraints of program budgets. The long-term total cost of ownership and sustainability of any solution comes under increasing scrutiny.

**With the PTP 45700, Cambium Networks breaks new ground in mission flexibility and overall project sustainability:**

- FIPS 140-2 NIST validated
- Ruggedized to MIL-STD-810
- Supports IPv6, SyncE, 1588v2



## PTP 45700 Fixed Wireless Backhaul

### Radio

<b>Model</b>	PTP 45700
<b>RF Bands</b>	Wide-band operation 4.4 GHz to 5.875 GHz in a single SKU, support bands including: <ul style="list-style-type: none"> <li>• NATO Band IV / NTIA Compliant (4.4 GHz to 4.99 GHz)</li> <li>• 4.9 GHz Public Safety Band</li> <li>• 5.1/5.2/5.4/5.8 GHz FCC/ETSI</li> </ul>
<b>Configuration</b>	1+0, 1+1 HSB; 2+0 (require external switch)
<b>Channel sizes</b>	5, 10, 15, 20, 30, 40, and 45 MHz channels. Channel sizes depend on individual country regulations.
<b>Spectral Efficiency</b>	10 bps/Hz maximum
<b>Channel selection</b>	By Dynamic Spectrum Optimization (DSO) or manual intervention Automatic selection on startup and continual self-optimization to avoid interference
<b>Maximum Transmit Power</b>	Up to 29 dBm
<b>System Gain</b>	Up to 169 dB with Integrated antenna
<b>Modulation / Error Correction</b>	Fast Preemptive Adaptive Modulation, featuring 13 modulation / FEC coding levels ranging from BPSK to 256 QAM dual payload MIMO
<b>Duplex Scheme</b>	Time Division Duplex (TDD) Adaptive or fixed transmit/receive duty cycles Split-frequency operation allows separate transmit and receive frequencies, where allowed by regulation. Optional TDD synchronization using PTP-SYNC Module
<b>Antenna</b>	Integrated flat panel: 23 dBi Connectorized: operate with a selection of separately purchased single- and dual-polarity antennas through 2 x N-type female connectors
<b>Range</b>	Up to 155 mi (250 km)
<b>Security</b>	128/256-bit AES encryption (optional) HTTPS and SNMPv3, user authentication and RADIUS support Identity-based user accounts Configurable password rules Event logging and management; optional logging via syslog

### Ethernet Bridging

<b>Protocol</b>	IEEE 802.3
<b>Latency</b>	1–3 ms one direction
<b>QoS</b>	Extensive QoS supporting up to 8 queues (PTP mode) and 4 queues (HCMP mode)
<b>Packet Classification</b>	Layer 2 and layer 3 IEEE 802.1p, MPLS
<b>Packet Performance</b>	Line rate (>850K packets per second)
<b>Timing Transport</b>	Synchronous Ethernet; IEEE 1588-2008 transparent clock
<b>Frame Support</b>	PTP Mode: Jumbo frame up to 9600 bytes HCMP Mode: 2000 bytes per frame
<b>Flexible I/O</b>	2 x Gigabit Ethernet copper ports: <ul style="list-style-type: none"> <li>• Gigabit Port 1: Data + PoE power input</li> <li>• Gigabit Port 2: 802.3at PoE output port</li> </ul> 1 x SFP port: single-mode fiber, multi-mode fiber or copper Gigabit Ethernet options available

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### Management

<b>Network Management</b>	In-band and out-of-band management (OOBM)
<b>System Management</b>	IPv6/IPv4 dual-stack management support Web access via browser using HTTP or HTTPS SNMP v1, v2c and v3, MIB-II, and proprietary PTP MIB Online spectrum analyzer (no impact on payload traffic or network operation)
<b>Installation</b>	Built-in audio and graphical assistance for link optimization

### High-Capacity Multipoint

<b>Remote Modules Master</b>	Up to 8 nodes																
<b>Channel Bandwidth</b>	20 MHz and 40 MHz																
<b>Spectral Efficiency in HCMP</b>	8 bps/Hz Max																
<b>Line Rate Packet per Second</b>	850K pps																
<b>Latency in HCMP Mode</b>	2 to 4 ms one way (typically)																
<b>Antenna Options</b>	4.4 GHz–5.875 GHz 90° sector (15 dBi gain) 4.4 GHz–5.875 GHz 36° sector (16 dBi gain)																
<b>Data Capacity per Remote Module in 1:1 Symmetry</b>	<table border="1"> <thead> <tr> <th>Number of Remote Module @ 40 MHz:</th> <th>2</th> <th>3</th> <th>4</th> <th>5</th> <th>6</th> <th>7</th> <th>8</th> </tr> </thead> <tbody> <tr> <td><b>Mbps:</b></td> <td>162</td> <td>106</td> <td>80</td> <td>66</td> <td>56</td> <td>46</td> <td>42</td> </tr> </tbody> </table>	Number of Remote Module @ 40 MHz:	2	3	4	5	6	7	8	<b>Mbps:</b>	162	106	80	66	56	46	42
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### Mechanical Specifications

<b>Dimensions (H x W x D)</b>	<b>Integrated Outdoor Unit (ODU):</b> 429 x 371 x 96 mm (16.9 x 14.6 x 3.8 in) <b>Connectorized ODU:</b> 318 x 204 x 90 mm (12.5 x 8.0 x 3.5 in)
<b>Weight</b>	<b>Connectorized + Integrated ODU:</b> 5.3 kg (11.7 lb) including bracket <b>Outdoor Unit (ODU):</b> 3.1 kg (6.8 lb) including bracket
<b>Operating Temperature</b>	-40° to 60°C (-40° to 140°F)
<b>Environmental Rating</b>	IP66 and IP67
<b>Shock/Vibration/Temperature</b>	MIL-STD-810
<b>Wind Speed Survival</b>	322 kph (200 mph)
<b>Power Supply</b>	AC + DC power injector: -40° to 140° F (-40° to 60° C); 70 W; 90-240 VAC, 50/60 Hz
<b>Power Consumption</b>	40W maximum (up to 70W with 802.3at device on auxiliary port)

### Environmental and Regulatory

<b>Protection and Safety</b>	UL 62368-1 and UL 60950-22; EN IEC 62368-1 and IEC 62368-3; EN 60529; CSA C22.2 62368-1, CSA C22.2 60950-22; CB approval for global use
<b>Radio</b>	4.9 GHz: FCC Part 90Y, RSS-111 5.x GHz: FCC Part 15, sub-parts 15C and 15E; RSS 247 Issue 1 EN 302 502; EN 301 893; EN 302 625; Eire ComReg 02/71R1, UK Approval to IR2007 NTIA Redbook; RSS-210
<b>EMC</b>	EN 301 489-1, EN 301 489-4, EN 301 489-17; FCC Part 15B Class B, ICES-003 Class B

## PTP 45700 Fixed Wireless Backhaul

Receiver Sensitivity and Transmit Power dBm @ 4.7 GHz								
Modulation Mode	5 MHz	10 MHz	15 MHz	20 MHz	30 MHz	40 MHz	45 MHz	Transmit Power (dBm)
<b>BPSK 0.63 Single</b>	-93.5	-92.0	-90.2	-89.0	-87.2	-86.0	-85.5	28.0
<b>QPSK 0.63 Single</b>	-90.0	-88.5	-86.7	-85.5	-83.7	-82.5	-82.0	27.0
<b>QPSK 0.87 Dual</b>	-86.0	-84.5	-82.7	-81.5	-79.7	-78.5	-77.9	26.0
<b>16QAM 0.63 Single</b>	-84.1	-82.6	-80.8	-79.5	-77.8	-76.5	-76.0	25.0
<b>16QAM 0.63 Dual</b>	-81.0	-79.5	-77.8	-76.5	-74.8	-73.5	-73.0	25.0
<b>16QAM 0.87 Single</b>	-79.4	-77.9	-76.1	-74.8	-73.1	-71.8	-71.3	24.0
<b>16QAM 0.87 Dual</b>	-76.3	-74.8	-73.0	-71.8	-70.0	-68.8	-68.3	24.0
<b>64QAM 0.75 Single</b>	-76.4	-74.9	-73.1	-71.9	-70.1	-68.9	-68.4	23.0
<b>64QAM 0.75 Dual</b>	-73.3	-71.8	-70.0	-68.8	-67.0	-65.8	-65.3	23.0
<b>64QAM 0.92 Single</b>	-72.6	-71.1	-69.4	-68.1	-66.3	-65.1	-64.6	23.0
<b>64QAM 0.92 Dual</b>	-69.4	-67.9	-66.1	-64.8	-63.1	-61.8	-61.3	23.0
<b>256QAM 0.81 Single</b>	-69.4	-67.9	-66.1	-64.8	-63.1	-61.8	-61.3	23.0
<b>256QAM 0.81 Dual</b>	-65.8	-64.3	-62.5	-61.3	-59.5	-58.3	-57.8	23.0

Throughput (Mbps @ 5 km)							
Modulation Mode	5 MHz	10 MHz	15 MHz	20 MHz	30 MHz	40 MHz	45 MHz
<b>BPSK 0.63 Single</b>	2.3	4.8	7.2	9.6	14.5	19.8	21.7
<b>QPSK 0.63 Single</b>	4.7	9.6	14.5	19.2	29.1	39.7	43.5
<b>QPSK 0.87 Dual</b>	6.5	13.4	20.2	26.8	40.5	55.2	60.5
<b>16QAM 0.63 Single</b>	9.3	19.3	29.0	38.5	58.1	79.4	87.0
<b>16QAM 0.63 Dual</b>	12.9	26.8	40.3	53.5	80.9	110.4	121.0
<b>16QAM 0.87 Single</b>	16.6	34.5	51.8	68.8	103.9	141.9	155.5
<b>16QAM 0.87 Dual</b>	20.4	42.2	63.4	84.2	127.2	173.7	190.3
<b>64QAM 0.75 Single</b>	24.2	50.0	75.3	99.9	151.0	206.1	225.9
<b>64QAM 0.75 Dual</b>	18.6	38.5	58.0	77.0	116.3	158.7	173.9
<b>64QAM 0.92 Single</b>	25.9	53.6	80.7	107.1	161.7	220.8	241.9
<b>64QAM 0.92 Dual</b>	33.3	68.9	103.7	137.6	207.9	283.8	311.0
<b>256QAM 0.81 Single</b>	40.7	84.2	126.9	168.4	254.4	347.3	380.6
<b>256QAM 0.81 Dual</b>	48.4	100.1	150.6	199.9	301.9	412.2	451.7

### ABOUT CAMBIUM NETWORKS

Cambium Networks enables service providers, enterprises, industrial organizations, and governments to deliver exceptional digital experiences and device connectivity with compelling economics. Our ONE Network platform simplifies management of Cambium Networks' wired and wireless broadband and network edge technologies. Our customers can focus more resources on managing their business rather than the network. We make connectivity that just works.