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 Multi Point (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-810G
- Supports IPv6, SyncE, 1588v2

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Radio	
Model	PTP 45700
RF Bands	Wide-band operation 4.4 to 5.875 GHz in a single SKU, support bands including: • NATO Band IV / NTIA Compliant (4.4 GHz to 4.99 GHz) • 4.9 GHz Public Safety Band • 5.1/5.2/5.4/5.8 GHz FCC/ETSI
Configuration	1+0, 1+1 HSB; 2+0 (require external switch)
Channel sizes	5, 10, 15, 20, 30, 40, and 45 MHz channels. Channel sizes depend on individual country regulations
Spectral Efficiency	10 bps/Hz maximum
Channel selection	By Dynamic Spectrum Optimization (DSO) or manual intervention Automatic selection on start-up and continual self-optimization to avoid interference
Maximum Transmit Power	Up to 29 dBm
System Gain	Up to 169 dB with Integrated antenna
Modulation / Error Correction	Fast Preemptive Adaptive Modulation featuring 13 modulation / FEC coding levels ranging from BPSK to 256 QAM dual payload MIMO
Duplex Scheme	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
Antenna	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
Range	Up to 155 miles (250 km)
Security	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 Disaster recovery and vulnerability management FIPS-197 compliant

Ethernet Bridging	
Protocol	IEEE 802.3
Latency	1-3 ms one direction
QoS	Extensive QoS supporting up to 8 Queues (PTP mode) and 4 Queues (HCMP mode)
Packet Classification	Layer 2 and Layer 3 IEEE 802.1p, MPLS
Packet Performance	Line rate (>850K packets per second)
Timing Transport	Synchronous Ethernet; IEEE 1588-2008 Transparent Clock
Frame Support	PTP Mode: Jumbo frame up to 9600 bytes; HCMP Mode: 2000 bytes per frame
Flexible I/O	2 x Gigabit Ethernet copper ports: Gigabit Port 1: Data + PoE power input Gigabit Port 2: 802.3at PoE output port 1 x SFP port: single-mode fiber, multi-mode fiber or copper Gigabit Ethernet options available
T1/E1 TDM Support	8 x T1/E1 TDM (Network Indoor Unit (NIDU)) G.823-compliant timing DC power input (compatible with AC+DC Power Injector output)

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Management

Network Management	In-band and out-of-band management (OOBM)
System Management	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
Installation	Built-in audio and graphical assistance for link optimization

High Capacity Multi-Point

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

Mechanical Specifications

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

Environmental and Regulatory

Protection and Safety	UL60950-1 and -22; IEC60950-1 and -22; EN60950-1 and -22; CSA-C22.2 No. 60950-1; CSA-C22 No. 60950-22-7; CB approval for Global
Radio	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
EMC	Europe – EN 301 489-1 and -17; FCC Part 15B Class B

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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)**
BPSK 0.63 Single	-93.5	-92.0	-90.2	-89.0	-87.2	-86.0	-85.5	28.0
QPSK 0.63 Single	-90.0	-88.5	-86.7	-85.5	-83.7	-82.5	-82.0	27.0
QPSK 0.87 Dual	-86.0	-84.5	-82.7	-81.5	-79.7	-78.5	-77.9	26.0
16QAM 0.63 Single	-84.1	-82.6	-80.8	-79.5	-77.8	-76.5	-76.0	25.0
16QAM 0.63 Dual	-81.0	-79.5	-77.8	-76.5	-74.8	-73.5	-73.0	25.0
16QAM 0.87 Single	-79.4	-77.9	-76.1	-74.8	-73.1	-71.8	-71.3	24.0
16QAM 0.87 Dual	-76.3	-74.8	-73.0	-71.8	-70.0	-68.8	-68.3	24.0
64QAM 0.75 Single	-76.4	-74.9	-73.1	-71.9	-70.1	-68.9	-68.4	23.0
64QAM 0.75 Dual	-73.3	-71.8	-70.0	-68.8	-67.0	-65.8	-65.3	23.0
64QAM 0.92 Single	-72.6	-71.1	-69.4	-68.1	-66.3	-65.1	-64.6	23.0
64QAM 0.92 Dual	-69.4	-67.9	-66.1	-64.8	-63.1	-61.8	-61.3	23.0
256QAM 0.81 Single	-69.4	-67.9	-66.1	-64.8	-63.1	-61.8	-61.3	23.0
256QAM 0.81 Dual	-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**
BPSK 0.63 Single	2.3	4.8	7.2	9.6	14.5	19.8	21.7
QPSK 0.63 Single	4.7	9.6	14.5	19.2	29.1	39.7	43.5
QPSK 0.87 Dual	6.5	13.4	20.2	26.8	40.5	55.2	60.5
16QAM 0.63 Single	9.3	19.3	29.0	38.5	58.1	79.4	87.0
16QAM 0.63 Dual	12.9	26.8	40.3	53.5	80.9	110.4	121.0
16QAM 0.87 Single	16.6	34.5	51.8	68.8	103.9	141.9	155.5
16QAM 0.87 Dual	20.4	42.2	63.4	84.2	127.2	173.7	190.3
64QAM 0.75 Single	24.2	50.0	75.3	99.9	151.0	206.1	225.9
64QAM 0.75 Dual	18.6	38.5	58.0	77.0	116.3	158.7	173.9
64QAM 0.92 Single	25.9	53.6	80.7	107.1	161.7	220.8	241.9
64QAM 0.92 Dual	33.3	68.9	103.7	137.6	207.9	283.8	311.0
256QAM 0.81 Single	40.7	84.2	126.9	168.4	254.4	347.3	380.6
256QAM 0.81 Dual	48.4	100.1	150.6	199.9	301.9	412.2	451.7

ABOUT CAMBIUM NETWORKS

Cambium Networks empowers millions of people with wireless connectivity worldwide. Its wireless portfolio is used by commercial and government network operators as well as broadband service providers to connect people, places and things. With a single network architecture spanning fixed wireless and Wi-Fi, Cambium Networks enables operators to achieve maximum performance with minimal spectrum. End-to-end cloud management transforms networks into dynamic environments that evolve to meet changing needs with minimal physical human intervention. Cambium Networks empowers a growing ecosystem of partners who design and deliver gigabit wireless solutions that just work.

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