Cambium Networks

PTP 670

PTP 670 INTEGRATED

PTP 670 CONNECTORIZED

Service providers, government public safety agencies, and critical infrastructure operators such as utilities and energy companies have experienced massive growth in bandwidth demands for reliable and secure broadband connectivity and backhaul. The nature of these deployments for small-cell backhaul, disaster recovery, video surveillance and Wi-Fi backhaul drive variety of deployment topologies.

Now with the Point-to-Point (PTP) 670 Series solution, Cambium Networks combines best-in- class spectral efficiency and reliability with high-capacity multipoint (HCMP) deployment flexibility. With up to 450 Mbps aggregate throughput, PTP 670 systems let you flexibly, reliably and securely handle today's needs.

FLEXIBLE, SPECTRALLY-EFFICIENT, SELF-OPTIMIZING SUB-6GHZ SOLUTION

Based on our widely deployed, field-proven non-line-of sight (NLOS) technology, PTP 670 wireless Ethernet bridges offer an array of features that give you more capacity, greater operational flexibility, and the highest spectral efficiency in the industry. PTP 670 systems provide 4.9 to 6.05 GHz, multi-band flexibility in a single radio and operate in channel sizes from 5 to 45 MHz.

With Dynamic Spectrum Optimization (DSO), PTP 670 systems are constantly optimizing the channel of operation to maximize link reliability and performance. The systems can provide up to 99.999% availability in virtually any environment, including non-line-of-sight, long-distance line-of-sight, high interference, over water and desert, and through extreme weather conditions. As a result, you can deliver more throughput with less spectrum and less investment in even the most challenging environments

HIGH-CAPACITY MULTIPOINT and POINT-TO-POINT IN SINGLE SOLUTION

With the PTP 670, operators now have the flexibility to deploy not only in Point to Point topologies but also in High-Capacity Multipoint (HCMP) Applications. HCMP allows for up to 8 remote nodes to connect to a single master radio opening up new deployment models that enable rapid deployment, simplify planning and by using the same hardware regardless of topology a rapid return on investment in equipment and training. Whether your organization is an enterprise, government agency, or service provider, PTP 670 systems are ideal solutions for a wide array of applications such as T1/E1 and fiber replacements or extensions; video surveillance backhaul; LTE, macro-cell, and small-cell backhaul; last-mile access; disaster recovery; network redundancy; and building-to-building campus connectivity.

FIELD TESTED AND SECURITY FOR PERFORMANCE IN THE REAL-WORLD

PTP 670 radios meet industry standards with proven compliance to assure you of interoperability, security, and ruggedization.

- FIPS-197 128/256-bit AES encryption
- IEEE 1588v2 and Synchronous Ethernet (SyncE)
- IPv6/IPv4 dual-stack management support
- Ingress Protection rated (IP66/67) protective aluminum radio enclosures

RADIO TECHNOLOGY	
MODEL	PTP 670
RF BANDS	Wide-band operation 4.9 to 6.05 GHz (Allowable frequencies and bands are dictated by individual country regulations)
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 or manual intervention Automatic selection on start-up and continual self-optimization to avoid interference
MAXIMUM TRANSMIT POWER	Up to 27 dBm
SYSTEM GAIN	Up to 164 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	FIPS-197 compliant 128/256-bit AES Encryption (optional) HTTPS and SNMPv3 Identity-based user accounts Configurable password rules User authentication and RADIUS support Event logging and management; optional logging via syslog Disaster recovery and vulnerability management
ETHERNET BRIDGING	
PROTOCOL	IEEE 802.3
LATENCY	1-3 ms one direction
QOS	Extensive QOS supporting up to 8 Queues
PACKET CLASSIFICATION	Layer 2 and Layer 3 IEEE 802.1p, MPLS, Ethernet priority
PACKET PERFORMANCE	Line rate (>850K packets per second)
TIMING TRANSPORT	Synchronous Ethernet; IEEE 1588v2
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)
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/TLS3 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

<table>
<tr><th colspan="2">HIGH CAPACITY MULTI POINT</th></tr>
<tr><td>REMOTE MODULES MASTER</td><td>Up to 8 Nodes</td></tr>
<tr><td>CHANNEL BANDWIDTH</td><td>20 MHz and 40 MHz</td></tr>
<tr><td>DATA CAPACITY PER REMOTE MODULE IN 1:1 SYMMETRY</td><td>
<table>
<tr><td>Number of Remote Module @ 40 MHz</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>7</td><td>8</td></tr>
<tr><td>Mbps</td><td>162</td><td>106</td><td>80</td><td>66</td><td>56</td><td>46</td><td>42</td></tr>
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</td></tr>
<tr><td>SPECTRAL EFFICIENCY IN HCMP</td><td>8 bps/Hz Max</td></tr>
<tr><td>LINE RATE PACKET PER SECOND</td><td>850K pps</td></tr>
<tr><td>LATENCY IN HCMP MODE</td><td>2 to 4 ms one way(typically)</td></tr>
<tr><th>PHYSICAL</th><th></th></tr>
<tr><td>DIMENSIONS</td><td>Integrated Outdoor Unit (ODU):
Width 305mm (12”), Height 305mm (13.5”), Depth 81mm (3.2”)
Connectorized ODU:
Width 204mm (8.0”), Height 318mm (12.5”), Depth 90mm (3.5”)</td></tr>
<tr><td>WEIGHT</td><td>Integrated ODU: 4.1 kg (8.95 lbs) including bracket
Connectorized ODU: 3.1 kg (6.8 lbs) including bracket</td></tr>
<tr><td>OPERATING TEMPERATURE</td><td>-40° to +168.8° F (-40° to +76° C)</td></tr>
<tr><td>DUST- WATER INTRUSION PROTECTION</td><td>IP66 and IP67</td></tr>
<tr><td>WIND SPEED SURVIVAL</td><td>200 mph (322 kph)</td></tr>
<tr><td>POWER SUPPLY</td><td>1. AC power injector: 32° to 104° F (0° to +40° C); 35 W; 90-240 VAC, 50/60Hz
Dimensions: Width 5.2”(132mm), Height 1.4”(36mm), Depth 2”(51mm)
2. AC + DC power injector: -40° to 140° F (-40° to +60° C); 70 W; 90-240 VAC, 50/60 Hz
Dimensions: Width 9.75” (250 mm), Height 1.5” (40 mm), Depth 3” (80 mm)</td></tr>
<tr><td>POWER CONSUMPTION</td><td>30 W maximum (up to 70 W with 802.3at device on auxiliary port)</td></tr>
<tr><th>ENVIRONMENTAL & REGULATORY</th><th></th></tr>
<tr><td>PROTECTION AND SAFTEY</td><td>UL60950-1; IEC60950-1; EN60950-1; CSA-C22.2 NO. 60950-1; CB approval for Global</td></tr>
<tr><td>RADIO</td><td>4.9 GHz: FCC Part 90Y, RSS-111
5.x GHz: FCC Part 15, sub-parts 15C and 15E; RSS 210 Issue 8;
EN 302 502; EN 301 893 Eire ComReg 02/71R1, UK Approval to IR2007</td></tr>
<tr><td>EMC</td><td>Europe – EN 301 489-1 and -4</td></tr>
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RECEIVER SENSITIVTY AND TRANSMIT POWER dbm @ 5.8 GHz								
	Channel Size							Transmit Power (dBm)
Modulation Mode	5 MHz	10 MHz	15 MHz	20 MHz	30 MHz	40 MHz	45 MHz	
BPSK 0.63 Single	-96.8	-94.8	-93.0	-91.8	-90.0	-88.8	-88.3	27
QPSK 0.63 Single	-93.7	-91.7	-89.9	-88.7	-86.9	-85.7	-85.2	26
QPSK 0.87 Dual	-89.7	-87.7	-85.9	-84.7	-82.9	-81.7	-81.1	26
16QAM 0.63 Single	-87.4	-85.4	-83.6	-82.3	-80.6	-79.3	-78.8	25
16QAM 0.63 Dual	-83.4	-81.4	-79.6	-78.4	-76.6	-75.4	-74.9	25
16QAM 0.87 Single	-82.9	-80.8	-79.1	-77.8	-76.1	-74.8	-74.3	25
16QAM 0.87 Dual	-79.8	-77.8	-76.0	-74.8	-73.0	-71.8	-71.2	25
64QAM 0.75 Single	-79.8	-77.8	-76.0	-74.8	-73.0	-71.8	-71.2	24
64QAM 0.75 Dual	-76.7	-74.7	-72.9	-71.6	-69.9	-68.6	-68.1	24
64QAM 0.92 Single	-75.8	-73.8	-72.1	-70.8	-69.1	-67.8	-67.3	24
64QAM 0.92 Dual	-72.5	-70.5	-68.8	-67.5	-65.8	-64.5	-64.0	24
256QAM 0.81 Single	-72.5	-70.5	-68.7	-67.4	-65.7	-64.4	-63.9	23
256QAM 0.81 Dual	-68.8	-66.8	-65.0	-63.8	-62.0	-60.8	-60.3	23

THROUGHPUT (MBPS @ 5 km)							
	Channel Size						
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	19.9	21.8
QPSK 0.63 Single	4.7	9.6	14.5	19.3	29.1	39.7	43.5
QPSK 0.87 Single	6.5	13.4	20.2	26.8	40.5	55.2	60.5
16QAM 0.63 Single	6.5	13.4	20.2	26.8	40.5	55.3	60.6
16QAM 0.87 Single	9.3	19.3	29.0	38.5	58.2	79.5	87.1
64QAM 0.75 Single	12.1	25.1	37.7	50.0	75.6	103.2	113.1
64QAM 0.92 Single	16.7	34.5	51.9	68.9	104.1	142.1	155.7
256QAM 0.81 Single	24.2	50.1	75.4	100.1	151.1	206.3	226.1
16QAM 0.63 Dual	13.0	26.8	40.4	53.6	80.9	110.5	121.1
16QAM 0.87 Dual	18.6	38.6	58.0	77.0	116.4	158.9	174.1
64QAM 0.75 Dual	24.2	50.1	75.4	100.0	151.1	206.3	226.1
64QAM 0.92 Dual	33.3	69.0	103.8	137.8	208.1	284.1	311.3
256QAM 0.81 Dual	48.4	100.2	150.7	200.1	302.2	412.6	452.2