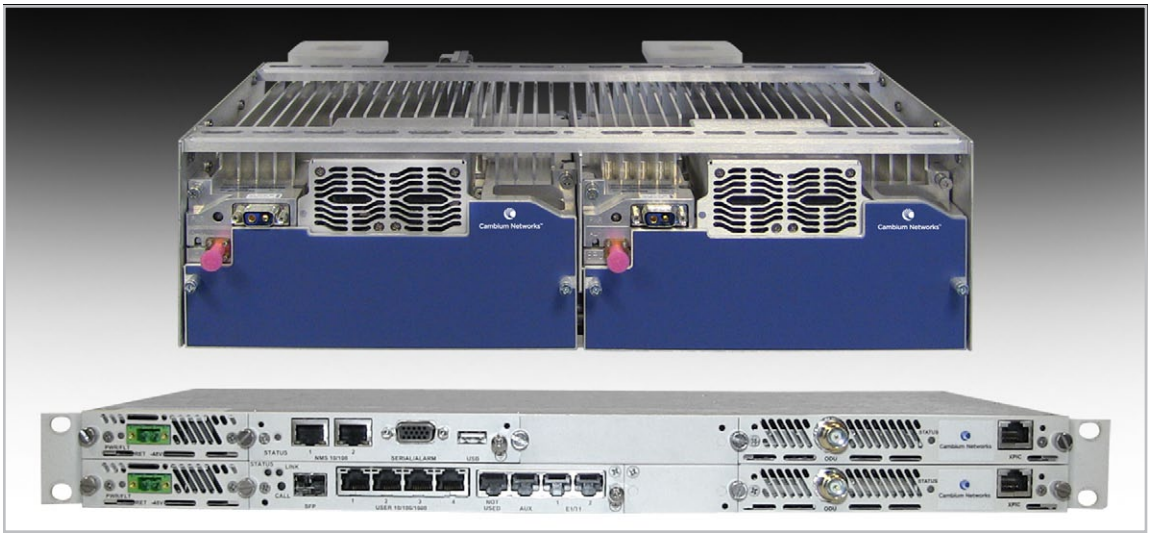

PTP 810i ALL-INDOOR SOLUTIONS

HIGH-PERFORMANCE LICENSED MICROWAVE WITH NATIVE ETHERNET AND NATIVE TDM SUPPORT IN ONE PLATFORM

With increasing demands for high-speed converged video, voice and data services, service providers and network operators are transitioning to all-IP (Internet Protocol) systems and extending Ethernet technology across their entire networks. The two-fold objective of these migrations is to lower operational and maintenance costs while supporting new packet-centric applications. However, as these networks evolve, TDM-based and Ethernet-based systems need to functionally co-exist to support a seamless migration. Our Cambium Point-to-Point (PTP) 810 Series Solutions are designed to help you make this transition smoothly and cost-effectively.

ALL-INDOOR ARCHITECTURE

The PTP 810 family of licensed microwave products offers you the choice between an all-indoor architecture and a split-mount architecture. The PTP 810i is our All-Indoor solution, and the PTP 810 is our Split-Mount solution. Information on the Split-Mount solution is available at PTP 810. With a PTP 810i All-Indoor system, you can install both the Indoor Radio Frequency Unit (IRFU) and the Modular Modem Unit (MMU) in your building or equipment housing unit. The antenna is mounted on a tower or rooftop and connects to the IRFU with a waveguide. Once deployed, any maintenance or upgrades to the IRFU and MMU can be performed easily regardless of the time of year or weather conditions.

FLEXIBLE AND POWERFUL

Our carrier-grade PTP 810i technology provides reliable, high-capacity connectivity and backhaul for both your Ethernet and TDM applications as you migrate to a packet-based environment. Designed for a wide variety of organizations such as public safety agencies, utility companies, railroads, and telecommunications providers, the PTP 810i All-Indoor solution operates in the 6 and 11 GHz radio frequency (RF) bands at up to 230 Mbps throughput. The systems support both Fast Ethernet and Gigabit Ethernet, making them ideal to cope with the bursts of sporadic, high-volume traffic served by Internet applications. The highly-modular PTP 810i supports both T1/E1 and STM-1/OC-3 interfaces, combined with a fully packet-based Carrier Ethernet Transport solution.

PREDICT PERFORMANCE ACCURATELY

Our industry-leading Cambium PTP LINKPlanner tool allows you to accurately project performance characteristics prior to purchase based on your specific radio path conditions. You can plan and optimize a single link or multiple links simultaneously, obtain configuration details to speed deployment, display a comprehensive overview of your entire wireless network via Google™ Earth, and receive a complete licensed-microwave Bill-of-Materials to simplify the ordering process. Thousands of PTP solutions have been planned and optimized using our LINKPlanner software. So, you can have full confidence that your system will perform as promised.

Radio Configuration		
Frequency (GHz)	**6**	**11**
Frequency Range (GHz)	5.925 ~ 6.425 (FCC/IC L6 GHz) 6.525 ~ 6.875 (FCC U6 GHz) 6.875 ~ 7.100 (FCC 7 GHz)	10.7 ~ 11.7 (FCC/IC)
Channel Bandwidth (MHz)	10, 30 (L6, U6) 25 (7 GHz)	10, 30, 40
Modulation	QPSK to 256 QAM	
Adaptive Coding & Modulation	Yes	
RF Channel Selection	Via Web GUI	
System Configuration	1 + 0, 1+1, 2+0, 1+1 w/SD	
Antenna Port Flange	WR-137 / CPR-137G	WR-90 / CPR-90G

MMU Configuration				
Base Model	**Standard**	**Standard Plus**	**GigE**	**Super PDH**
Capacity	1-16 E1/T1 + Ethernet + NMS	1-16 E1/T1 + Ethernet + STM-1 MUX/DEMUX + NMS	1-2 E1/T1 + Ethernet + NMS	1-42 E1/T1 + Ethernet + NMS
Optional additional E1/T1 Capacity	1-16 E1/T1 or 1-21 E1/T1	1-16 E1/T1 or 1-21 E1/T1	1-16 E1/T1 or 1-21 E1/T1	1-16 E1/T1 or 1-21 E1/T1
Optional additional STM-1 Capacity	1-3 STM-1	1-3 STM-1	1-3 STM-1	2 STM-1
Modulation	QPSK, 16-256 QAM Supports Both Fixed Modulation and Adaptive & Coding Modulation			
Channelization	10 - 40 MHz			
T1/E1	100 Ω / 120 Ω Balanced RJ-48C Female (2) Molex High-Density 60-pin (14)	100 Ω / 120 Ω Balanced RJ-48C Female (2) Molex High-Density 60-pin (14)	100 Ω / 120 Ω Balanced RJ-48C Female (2)	100 Ω / 120 Ω Balanced RJ-48C Female (2) Molex High-Density 60-pin (3x14)
Ethernet	10Base-T/ 100Base-TX / RJ-45 Female (2)	10Base-T/ 100Base-TX / RJ-45 Female (2)	10Base-T/ 100Base-TX/ 1000Base-T RJ-45 (4) SFP (1)	10Base-T/ 100Base-TX/ RJ-45 Female (2)
STM-1	Single Mode, SC Duplex Fiber 1310 nm or 75 Ohm BNC Coax or SFP			
Alarm Port	2 Form C (SPDT), 2 TTL Output, 4 TTL Input, DB15HD			
Auxiliary Data (64 kbps)	RS422 via RJ-45			
Network Management	SNMP, User GUI, CLI			
NMS Connector	10Base-T/ 100Base-TX/ RJ-45 Female (2)			
Encryption	AES for NMS			

PTP 810i All-Indoor Systems	
PTP 06810i	6 GHz
PTP 11810i	11 GHz

PHYSICAL

Physical Configuration	All indoor – Modular Modem Unit (MMU) and Indoor Radio Frequency Unit (IRFU)
Dimensions	IRFU: 17" (43.2 cm), Depth 11" (28.0 cm), Height 5.25" (13.3 cm) MMU: Width 17.5" (44.5 cm), Depth 9.375" (23.85 cm), Height 1.72" (4.45 cm)
Weight	IRFU-1+0 Configuration: 17.8 lbs (8.1 kg) IRFU-1+1 Configuration: 26.0 lbs (11.8 kg) MMU: 7 lbs (3.12 kg)
Connection	Waveguide between antenna and Indoor Radio Frequency unit (IRFU); IF cable between IRFU and Modular Modem Unit (MMU)
Power source	- 48 VDC
Power consumption	IRFU-HP: 88 Watts @48 VDC
MMU power consumption	Standard – 1-16 T1/E1 + Eth + NMS Single Modem: 36 Watts Maximum — Dual Modem: 56 Watts Maximum Standard Plus – 1-16 T1/E1 + Eth + STM-1 MUX/DEMUX + NMS Single Modem: 36 Watts Maximum — Dual Modem: 56 Watts Maximum GigE – 1-2 T1/E1 + Eth + NMS Single Modem: 40 Watts Maximum — Dual Modem: 58 Watts Maximum Super PDH – 1-42 T1/E1 + Eth + NMS Single Modem: 40 Watts Maximum — Dual Modem: 61 Watts Maximum
IRFU power consumption	IRFU – 1+0 Configuration 6 GHz: 85 Watts Maximum — 11 GHz: 75 Watts Maximum IRFU – 1+1 Configuration 6 GHz: 158 Watts Maximum — 11 GHz: 140 Watts Maximum

ENVIRONMENTAL & REGULATORY

Operating temperature	IRFU & MMU: 23° to +122° F (-5° to +50° C) EN 300 019-1-3
Humidity	IRFU & MMU: Up to 95%, non-condensing
Safety	UL 60950; IEC 60950; EN 60950; CSA 22.2 No. 60950
EMC	USA: FCC Part 15, Class B Europe: EN 301 489-1 and EN 301 489-4
Radio standard	FCC Regulation Title 47, Part 101 Industry Canada Specification RSS-GEN and relevant SRSP Specifications

User Data Throughput for 1+x (1+0 or 1+1) Configuration					
Channel Size (FCC)	**Modulation**	**Minimum Required Capacity Key**	**Maximum Link Throughput (Mbps) (Eth + T1)**	**Maximum Ethernet Throughput (Mbps)**	**Maximum Number of T1s Supported**
10 MHz	**QPSK**	10 Mbps	13.8	13.0	8
	16 QAM	30 Mbps	27.8	27.0	17
	32 QAM	30 Mbps	33.9	33.0	21
	64 QAM	40 Mbps	41.4	40.0	26
	128 QAM	50 Mbps	49.2	47.0	31
	256 QAM	50 Mbps	56.7	55.0	36
25 MHz	**QPSK**	40 Mbps	34.7	33.0	21
	16 QAM	100 Mbps	69.6	67.0	44
	32 QAM	100 Mbps	89.5	87.0	57
	64 QAM	100 Mbps	105.7	100.0	67
	128 QAM	150 Mbps	124.9	120.0	80
	256 QAM	150 Mbps	144.1	136.0	92
30 MHz	**QPSK**	40 Mbps	41.6	40.0	26
	16 QAM	100 Mbps	83.5	81.0	53
	32 QAM	100 Mbps	107.4	104.0	68
	64 QAM	150 Mbps	134.4	128.0	86
	128 QAM	150 Mbps	149.9	144.0	96
	256 QAM	150 Mbps	173.0	168.0	110
40 MHz	**QPSK**	50 Mbps	55.7	54.0	35
	16 QAM	100 Mbps	111.4	104.0	71
	32 QAM	150 Mbps	143.2	136.0	91
	64 QAM	150 Mbps	170.0	160.0	109
	128 QAM	200 Mbps	200.8	192.0	126
	256 QAM	200 Mbps	231.7	224.0	126

User Data Throughput for 2+0 Configuration					
Channel Size (FCC)	**Modulation**	**Minimum Required Capacity Key**	**Maximum Link Throughput (Mbps) (Eth + T1)**	**Maximum Ethernet Throughput (Mbps)**	**Maximum Number of T1s Supported**
10 MHz	**QPSK**	30 Mbps	27.6	24.0	16
	16 QAM	50 Mbps	55.5	52.0	34
	32 QAM	50 Mbps	67.8	64.0	42
	64 QAM	100 Mbps	82.8	80.0	52
	128 QAM	100 Mbps	98.3	94.0	62
	256 QAM	100 Mbps	113.4	110.0	72
25 MHz	**QPSK**	50 Mbps	69.4	66.0	42
	16 QAM	150 Mbps	139.2	135.0	88
	32 QAM	200 Mbps	179.0	174.0	114
	64 QAM	200 Mbps	211.4	200.0	134
	128 QAM	300 Mbps	249.9	240.0	160
	256 QAM	300 Mbps	288.3	272.0	184
30 MHz	**QPSK**	100 Mbps	83.2	80.0	52
	16 QAM	150 Mbps	167.1	162.0	106
	32 QAM	200 Mbps	214.8	208.0	136
	64 QAM	300 Mbps	268.8	256.0	172
	128 QAM	300 Mbps	299.8	288.0	192
	256 QAM	300 Mbps	345.9	336.0	205
40 MHz	**QPSK**	100 Mbps	111.4	108.0	70
	16 QAM	200 Mbps	222.7	208.0	142
	32 QAM	300 Mbps	286.3	272.0	182
	64 QAM	300 Mbps	339.9	320.0	205
	128 QAM	400 Mbps	401.7	384.0	205
	256 QAM	400 Mbps	463.5	448.0	205

User Data Throughput for XPIC Configuration					
Channel Size (FCC)	**Modulation**	**Minimum Required Capacity Key**	**Maximum Link Throughput (Mbps) (Eth + T1)**	**Maximum Ethernet Throughput (Mbps)**	**Maximum Number of T1s Supported**
30 MHz	**64 QAM**	300 Mbps	273.7	256.0	174
	128 QAM	300 Mbps	310.2	288.0	198
	256 QAM	400 Mbps	357.9	336.0	205
40 MHz	**64 QAM**	300 Mbps	349.9	336.0	205
	128 QAM	400 Mbps	413.5	400.0	205
	256 QAM	400 Mbps	477.4	464.0	205
	256 QAM	600 Mbps	696.4	672.0	205

NOTE:
While the information presented herein is, to the best of our knowledge, true and accurate, the information provided in this document is subject to change without notice.

Receive Sensitivity				
BER = 1e-6	**Modulation**	**Frequency (GHz)**		
		6	**7**	**11**
Receive Sensitivity @ 40 MHz channel (dBm)	**256 QAM**	N/A	N/A	-64.7
	128 QAM	N/A	N/A	-68.9
	64 QAM	N/A	N/A	-72.0
	32 QAM	N/A	N/A	-76.7
	16 QAM	N/A	N/A	-80.1
	QPSK	N/A	N/A	-86.3
Receive Sensitivity @ 30 MHz channel (dBm)	**256 QAM**	-65.9	N/A	-65.4
	128 QAM	-70.8	N/A	-70.3
	64 QAM	-72.6	N/A	-72.1
	32 QAM	-78.5	N/A	-78.0
	16 QAM	-81.8	N/A	-81.3
	QPSK	-86.0	N/A	-87.5

Receive Sensitivity continued				
BER = 1e-6	**Modulation**	**Frequency (GHz)**		
		6	**7**	**11**
Receive Sensitivity @ 25 MHz channel (dBm)	**256 QAM**	N/A	-66.6	N/A
	128 QAM	N/A	-71.6	N/A
	64 QAM	N/A	-74.8	N/A
	32 QAM	N/A	-79.3	N/A
	16 QAM	N/A	-82.6	N/A
	QPSK	N/A	-88.8	N/A
Receive Sensitivity @ 10 MHz channel (dBm)	**256 QAM**	-71.5	N/A	-71.0
	128 QAM	-75.1	N/A	-74.6
	64 QAM	-78.4	N/A	-77.9
	32 QAM	-82.1	N/A	-81.6
	16 QAM	-86.4	N/A	-85.9
	QPSK	-92.6	N/A	-92.1

Transmit Power		
Modulation	**IRFU-HP**	
	Frequency (GHz)	
	6	**11**
256 QAM	29	26
128 QAM	30	27
64 QAM	31	28
32 QAM	32	29
16 QAM	33	30
QPSK	34	31

For more information, refer to the PTP 810i Data Sheet.

Cambium Networks™

www.cambiumnetworks.com

Cambium Networks and the stylized circular logo are trademarks of Cambium Networks, Ltd. All other trademarks are the property of their respective owners. © Copyright 2012 Cambium Networks, Ltd. All rights reserved.

PTP 810i 01-10 SS 091312