![Cambium Networks]

PTP 810 SOLUTIONS

LICENSED MICROWAVE WITH NATIVE ETHERNET AND NATIVE TDM SUPPORT IN ONE PLATFORM

With increasing demands for high-speed converged video, voice and data services and the evolution of LTE and 4G networks, 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 highly-flexible, convenient Cambium Point-to-Point (PTP) 810 Licensed Microwave Solutions are designed to help you make this transition smoothly and cost-effectively. Our advanced PTP 810 technology platform is designed to provide the carrier-grade reliability and high performance necessary to address your current and future network needs as you migrate from legacy TDM technology to a packet-based environment.

CLEAR-CUT AND POWERFUL

PTP 810 systems offer you a straightforward, yet future-proof transition toward packet transport. 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 810 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 Specifications – General

Frequency (GHz)		L6	U6	7	8	11	13	15	18	23	26	28	32	38
Standard		ETSI / FCC	ETSI / FCC	ETSI	ETSI	ETSI / FCC	ETSI	ETSI	ETSI / FCC	ETSI / FCC	ETSI / FCC	ETSI	ETSI	ETSI / FCC
Frequency Range (GHz)		5.925 ~ 6.425	6.425 ~ 7.100	7.125 ~ 7.9	7.725 ~ 8.47	10.7 ~ 11.7	12.75 ~ 13.25	14.4 ~ 15.35	17.7 ~ 19.7	21.2 ~ 23.6	24.25 ~ 26.5	27.5 ~ 29.5	31.8 ~ 33.4	37.0 ~ 40.0
F C C	T/R Spacing (MHz)	252.04	160 170			490			1560	1200	800			700
	Channel Bandwidth (MHz)	10 30	10 30			10 30 40			10 20 30 40 50 80	10 20 30 40 50	10 20 40			10 50
E T S I	T/R Spacing (MHz)	252.04	340	154 161 168 196 245	119 208 266 311.32	490 530	266	315 420 490 644 728	1010	1008 1232	1008	1008	812	1260
	Channel Bandwidth (MHz)	29.65	7 14 30 40 60	7 14 28	7 14 28	40	7 14 28	7 14 28 56	7 13.75 27.5 55	7 14 28 56	7 14 28 56	7 14 28 56	7 14 28 56	7 14 28 56
RF Channel Selection		Via Web GUI (HTTP), CLI or EMS												
System Configuration		Non-Protected (1+0), Protected (1+1), 2+0, XPIC Spatial Diversity (SD), Frequency Diversity (FD)												
ATPC		Transmit Power Control – Adaptive												
ODU Support		ODU-A (6 - 38 GHz) ODU-B (11, 18, 23 GHz)												
MMU to ODU Connection		Coaxial IF Cable, up to 1000 ft. (300 meters) using the LMR600 cable; 630 ft. (190 meters) is achievable with the CNT400 IF cable												
Antenna Connection		Direct Mount; Remote Mount with standard waveguide (frequency dependent)												
Installation		ODU – RSSI output assistant for link alignment												

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	7 - 80 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			

PHYSICAL

Physical Configuration	Split Mount – Modular Modem Unit (MMU) and Outdoor Unit (ODU)
Dimensions	ODU: Diameter 10.5" (26.7 cm), Depth 3.5" (8.9cm)
	MMU: Width 17.5" (44.5 cm), Depth 9.375" (23.85 cm), Height 1.72" (4.45 cm)
Weight	ODU-A: 10.0 lbs (4.6 kg)
	ODU-B: 8.6 lbs (3.9 kg)
	MMU: 7 lbs (3.12 kg)
Power source	- 48 VDC

ODU power consumption	ODU-A – Per Unit	ODU-B – Per Unit
	6 -11 GHz: 51 Watts Maximum	11 GHz: 36 Watts Maximum
	13-38 GHz: 42 Watts Maximum	18, 23 GHz: 30 Watts Maximum

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

PTP 810 Family of Product	
PTP L6810	L6 GHz
PTP U6810	U6 GHz
PTP 07810	7 GHz
PTP 08810	8 GHz
PTP 11810	11 GHz
PTP 13810	13 GHz
PTP 15810	15 GHz
PTP 18810	18 GHz
PTP 23810	23 GHz
PTP 26810	26 GHz
PTP 32810	32 GHz
PTP 38810	38 GHz

ENVIRONMENTAL & REGULATORY

Operating temperature	ODU:-27° to +131° F (-33° to +55° C) - EN 300 019-1-4
	MMU: 23° to +131° F (-5° to +55° C) – EN 300 019-1-3
Humidity	ODU: Up to 100%
	MMU: Up to 95%, non-condensing
Safety	UL 60950; IEC 60950; EN 60950; CSA 22.2 No. 60950
EMC	USA: FCC Part 15, Class A
	Europe: EN 301 489-1 and EN 301 489-4
Radio standard	ETSI Harmonized Standard EN 302 217-2-2
	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 – ETSI					
Channel Size (ETSI)	Modulation	Minimum Required Capacity Key	Maximum Link Throughput[1] (Mbps) (Eth + E1)	Maximum Ethernet Throughput (Mbps)	Maximum Number of E1s Supported
7 MHz	QPSK	10 Mbps	10.0	9.0	4
	16 QAM	20 Mbps	20.0	19.0	9
	32 QAM	20 Mbps	24.6	23.0	11
	64 QAM	30 Mbps	30.0	28.0	14
	128 QAM	40 Mbps	35.5	34.0	16
13.75/14 MHz	QPSK	20 Mbps	20.0	19.0	9
	16 QAM	40 Mbps	40.2	38.0	18
	32 QAM	50 Mbps	49.8	48.0	23
	64 QAM	50 Mbps	60.9	59.0	29
	128 QAM	50 Mbps	71.9	70.0	34
27.5/28/29.65/30 MHz	QPSK	40 Mbps	40.5	39.0	19
	16 QAM	100 Mbps	81.3	79.0	39
	32 QAM	100 Mbps	104.5	100.0	50
	64 QAM	100 Mbps	123.5	120.0	59
	128 QAM	150 Mbps	145.9	136.0	70
	256 QAM	150 Mbps	168.3	160.0	81
40 MHz	QPSK	50 Mbps	55.4	53.0	26
	16 QAM	100 Mbps	110.7	104.0	53
	32 QAM	150 Mbps	142.3	136.0	68
	64 QAM	150 Mbps	169.0	160.0	81
	128 QAM	200 Mbps	199.7	192.0	96
	256 QAM	200 Mbps	230.4	224.0	110
55/56/60 MHz	QPSK	100 Mbps	81.3	79.0	39
	16 QAM	150 Mbps	155.2	152.0	75
	32 QAM	200 Mbps	208.3	200.0	101
	64 QAM	300 Mbps	255.4	248.0	123
	128 QAM	300 Mbps	294.2	288.0	126
	256 QAM	300 Mbps	339.5	328.0	126

[1] Throughput includes NMS and 64 Kbps auxiliary data.

User Data Throughput for 1+x (1+0 or 1+1) Configuration – FCC					
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
20 MHz	QPSK	30 Mbps	27.8	27.0	17
	16 QAM	50 Mbps	55.7	54.0	35
	32 QAM	50 Mbps	68.8	67.0	43
	64 QAM	100 Mbps	84.0	82.0	53
	128 QAM	100 Mbps	99.3	96.0	63
	256 QAM	100 Mbps	114.5	104.0	73
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
50 MHz	QPSK	50 Mbps	69.6	67.0	44
	16 QAM	150 Mbps	139.2	136.0	89
	32 QAM	200 Mbps	178.9	168.0	114
	64 QAM	200 Mbps	218.7	208.0	126
	128 QAM	300 Mbps	252.0	240.0	126
	256 QAM	300 Mbps	290.7	280.0	126
80 MHz	QPSK	100 Mbps	81.3	79.0	51
	16 QAM	150 Mbps	162.5	152.0	104
	32 QAM	200 Mbps	208.9	200.0	125
	64 QAM	300 Mbps	255.4	248.0	126
	128 QAM	300 Mbps	294.2	288.0	126
	256 QAM	300 Mbps	339.5	328.0	126

User Data Throughput for 2+0 Configuration – ETSI					
Channel Size (ETSI)	Modulation	Minimum Required Capacity Key	Maximum Link Throughput[2] (Mbps) (Eth + E1)	Maximum Ethernet Throughput (Mbps)	Maximum Number of E1s Supported
7 MHz	QPSK	20 Mbps	19.9	18.0	8
	16 QAM	40 Mbps	40.1	38.0	18
	32 QAM	50 Mbps	49.1	46.0	22
	64 QAM	50 Mbps	60.0	56.0	28
	128 QAM	50 Mbps	70.9	68.0	32
13.75/14 MHz	QPSK	40 Mbps	40.1	38.0	18
	16 QAM	100 Mbps	80.4	76.0	36
	32 QAM	100 Mbps	99.6	96.0	46
	64 QAM	100 Mbps	121.7	118.0	58
	128 QAM	150 Mbps	143.8	140.0	68
27.5/28/29.65/30 MHz	QPSK	100 Mbps	81.0	78.0	38
	16 QAM	150 Mbps	162.6	158.0	78
	32 QAM	200 Mbps	209.0	200.0	100
	64 QAM	200 Mbps	246.9	240.0	118
	128 QAM	300 Mbps	291.8	272.0	140
	256 QAM	300 Mbps	336.7	320.0	162
40 MHz	QPSK	100 Mbps	110.8	106.0	52
	16 QAM	200 Mbps	221.4	208.0	106
	32 QAM	300 Mbps	284.7	272.0	136
	64 QAM	300 Mbps	338.0	320.0	162
	128 QAM	400 Mbps	399.4	384.0	192
	256 QAM	400 Mbps	460.8	448.0	205
55/56/60 MHz	QPSK	150 Mbps	162.6	158.0	78
	16 QAM	300 Mbps	310.3	304.0	150
	32 QAM	400 Mbps	417.9	400.0	202
	64 QAM	600 Mbps	510.7	496.0	205
	128 QAM	600 Mbps	588.5	576.0	205
	256 QAM	600 Mbps	679.0	656.0	205

[2] Throughput includes NMS and 64 Kbps auxiliary data.

User Data Throughput for 2+0 Configuration – FCC					
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
20 MHz	QPSK	50 Mbps	55.5	52.0	34
	16 QAM	100 Mbps	111.4	108.0	70
	32 QAM	150 Mbps	137.5	134.0	86
	64 QAM	150 Mbps	168.0	162.0	106
	128 QAM	200 Mbps	198.5	192.0	126
	256 QAM	200 Mbps	229.1	208.0	146
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
50 MHz	QPSK	150 Mbps	139.2	134.0	88
	16 QAM	300 Mbps	278.4	272.0	178
	32 QAM	400 Mbps	357.9	336.0	205
	64 QAM	400 Mbps	437.3	416.0	205
	128 QAM	600 Mbps	503.9	480.0	205
	256 QAM	600 Mbps	581.4	560.0	205
80 MHz	QPSK	150 Mbps	162.6	158.0	102
	16 QAM	300 Mbps	325.0	304.0	205
	32 QAM	400 Mbps	417.9	400.0	205
	64 QAM	600 Mbps	510.7	496.0	205
	128 QAM	600 Mbps	588.5	576.0	205
	256 QAM	600 Mbps	679.0	656.0	205

User Data Throughput for XPIC Configuration – ETSI

Channel Size (ETSI)	Modulation	Minimum Required Capacity Key	Maximum Link Throughput (Mbps) (Eth + E1)	Maximum Ethernet Throughput (Mbps)	Maximum Number of E1s Supported
27.5/28/29.5/30 MHz	64 QAM	300 Mbps	255.4	240.0	120
	128 QAM	300 Mbps	301.8	288.0	146
	256 QAM	300 Mbps	348.3	336.0	168
40 MHz	64 QAM	300 Mbps	347.9	336.0	168
	128 QAM	400 Mbps	411.1	400.0	198
	256 QAM	400 Mbps	474.4	464.0	205
55/56/60 MHz	64 QAM	600 Mbps	510.7	496.0	205
	128 QAM	600 Mbps	603.6	576.0	205
	256 QAM	600 Mbps	696.4	672.0	205

User Data Throughput for XPIC Configuration – FCC

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
50 MHz	64 QAM	400 Mbps	437.1	416.0	205
	128 QAM	600 Mbps	516.8	496.0	205
	256 QAM	600 Mbps	596.3	576.0	205
80 MHz	64 QAM	600 Mbps	510.7	496.0	205
	128 QAM	600 Mbps	603.6	576.0	205
	256 QAM	600 Mbps	696.4	672.0	205

Radio Transmit Power – ODU-A

Modulation	Maximum Transmit Power – ETSI (dBm)							Maximum Transmit Power – FCC (dBm)			
	Frequency (GHz)							Frequency (GHz)			
	6, 7, 8	11	13, 15	18	23, 26, 28	32	38	6	11	18, 23, 26	38
QPSK	30.0	28.0	26.0	25.5	25.0	23.0	23.0	22.0	19.0	23.0	20.0
16 QAM	28.0	26.0	23.0	22.0	22.0	21.0	20.0	22.0	19.0	22.0	19.0
32 QAM	28.0[3]	26.0	23.0	22.0	22.0[4]	19.0	20.0	22.0	19.0	22.0	19.0
64 QAM	24.0	21.0	18.0	17.0	17.0	16.0	16.0	22.0	19.0	17.0	15.0
128 QAM	24.0	21.0	18.0	17.0	17.0	16.0	16.0	22.0	19.0	17.0	15.0
256 QAM	22.0	19.0	16.0	15.0	15.0	14.0	14.0	22.0	19.0	15.0	13.0

[3] For ETSI U6, maximum Tx power is 26 dBm for 32 QAM

[4] For ETSI 28 GHz, maximum Tx power is 20 dBm for 32 QAM

Radio Receive Sensitivity – ODU-A

BER = 1e-6	Modulation	Frequency (GHz)							
		6, 7, 8	11	13, 15	18	23, 26	28	32	38
Receive Sensitivity @ 55/56/60 MHz channel (dBm)	256 QAM	-62.1	N/A	-62.6	-62.6	-62.1	-61.6	-61.1	-60.1
	128 QAM	-66.7	N/A	-67.2	-67.2	-66.7	-66.2	-65.7	-64.7
	64 QAM	-70.7	N/A	-71.2	-71.2	-70.7	-70.2	-69.7	-68.7
	32 QAM	A	N/A	A	A	A	-73.9	-73.4	A
	16 QAM	A	N/A	-78.7	-78.7	-78.2	-77.7	-77.2	-76.2
	QPSK	A	N/A	-84.2	-84.2	-83.7	-83.2	-82.7	-81.7
Receive Sensitivity @ 50 MHz channel (dBm)	256 QAM	N/A	N/A	N/A	-63.2	-62.7	N/A	N/A	-59.7
	128 QAM	N/A	N/A	N/A	-68.0	-67.5	N/A	N/A	-64.5
	64 QAM	N/A	N/A	N/A	-72.2	-71.7	N/A	N/A	-68.7
	32 QAM	N/A	N/A	N/A	-75.7	-75.2	N/A	N/A	-72.2
	16 QAM	N/A	N/A	N/A	-78.9	-78.4	N/A	N/A	-75.4
	QPSK	N/A	N/A	N/A	-85.0	-84.5	N/A	N/A	-81.5
Receive Sensitivity @ 40 MHz channel (dBm)	256 QAM	A	-64.7	N/A	-64.7	-64.2	N/A	N/A	N/A
	128 QAM	-68.5	-68.9	N/A	-68.9	-68.4	N/A	N/A	N/A
	64 QAM	-71.6	-72.0	N/A	-72.0	-71.5	N/A	N/A	N/A
	32 QAM	A	-76.7	N/A	-76.7	-76.2	N/A	N/A	N/A
	16 QAM	A	-80.1	N/A	-80.1	-79.6	N/A	N/A	N/A
	QPSK	A	-86.3	N/A	-86.3	-85.8	N/A	N/A	N/A
Receive Sensitivity @ 30 MHz channel (dBm)	256 QAM	-64.7/-64.9[5]	-65.4	N/A	-65.4	-64.9	N/A	N/A	N/A
	128 QAM	-69.7/-69.5[5]	-70.3	N/A	-70.3	-69.8	N/A	N/A	N/A
	64 QAM	-72.9/-71.6[5]	-72.1	N/A	-72.1	-71.6	N/A	N/A	N/A
	32 QAM	-77.5	-78.0	N/A	-78.0	-77.5	N/A	N/A	N/A
	16 QAM	-80.8	-81.3	N/A	-81.3	-80.8	N/A	N/A	N/A
	QPSK	-87.0	-87.5	N/A	-87.5	-87.0	N/A	N/A	N/A
Receive Sensitivity @ 27.5/28/29.65 MHz channel (dBm)	256 QAM	-64.7	N/A	-65.2	-65.2	-64.7	-64.2	-63.7	-62.7
	128 QAM	-69.7	N/A	-70.2	-70.2	-69.7	-69.2	-68.7	-67.7
	64 QAM	-72.9	N/A	-73.4	-73.4	-72.9	-72.4	-71.9	-70.9
	32 QAM	-77.5	N/A	-78.0	-78.0	-77.5	-77.0	-76.5	-75.5
	16 QAM	-80.8	N/A	-81.3	-81.3	-80.8	-80.3	-79.8	-78.8
	QPSK	-87.0	N/A	-87.5	-87.5	-87.0	-86.5	-86.0	-85.0
Receive Sensitivity @ 20 MHz channel (dBm)	256 QAM	N/A	N/A	N/A	-68.0	-67.5	N/A	N/A	N/A
	128 QAM	N/A	N/A	N/A	-72.1	-71.6	N/A	N/A	N/A
	64 QAM	N/A	N/A	N/A	-75.1	-74.6	N/A	N/A	N/A
	32 QAM	N/A	N/A	N/A	-78.6	-78.1	N/A	N/A	N/A
	16 QAM	N/A	N/A	N/A	-82.7	-82.2	N/A	N/A	N/A
	QPSK	N/A	N/A	N/A	-89.1	-88.6	N/A	N/A	N/A
Receive Sensitivity @ 13.75/14 MHz channel (dBm)	128 QAM	-72.7	N/A	-73.2	-73.2	-72.7	-72.2	-71.7	-70.7
	64 QAM	-74.8	N/A	-75.3	-75.3	-74.8	-74.3	-73.8	-72.8
	32 QAM	-79.3	N/A	-79.8	-79.8	A	-78.8	-78.3	A
	16 QAM	-83.4	N/A	-83.9	-83.9	-83.4	-82.9	-82.4	-81.4
	QPSK	-89.9	N/A	-90.4	-90.4	-89.9	-89.4	-88.9	-87.9
Receive Sensitivity @ 10 MHz channel (dBm)	128 QAM	-73.8	-74.3	N/A	-74.3	-73.8	N/A	N/A	-70.8
	64 QAM	-77.4	-77.9	N/A	-77.9	-77.4	N/A	N/A	-74.4
	32 QAM	-81.1	-81.6	N/A	-81.6	-81.1	N/A	N/A	-78.1
	16 QAM	-85.4	-85.9	N/A	-85.9	-85.4	N/A	N/A	-82.4
	QPSK	-91.6	-92.1	N/A	-92.1	-91.6	N/A	N/A	-88.6
Receive Sensitivity @ 7 MHz channel (dBm)	128 QAM	-75.1	N/A	-75.6	-75.6	-75.1	-74.6	-74.1	-73.1
	64 QAM	-78.5	N/A	-79.0	-79.0	-78.5	-78.0	-77.5	-76.5
	32 QAM	-82.2	N/A	A	A	A	-81.7	-81.2	A
	16 QAM	-86.4	N/A	-86.9	-86.9	-86.4	-85.9	-85.4	-84.4
	QPSK	-92.8	N/A	-93.3	-93.3	-92.8	-92.3	-91.8	-90.8

[5] For 256, 128 and 64 QAM modulation in a 30 MHz channel, the first value refers to ETSI and the second value refers to FCC.

Radio Transmit Power – ODU-B

Modulation	Maximum Transmit Power – FCC (dBm)		
	Frequency (GHz)		
	11	18	23
QPSK	20.0	24.0	23.0
16 QAM	20.0	23.0	23.0
32 QAM	20.0	23.0	23.0
64 QAM	20.0	19.0	19.0
128 QAM	20.0	19.0	19.0
256 QAM	20.0	17.0	17.0

Radio Receive Sensitivity – ODU-B

BER = 1e-6	Modulation	Frequency (GHz)		
		11	18	23
Receive Sensitivity @ 80 MHz channel (dBm)	256 QAM	N/A	-62.6	N/A
	128 QAM	N/A	-67.2	N/A
	64 QAM	N/A	-71.2	N/A
	32 QAM	N/A	-74.9	N/A
	16 QAM	N/A	-77.9	N/A
	QPSK	N/A	-84.2	N/A
Receive Sensitivity @ 50 MHz channel (dBm)	256 QAM	N/A	-63.2	-62.7
	128 QAM	N/A	-68.0	-67.5
	64 QAM	N/A	-72.2	-71.7
	32 QAM	N/A	-75.7	-75.2
	16 QAM	N/A	-78.9	-78.4
	QPSK	N/A	-85.0	-84.5
Receive Sensitivity @ 40 MHz channel (dBm)	256 QAM	-64.7	-64.7	-64.2
	128 QAM	-68.9	-68.9	-68.4
	64 QAM	-72.0	-72.0	-71.5
	32 QAM	-76.7	-76.7	-76.2
	16 QAM	-80.1	-80.1	-79.6
	QPSK	-86.3	-86.3	-85.8
Receive Sensitivity @30 MHz channel (dBm)	256 QAM	-65.4	-65.4	-64.9
	128 QAM	-70.3	-70.3	-69.8
	64 QAM	-72.1	-72.1	-71.6
	32 QAM	-78.0	-78.0	-77.5
	16 QAM	-81.3	-81.3	-80.8
	QPSK	-87.5	-87.5	-87.0
Receive Sensitivity @20 MHz channel (dBm)	256 QAM	N/A	-68.0	-67.5
	128 QAM	N/A	-72.1	-71.6
	64 QAM	N/A	-75.1	-74.6
	32 QAM	N/A	-78.6	-78.1
	16 QAM	N/A	-82.7	-82.2
	QPSK	N/A	-89.1	-88.6
Receive Sensitivity @10 MHz channel (dBm)	128 QAM	-74.3	-74.3	-73.8
	64 QAM	-77.9	-77.9	-77.4
	32 QAM	-81.6	-81.6	-81.1
	16 QAM	-85.9	-85.9	-85.4
	QPSK	-92.1	-92.1	-91.6

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.

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

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