PTP 820G Licensed Microwave Radio

QUICK LOOK:

PTP 820G, a split mount multi core aggregation unit with Multi carrier adaptive bandwidth control

- **Supports 6-38 GHz**
- **Supports 1+0, 1+1 HSB, 2+0, E/W configuration**
- **Supports 1+1 Unit redundancy (external protection)**

Radio

6-38 GHz
1+0, 1+1 HSB, 2+0, E/W
1+1 Unit redundancy (external protection)

Radio Features

Multi-Carrier Adaptive Bandwidth Control (up to 2+0)
Protection and diversity: HSB, SD (BBS)
QPSK to 2048 QAM w/ACM
3.5 MHz to 60 MHz channel size
XPIC

Ethernet

Ethernet Interfaces

Traffic Interfaces – 4 x 10/100/1000Base-T (RJ-45) and 2x1000base-X (SFP), 16 x E1/T1 (Optional MDR 69-pin)
Management Interface - 2 x 10/100 Base-T (RJ-45)
External Alarm Interface – 1 x DB9
SFP Types - Optical 1000Base-LX (1310 nm) or SX (850nm)

Ethernet Features

MTU – 9600 Bytes
Quality of Service Multiple Classification criteria (VLAN ID, p-bits, IPv4, DSCP, IPv6 TC, MPLS EXP) 8 priority queues per port Deep buffering (configurable up to 64 Mbit per queue) WRED P-bit marking/remarking
4K VLANs
VLAN add/remove
MSTP, ERP (ITU-T G.8032)
Frame Cut Through – controlled latency and PDV for delay sensitive applications
Header De-Duplication – Capacity boosting by eliminating inefficiency in all layers (L2, MPLS, L3, L4, Tunneling – GTP for LTE, GRE)
Y.1731 Ethernet OAM
Y.1731 Ethernet Bandwidth Notification (ETH-BN)

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Management Protocols

SNMP

REST

SDN support: NETCONF/YANG

TDM

16 x T1/E1

Native TDM services and TDM PWE using the same hardware

XC capacity – 256 VCs

Timing options – Loop timing, system clock, recovered clock

1+1 / 1:1 path protection

Synchronization

Synchronization Distribution

Sync Distribution over any traffic interface (GE/FE)

Dedicated In/Out sync interface (E1/2 MHz)

Sync-E (ITU-T G.8261, G.8262)

SSM/ESMC Support for ring/mesh applications (ITU-T G.8264)

Sync-E Regenerator mode, providing PRC grade (ITU-T G.811) performance for smart pipe applications.

IEEE-1588

Optimized Transport for reduced PDV

IEEE-1588 Transparent Clock (TC)

IEEE-1588 Boundary Clock (BC)

Security

AES 256-bit Encryption

Secured protocols (HTTPS, SNMPV3, SSH, SFTP)

Radius authentication and authorization

TACACS+ Authentication and Authorization (Session-based)

Standard

MEF

Carrier Ethernet 2.0

Supported Ethernet Standards

10/100/1000base-T/X (IEEE 802.3)

Ethernet VLANs (IEEE 802.3ac)

Virtual LAN (VLAN, IEEE 802.1Q)

Class of service (IEEE 802.1p)

Provider bridges (QinQ – IEEE 802.1ad)

Link aggregation (IEEE 802.3ad)

Auto MDI/MDIX for 1000baseT

RFC 1349: IPv4 TOS

RFC 2474: IPv4 DSCP

RFC 2460: IPv6 Traffic Classes

Standard - continued

Supported E1 Standards

ITU-T G.703, G.736, G.775, G.823, G.824, G.828, ITU-T I.432, ETSI ETS 300 147, ETS 300 417

TDM Pseudowire Standards

SAToP – RFC 4553

Standards Compliance

Radio Spectral Efficiency: EN 302 217-2-2

EMC: EN 301 489-4, EN 301 489-1, FCC 47 CFR, Part15, Class B

Safety: IEC 60950, EN60950-1, IEC 60950-1, UL60950-1, CSA-C22.2 No.60950-1, EN 60950-22, UL 60950-22, CSA C22.2.60950-22

Ingress Protection: RFU-C - IP66

Storage: ETSI EN 300 019-1-1 Class 1.2

Transportation: ETSI EN 300 019-1-2 Class 2.3

Technical

Mechanical Specifications

IDU - 44mm x 426mm x 180mm (1.73” x 16.77” x 7.08”), 2.5kg (5.5 lbs.)

RFU-A - 46mm x 482.6 x 335mm (1.8” x 19” x 13.18”), 12kg (26.45 lbs.)

RFU-C - 200mm x 200mm x 85mm (7.87” x 7.87” x 3.35”), 4kg (9 lbs.)

Environmental Specifications

IDU: -5°C to +55°C (-25°C to +65°C extended), +23°F to +131°F (-13°F to +149°F extended)

RFU-A: -5°C to +55°C (-25°C to +65°C extended), +23°F to +131°F (-13°F to +149°F extended)

RFU-C: -33°C to +55°C (-45°C to +60°C extended), -27°F to +131°F (-49°F to +140°F extended)

Power Input Specifications

IDU Standard Input: -48 VDC

IDU DC Input range: -40 to -60 VDC

Dual-feed power support

Power Consumption Specifications

IDU Eth-only with single modem: 23.5W, addition for second modem, 2.9W, additional for 16 E1/DS1, 11w

RFU-A (1+0) – High Level: 77W; Medium Level: 53W; Low Level: 43W; Mute: 24W

RFU-A (1+1 HSB/SD BBS) – High Level: 101W

RFU-C: 6-26GHz; 1+0 22W; 1+1 39W; 28-38Ghz, 1+0 26W; 1+1 43W

*- *Available in future release*

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Transmit Power RFU-C

Transmit Power (dBm)	6-8 GHz	11-15 GHz	18-23 GHz	26 GHz	28 GHz	31 GHz	32 GHz	36 GHz	38 GHz
QPSK	26	24	22	21	14	16	18	12	18
8 PSK	26	24	22	21	14	16	18	12	18
16 QAM	25	23	21	20	14	15	17	11	17
32 QAM	24	22	20	19	14	14	16	10	16
64 QAM	24	22	20	19	14	14	16	10	16
128 QAM	24	22	20	19	14	14	16	10	16
256 QAM	22	20	18	17	12	12	14	8	14
512 QAM	22	20	18	17	9	12	14	10	14
1024 QAM	21	19	17	16	8	11	13	9	13
2048 QAM	19	17	15	14	6	9	11	7	11

RFU-A Extended Modulation

Transmit Power (dBm)	6L & 6H GHz	11 GHz
QPSK	33	30
8 PSK	33	30
16 QAM	33	30
32 QAM	33	30
64 QAM	33	30
128 QAM	33	29
256 QAM	32	28
512 QAM	29	26
1024 QAM	29	26

RFU-A Extended Premium Modulation

Transmit Power (dBm)	6L & 6H GHz
QPSK	35
8 PSK	35
16 QAM	35
32 QAM	35
64 QAM	35
128 QAM	34
256 QAM	34
512 QAM	33
1024 QAM	32
2048 QAM	30

Note: The Transmit power is measured at the antenna port of the RFU-A Chassis

Receive Sensitivity (RSL) (dBm @BER = 10-6) RFU-C

3.5 MHz	6 GHz	7-8 GHz	11-15 GHz	18 GHz	23 GHz	26 GHz	28 GHz	31-38 GHz
QPSK	-97.5	-97.0	-97.5	-96.5	-96.0	-95.0	-93.0	-94.0
16 QAM	-91.0	-90.5	-91.0	-90.0	-89.5	-88.5	-86.5	-87.5
32 QAM	-88.0	-87.5	-88.0	-87.0	-86.5	-85.5	-83.5	-84.5
64 QAM	-84.5	-84.0	-84.5	-83.5	-83.0	-82.0	-80.0	-81.0
128 QAM	-81.0	-80.5	-81.0	-80.0	-79.5	-78.5	-76.5	-77.5
256 QAM	-77.5	-77.0	-77.5	-76.5	-76.0	-75.0	-73.0	-74.0

PTP 820G Licensed Microwave Radio

Receive Sensitivity (RSL) (dBm @BER = 10-6) RFU-C - continued								
5 MHz	**6 GHz**	**7-8 GHz**	**11-15 GHz**	**18 GHz**	**23 GHz**	**26 GHz**	**28 GHz**	**31-38 GHz**
QPSK	-98.0	-97.5	-98.0	-97.0	-96.5	-95.5	-93.5	-94.5
16 QAM	-91.5	-91.0	-91.5	-90.5	-90.0	-89.0	-87.0	-88.0
32 QAM	-88.0	-87.5	-88.0	-87.0	-86.5	-85.5	-83.5	-84.5
64 QAM	-84.5	-84.0	-84.5	-83.5	-83.0	-82.0	-80.0	-81.0
128 QAM	-81.0	-80.5	-81.0	-80.0	-79.5	-78.5	-76.5	-77.5
256 QAM	-78.0	-77.5	-78.0	-77.0	-76.5	-75.5	-73.5	-74.5
7 MHz	**6 GHz**	**7-8 GHz**	**11-15 GHz**	**18 GHz**	**23 GHz**	**26 GHz**	**28 GHz**	**31-38 GHz**
QPSK	-95.0	-94.5	-95.0	-94.0	-93.5	-92.5	-90.5	-91.5
8 PSK	-89.0	-88.5	-89.0	-88.0	-87.5	-86.5	-84.5	-85.5
16 QAM	-88.5	-88.0	-88.5	-87.5	-87.0	-86.0	-84.0	-85.0
32 QAM	-85.0	-84.5	-85.0	-84.0	-83.5	-82.5	-80.5	-81.5
64 QAM	-82.0	-81.5	-82.0	-81.0	-80.5	-79.5	-77.5	-78.5
128 QAM	-79.0	-78.5	-79.0	-78.0	-77.5	-76.5	-74.5	-75.5
256 QAM	-75.5	-75.0	-75.5	-74.5	-74.0	-73.0	-71.0	-72.0
512 QAM	-73.5	-73.0	-73.5	-72.5	-72.0	-71.0	-69.0	-70.0
1024 QAM (strong FEC)	-70.0	-69.5	-70.0	-69.0	-68.5	-67.5	-65.5	-66.5
1024 QAM (light FEC)	-69.5	-69	-69.5	-68.5	-68.0	-67.0	-65.0	-66.0
10 MHz	**6 GHz**	**7-8 GHz**	**11-15 GHz**	**18 GHz**	**23 GHz**	**26 GHz**	**28 GHz**	**31-38 GHz**
QPSK	-93.5	-93.0	-93.5	-92.5	-92.0	-91.0	-89.0	-90.0
8 PSK	-88.5	-88.0	-88.5	-87.5	-87.0	-86.0	-84.0	-85.0
16 QAM	-87.5	-87.0	-87.5	-86.5	-86.0	-85.0	-83.0	-84.0
32 QAM	-84.0	-83.5	-84.0	-83.0	-82.5	-81.5	-79.5	-80.5
64 QAM	-80.5	-80.0	-80.5	-79.5	-79.0	-78.0	-76.0	-77.0
128 QAM	-77.5	-77.0	-77.5	-76.5	-76.0	-75.0	-73.0	-74.0
256 QAM	-74.5	-74.0	-74.5	-73.5	-73.0	-72.0	-70.0	-71.0
512 QAM	-72.0	-71.5	-72.0	-71.0	-70.5	-69.5	-67.5	-68.5
1024 QAM (strong FEC)	-69.0	-68.5	-69.0	-68.0	-67.5	-66.5	-64.5	-65.5
1024 QAM (light FEC)	-68.0	-67.5	-68.0	-67.0	-66.5	-65.5	-63.5	-64.5
14 MHz	**6 GHz**	**7-8 GHz**	**11-15 GHz**	**18 GHz**	**23 GHz**	**26 GHz**	**28 GHz**	**31-38 GHz**
QPSK	-92.0	-91.5	-92.0	-91.0	-90.5	-89.5	-87.5	-88.5
8 PSK	-86.0	-85.5	-86.0	-85.0	-84.5	-83.5	-81.5	-82.5
16 QAM	-85.0	-84.5	-85.0	-84.0	-83.5	-82.5	-80.5	-81.5
32 QAM	-82.0	-81.5	-82.0	-81.0	-80.5	-79.5	-77.5	-78.5
64 QAM	-79.0	-78.5	-79.0	-78.0	-77.5	-76.5	-74.5	-75.5
128 QAM	-75.5	-75.0	-75.5	-74.5	-74.0	-73.0	-71.0	-72.0
256 QAM	-73.0	-72.5	-73.0	-72.0	-71.5	-70.5	-68.5	-69.5
512 QAM	-70.0	-69.5	-70.0	-69.0	-68.5	-67.5	-65.5	-66.5
1024 QAM (strong FEC)	-67.0	-66.5	-67.0	-66.0	-65.5	-64.5	-62.5	-63.5
1024 QAM (light FEC)	-66.5	-66.0	-66.5	-65.5	-65.0	-64.0	-62.0	-63.0

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Receive Sensitivity (RSL) (dBm @BER = 10-6) RFU-C - continued								
20 MHz	**6 GHz**	**7-8 GHz**	**11-15 GHz**	**18 GHz**	**23 GHz**	**26 GHz**	**28 GHz**	**31-38 GHz**
QPSK	-90.5	-90.0	-90.5	-89.5	-89.0	-88.0	-86.0	-87.0
8 PSK	-85.5	-85.0	-85.5	-84.5	-84.0	-83.0	-81.0	-82.0
16 QAM	-84.0	-83.5	-84.0	-83.0	-82.5	-81.5	-79.5	-80.5
32 QAM	-80.5	-80.0	-80.5	-79.5	-79.0	-78.0	-76.0	-77.0
64 QAM	-77.5	-77.0	-77.5	-76.5	-76.0	-75.0	-73.0	-74.0
128 QAM	-74.5	-74.0	-74.5	-73.5	-73.0	-72.0	-70.0	-71.0
256 QAM	-71.5	-71.0	-71.5	-70.5	-70.0	-69.0	-67.0	-68.0
512 QAM	-69.0	-68.5	-69.0	-68.0	-67.5	-66.5	-64.5	-65.5
1024 QAM (Strong FEC)	-66.0	-65.5	-66.0	-65.0	-64.5	-63.5	-61.5	-62.5
1024 QAM (Light FEC)	-65.0	-64.5	-65.0	-64.0	-63.5	-62.5	-60.5	-61.5
2048 QAM	-61.5	-61.0	-61.5	-60.5	-60.0	-59.0	-57.0	-58.0
25 MHz	**6 GHz**	**7-8 GHz**	**11-15 GHz**	**18 GHz**	**23 GHz**	**26 GHz**	**28 GHz**	**31-38 GHz**
QPSK	-90.0	-89.5	-90.0	-89.0	-88.5	-87.5	-85.5	-86.5
8 PSK	-84.5	-84.0	-84.5	-83.5	-83.0	-82.0	-80.0	-81.0
16 QAM	-83.0	-82.5	-83.0	-82.0	-81.5	-80.5	-78.5	-79.5
32 QAM	-79.5	-79.0	-79.5	-78.5	-78.0	-77.0	-75.0	-76.0
64 QAM	-76.5	-76.0	-76.5	-75.5	-75.0	-74.0	-72.0	-73.0
128 QAM	-73.5	-73.0	-73.5	-72.5	-72.0	-71.0	-69.0	-70.0
256 QAM	-70.5	-70.0	-70.5	-69.5	-69.0	-68.0	-66.0	-67.0
512 QAM	-68.0	-67.5	-68.0	-67.0	-66.5	-65.5	-63.5	-64.5
1024 QAM (Strong FEC)	-65.0	-64.5	-65.0	-64.0	-63.5	-62.5	-60.5	-61.5
1024 QAM (Light FEC)	-64.5	-64.0	-64.5	-63.5	-63.0	-62.0	-60.0	-61.0
2048 QAM	-60.5	-60.0	-60.5	-59.5	-59.0	-58.0	-56.0	-57.0
28 MHz	**6 GHz**	**7-8 GHz**	**11-15 GHz**	**18 GHz**	**23 GHz**	**26 GHz**	**28 GHz**	**31-38 GHz**
QPSK	-89.0	-88.5	-89.0	-88.0	-87.5	-86.5	-84.5	-85.5
8 PSK	-84.5	-84.0	-84.5	-83.5	-83.0	-82.0	-80.0	-81.0
16 QAM	-82.5	-82.0	-82.5	-81.5	-81.0	-80.0	-78.0	-79.0
32 QAM	-79.0	-78.5	-79.0	-78.0	-77.5	-76.5	-74.5	-75.5
64 QAM	-76.0	-75.5	-76.0	-75.0	-74.5	-73.5	-71.5	-72.5
128 QAM	-72.5	-72.0	-72.5	-71.5	-71.0	-70.0	-68.0	-69.0
256 QAM	-69.5	-69.0	-69.5	-68.5	-68.0	-67.0	-65.0	-66.0
512 QAM	-67.5	-67.0	-67.5	-66.5	-66.0	-65.0	-63.0	-64.0
1024 QAM (Strong FEC)	-64.5	-64.0	-64.5	-63.5	-63.0	-62.0	-60.0	-61.0
1024 QAM (Light FEC)	-63.5	-63.0	-63.5	-62.5	-62.0	-61.0	-59.0	-60.0
2048 QAM	-60.0	-59.5	-60.0	-59.0	-58.5	-57.5	-55.5	-56.5

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Receive Sensitivity (RSL) (dBm @BER = 10-6) RFU-C - continued

30 MHz	6 GHz	7-8 GHz	11-15 GHz	18 GHz	23 GHz	26 GHz	28 GHz	31-38 GHz
QPSK	-89.0	-88.5	-89.0	-88.0	-87.5	-86.5	-84.5	-85.5
8 PSK	-83.5	-83.0	-83.5	-82.5	-82.0	-81.0	-79.0	-80.0
16 QAM	-82.0	-81.5	-82.0	-81.0	-80.5	-79.5	-77.5	-78.5
32 QAM	-78.5	-78.0	-78.5	-77.5	-77.0	-76.0	-74.0	-75.0
64 QAM	-75.5	-75.0	-75.5	-74.5	-74.0	-73.0	-71.0	-72.0
128 QAM	-72.5	-72.0	-72.5	-71.5	-71.0	-70.0	-68.0	-69.0
256 QAM	-69.5	-69.0	-69.5	-68.5	-68.0	-67.0	-65.0	-66.0
512 QAM	-67.5	-67.0	-67.5	-66.5	-66.0	-65.0	-63.0	-64.0
1024 QAM (strong FEC)	-64.0	-63.5	-64.0	-63.0	-62.5	-61.5	-59.5	-60.5
1024 QAM (light FEC)	-63.0	-62.5	-63.0	-62.0	-61.5	-60.5	-58.5	-59.5
2048 QAM	-59.5	-59.0	-59.5	-58.5	-58.0	-57.0	-55.0	-56.0

40 MHz	6 GHz	7-8 GHz	11-15 GHz	18 GHz	23 GHz	26 GHz	28 GHz	31-38 GHz
QPSK	-87.5	-87.0	-87.5	-86.5	-86.0	-85.0	-83.0	-84.0
8 PSK	-82.5	-82.0	-82.5	-81.5	-81.0	-80.0	-78.0	-79.0
16 QAM	-81.0	-80.5	-81.0	-80.0	-79.5	-78.5	-76.5	-77.5
32 QAM	-77.5	-77.0	-77.5	-76.5	-76.0	-75.0	-73.0	-74.0
64 QAM	-74.5	-74.0	-74.5	-73.5	-73.0	-72.0	-70.0	-71.0
128 QAM	-71.5	-71.0	-71.5	-70.5	-70.0	-69.0	-67.0	-68.0
256 QAM	-69.0	-68.5	-69.0	-68.0	-67.5	-66.5	-64.5	-65.5
512 QAM	-66.5	-66.0	-66.5	-65.5	-65.0	-64.0	-62.0	-63.0
1024 QAM (strong FEC)	-63.5	-63.0	-63.5	-62.5	-62.0	-61.0	-59.0	-60.0
1024 QAM (light FEC)	-62.5	-62.0	-62.5	-61.5	-61.0	-60.0	-58.0	-59.0
2048 QAM	-59.0	-58.5	-59.0	-58.0	-57.5	-56.5	-54.5	-55.5

50 MHz	6 GHz	7-8 GHz	11-15 GHz	18 GHz	23 GHz	26 GHz	28 GHz	31-38 GHz
QPSK	-87.0	-86.5	-87.0	-86.0	-85.5	-84.5	-82.5	-83.5
8 PSK	-81.5	-81.0	-81.5	-80.5	-80.0	-79.0	-77.0	-78.0
16 QAM	-80.0	-79.5	-80.0	-79.0	-78.5	-77.5	-75.5	-76.5
32 QAM	-76.5	-76.0	-76.5	-75.5	-75.0	-74.0	-72.0	-73.0
64 QAM	-73.0	-72.5	-73.0	-72.0	-71.5	-70.5	-68.5	-69.5
128 QAM	-71.0	-70.5	-71.0	-70.0	-69.5	-68.5	-66.5	-67.5
256 QAM	-67.5	-67.0	-67.5	-66.5	-66.0	-65.0	-63.0	-64.0
512 QAM	-65.0	-64.5	-65.0	-64.0	-63.5	-62.5	-60.5	-61.5
1024 QAM (strong FEC)	-62.0	-61.5	-62.0	-61.0	-60.5	-59.5	-57.5	-58.5
1024 QAM (light FEC)	-61.0	-60.5	-61.0	-60.0	-59.5	-58.5	-56.5	-57.5
2048 QAM	-57.5	-57.0	-57.5	-56.5	-56.0	-55.0	-53.0	-54.0

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Receive Sensitivity (RSL) (dBm @BER = 10-6) RFU-C - continued								
56 MHz	**6 GHz**	**7-8 GHz**	**11-15 GHz**	**18 GHz**	**23 GHz**	**26 GHz**	**28 GHz**	**31-38 GHz**
QPSK	-85.5	-85.0	-85.5	-84.5	-84.0	-83.0	-81.0	-82.0
8 PSK	-81.5	-81.0	-81.5	-80.5	-80.0	-79.0	-77.0	-78.0
16 QAM	-79.0	-78.5	-79.0	-78.0	-77.5	-76.5	-74.5	-75.5
32 QAM	-75.5	-75.0	-75.5	-74.5	-74.0	-73.0	-71.0	-72.0
64 QAM	-72.5	-72.0	-72.5	-71.5	-71.0	-70.0	-68.0	-69.0
128 QAM	-69.5	-69.0	-69.5	-68.5	-68.0	-67.0	-65.0	-66.0
256 QAM	-66.5	-66.0	-66.5	-65.5	-65.0	-64.0	-62.0	-63.0
512 QAM	-64.5	-64.0	-64.5	-63.5	-63.0	-62.0	-60.0	-61.0
1024 QAM (strong FEC)	-61.0	-60.5	-61.0	-60.0	-59.5	-58.5	-56.5	-57.5
1024 QAM (light FEC)	-60.0	-59.5	-60.0	-59.0	-58.5	-57.5	-55.5	-56.5
2048 QAM	-55.5	-55.0	-55.5	-54.5	-54.0	-53.0	-51.0	-52.0
60 MHz	**6 GHz**	**7-8 GHz**	**11-15 GHz**	**18 GHz**	**23 GHz**	**26 GHz**	**28 GHz**	**31-38 GHz**
QPSK	-86.0	-85.5	-86.0	-85.0	-84.5	-83.5	-81.5	-82.5
8 PSK	-81.5	-81.0	-81.5	-80.5	-80.0	-79.0	-77.0	-78.0
16 QAM	-79.0	-78.5	-79.0	-78.0	-77.5	-76.5	-74.5	-75.5
32 QAM	-75.5	-75.0	-75.5	-74.5	-74.0	-73.0	-71.0	-72.0
64 QAM	-72.5	-72.0	-72.5	-71.5	-71.0	-70.0	-68.0	-69.0
128 QAM	-69.5	-69.0	-69.5	-68.5	-68.0	-67.0	-65.0	-66.0
256 QAM	-66.5	-66.0	-66.5	-65.5	-65.0	-64.0	-62.0	-63.0
512 QAM	-64.5	-64.0	-64.5	-63.5	-63.0	-62.0	-60.0	-61.0
1024 QAM (strong FEC)	-61.0	-60.5	-61.0	-60.0	-59.5	-58.5	-56.5	-57.5
1024 QAM (light FEC)	-61.0	-60.5	-61.0	-60.0	-59.5	-58.5	-56.5	-57.5
2048 QAM	-57.0	-56.5	-57.0	-56.0	-55.5	-54.5	-52.5	-53.5

PTP 820G Licensed Microwave Radio

Receive Sensitivity (RSL) (dBm @BER = 10-6) RFU-A		
5 MHz	**6L & 6H GHz**	**11 GHz**
QPSK	-97.0	-96.5
16 QAM	-90.5	-90.0
32 QAM	-87.0	-86.5
64 QAM	-83.5	-83.0
128 QAM	-80.0	-79.5
256 QAM	-77.0	-76.5
10 MHz	**6L & 6H GHz**	**11 GHz**
QPSK	-92.5	-92.0
8 PSK	-87.5	-87.0
16 QAM	-86.5	-86.0
32 QAM	-83.0	-82.5
64 QAM	-79.5	-79.0
128 QAM	-76.5	-76.0
256 QAM	-73.5	-73.0
512 QAM	-71.0	-70.5
1024 QAM Strong	-68.0	-67.5
1024 QAM Light	-67.0	-66.5
20 MHz	**6L & 6H GHz**	**11 GHz**
QPSK	-89.5	-89.0
8 PSK	-84.5	-84.0
16 QAM	-83.0	-82.5
32 QAM	-79.5	-79.0
64 QAM	-76.5	-76.0
128 QAM	-73.5	-73.0
256 QAM	-70.5	-70.0
512 QAM	-68.0	-67.5
1024 QAM Strong	-65.0	-64.5
1024 QAM Light	-64.0	-63.5
2048 QAM	-60.5	-60.0

PTP 820G Licensed Microwave Radio

Receive Sensitivity (RSL) (dBm @BER = 10-6) RFU-A - continued		
25 MHz	**6L & 6H GHz**	**11 GHz**
QPSK	-89.0	-88.5
8 PSK	-83.5	-83.0
16 QAM	-82.0	-81.5
32 QAM	-78.5	-78.0
64 QAM	-75.5	-75.0
128 QAM	-72.5	-72.0
256 QAM	-69.5	-69.0
512 QAM	-67.0	-66.5
1024 QAM Strong	-64.0	-63.5
1024 QAM Light	-63.5	-63.0
2048 QAM	-59.5	-59.0
30 MHz	**6L & 6H GHz**	**11 GHz**
QPSK	-88.0	-87.5
8 PSK	-83.0	-82.5
16 QAM	-81.0	-80.5
32 QAM	-77.5	-77.0
64 QAM	-74.5	-74.0
128 QAM	-71.5	-71.0
256 QAM	-68.5	-68.0
512 QAM	-66.5	-66.0
1024 QAM Strong	-63.0	-62.5
1024 QAM Light	-62.5	-62.0
2048 QAM	-59.0	-58.5
40 MHz	**6L & 6H GHz**	**11 GHz**
QPSK	-86.5	-86.0
8 PSK	-81.5	-81.0
16 QAM	-80.0	-79.5
32 QAM	-76.5	-76.0
64 QAM	-73.5	-73.0
128 QAM	-70.5	-70.0
256 QAM	-68.0	-67.5
512 QAM	-65.5	-65.0
1024 QAM Strong	-62.5	-62.0
1024 QAM Light	-61.5	-61.0
2048 QAM	-58.0	-57.5

PTP 820G Licensed Microwave Radio

Receive Sensitivity (RSL) (dBm @BER = 10-6) RFU-A - continued		
50 MHz	**6L & 6H GHz**	**11 GHz**
QPSK	-86.0	-85.5
8 PSK	-80.5	-80.0
16 QAM	-79.0	-78.5
32 QAM	-75.5	-75.0
64 QAM	-72.0	-71.5
128 QAM	-70.0	-69.5
256 QAM	-66.5	-66.0
512 QAM	-64.0	-63.5
1024 QAM Strong	-61.0	-60.5
1024 QAM Light	-60.0	-59.5
2048 QAM	-56.5	-56.0
60 MHz	**6L & 6H GHz**	**11 GHz**
QPSK	-85.0	-84.5
8 PSK	-80.5	-80.0
16 QAM	-78.0	-77.5
32 QAM	-74.5	-74.0
64 QAM	-71.5	-71.0
128 QAM	-68.5	-68.0
256 QAM	-65.5	-65.0
512 QAM	-63.5	-63.0
1024 QAM Strong	-60.0	-59.5
1024 QAM Light	-60.0	-59.5
2048 QAM	-56.0	-55.5

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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