

PTP 820S Licensed Microwave Radio



All-Outdoor Specifications

RADIO

- 6-38 GHz
- 1+0, 1+1 HSB, 2+0

Radio Features

- Protection: 1+1 HSB
- High spectral utilization: QPSK to 2048 QAM w/ACM
- AES 256-bit Encryption
- FIPS-140-2 **

ETHERNET

Ethernet Interfaces

- Traffic Interfaces – 1 x 10/100/1000Base-T (RJ-45) and 2 x 1000base-X (SFP) or 2 x 10/100/1000 Base-T (electrical SFP)
- Management Interface - 1 x 10/100 Base-T (RJ-45)
- Optical SFP Types - Optical 1000Base-LX (1310 nm) or SX (850nm)
Note: SFP devices must be of industrial grade (-40°C to +85°C)

Ethernet Features

- MTU – 9600 Bytes
- Quality of Service
 - Multiple Classification criteria (VLAN ID, p-bits, IPv4, DSCP, IPv6 TC, MPLS EXP)
 - 8 priority queues
 - Deep buffering (configurable up to 64 Mbit per queue)
 - WRED
 - Hierarchical QoS – high service granularity*
 - P-bit marking/remarking
- 4K VLANs
- VLAN add/remove/translate
- 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)
- Network Resiliency - G.8032 and Multiple Spanning Tree Protocol (MSTP)*

- Ethernet OAM – EFM (IEEE 802.3ah), CFM (IEEE 802.1ag), ITU-T Y.1731*

SYNCHRONIZATION

Synchronization Distribution

- Sync Distribution over any traffic interface (GE/FE)
- 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 TC

STANDARD

MEF

- Carrier Ethernet 2.0 (CE 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

Standards Compliance

- EMC: EN 301 489-1, EN 301 489-4, Class B (Europe), FCC 47 CFR, part 15, class B (US), ICES-003, Class B (Canada), TEC/EMI/TEL-001/01, Class B (India)
- Surge: EN61000-4-5, Class 4 (for PWR and ETH1/PoE ports)
- Safety: EN 60950-1, IEC 60950-1, UL 60950-1, CSA-C22.2 No.60950-1, EN 60950-22, UL 60950-22, CSAC22.2.60950-22
- Ingress Protection: IP66-compliant

- Storage: ETSI EN 300 019-1-1 Class 1.2
- Transportation: ETSI EN 300 019-1-2 Class 2.3

TECHNICAL SPECIFICATION

Mechanical Specifications

- Dimensions: 230mm(H), 233mm(W), 98mm(D), 6.0kg
- Pole Diameter Range (for Remote Mount Installation): 8.89 cm – 11.43 cm

Environmental Specifications

- -33°C to +55°C (-45°C to +60°C extended)

Power Input Specifications

- Standard Input: -48 VDC
- IDU DC Input range: -40 to -60 VDC

Power Consumption Specifications

- Maximum Power Consumption 6-11 GHz: 40W; 13-38 GHz: 35W

PoE Injector Mechanical Specifications

- Dimensions – 134mm(H), 190mm(W), 62mm(D), 1 kg

PoE Injector Environmental Specifications

- 33°C to +55°C (-45°C to +60°C extended)

PoE Injector Power Input Specifications

- Standard Input: -48 or +24 VDC (Optional)
- DC Input range: ±(18/40.5 to 60) VDC (+18VDC extended range is supported as part of the nominal +24VDC support)

PoE Injector Interfaces

- GbE Data Port supporting 10/100/1000Base-T
- Power-Over-Ethernet (PoE) Port
- DC Power Port –40V to -60V (a PoE supporting two redundant DC feeds each supporting ±(18-60)V is available)

* Planned for future release.

** Certification pending.

Specifications

TRANSMIT POWER

Transmit Power (dBm)	Frequency (GHz)								
	6	7	8	10-11	13-15	18	23	26	28-38
QPSK	29	28	28	27	24	22	20	21	18
8 PSK	29	28	28	27	24	22	20	21	18
16 QAM	28	27	27	26	23	21	20	20	17
32 QAM	27	26	26	25	22	20	20	19	16
64 QAM	27	26	26	25	22	20	20	19	16
128 QAM	27	26	26	25	22	20	20	19	16
256 QAM	27	26	24	25	22	20	18	17	14
512 QAM	25	24	24	24	20	18	18	17	14
1024 QAM	25	24	24	23	20	18	17	16	13
2048 QAM	23	22	22	21	18	16	16	15	12

RECEIVE SENSITIVITY

Modulation	Channel Spacing	Frequency (GHz)											
		6	7	8	11	13	15	18	23	26	28-31	32	38
QPSK	3.5 MHz	-96.5	-96.0	-96.0	-96.5	-95.5	-94.5	-96.0	-95.0	-94.5	-94.5	-94.0	-94.0
8 PSK		-90.0	-89.0	-89.0	-89.5	-88.5	-88.0	-89.0	-88.0	-88.0	-87.5	-87.5	-87.0
16 QAM		-86.5	-85.5	-85.5	-86.0	-85.0	-84.5	-85.5	-84.5	-84.5	-84.0	-84.0	-83.5
32 QAM		-83.0	-82.5	-82.5	-83.0	-82.0	-81.0	-82.5	-81.5	-81.0	-81.0	-80.5	-80.5
64 QAM		-79.5	-79.0	-79.0	-79.5	-78.5	-77.5	-79.0	-78.0	-77.5	-77.5	-77.0	-77.0
128 QAM		-76.5	-75.5	-75.5	-76.5	-75.0	-74.5	-75.5	-75.0	-74.5	-74.0	-74.0	-73.5
256 QAM		-96.5	-96.0	-96.0	-96.5	-95.5	-94.5	-96.0	-95.0	-94.5	-94.5	-94.0	-94.0
QPSK	7 MHz	-93.0	-91.5	-91.0	-92.5	-92.0	-91.0	-92.0	-90.5	-90.0	-90.5	-91.5	-88.5
8 PSK		-87.0	-85.5	-85.0	-86.5	-86.0	-85.0	-86.0	-84.5	-84.0	-84.5	-85.5	-82.5
16 QAM		-86.5	-85.0	-84.5	-86.0	-85.5	-84.5	-85.5	-84.0	-83.5	-84.0	-85.0	-82.0
32 QAM		-83.0	-81.5	-81.0	-82.5	-82.0	-81.0	-82.0	-80.5	-80.0	-80.5	-81.5	-78.5
64 QAM		-80.0	-78.5	-78.0	-79.5	-79.0	-78.0	-79.0	-77.5	-77.0	-77.5	-78.5	-75.5
128 QAM		-77.0	-75.5	-75.0	-76.5	-76.0	-75.0	-76.0	-74.5	-74.0	-74.5	-75.5	-72.5
256 QAM		-73.5	-72.0	-71.5	-73.0	-72.5	-71.5	-72.5	-71.0	-70.5	-71.0	-72.0	-69.0
512 QAM		-71.5	-70.0	-69.5	-71.0	-70.5	-69.5	-70.5	-69.0	-68.5	-69.0	-70.0	-67.0
1024 QAM Strong		-68.0	-66.5	-66.0	-67.5	-67.0	-66.0	-67.0	-65.5	-65.0	-65.5	-66.5	-63.5
1024 QAM Light	-67.5	-66.0	-65.5	-67.0	-66.5	-65.5	-66.5	-65.0	-64.5	-65.0	-66.0	-63.0	
QPSK	10 MHz	-92.0	-91.5	-91.5	-92.0	-91.0	-90.0	-91.5	-90.5	-90.0	-90.0	-89.5	-89.5
8 PSK		-87.0	-86.5	-86.5	-87.0	-85.5	-85.0	-86.5	-85.5	-85.0	-85.0	-84.5	-84.0
16 QAM		-86.0	-85.0	-85.0	-86.0	-84.5	-84.0	-85.0	-84.5	-84.0	-83.5	-83.5	-83.0
32 QAM		-82.5	-81.5	-81.5	-82.0	-81.0	-80.5	-81.5	-80.5	-80.5	-80.0	-80.0	-79.5
64 QAM		-79.0	-78.5	-78.5	-79.0	-78.0	-77.0	-78.5	-77.5	-77.0	-77.0	-76.5	-76.5
128 QAM		-76.0	-75.0	-75.0	-76.0	-74.5	-74.0	-75.0	-74.5	-74.0	-73.5	-73.5	-73.0
256 QAM		-73.0	-72.0	-72.0	-73.0	-71.5	-71.0	-72.0	-71.5	-71.0	-70.5	-70.5	-70.0
512 QAM		-70.5	-69.5	-69.5	-70.0	-69.0	-68.5	-69.5	-68.5	-68.5	-68.0	-68.0	-67.5
1024L QAM		-67.5	-66.5	-66.5	-67.0	-66.0	-65.5	-66.5	-65.5	-65.5	-65.0	-65.0	-64.5
1024H QAM		-66.5	-66.0	-66.0	-66.5	-65.0	-64.5	-66.0	-65.0	-64.5	-64.5	-64.0	-63.5
2048 QAM		-63.0	-62.0	-62.0	-62.5	-61.5	-61.0	-62.0	-61.0	-61.0	-60.5	-60.5	-60.0
QPSK	14 MHz	-90.0	-88.5	-88.0	-89.5	-89.0	-88.0	-89.0	-87.5	-87.0	-87.5	-88.5	-85.5
8 PSK		-84.0	-82.5	-82.0	-83.5	-83.0	-82.0	-83.0	-81.5	-81.0	-81.5	-82.5	-79.5
16 QAM		-83.0	-81.5	-81.0	-82.5	-82.0	-81.0	-82.0	-80.5	-80.0	-80.5	-81.5	-78.5

PTP 820S SPECIFICATION SHEET

Modulation	Channel Spacing	Frequency (GHz)											
		6	7	8	11	13	15	18	23	26	28-31	32	38
32 QAM	14 MHz	-80.0	-78.5	-78.0	-79.5	-79.0	-78.0	-79.0	-77.5	-77.0	-77.5	-78.5	-75.5
64 QAM		-77.0	-75.5	-75.0	-76.5	-76.0	-75.0	-76.0	-74.5	-74.0	-74.5	-75.5	-72.5
128 QAM		-73.5	-72.0	-71.5	-73.0	-72.5	-71.5	-72.5	-71.0	-70.5	-71.0	-72.0	-69.0
256 QAM		-71.0	-69.5	-69.0	-70.5	-70.0	-69.0	-70.0	-68.5	-68.0	-68.5	-69.5	-66.5
512 QAM		-68.0	-66.5	-66.0	-67.5	-67.0	-66.0	-67.0	-65.5	-65.0	-65.5	-66.5	-63.5
1024 QAM Strong		-65.0	-63.5	-63.0	-64.5	-64.0	-63.0	-64.0	-62.5	-62.0	-62.5	-63.5	-60.5
1024 QAM Light		-64.5	-63.0	-62.5	-64.0	-63.5	-62.5	-63.5	-62.0	-61.5	-62.0	-63.0	-60.0
QPSK	20 MHz	-89.0	-88.5	-88.5	-89.0	-88.0	-87.0	-88.5	-87.5	-87.0	-87.0	-86.5	-86.5
8 PSK		-84.0	-83.5	-83.5	-84.0	-83.0	-82.0	-83.5	-82.5	-82.0	-82.0	-81.5	-81.5
16 QAM		-82.5	-82.0	-82.0	-82.5	-81.0	-80.5	-82.0	-81.0	-80.5	-80.5	-80.0	-79.5
32 QAM		-79.0	-78.5	-78.5	-79.0	-77.5	-77.0	-78.5	-77.5	-77.0	-77.0	-76.5	-76.0
64 QAM		-76.0	-75.5	-75.5	-76.0	-75.0	-74.0	-75.5	-74.5	-74.0	-74.0	-73.5	-73.5
128 QAM		-73.0	-72.5	-72.5	-73.0	-71.5	-71.0	-72.5	-71.5	-71.0	-71.0	-70.5	-70.0
256 QAM		-70.0	-69.5	-69.5	-70.0	-68.5	-68.0	-69.5	-68.5	-68.0	-68.0	-67.5	-67.0
512 QAM		-67.5	-66.5	-66.5	-67.5	-66.0	-65.5	-66.5	-66.0	-65.5	-65.0	-65.0	-64.5
1024L QAM		-64.5	-63.5	-63.5	-64.5	-63.0	-62.5	-63.5	-63.0	-62.5	-62.0	-62.0	-61.5
1024H QAM		-63.5	-63.0	-63.0	-63.5	-62.5	-61.5	-63.0	-62.0	-61.5	-61.5	-61.0	-61.0
2048 QAM		-60.0	-59.5	-59.5	-60.0	-59.0	-58.0	-59.5	-58.5	-58.0	-58.0	-57.5	-57.5
QPSK	25 MHz	-87.5	-86.5	-86.5	-87.0	-86.0	-85.5	-86.5	-85.5	-85.5	-85.0	-85.0	-84.0
8 PSK		-82.5	-82.0	-82.0	-82.5	-81.5	-80.5	-82.0	-81.0	-80.5	-80.5	-80.0	-79.5
16 QAM		-80.5	-80.0	-80.0	-80.5	-79.5	-78.5	-80.0	-79.0	-78.5	-78.5	-78.0	-77.5
32 QAM		-77.5	-77.0	-77.0	-77.5	-76.0	-75.5	-77.0	-76.0	-75.5	-75.5	-75.0	-74.5
64 QAM		-74.5	-74.0	-74.0	-74.5	-73.5	-72.5	-74.0	-73.0	-72.5	-72.5	-72.0	-71.5
128 QAM		-71.5	-71.0	-71.0	-71.5	-70.5	-69.5	-71.0	-70.0	-69.5	-69.5	-69.0	-68.5
256 QAM		-68.5	-67.5	-67.5	-68.5	-67.0	-66.5	-67.5	-67.0	-66.5	-66.0	-66.0	-65.5
512 QAM		-66.0	-65.0	-65.0	-66.0	-64.5	-64.0	-65.0	-64.5	-64.0	-63.5	-63.5	-63.0
1024L QAM		-63.0	-62.5	-62.5	-63.0	-61.5	-61.0	-62.5	-61.5	-61.0	-61.0	-60.5	-60.0
1024H QAM		-62.5	-61.5	-61.5	-62.5	-61.0	-60.5	-61.5	-61.0	-60.5	-60.0	-60.0	-59.5
2048 QAM		-58.5	-58.0	-58.0	-58.5	-57.0	-56.5	-58.0	-57.0	-56.5	-56.5	-56.0	-55.5
QPSK	28 MHz ACCP	-87.0	-85.5	-85.0	-86.5	-86.0	-85.0	-86.0	-84.5	-84.0	-84.5	-85.5	-82.5
8 PSK		-82.5	-81.0	-80.5	-82.0	-81.5	-80.5	-81.5	-80.0	-79.5	-80.0	-81.0	-78.0
16 QAM		-80.5	-79.0	-78.5	-80.0	-79.5	-78.5	-79.5	-78.0	-77.5	-78.0	-79.0	-76.0
32 QAM		-77.0	-75.5	-75.0	-76.5	-76.0	-75.0	-76.0	-74.5	-74.0	-74.5	-75.5	-72.5
64 QAM		-74.0	-72.5	-72.0	-73.5	-73.0	-72.0	-73.0	-71.5	-71.0	-71.5	-72.5	-69.5
128 QAM		-71.0	-69.5	-69.0	-70.5	-70.0	-69.0	-70.0	-68.5	-68.0	-68.5	-69.5	-66.5
256 QAM		-68.0	-66.5	-66.0	-67.5	-67.0	-66.0	-67.0	-65.5	-65.0	-65.5	-66.5	-63.5
512 QAM		-65.5	-64.0	-63.5	-65.0	-64.5	-63.5	-64.5	-63.0	-62.5	-63.0	-64.0	-61.0
1024 QAM Strong		-62.5	-61.0	-60.5	-62.0	-61.5	-60.5	-61.5	-60.0	-59.5	-60.0	-61.0	-58.0
1024 QAM Light		-61.5	-60.0	-59.5	-61.0	-60.5	-59.5	-60.5	-59.0	-58.5	-59.0	-60.0	-57.0
2048 QAM		-58.0	-56.5	-56.0	-57.5	-57.0	-56.0	-57.0	-55.5	-55.0	-55.5	-56.5	-53.5
QPSK	28 MHz ACAP / 30 MHz	-87.5	-85.5	-85.0	-86.5	-86.0	-85.0	-86.0	-84.5	-84.0	-84.5	-85.5	-82.5
8 PSK		-82.5	-80.5	-80.0	-81.5	-81.0	-80.0	-81.0	-79.5	-79.0	-79.5	-80.5	-77.5
16 QAM		-81.0	-79.0	-78.5	-80.0	-79.5	-78.5	-79.5	-78.0	-77.5	-78.0	-79.0	-76.0
32 QAM		-77.0	-75.0	-74.5	-76.0	-75.5	-74.5	-75.5	-74.0	-73.5	-74.0	-75.0	-72.0
64 QAM		-74.5	-72.5	-72.0	-73.5	-73.0	-72.0	-73.0	-71.5	-71.0	-71.5	-72.5	-69.5
128 QAM		-71.5	-69.0	-68.5	-70.5	-69.5	-68.5	-69.5	-68.0	-67.5	-68.0	-69.0	-66.0
256 QAM		-68.5	-66.0	-65.5	-67.5	-66.5	-65.5	-66.5	-65.0	-64.5	-65.0	-66.0	-63.0
512 QAM		-66.5	-64.0	-63.5	-65.5	-64.5	-63.5	-64.5	-63.0	-62.5	-63.0	-64.0	-61.0
1024 QAM Strong		-63.0	-61.0	-60.5	-62.0	-61.5	-60.5	-61.5	-60.0	-59.5	-60.0	-61.0	-58.0
1024 QAM Light		-62.0	-60.0	-59.5	-61.0	-60.5	-59.5	-60.5	-59.0	-58.5	-59.0	-60.0	-57.0

PTP 820S SPECIFICATION SHEET

Modulation	Channel Spacing	Frequency (GHz)											
		6	7	8	11	13	15	18	23	26	28-31	32	38
2048 QAM	28 MHz ACAP / 30 MHz	-58.5	-56.0	-55.5	-57.5	-56.5	-55.5	-56.5	-55.0	-54.5	-55.0	-56.0	-53.0
QPSK	40 MHz	-85.5	-84.0	-83.5	-86.0	-84.5	-83.5	-84.5	-83.0	-82.5	-83.0	-84.0	-81.0
8 PSK		-80.5	-79.0	-78.5	-80.5	-79.5	-78.5	-79.5	-78.0	-77.5	-78.0	-79.0	-76.0
16 QAM		-79.0	-77.5	-77.0	-79.0	-78.0	-77.0	-78.0	-76.5	-76.0	-76.5	-77.5	-74.5
32 QAM		-75.5	-74.0	-73.5	-75.5	-74.5	-73.5	-74.5	-73.0	-72.5	-73.0	-74.0	-71.0
64 QAM		-72.5	-71.0	-70.5	-72.5	-71.5	-70.5	-71.5	-70.0	-69.5	-70.0	-71.0	-68.0
128 QAM		-69.5	-68.0	-67.5	-70.0	-68.5	-67.5	-68.5	-67.0	-66.5	-67.0	-68.0	-65.0
256 QAM		-66.5	-65.0	-64.5	-67.5	-65.5	-64.5	-65.5	-64.0	-63.5	-64.0	-65.0	-62.0
512 QAM		-63.5	-62.0	-61.5	-65.0	-62.5	-61.5	-62.5	-61.0	-60.5	-61.0	-62.0	-59.0
1024 QAM Strong		-61.0	-59.5	-59.0	-61.5	-60.0	-59.0	-60.0	-58.5	-58.0	-58.5	-59.5	-56.5
1024 QAM Light		-60.0	-58.5	-58.0	-60.5	-59.0	-58.0	-59.0	-57.5	-57.0	-57.5	-58.5	-55.5
2048 QAM		-57.5	-56.0	-55.5	-57.5	-56.5	-55.5	-56.5	-55.0	-54.5	-55.0	-56.0	-53.0
QPSK	50 MHz	-85.0	-83.5	-83.0	-84.5	-84.0	-83.0	-84.0	-82.5	-82.0	-82.5	-83.5	-80.5
8 PSK		-79.5	-78.0	-77.5	-79.0	-78.5	-77.5	-78.5	-77.0	-76.5	-77.0	-78.0	-75.0
16 QAM		-78.0	-76.5	-76.0	-77.5	-77.0	-76.0	-77.0	-75.5	-75.0	-75.5	-76.5	-73.5
32 QAM		-74.0	-72.5	-72.0	-73.5	-73.0	-72.0	-73.0	-71.5	-71.0	-71.5	-72.5	-69.5
64 QAM		-71.0	-69.5	-69.0	-70.5	-70.0	-69.0	-70.0	-68.5	-68.0	-68.5	-69.5	-66.5
128 QAM		-68.0	-66.5	-66.0	-67.5	-67.0	-66.0	-67.0	-65.5	-65.0	-65.5	-66.5	-63.5
256 QAM		-65.5	-64.0	-63.5	-65.0	-64.5	-63.5	-64.5	-63.0	-62.5	-63.0	-64.0	-61.0
512 QAM		-63.0	-61.5	-61.0	-62.5	-62.0	-61.0	-62.0	-60.5	-60.0	-60.5	-61.5	-58.5
1024 QAM Strong		-59.5	-58.0	-57.5	-59.0	-58.5	-57.5	-58.5	-57.0	-56.5	-57.0	-58.0	-55.0
1024 QAM Light		-58.5	-57.0	-56.5	-58.0	-57.5	-56.5	-57.5	-56.0	-55.5	-56.0	-57.0	-54.0
2048 QAM		-56.5	-55.0	-54.5	-56.0	-55.5	-54.5	-55.5	-54.0	-53.5	-54.0	-55.0	-52.0
QPSK	56 MHz	-83.5	-82.0	-81.5	-83.0	-82.5	-81.5	-82.5	-81.0	-80.5	-81.0	-82.0	-79.0
8 PSK		-79.5	-78.0	-77.5	-79.0	-78.5	-77.5	-78.5	-77.0	-76.5	-77.0	-78.0	-75.0
16 QAM		-77.0	-75.5	-75.0	-76.5	-76.0	-75.0	-76.0	-74.5	-74.0	-74.5	-75.5	-72.5
32 QAM		-74.0	-72.5	-72.0	-73.5	-73.0	-72.0	-73.0	-71.5	-71.0	-71.5	-72.5	-69.5
64 QAM		-70.5	-69.0	-68.5	-70.0	-69.5	-68.5	-69.5	-68.0	-67.5	-68.0	-69.0	-66.0
128 QAM		-68.0	-66.5	-66.0	-67.5	-67.0	-66.0	-67.0	-65.5	-65.0	-65.5	-66.5	-63.5
256 QAM		-64.5	-63.0	-62.5	-64.0	-63.5	-62.5	-63.5	-62.0	-61.5	-62.0	-63.0	-60.0
512 QAM		-62.5	-61.0	-60.5	-62.0	-61.5	-60.5	-61.5	-60.0	-59.5	-60.0	-61.0	-58.0
1024 QAM Strong		-59.0	-57.5	-57.0	-58.5	-58.0	-57.0	-58.0	-56.5	-56.0	-56.5	-57.5	-54.5
1024 QAM Light		-58.0	-56.5	-56.0	-57.5	-57.0	-56.0	-57.0	-55.5	-55.0	-55.5	-56.5	-53.5
2048 QAM		-53.5	-52.0	-51.5	-53.0	-52.5	-51.5	-52.5	-51.0	-50.5	-51.0	-52.0	-49.0
QPSK	56 MHz ACAP / 60 MHz	-84.5	-82.5	-82.0	-83.5	-83.0	-82.0	-83.0	-81.5	-81.0	-81.5	-82.5	-79.5
8 PSK		-80.0	-78.0	-77.5	-79.0	-78.5	-77.5	-78.5	-77.0	-76.5	-77.0	-78.0	-75.0
16 QAM		-77.5	-75.5	-75.0	-76.5	-76.0	-75.0	-76.0	-74.5	-74.0	-74.5	-75.5	-72.5
32 QAM		-74.0	-72.0	-71.5	-73.0	-72.5	-71.5	-72.5	-71.0	-70.5	-71.0	-72.0	-69.0
64 QAM		-71.0	-68.5	-68.0	-69.5	-69.0	-68.0	-69.0	-67.5	-67.0	-67.5	-68.5	-65.5
128 QAM		-68.5	-66.0	-65.5	-67.0	-66.5	-65.5	-66.5	-65.0	-64.5	-65.0	-66.0	-63.0
256 QAM		-65.0	-62.5	-62.0	-63.5	-63.0	-62.0	-63.0	-61.5	-61.0	-61.5	-62.5	-59.5
512 QAM		-63.0	-60.5	-60.0	-61.5	-61.0	-60.0	-61.0	-59.5	-59.0	-59.5	-60.5	-57.5
1024 QAM Strong		-59.5	-57.0	-56.5	-58.0	-57.5	-56.5	-57.5	-56.0	-55.5	-56.0	-57.0	-54.0
1024 QAM Light		-58.5	-56.0	-55.5	-57.0	-56.5	-55.5	-56.5	-55.0	-54.5	-55.0	-56.0	-53.0
2048 QAM		-56.0	-53.5	-53.0	-54.5	-54.0	-53.0	-54.0	-52.5	-52.0	-52.5	-53.5	-50.5
QPSK	80 MHz	-83.0	-81.5	-81.0	-82.5	-82.0	-81.0	-82.0	-80.5	-80.0	-80.5	-81.5	-78.5
8 PSK		-78.0	-76.5	-76.0	-77.5	-77.0	-76.0	-77.0	-75.5	-75.0	-75.5	-76.5	-73.5
16 QAM		-76.0	-74.5	-74.0	-75.5	-75.0	-74.0	-75.0	-73.5	-73.0	-73.5	-74.5	-71.5
32 QAM		-72.5	-71.0	-70.5	-72.0	-71.5	-70.5	-71.5	-70.0	-69.5	-70.0	-71.0	-68.0

Modulation	Channel Spacing	Frequency (GHz)											
		6	7	8	11	13	15	18	23	26	28-31	32	38
64 QAM	80MHz	-69.5	-68.0	-67.5	-69.0	-68.5	-67.5	-68.5	-67.0	-66.5	-67.0	-68.0	-65.0
128 QAM		-67.0	-65.5	-65.0	-66.5	-66.0	-65.0	-66.0	-64.5	-64.0	-64.5	-65.5	-62.5
256 QAM		-64.0	-62.5	-62.0	-63.5	-63.0	-62.0	-63.0	-61.5	-61.0	-61.5	-62.5	-59.5
512 QAM		-61.0	-59.5	-59.0	-60.5	-60.0	-59.0	-60.0	-58.5	-58.0	-58.5	-59.5	-56.5
1024 QAM Strong		-58.5	-57.0	-56.5	-58.0	-57.5	-56.5	-57.5	-56.0	-55.5	-56.0	-57.0	-54.0
1024 QAM Light		-57.5	-56.0	-55.5	-57.0	-56.5	-55.5	-56.5	-55.0	-54.5	-55.0	-56.0	-53.0
2048 QAM		-55.5	-54.0	-53.5	-55.0	-54.5	-53.5	-54.5	-53.0	-52.5	-53.0	-54.0	-51.0

ETHERNET THROUGHPUT

Modulation	Channel Size	Ethernet Throughput (Mbps)			Channel Size	Ethernet Throughput (Mbps)		
		No Compression	L2 Compression	Multi-Layer Compression		No Compression	L2 Compression	Multi-Layer Compression
QPSK	3.5 MHz	3	3-4	4-11	7 MHz	8	8-10	9-27
8 PSK		NA	NA	NA		13	13-14	13-40
16 QAM		8	8-10	9-27		18	18-20	19-58
32 QAM		11	11-13	12-36		24	24-27	25-77
64 QAM		14	14-16	15-45		30	30-34	31-95
128 QAM		17	17-20	18-54		36	36-41	37-114
256 QAM		19	20-22	20-62		41	41-47	43-132
512 QAM		NA	NA	NA		44	44-50	46-141
1024 QAM Strong		NA	NA	NA		47	47-54	49-151
1024 QAM Light		NA	NA	NA		50	51-57	53-161
QPSK	10 MHz	12	12-14	13-40	14 MHz	19	19-22	20-62
8 PSK		19	19-21	20-61		29	29-33	30-93
16 QAM		26	26-30	27-83		40	40-45	42-128
32 QAM		34	35-39	36-111		53	53-60	55-169
64 QAM		42	43-48	45-137		65	65-74	68-208
128 QAM		51	51-58	53-164		78	79-89	82-251
256 QAM		58	59-67	61-188		89	90-102	94-287
512 QAM		64	65-73	67-206		98	99-112	103-316
1024 QAM Strong		67	68-77	71-216		104	105-119	109-335
1024 QAM Light		72	72-82	75-230		111	111-126	116-355
QPSK	20 MHz	27	28-31	29-88	25 MHz	35	35-40	37-112
8 PSK		41	41-47	43-132		52	53-60	55-168
16 QAM		56	57-64	59-180		71	72-81	75-229
32 QAM		74	75-85	78-238		94	95-107	99-302
64 QAM		91	92-104	96-293		116	117-132	121-372
128 QAM		110	111-126	116-354		139	141-159	147-448
256 QAM		125	126-142	131-401		159	160-181	167-511
512 QAM		136	137-156	143-438		175	177-200	184-564
1024 QAM Strong		145	146-165	152-466		186	188-213	196-599
1024 QAM Light		154	155-176	162-495		198	199-226	208-636
2048 QAM	164	165-187	172-528	212	214-242	223-682		

PTP 820S SPECIFICATION SHEET

Modulation	Channel Size	No Compression	L2 Compression	Multi-Layer Compression	Modulation	Channel Size	No Compression	L2 Compression
QPSK	28 MHz	40	40-45	42-127	30 MHz	41	41-47	43-132
8 PSK		59	60-68	62-191		61	62-70	65-197
16 QAM		81	82-93	85-261		84	85-96	88-270
32 QAM		107	108-122	112-344		111	111-126	116-355
64 QAM		132	133-150	138-424		136	137-155	143-437
128 QAM		159	160-181	166-509		164	166-188	173-528
256 QAM		181	182-206	190-580		188	190-215	198-604
512 QAM		199	201-227	209-640		209	211-238	220-672
1024 QAM Strong		212	214-242	223-681		222	224-253	233-714
1024 QAM Light		225	227-257	236-723		236	238-269	248-758
2048 QAM		241	243--275	253-775		256	258-292	268-821
QPSK	40 MHz	57	57-65	60-183	50 MHz	69	70-79	73-223
8 PSK		85	86-97	89-273		108	108-123	113-346
16 QAM		116	117-132	121-372		146	147-166	153-469
32 QAM		152	154-174	160-490		183	185-209	193-589
64 QAM		187	189-214	197-602		237	239-270	249-761
128 QAM		226	228-258	238-728		276	278-315	290-833
256 QAM		243	245-278	256-782		327	330-374	344-833
512 QAM		267	269-304	280-833		355	358-405	373-833
1024 QAM Strong		302	305-345	318-833		387	390-441	406-833
1024 QAM Light		321	324-366	337-833		411	414-468	431-833
2048 QAM		347	350-396	365-833		443	446-505	465-833
QPSK	56 MHz	81	82-93	86-262	60 MHz	86	86-98	90-276
8 PSK		121	122-138	127-390		125	126-143	131-402
16 QAM		165	166-188	173-531		174	175-198	182-558
32 QAM		217	219-248	228-699		229	230-261	240-734
64 QAM		267	269-304	280-833		281	283-320	295-833
128 QAM		323	325-368	339-833		339	342-387	356-833
256 QAM		369	372-421	388-833		391	394-447	411-833
512 QAM		401	404-457	421-833		421	424-480	442-833
1024 QAM Strong		436	439-497	458-833		458	461-522	481-833
1024 QAM Light		462	466-528	486-833		486	490-555	511-833
2048 QAM		500	505-572	527-833		527	531-601	553-833
QPSK	80 MHz	113	114-129	119-363				
8 PSK		160	161-183	168-515				
16 QAM		228	230-260	240-733				
32 QAM		300	302-342	315-833				
64 QAM		367	369-418	385-833				
128 QAM		433	436-494	455-833				
256 QAM		499	503-569	524-833				
512 QAM		548	552-625	576-833				
1024 QAM Strong		596	601-680	626-833				
1024 QAM Light		633	638-722	665-833				