

PTP 820S Licensed Microwave Radio



All-Outdoor Specifications

RADIO

Supported Frequency Range

- 6-38 GHz

Configurations

- 1+0, 1+1 HSB, 2+0

Radio Features

- Protection: 1+1 HSB
- High spectral utilization: QPSK to 2048 QAM w/ACM

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 | 36 | 38 |
| 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 | -89.0 | -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 | -83.0 | -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 | -82.5 | -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 | -79.0 | -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 | -76.0 | -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 | -73.0 | -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 | -69.5 | -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 | -67.5 | -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 | -64.0 | -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 | -63.5 | -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 | -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 | -84.5 | -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 | -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 | -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 | -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 | -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 | -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 | -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 | -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 | -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 | -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 | -86.0 | -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 | -80.0 | -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 | -79.0 | -78.5 |
| 32 QAM | | -80.0 | -78.5 | -78.0 | -79.5 | -79.0 | -78.0 | -79.0 | -77.5 | -77.0 | -77.5 | -78.5 | -76.0 | -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 | -73.0 | -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 | -69.5 | -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 | -67.0 | -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 | -64.0 | -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 | -61.0 | -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 | -60.5 | -60.0 |

PTP 820 All Indoor Solution SPECIFICATION SHEET

| Modulation | Channel Spacing | Frequency (GHz) | | | | | | | | | | | | | |
|-----------------|----------------------|-----------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| | | 6 | 7 | 8 | 11 | 13 | 15 | 18 | 23 | 26 | 28-31 | 32 | 36 | 38 | |
| 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 | -86.5 | |
| 8 PSK | | -84.0 | -83.5 | -83.5 | -84.0 | -83.0 | -82.0 | -83.5 | -82.5 | -82.0 | -82.0 | -82.0 | -81.5 | -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 | -80.5 | -80.0 | -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 | -77.0 | -76.5 | -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 | -74.0 | -73.5 | -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 | -71.0 | -70.5 | -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 | -68.0 | -67.5 | -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 | -65.0 | -64.5 | -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 | -62.0 | -61.5 | -61.5 |
| 1024H QAM | | -63.5 | -63.0 | -63.0 | -63.5 | -62.5 | -61.5 | -63.0 | -62.0 | -61.5 | -61.5 | -61.5 | -61.0 | -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 | -58.0 | -57.5 | -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 | -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 | -80.0 | -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 | -78.0 | -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 | -75.0 | -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 | -72.0 | -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 | -69.0 | -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 | -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 | -63.5 | -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 | -60.5 | -60.0 | -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 | -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 | -56.0 | -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 | -83.0 | -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 | -78.5 | -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 | -76.5 | -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 | -73.0 | -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 | -70.0 | -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 | -67.0 | -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 | -64.0 | -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 | -61.5 | -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 | -58.5 | -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 | -57.5 | -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 | -54.0 | -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 | -83.0 | -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 | -78.0 | -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 | -76.5 | -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 | -72.5 | -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 | -70.0 | -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 | -66.5 | -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 | -63.5 | -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 | -61.5 | -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 | -58.5 | -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 | -57.5 | -57.0 | |
| 2048 QAM | | -58.5 | -56.0 | -55.5 | -57.5 | -56.5 | -55.5 | -56.5 | -55.0 | -54.5 | -55.0 | -56.0 | -53.5 | -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 | -81.5 | -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 | -76.5 | -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 | -75.0 | -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 | -71.5 | -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 | -68.5 | -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 | -65.5 | -65.0 | |

PTP 820 All Indoor Solution SPECIFICATION SHEET

| Modulation | Channel Spacing | Frequency (GHz) | | | | | | | | | | | | | |
|-----------------|----------------------|-----------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| | | 6 | 7 | 8 | 11 | 13 | 15 | 18 | 23 | 26 | 28-31 | 32 | 36 | 38 | |
| 256 QAM | 40 MHz | -66.5 | -65.0 | -64.5 | -67.5 | -65.5 | -64.5 | -65.5 | -64.0 | -63.5 | -64.0 | -65.0 | -62.5 | -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 | -59.5 | -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 | -57.0 | -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 | -56.0 | -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 | -53.5 | -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 | -81.0 | -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 | -75.5 | -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 | -74.0 | -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 | -70.0 | -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 | -67.0 | -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 | -64.0 | -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 | -61.5 | -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 | -59.0 | -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 | -55.5 | -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 | -54.5 | -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 | -52.5 | -52.0 | |
| QPSK | | 56 MHz ACCP | -83.5 | -82.0 | -81.5 | -83.0 | -82.5 | -81.5 | -82.5 | -81.0 | -80.5 | -81.0 | -82.0 | -79.5 | -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 | -75.5 | -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 | -73.0 | -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 | -70.0 | -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 | -66.5 | -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 | -64.0 | -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 | -60.5 | -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 | -58.5 | -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 | -55.0 | -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 | -54.0 | -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 | -49.5 | -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 | -80.0 | -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 | -75.5 | -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 | -73.0 | -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 | -69.5 | -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 | -66.0 | -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 | -63.5 | -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 | -60.0 | -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 | -58.0 | -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 | -54.5 | -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 | -53.5 | -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 | -51.0 | -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 | -79.0 | -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 | -74.0 | -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 | -72.0 | -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 | -68.5 | -68.0 |
| 64 QAM | -69.5 | | -68.0 | -67.5 | -69.0 | -68.5 | -67.5 | -68.5 | -67.0 | -66.5 | -67.0 | -68.0 | -65.5 | -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 | -63.0 | -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 | -60.0 | -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 | -57.0 | -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 | -54.5 | -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 | -53.5 | -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 | -51.5 | -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 | 7 MHz | 8 | 8-10 | 9-27 | 10 MHz | 12 | 12-14 | 13-40 | | |
| 8 PSK | | 13 | 13-14 | 13-40 | | 19 | 19-21 | 20-61 | | |
| 16 QAM | | 18 | 18-20 | 19-58 | | 26 | 26-30 | 27-83 | | |
| 32 QAM | | 24 | 24-27 | 25-77 | | 34 | 35-39 | 36-111 | | |
| 64 QAM | | 30 | 30-34 | 31-95 | | 42 | 43-48 | 45-137 | | |
| 128 QAM | | 36 | 36-41 | 37-114 | | 51 | 51-58 | 53-164 | | |
| 256 QAM | | 41 | 41-47 | 43-132 | | 58 | 59-67 | 61-188 | | |
| 512 QAM | | 44 | 44-50 | 46-141 | | 64 | 65-73 | 67-206 | | |
| 1024 QAM Strong | | 47 | 47-54 | 49-151 | | 67 | 68-77 | 71-216 | | |
| 1024 QAM Light | | 50 | 51-57 | 53-161 | | 72 | 72-82 | 75-230 | | |
| QPSK | 14 MHz | 19 | 19-22 | 20-62 | 20 MHz | 27 | 28-31 | 29-88 | | |
| 8 PSK | | 29 | 29-33 | 30-93 | | 41 | 41-47 | 43-132 | | |
| 16 QAM | | 40 | 40-45 | 42-128 | | 56 | 57-64 | 59-180 | | |
| 32 QAM | | 53 | 53-60 | 55-169 | | 74 | 75-85 | 78-238 | | |
| 64 QAM | | 65 | 65-74 | 68-208 | | 91 | 92-104 | 96-293 | | |
| 128 QAM | | 78 | 79-89 | 82-251 | | 110 | 111-126 | 116-354 | | |
| 256 QAM | | 89 | 90-102 | 94-287 | | 125 | 126-142 | 131-401 | | |
| 512 QAM | | 98 | 99-112 | 103-316 | | 136 | 137-156 | 143-438 | | |
| 1024 QAM Strong | | 104 | 105-119 | 109-335 | | 145 | 146-165 | 152-466 | | |
| 1024 QAM Light | | 111 | 111-126 | 116-355 | | 154 | 155-176 | 162-495 | | |
| 2048 QAM | | NA | NA | NA | | 164 | 165-187 | 172-528 | | |
| QPSK | | 25 MHz | 35 | 35-40 | | 37-112 | 28 MHz | 40 | 40-45 | 42-127 |
| 8 PSK | | | 52 | 53-60 | | 55-168 | | 59 | 60-68 | 62-191 |
| 16 QAM | | | 71 | 72-81 | | 75-229 | | 81 | 82-93 | 85-261 |
| 32 QAM | 94 | | 95-107 | 99-302 | 107 | 108-122 | | 112-344 | | |
| 64 QAM | 116 | | 117-132 | 121-372 | 132 | 133-150 | | 138-424 | | |
| 128 QAM | 139 | | 141-159 | 147-448 | 159 | 160-181 | | 166-509 | | |
| 256 QAM | 159 | | 160-181 | 167-511 | 181 | 182-206 | | 190-580 | | |
| 512 QAM | 175 | | 177-200 | 184-564 | 199 | 201-227 | | 209-640 | | |
| 1024 QAM Strong | 186 | | 188-213 | 196-599 | 212 | 214-242 | | 223-681 | | |
| 1024 QAM Light | 198 | | 199-226 | 208-636 | 225 | 227-257 | | 236-723 | | |
| 2048 QAM | 212 | 214-242 | 223-682 | 241 | 243-275 | 253-775 | | | | |
| QPSK | 30 MHz | 41 | 41-47 | 43-132 | 40 MHz | 57 | 57-65 | 60-183 | | |
| 8 PSK | | 61 | 62-70 | 65-197 | | 85 | 86-97 | 89-273 | | |
| 16 QAM | | 84 | 85-96 | 88-270 | | 116 | 117-132 | 121-372 | | |
| 32 QAM | | 111 | 111-126 | 116-355 | | 152 | 154-174 | 160-490 | | |
| 64 QAM | | 136 | 137-155 | 143-437 | | 187 | 189-214 | 197-602 | | |
| 128 QAM | | 164 | 166-188 | 173-528 | | 226 | 228-258 | 238-728 | | |
| 256 QAM | | 188 | 190-215 | 198-604 | | 243 | 245-278 | 256-782 | | |
| 512 QAM | | 209 | 211-238 | 220-672 | | 267 | 269-304 | 280-833 | | |
| 1024 QAM Strong | | 222 | 224-253 | 233-714 | | 302 | 305-345 | 318-833 | | |
| 1024 QAM Light | | 236 | 238-269 | 248-758 | | 321 | 324-366 | 337-833 | | |
| 2048 QAM | 256 | 258-292 | 268-821 | 347 | 350-396 | 365-833 | | | | |
| QPSK | 50 MHz | 69 | 70-79 | 73-223 | 56 MHz | 81 | 82-93 | 86-262 | | |
| 8 PSK | | 108 | 108-123 | 113-346 | | 121 | 122-138 | 127-390 | | |
| 16 QAM | | 146 | 147-166 | 153-469 | | 165 | 166-188 | 173-531 | | |
| 32 QAM | | 183 | 185-209 | 193-589 | | 217 | 219-248 | 228-699 | | |
| 64 QAM | | 237 | 239-270 | 249-761 | | 267 | 269-304 | 280-833 | | |
| 128 QAM | | 276 | 278-315 | 290-833 | | 323 | 325-368 | 339-833 | | |
| 256 QAM | | 327 | 330-374 | 344-833 | | 369 | 372-421 | 388-833 | | |
| 512 QAM | | 355 | 358-405 | 373-833 | | 401 | 404-457 | 421-833 | | |
| 1024 QAM Strong | | 387 | 390-441 | 406-833 | | 436 | 439-497 | 458-833 | | |
| 1024 QAM Light | | 411 | 414-468 | 431-833 | | 462 | 466-528 | 486-833 | | |
| 2048 QAM | 443 | 446-505 | 465-833 | 500 | 502 | 505-572 | | | | |

PTP 820 All Indoor Solution SPECIFICATION SHEET

| 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 | 60 MHz | 86 | 86-98 | 90-276 | 80 MHz | 113 | 114-129 | 119-363 |
| 8 PSK | | 125 | 126-143 | 131-402 | | 160 | 161-183 | 168-515 |
| 16 QAM | | 174 | 175-198 | 182-558 | | 228 | 230-260 | 240-733 |
| 32 QAM | | 229 | 230-261 | 240-734 | | 300 | 302-342 | 315-833 |
| 64 QAM | | 281 | 283-320 | 295-833 | | 367 | 369-418 | 385-833 |
| 128 QAM | | 339 | 342-387 | 356-833 | | 433 | 436-494 | 455-833 |
| 256 QAM | | 391 | 394-447 | 411-833 | | 499 | 503-569 | 524-833 |
| 512 QAM | | 421 | 424-480 | 442-833 | | 548 | 552-625 | 576-833 |
| 1024 QAM Strong | | 458 | 461-522 | 481-833 | | 596 | 601-680 | 626-833 |
| 1024 QAM Light | | 486 | 490-555 | 511-833 | | 633 | 638-722 | 665-833 |
| 2048 QAM | | 527 | 531-601 | 553-833 | | NA | NA | NA |