

PTP 820G

Licensed Microwave Radio



Split-Mount / All-Indoor, Multi-Carrier Options

Specifications

RADIO

Supported Frequency Range

- 6-38 GHz

Configurations

- 1+0, 1+1 HSB, 2+0 (E/W), 2+0 XPIC, 2+0 MC-ABC

Radio Features

- Multi-Carrier Adaptive Bandwidth Control (up to 2+0)
- Protection: 1+1 HSB
- High spectral utilization: QPSK to 2048 QAM w/ACM
- 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)
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 301 489-4, 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: IEC 60529 IP56
- Operation: ETSI EN 300 019-1-3 class 3.2
- Storage: ETSI EN 300 019-1-1 Class 1.2
- Transportation: ETSI EN 300 019-1-2 Class 2.3

TECHNICAL SPECIFICATION

Mechanical Specifications

- IDU Dimensions – 44mm(H), 426mm(W), 180mm(D), 2.5kg
- RFU-C Dimensions – 200mm (H), 200mm (W), 85mm(D), 4kg

Environmental Specifications

- IDU: -5°C to +55°C (-25°C to +65°C extended)
- RFU-C: -33°C to +55°C (-45°C to +60°C extended)

Power Input Specifications

- IDU Standard Input: -48 VDC
- IDU DC Input range: -40 to -60 VDC
- RFU-C DC Input range: -40.5 to -59 VDC

Power Consumption Specifications

- IDU Eth-only with single modem: 23.5W, addition for second modem, 2.9W, additional for 16 E1/DS1, 11w
- RFU-C: 6-26GHz; 1+0 22W; 1+1 39W; 28-38GHz, 1+0 26W; 1+1 43W

* Planned for future release.

** Certification pending.

Specifications

TRANSMIT POWER

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

RECEIVE SENSITIVITY

Modulation	Channel Spacing	Frequency (GHz)							
		6	7-10	11-15	18	23	26	28	31-38
QPSK	7 MHz	-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		-70.0	-69.5	-70.0	-69.0	-68.5	-67.5	-65.5	-66.5
1024 QAM Light		-69.5	-69.0	-69.5	-68.5	-68.0	-67.0	-65.0	-66.0
QPSK	10 MHz	-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		-69.0	-68.5	-69.0	-68.0	-67.5	-66.5	-64.5	-65.5
1024 QAM Light		-68.0	-67.5	-68.0	-67.0	-66.5	-65.5	-63.5	-64.5
QPSK	14 MHz	-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		-67.0	-66.5	-67.0	-66.0	-65.5	-64.5	-62.5	-63.5
1024 QAM Light		-66.5	-66.0	-66.5	-65.5	-65.0	-64.0	-62.0	-63.0
QPSK	20 MHz	-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

PTP 820 All Indoor Solution SPECIFICATION SHEET

Modulation	Channel Spacing	Frequency (GHz)							
		6	7-10	11-15	18	23	26	28	31-38
16 QAM	20 MHz	-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		-66.0	-65.5	-66.0	-65.0	-64.5	-63.5	-61.5	-62.5
1024 QAM Light		-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
QPSK	25 MHz	-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
1024L QAM		-65.0	-64.5	-65.0	-64.0	-63.5	-62.5	-60.5	-61.5
1024H QAM		-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	
QPSK	28 MHz	-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	-69.5
256 QAM		-69.5	-69.0	-69.5	-68.5	-68.0	-67.0	-65.0	-66.5
512 QAM		-67.5	-67.0	-67.5	-66.5	-66.0	-65.0	-63.0	-64.0
1024 QAM Strong		-64.5	-64.0	-64.5	-63.5	-63.0	-62.0	-60.0	-61.0
1024 QAM Light		-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	
QPSK	30 MHz	-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		-64.0	-63.5	-64.0	-63.0	-62.5	-61.5	-59.5	-60.5
1024 QAM Light		-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	
QPSK	40 MHz	-87.5	-87.0	-87.5	-86.5	-86.0	-85.0	-83.0	-84.0
8 PSK		-81.5	-81.0	-81.5	-80.5	-80.0	-79.0	-77.0	-78.0
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

PTP 820 All Indoor Solution SPECIFICATION SHEET

Modulation	Channel Spacing	Frequency (GHz)								
		6	7-10	11-15	18	23	26	28	31-38	
512 QAM	40 MHz	-66.5	-66.0	-66.5	-65.5	-65.0	-64.0	-62.0	-63.0	
1024 QAM Strong		-63.0	-62.5	-63.0	-62.0	-61.5	-60.5	-58.5	-59.5	
1024 QAM Light		-62.0	-61.5	-62.0	-61.0	-60.5	-59.5	-57.5	-58.5	
2048 QAM		-59.5	-59.0	-59.5	-58.5	-58.0	-57.0	-55.0	-56.0	
QPSK	50 MHz	-86.5	-86.0	-86.5	-85.5	-85.0	-84.0	-82.0	-83.0	
8 PSK		-82.0	-81.5	-82.0	-81.0	-80.5	-79.5	-77.5	-78.5	
16 QAM		-80.0	-79.5	-80.0	-79.0	-78.5	-77.5	-75.5	-76.5	
32 QAM		-76.0	-75.5	-76.0	-75.0	-74.5	-73.5	-71.5	-72.5	
64 QAM		-73.5	-73.0	-73.5	-72.5	-72.0	-71.0	-69.0	-70.0	
128 QAM		-70.5	-70.0	-70.5	-69.5	-69.0	-68.0	-66.0	-67.0	
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		-62.0	-61.5	-62.0	-61.0	-60.5	-59.5	-57.5	-58.5	
1024 QAM Light		-61.0	-60.5	-61.0	-60.0	-59.5	-58.5	-56.5	-57.5	
QPSK		56 MHz	-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	-72.5	
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	-61.0		-60.5	-61.0	-60.0	-59.5	-58.5	-56.5	-57.5	
1024 QAM Light	-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	
QPSK	60 MHz		-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		-72.0	-71.5	-72.0	-71.0	-70.5	-69.5	-67.5	-68.5	
128 QAM		-69.5	-69.0	-69.5	-68.5	-68.0	-67.0	-65.0	-66.0	
256 QAM		-66.0	-65.5	-66.0	-65.0	-64.5	-63.5	-61.5	-62.5	
512 QAM		-64.0	-63.5	-64.0	-63.0	-62.5	-61.5	-59.5	-60.5	
1024 QAM Strong		-60.5	-60.0	-60.5	-59.5	-59.0	-58.0	-56.0	-57.0	
1024 QAM Light		-59.5	-59.0	-59.5	-58.5	-58.0	-57.0	-55.0	-56.0	

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

PTP 820 All Indoor Solution SPECIFICATION SHEET

Modulation	Channel Size	No Compression	L2 Compression	Multi-Layer Compression	Channel Size	No Compression	L2 Compression	Multi-Layer Compression
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
QPSK	60 MHz	86	86-98	90-276	60 MHz	86	86-98	90-276
8 PSK		125	126-143	131-402		125	126-143	131-402
16 QAM		174	175-198	182-558		174	175-198	182-558
32 QAM		229	230-261	240-734		229	230-261	240-734
64 QAM		281	283-320	295-833		281	283-320	295-833
128 QAM		339	342-387	356-833		339	342-387	356-833
256 QAM		391	394-447	411-833		391	394-447	411-833
512 QAM		421	424-480	442-833		421	424-480	442-833
1024 QAM Strong		458	461-522	481-833		458	461-522	481-833
1024 QAM Light		486	490-555	511-833		486	490-555	511-833
2048 QAM		527	531-601	553-833		527	531-601	553-833