

# PTP 820C High Power Licensed Microwave Radio



## All-Outdoor / Multi-Core

### Specifications

#### RADIO

- 6-11 GHz
- 1+0, 2+0 SP/DP, 2+0 XPIC
- Field Changeable Diplexers

#### Radio Features

- Multi-Carrier Adaptive Bandwidth Control (up to 2+0)
- Protection: 1+1/2+2 HSB
- QPSK to 2048 QAM w/ACM

#### ETHERNET

#### Ethernet Interfaces

- Traffic Interfaces – 1 x 10/100/1000Base-T (RJ-45) and 1x1000base-X (SFP) or 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
  - 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)
- Adaptive Bandwidth Notification (ABN)
- Ethernet OAM – 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

#### 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 (Q-in-Q – 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

#### Security

- AES 256-bit Encryption
- Secured protocols (HTTPS, SNMPV3, SSH, SFTP)

- Radius authentication and authorization
- Standards Compliance
- Radio Spectral Efficiency: EN 302 217-2-2
- 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 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

#### TECHNICAL SPECIFICATION

#### Mechanical Specifications

- Dimensions: 315mm(H), 284mm(W), 107mm(D), 6.8kg
- Pole Diameter Range (for Remote Mount Installation): 88.9 mm – 114.3 mm

#### Environmental Specifications

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

#### Power Input Specifications

- Standard Input: -48 VDC
- DC Input range: -40 to -60 VDC
- Separate DC feed

#### Power Consumption Specifications

- Maximum Power Consumption (Multi-Core Operation): 135W
- Maximum Power Consumption (1+0 Operation): 81W

## Specifications

### TRANSMIT POWER

Transmit Power (dBm)	Frequency (GHz)			
	6	7	8	11
QPSK	35	33	31	32
8 PSK	35	33	31	32
16 QAM	35	33	31	32
32 QAM	35	33	31	32
64 QAM	35	33	31	32
128 QAM	35	33	31	32
256 QAM	34	32	30	31
512 QAM	33	32	30	30
1024 QAM	31	31	30	29
2048 QAM	31	31	29	29

### Diplexer Unit Typical Losses

Frequency	6-8 GHz	11 GHz
Losses (dB)	1.3	0.7

### RECEIVE SENSITIVITY

Modulation	Channel Spacing	Frequency (GHz)			
		6	7	8	11
QPSK	5 MHz	-96.5	-96.0	-96.0	-96.5
16 QAM		-90.0	-89.0	-89.0	-89.5
32 QAM		-86.5	-85.5	-85.5	-86.0
64 QAM		-83.0	-82.5	-82.5	-83.0
128 QAM		-79.5	-79.0	-79.0	-79.5
256 QAM		-76.5	-75.5	-75.5	-76.5
QPSK	10 MHz	-92.0	-91.5	-91.5	-92.0
8 PSK		-87.0	-86.0	-86.0	-87.0
16 QAM		-85.5	-85.0	-85.0	-85.5
32 QAM		-82.0	-81.5	-81.5	-82.0
64 QAM		-79.0	-78.5	-78.5	-79.0
128 QAM		-75.5	-75.0	-75.0	-75.5
256 QAM		-72.5	-72.0	-72.0	-72.5
512 QAM		-70.0	-69.5	-69.5	-70.0
1024 QAM (strong FEC)		-67.0	-66.5	-66.5	-67.0
1024 QAM (light FEC)		-66.5	-65.5	-65.5	-66.5
QPSK	20 MHz	-89.0	-88.5	-88.5	-89.0
8 PSK		-84.0	-83.5	-83.5	-84.0
16 QAM		-82.5	-82.0	-82.0	-82.5
32 QAM		-79.0	-78.5	-78.5	-79.0
64 QAM		-76.0	-75.0	-75.0	-76.0
128 QAM		-73.0	-72.0	-72.0	-73.0
256 QAM		-70.0	-69.5	-69.5	-70.0
512 QAM		-67.5	-66.5	-66.5	-67.5
1024 QAM (strong FEC)		-64.5	-63.5	-63.5	-64.5
1024 QAM (light FEC)		-63.5	-63.0	-63.0	-63.5
2048 QAM		-60.0	-59.5	-59.5	-60.0

PTP 820C HP SPECIFICATION SHEET

Modulation	Channel Spacing	6	7	8	11	
QPSK	25 MHz	-87.5	-86.5	-86.5	-87.0	
8 PSK		-82.5	-82.0	-82.0	-82.5	
16 QAM		-80.5	-80.0	-80.0	-80.5	
32 QAM		-77.5	-77.0	-77.0	-77.5	
64 QAM		-74.5	-74.0	-74.0	-74.5	
128 QAM		-71.5	-71.0	-71.0	-71.5	
256 QAM		-68.5	-67.5	-67.5	-68.5	
512 QAM		-66.0	-65.0	-65.0	-66.0	
1024 QAM (strong FEC)		-63.0	-62.5	-62.5	-63.0	
1024 QAM (light FEC)		-62.5	-61.5	-61.5	-62.5	
2048 QAM		-58.5	-58.0	-58.0	-58.5	
QPSK		30 MHz	-87.5	-87.0	-87.0	-87.5
8 PSK			-82.5	-81.5	-81.5	-82.5
16 QAM	-81.0		-80.0	-80.0	-80.5	
32 QAM	-77.0		-76.5	-76.5	-77.0	
64 QAM	-74.5		-73.5	-73.5	-74.0	
128 QAM	-71.0		-70.5	-70.5	-71.0	
256 QAM	-68.0		-67.5	-67.5	-68.0	
512 QAM	-66.0		-65.5	-65.5	-66.0	
1024 QAM (strong FEC)	-63.0		-62.0	-62.0	-62.5	
1024 QAM (light FEC)	-62.0		-61.0	-61.0	-62.0	
2048 QAM	-58.0		-57.5	-57.5	-58.0	
QPSK	40 MHz		-86.0	-85.5	-85.5	-86.0
8 PSK			-81.0	-80.5	-80.5	-81.0
16 QAM		-79.5	-79.0	-79.0	-79.5	
32 QAM		-76.0	-75.0	-75.0	-75.5	
64 QAM		-73.0	-72.0	-72.0	-73.0	
128 QAM		-70.0	-69.0	-69.0	-70.0	
256 QAM		-67.0	-66.0	-66.0	-66.5	
512 QAM		-64.0	-63.5	-63.5	-64.0	
1024 QAM (strong FEC)		-61.5	-61.0	-61.0	-61.5	
1024 QAM (light FEC)		-60.5	-60.0	-60.0	-60.5	
2048 QAM		-58.0	-57.0	-57.0	-58.0	
QPSK		50 MHz	-85.5	-84.5	-84.5	-85.0
8 PSK			-80.0	-79.5	-79.5	-80.0
16 QAM	-78.5		-77.5	-77.5	-78.0	
32 QAM	-74.5		-74.0	-74.0	-74.5	
64 QAM	-71.5		-70.5	-70.5	-71.5	
128 QAM	-68.5		-68.0	-68.0	-68.5	
256 QAM	-66.0		-65.0	-65.0	-66.0	
512 QAM	-63.5		-63.0	-63.0	-63.5	
1024 QAM (strong FEC)	-60.0		-59.5	-59.5	-60.0	
1024 QAM (light FEC)	-59.0		-58.0	-58.0	-59.0	
2048 QAM	-57.0		-56.0	-56.0	-56.5	
QPSK	60 MHz		-84.5	-84.0	-84.0	-84.5
8 PSK			-80.0	-79.0	-79.0	-79.5
16 QAM		-77.5	-77.0	-77.0	-77.5	
32 QAM		-74.0	-73.0	-73.0	-73.5	
64 QAM		-70.5	-70.0	-70.0	-70.5	
128 QAM		-68.0	-67.0	-67.0	-67.5	
256 QAM		-64.5	-64.0	-64.0	-64.5	
512 QAM		-62.5	-62.0	-62.0	-62.5	
1024 QAM (strong FEC)		-59.0	-58.5	-58.5	-59.0	
1024 QAM (light FEC)		-58.0	-57.5	-57.5	-58.0	
2048 QAM		-55.5	-54.5	-54.5	-55.0	

PTP 820C HP SPECIFICATION SHEET

Modulation	Channel Spacing	6	7	8	11
QPSK	80 MHz	N/A	N/A	N/A	-83.5
8 PSK		N/A	N/A	N/A	-78.0
16 QAM		N/A	N/A	N/A	-76.5
32 QAM		N/A	N/A	N/A	-73.0
64 QAM		N/A	N/A	N/A	-70.0
128 QAM		N/A	N/A	N/A	-67.0
256 QAM		N/A	N/A	N/A	-64.5
512 QAM		N/A	N/A	N/A	-61.5
1024 QAM (strong FEC)		N/A	N/A	N/A	-58.5
1024 QAM (light FEC)		N/A	N/A	N/A	-58.0

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	5 MHz	3	3-4	4-11	10 MHz	12	12-14	13-40
8 PSK		N/A	N/A	N/A		19	19-21	20-61
16 QAM		8	8-9	9-26		26	26-30	27-83
32 QAM		11	11-13	12-36		34	35-39	36-111
64 QAM		14	14-16	15-45		42	43-48	45-137
128 QAM		17	17-19	18-54		51	51-58	53-164
256 QAM		19	20-22	20-62		58	59-67	61-188
512 QAM		N/A	N/A	N/A		64	65-73	67-206
1024 QAM (strong FEC)		N/A	N/A	N/A		67	68-77	71-216
1024 QAM (light FEC)		N/A	N/A	N/A		72	72-82	75-230
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 FEC)		145	146-165	152-466		186	188-213	196-599
1024 QAM (light FEC)		154	155-176	162-495		198	199-226	208-636
2048 QAM	164	165-187	172-528	212	214-242	223-682		
QPSK	30 MHz	42	42-48	44-135	40 MHz	57	57-65	60-183
8 PSK		61	62-70	65-197		85	86-97	89-273
16 QAM		86	87-98	90-277		116	117-132	121-372
32 QAM		113	114-129	119-364		152	154-174	160-490
64 QAM		139	140-159	147-449		187	189-214	197-602
128 QAM		168	169-192	176-540		226	228-258	238-728
256 QAM		193	195-220	203-621		243	245-278	256-782
512 QAM		206	208-235	216-662		267	269-304	280-833
1024 QAM (strong FEC)		224	226-259	236-722		302	305-345	318-833
1024 QAM (light FEC)		238	240-271	250-764		321	324-366	337-833
2048 QAM	260	262-296	273-833	347	350-396	365-833		

Modulation	Channel Size	No Compression	L2 Compression	Multi-Layer Compression	Channel Size	No Compression	L2 Compression	Multi-Layer Compression
QPSK	50 MHz	69	70-79	73-223	60 MHz	86	86-98	90-276
8 PSK		108	108-123	113-346		125	126-143	131-402
16 QAM		146	147-166	153-469		174	175-198	182-558
32 QAM		183	185-209	193-589		229	230-261	240-734
64 QAM		237	239-270	249-761		281	283-320	295-833
128 QAM		276	278-315	290-833		339	342-387	356-833
256 QAM		327	330-374	344-833		391	394-447	411-833
512 QAM		355	358-405	373-833		421	424-480	442-833
1024 QAM (strong FEC)		387	390-441	406-833		458	461-522	481-833
1024 QAM (light FEC)		411	414-468	431-833		486	490-555	511-833
2048 QAM		443	446-505	465-833		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		596	601-680	626-833				