

# PTP 850EX Millimeter Wave Radio

## PTP 850EX Quick Look

- Capable of 1024 QAM with ACM
- Supports 71–76 GHz, 81–86 GHz
- Supports 1+0, 2+0\*, 1+1 HSB\* configuration
- Includes built-in frequency scanner to determine the current interference level for each channel



### Radio

Radio	71-76 GHz, 81-86 GHz
Features	BPSK to 1024 QAM with hitless ACMB (Adaptive Coding Modulation and Bandwidth)
	1+0, 2+0 (XPIC), 1+1 HSB Protection with Unit Redundancy
	Built-in frequency scanner to determine the current interference level for each channel
	Multiband* with PTP-820 and PTP-850 families
	ATPC*
	Adaptive bandwidth notification (EOAM)*

\*Roadmap feature

### Ethernet

Interfaces	Port 1: DC port Port 2: RJ45, 1 GE/management Port 3: SFP28 - 1/2.5/10/25GbE	Port 4: SFP28 - 1/2.5/10/25GbE Port 5: QSFP
MTU	9,612 bytes	
Quality of Service	Multiple classification criteria (VLAN ID, p-bits, IPv4 DSCP, IPv6 TC, MPLS EXP) 8 CoS queues per port Deep buffering (configurable up to 64 Mbit per queue) WRED P-bit marking/remarking	
VLAN	4K VLAN add/remove/translate	
Network Protocols	MSTP, ERP (ITU-T G.8032) Y.1731 Ethernet OAM Y.1731 Ethernet bandwidth notification (ETH-BN)	

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### Management

<b>Management</b>	SNMP
<b>Protocols</b>	REST
	SDN Support: NETCONF/YANG

### Synchronization

Enhanced Ethernet equipment clock (eEEC) Specification (G.8262.1)
PTP telecom boundary clock (T-BC) and Time Save Clock (T-TSC) specification (G.8273.2)
PTP telecom transparent clock (T-TC) specification (G.8273.3)
Enhanced SyncE network limits (G.8261, clause 9.2.1)
Enhanced PTP network limits (G.8271.1)
Ethernet synchronization messaging channel (ESMC) (G.8264, clause 11)
PTP telecom profile for time (full timing support) (G.8275.1)
Precision time protocol (version 2, IEEE1588-2008)

### Security

Secured protocols (HTTPS, SNMPV3, SSH, SFTP)
RADIUS authentication and authorization
TACACS+ authentication and authorization (session based)

### Standard

<b>MEF</b>	Carrier Ethernet 2.0
<b>Supported Ethernet Standards:</b>	10/100/1000base-T/X (IEEE 802.3)
	Optical 10Gbase-LR (IEEE 802.3ae)
	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 802.1ax)
	Auto MDI/MDIX for 1000baseT
	RFC 1349: IPv4 TOS
	RFC 2474: IPv4 DSCP
	RFC 2460: IPv6 Traffic Classes

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### Standards Compliance

<b>Radio Spectral Efficiency</b>	EN 302 217-2
<b>Compliance</b>	EMC: EN 301 489-1, EN 301 489-4, Class A(Europe) FCC 47 CFR, part 15, subpart B, class A(US) ICES-003, Class A(Canada) TEC/SD/DD/EMC-221/05 TEC/SD/DD/EMC-221/05/OCT-16, Class A (India) IEC 61000-4-29
<b>Surge</b>	EN61000-4-5, Class 4 (for PWR and ETH1/PoE ports)
<b>Safety:</b>	EN 60950-1, EN 62368-1, IEC 60950-1, IEC 62368-1, UL60950-1, UL 62368-1, CAN/CSA C22.2 NO 60950-1, CAN/CSA C22.2 NO 62368-1, EN60950-22, IEC 60950-22, UL 60950-22, CAN/CSA C22.2 NO 60950-22
<b>Storage</b>	ETSI EN 300 019-1-1 Class 1.2
<b>Transportation</b>	ETSI EN 300 019-1-2 Class 2
<b>Ingress Protection:</b>	IP67

### Technical

<b>Dimensions: Direct Mount (H x W x D)</b>	228 mm x 233 mm x 76 mm, 2.77 kg 8.9 in x 9.5 in x 2.95 in, 4.4 lb
<b>Specifications</b>	-40°C to +55° ( -40°F to +131°F)
<b>Standard Input</b>	-48 VDC
<b>DC Input Range</b>	-40.5 to -60 VDC
<b>Active</b>	50W
<b>Max Power</b>	55W

### Default License Keys Included in Keyed Version

PTP 850EX Act.Key - Capacity 10G with ACM Enabled, per Tx Chan, PTP 820/850 Act.Key - 10GE port

## PTP 850EX Millimeter Wave Radio

Transmit Power (dBm)				
Channel Size	250 MHz	500 MHz	1000 MHz	2000 MHz
¼ BPSK	21	21	21	21
½ BPSK	21	21	21	21
BPSK	21	21	21	21
4 QAM	21	21	21	21
8 QAM	20	20	20	20
16 QAM	19	19	19	19
32 QAM	18	18	18	18
64 QAM	17	17	17	17
128 QAM	16	16	16	16
256 QAM	15	15	15	–
512 QAM	15	15	15	–
1024 QAM	14	14	–	–

Receive Sensitivity (dBm @10E-6)				
Channel Size	250 MHz	500 MHz	1000 MHz	2000 MHz
BPSK	-77.2	-74.2	-71	-68.9
4 QAM	-74.9	-71.6	-68.5	-65.9
8 QAM	-69.8	-66.4	-63.3	-60.5
16 QAM	-68.4	-65.2	-61.9	-59.1
32 QAM	-64.3	-61.2	-58.1	-56.2
64 QAM	-62.5	-59.2	-56	-53.4
128 QAM	-59.6	-56.3	-53	-49.8
256 QAM	-56.7	-53.4	-50.1	–
512 QAM	-53.5	-50.3	-47	–
1024 QAM	-49.5	-47.1	–	–

## PTP 850EX Millimeter Wave Radio

Throughput Sensitivity (Mbps)				
Channel Size	250 MHz	500 MHz	1000 MHz	2000 MHz
BPSK – ¼ channel spacing	48–59	98–121	190–234	330–407
BPSK – ½ channel spacing	95–117	197–243	379–467	660–814
BPSK – full channel spacing	190–235	394–485	758–935	1319–1627
QPSK	382–471	788–972	1517–1871	2640–3256
8 PSK	574–707	1183–1459	2276–2807	4108–5067
16 QAM	765–944	1578–1946	3036–3744	5478–6756
32 QAM	957–1180	1973–2433	3795–4680	6848–8446
64 QAM	1148–1416	2367–2920	4554–5616	8218–10000
128 QAM	1340–1652	2762–3406	5313–6553	9931–10000
256 QAM	1532–1889	3157–3893	6073–7489	–
512 QAM	1723–2125	3552–4380	6832–8425	–
1024 QAM	1915–2361	3946–4867	–	–

### Part Numbers

<b>C800085B007A</b>	PTP 850EX Radio, 10Gbps, Lo, TX 71-76GHz, RX 81-86GHz, without License keys
<b>C800085B008A</b>	PTP 850EX Radio, 10Gbps, Hi, TX 81-86GHz, RX 71-76GHz, without License keys
<b>C800085B009A</b>	PTP 850EX Keyed Radio, with Act Keys, 10Gbps, Lo, TX 71-76GHz, RX 81-86GHz
<b>C800085B010A</b>	PTP 850EX Keyed Radio, with Act Keys, 10Gbps, Hi, TX 81-86GHz, RX 71-76GHz

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