



Datasheet

IP-50E

February 2024 | Rev. H.02



Note: For feature availability, check the Release Notes for the CeraOS version you are using.

Radio

Supported Frequency Range

71-76 GHz, 81-86 GHz

Radio Configurations

1+0, 2+0 (XPIC), 1+1 HSB Protection with Unit Redundancy

Radio Features

- ATPC*
- High spectral utilization: BPSK to 512 QAM w/ACMB
- Built-in frequency scanner to determine the current interference level for each channel
- Adaptive Bandwidth Notification (EOAM)*
- XPIC
- Multiband (with IP-20C, IP-20C-HP, IP-20S, IP-20N, IP-20A, or third-party radio carrier)
- Multiband with Layer 1 Link Bonding (with IP-50C, IP-20C, IP-20C-HP, or third-party devices)
- Multiband with Layer 1 Link Bonding (with IP-20N or IP-20A)
- Supports E-Stabilizer Antenna

Ethernet

Ethernet Interfaces

Port 1:

- DC port

Port 2:

- RJ-45 1GE/Management/Traffic/PoE interface

Port 3:

- SFP – 1/2.5GE traffic interface

Port 4:

- QSFP – 4 x 1/10GE, 1 x 1/10GE, or 1x40GE traffic interface (QSFP+)
- Option for SFP+ (1x10GE) with adaptor
- Option for CPRI with adaptor*

Port 5:

- SFP –1 GE and 10 GE traffic interface (SFP+)

Notes: For information on which interfaces are supported, refer to the Release Notes for the CeraOS release you are using.

SFP+ and QSFP+ devices must be of industrial grade (-40°C to +85°C, -40°F to +185°F)

* Planned for future release.

Ethernet Features

MTU – 9612 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

4K VLANs

VLAN add/remove

MSTP, ERP (ITU-T G.8032)

Y.1731 Ethernet OAM

Y.1731 Ethernet Bandwidth Notification (ETH-BN)

Management Protocols

SNMP

REST

SDN Support:

- NETCONF/YANG

Synchronization Protocols

Enhanced Ethernet Equipment Clock (eEEEC) Specification (G.8262.1)

PTP Telecom Class C Boundary Clock (T-BC) and Time Slave Clock (T-TSC) Specification (G.8273.2)

PTP Telecom Class C 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)



Standards

MEF

Carrier Ethernet 2.0 (CE 2.0)

Supported Ethernet Standards

10/100/1000base-T/X (IEEE 802.3)

10GBase-LR (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 802.1AX)

Auto MDI/MDIX for 1000baseT

RFC 1349: IPv4 TOS

RFC 2474: IPv4 DSCP

RFC 2460: IPv6 Traffic Classes

Security

Radio Encryption – AES 256

Secured protocols:

- HTTPS
- SNMPv3
- SSH
- SFTP

RADIUS authentication and authorization

TACACS+ Authentication, Authorization, and Accounting (session-based)

Standards Compliance

Radio Spectral Efficiency: FCC Part 101, EN 302 217-2
 Certification ordinance Article 2-1-31-5, Land Mobile Station in the 80GHz band (Japan)

EMC: EN 301 489-4, EN 301 489-1, FCC 47 CFR, part 15, subpart B, ICES-003, TEC/SD/DD/EMC-221/05/OCT-16, IEC 61000-4-29

Surge: EN61000-4-5, Class 4 (for PWR and ETH1/PoE ports)

Safety: EN 62368-1, IEC 62368-1, UL 62368-1 CSA-C22.2 No.62368-1

Storage: ETSI EN 300 019-1-1 Class 1.2

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

Technical Specifications

Mechanical Specifications

Dimensions (Direct Mount HW) –

322mm(H), 270mm(W), 85mm(D), 4.66kg
 12.67”(H), 10.62”(W), 3.35”(D), 10.27 lbs.

Dimensions (43dBi Integrated Antenna) -

341mm(H), 270/276mm(W), 103mm(D), 6.3kg
 13.42”(H), 10.62/10.86”(W), 4.05”(D), 13.89 lbs.

Pole Diameter Range (for Remote Mount Installation)

8.89cm – 11.43cm; 3.5” – 4.5”

Environmental Specifications

-33°C to +55°C

-27°F to +131°F

Power Input Specifications

Standard Input: -48 VDC; DC Input range: -40.5 to -60 VDC

Power Redundancy option by using both a DC power input and a passive PoE injector simultaneously.

Power Consumption Specifications

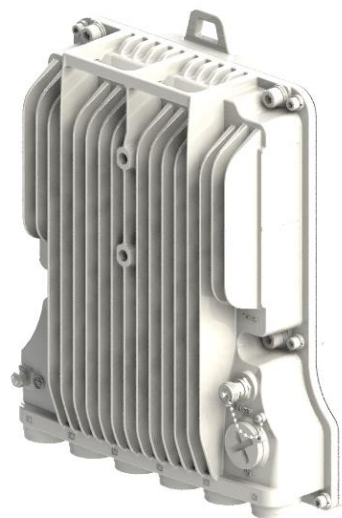
Active with XPIC – 73W

Active without XPIC – 63W

Standby – 51W

Product Images

IP-50E



Radio Specifications

Note that the modulation per profile differs per channel bandwidth. For 250-2000 MHz channels, IP-50E implements ACMB with eleven available working points, as shown in the following table:

Profile and Modulation	250-2000 MHz
Profile 0	BPSK – ¼ channel spacing
Profile 1	BPSK – ½ channel spacing
Profile 2	BPSK – full channel spacing
Profile 3	QPSK
Profile 4	8 PSK
Profile 5	16 QAM
Profile 6	32 QAM
Profile 7	64 QAM
Profile 8	128 QAM
Profile 9	256 QAM
Profile 10	512 QAM

For 62.5 channels, Profile 0 is BPSK with the normal (62.5 MHz) channel spacing, Profile 1 is QPSK, and so on.

For 125 MHz channels, Profile 0 is BPSK with ½ channel spacing. Profile 1 BPSK is BPSK with the normal channel spacing, Profile 2 is QPSK, and so on.

Ethernet Capacity [Mbps]

Profile	62.5	125	250	500	750
0	37-48	39-51	46-60	92-120	136-176
1	77-99	81-104	92-120	186-241	271-351
2	116-150	163-211	186-241	372-482	557-722
3	155-201	246-318	373-484	766-992	1115-1444
4	195-252	328-425	576-746	1150-1489	1673-2167
5	234-303	421-546	768-994	1533-1986	2232-2892
6	273-354	505-654	960-1244	1916-2482	2790-3614
7	313-405	590-764	1153-1494	2301-2980	3348-4337
8	–	674-873	1346-1743	2684-3476	3907-5061
9	–	759-983	1538-1993	3068-3975	4465-5784
10	–	–	1730-2242	3452-4472	–

Profile	1000	1250	1500	1750	2000
0	185-239	231-299	271-351	303-392	323-419
1	370-480	475-616	557-722	621-804	663-859
2	761-985	952-1233	1114-1443	1242-1609	1326-1717
3	1524-1974	1905-2467	2232-2892	2487-3222	2652-3436
4	2287-2962	2859-3703	3349-4339	3733-4836	4128-5347
5	3050-3951	3811-4937	4467-5787	4978-6448	5504-7130
6	3813-4939	4766-6174	5584-7234	6223-8061	6867-8896
7	4575-5927	5719-7409	6697-8675	7453-9655	8241-9882
8	5339-6916	6673-8645	7804-9882	8691-9882	9882-9940
9	6101-7903	7612-9861	–	–	–



Transmit Power [dBm]

Note: The accuracy of these values is up to +/-2dB.

In order to comply with the TELEC standard, it is necessary to reduce the power listed in the table below by the following:

- Up to QPSK: 2 dB
- 8 QAM: 1 dB for all channels except 2000 MHz
- 8 QAM at 2000 MHz: 2 dB

No reduction is necessary for modulations above 8 QAM.

Note: The Transmit Power may differ according to the hardware revision. For Transmit Power figures per hardware revision, refer to PCN20200914 – Product Change Notification for IP-50E – Updated TX Power.

Channel Spacing (MHz)	62.5	125	250	500	750	1000	1250	1500	1750	2000
¼ BPSK	–	–	20	20	20	20	20	20	20	20
½ BPSK	–	20	20	20	20	20	20	20	20	20
BPSK	20	20	20	20	20	20	20	20	20	20
4 QAM	20	20	20	20	20	20	20	20	20	20
8 QAM	18	18	18	18	18	18	18	18	18	18
16 QAM	17	17	17	17	17	17	17	17	17	17
32 QAM	17	17	17	17	17	17	17	17	17	17
64 QAM	16	16	16	16	16	16	16	16	16	16
128 QAM	16	16	16	16	16	16	16	16	16	16
256 QAM	15	15	15	15	15	15	15	–	–	–
512 QAM	–	14	14	14	–	–	–	–	–	–

Receive Level Threshold [dBm@10E-6]

Note: The values listed in this section are typical. Actual values may differ in either direction by up to 2dB.

Channel Spacing (MHz)	62.5	125	250	500	750	1000	1250	1500	1750	2000
¼ BPSK	–	–	-81.8	-78.8	-76.5	-75.8	-74.0	-74.0	-73.0	-73.4
½ BPSK	–	-81.8	-78.8	-75.8	-73.5	-72.8	-71.0	-71.0	-70.0	-70.4
BPSK	-80.0	-78.8	-75.8	-72.8	-70.5	-69.8	-68.0	-68.0	-67.0	-67.4
4 QAM	-78.0	-76.7	-73.7	-70.5	-68.5	-67.6	-66.0	-65.5	-65.0	-64.9
8 QAM	-73.2	-72.1	-69.1	-65.8	-63.5	-62.8	-61.0	-60.5	-60.0	-59.9
16 QAM	-71.3	-70.3	-67.3	-64.3	-62.5	-61.2	-60.0	-59.5	-58.0	-58.6
32 QAM	-70.0	-67.8	-64.8	-60.7	-60.0	-58.6	-57.0	-56.5	-56.0	-55.5
64 QAM	-68.3	-65.5	-61.9	-57.6	-57.5	-55.7	-55.0	-53.5	-53.0	-52.4
128 QAM	-64.1	-63.0	-58.9	-54.7	-54.5	-52.6	-52.0	-50.5	-50.0	-48.0
256 QAM	-61.0	-59.5	-56.0	-50.4	-51.5	-49.8	-48.5	–	–	–
512 QAM	–	-55.4	-52.4	-49.4	–	–	–	–	–	–

