



Datasheet

IP-50E

April 2020 | Rev. D



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)

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)

Ethernet

Ethernet Interfaces

Port 1:

- DC port

Port 2:

- RJ-45 1GE/Management/PoE Port (no traffic)

Port 3:

- SFP – 1/2.5GE Multiband port

Port 4:

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

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

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)

Optical 10Gbase-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

* Planned for future release.



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: EN 302 217-2

Certification ordinance Article 2-1-31-5, Land Mobile Station in the 80GHz band (Japan)

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

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

Safety: EN 60950-1, EN 62368-1, IEC 60950-1, IEC 62368-1, UL 60950-1, UL 62368-1, CAN/CSA C22.2 NO 60950-1, CAN/CSA C22.2 NO 62368-1, EN 60950-22, IEC 60950-22, UL 60950-22, CAN/CSA C22.2 NO 60950-22

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

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

Power Consumption Specifications

Active – 58W; Standby – 47W

Product Images

IP-50E



Technical Specifications

Mechanical Specifications

Dimensions (Direct Mount HW) –

322mm(H), 227/270mm(W), 86mm(D), 5.5kg
12.67”(H), 8.93”/10.62”(W), 3.38”(D), 12.12 lbs.

Dimensions (43dBi Integrated Antenna) -

341mm(H), 270/276mm(W), 103mm(D), 7kg
13.42”(H), 10.62/10.86”(W), 4.05”(D), 15.43 lbs.

Pole Diameter Range (for Remote Mount Installation)

8.89cm – 11.43cm; 3.5” – 4.5”

Environmental Specifications

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

-27°F to +131°F (-49°F to +140°F extended)

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.



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	1000	1500	2000
0	37-48	39-51	46-60	95-123	134-175	185-239	268-351	323-419
1	77-99	81-104	92-120	192-248	268-351	370-480	551-721	663-859
2	116-150	163-211	186-241	384-498	551-721	761-985	1101-1443	1326-1717
3	155-201	246-318	373-484	791-1024	1100-1444	1524-1974	2207-2891	2652-3436
4	195-252	328-425	576-747	1188-1539	1654-2167	2287-2962	3312-4338	4128-5347
5	234-303	421-546	768-995	1585-2053	2207-2891	3050-3951	4418-5787	5505-7131
6	273-354	505-654	960-1244	1982-2567	2759-3614	3813-4939	5523-7234	6869-8897
7	313-405	590-764	1154-1494	2377-3080	3311-4337	4575-5927	6623-8675	8243-9439
8	–	674-873	1346-1743	2774-3594	3864-5061	5339-6916	7718-9438	9439-9941
9	–	759-983	1538-1993	3171-4108	4416-5784	6101-7904	–	–
10	–	–	1731-2242	3568-4622	–	–	–	–

Transmit Power [dBm]

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

Channel Spacing (MHz)	62.5	125	250	500	750	1000	1500	2000
¼ BPSK	–	–	18	18	18	18	18	18
½ BPSK	–	18	18	18	18	18	18	18
BPSK	18	18	18	18	18	18	18	18
4 QAM	18	18	18	18	18	18	18	18
8 QAM	17	17	17	17	17	17	17	16
16 QAM	17	17	17	17	17	17	17	16
32 QAM	17	17	17	17	17	17	17	16
64 QAM	16	16	16	16	16	16	16	15
128 QAM	16	16	16	16	16	16	16	15
256 QAM	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	1500	2000
¼ BPSK	–	–	-81.8	-78.8	-76.5	-75.8	-74.0	-73.4
½ BPSK	–	-81.8	-78.8	-75.8	-73.5	-72.8	-71.0	-70.4
BPSK	-80.0	-78.8	-75.8	-72.8	-70.5	-69.8	-68.0	-67.4
4 QAM	-78.0	-76.7	-73.7	-70.5	-68.5	-67.6	-65.5	-64.9
8 QAM	-73.2	-72.1	-69.1	-65.8	-63.5	-62.8	-60.5	-59.9
16 QAM	-71.3	-70.3	-67.3	-64.3	-62.5	-61.2	-59.5	-58.6
32 QAM	-70.0	-67.8	-64.8	-60.7	-60.0	-58.6	-56.5	-55.5
64 QAM	-68.3	-65.5	-61.9	-57.6	-57.5	-55.7	-53.5	-52.4
128 QAM	-64.1	-63.0	-58.9	-54.7	-54.5	-52.6	-50.5	-48.0
256 QAM	-61.0	-59.5	-56.0	-50.4	-51.5	-49.8	–	–
512 QAM	–	-55.4	-52.4	-49.4	–	–	–	–

