



Datasheet

IP-50C

Rev A.04 | October 2019



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

Radio

Supported Frequency Range

6-42 GHz

Radio Configurations

1+0 up to 4+0, 1+1/2+2, 2+0 XPIC, 2x1+0 East/West

Radio Features

Multi-Carrier ABC (up to 2+0)

Protection: 1+1 HSB/2+2 HSB, 1+1 HSB-SD

High spectral utilization: BPSK to 4096 QAM w/ACM

Channel bandwidth: 14 to 224 MHz

XPIC

2x2/4x4 LoS MIMO

Advanced Frequency Reuse (AFR)

Multiband (with IP-20E or IP-50E)

Ethernet

Ethernet Interfaces

Port 1:

- DC Port

Port 2:

- RJ-45 - Electric MultiRate 1, 2.5, 5, 10 Gbps traffic interface/PoE port

Port 3:

- SFP – 1/2.5G Multiband port

Port 4:

- SFP – 1/10GE traffic interface/MIMO extension port (SFP+)

Port 5:

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

Port 6:

- RJ-45 – Management/Protection interface - 1 x 10/100 Base-T

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

Ethernet Features

MTU – 9612 Bytes

Layer 3 Support

- TWAMP
- L3-VPN
- IGP: OSPF, ISIS, ISIS-TE, ISIS-SR
- BGP, eBGP Option A, MP-iBGP
- RSVP-TE
- TI-LFA
- Segment routing
- Seamless MPLS (RSVP, LDP, IGMP)

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 (EBN)

Management Protocols

SNMP

REST

SDN Support:

- NETCONF/YANG

Synchronization Protocols

Enhanced Ethernet Equipment Clock (eEEC) Specification (G.8262 Opt 1 and Opt 2)

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

PTP Telecom Transparent Clock (T-TC) Specification (G.8273.3, Class C)

Enhanced SyncE Network Limits (G.8261, clause 9.2)

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

Security

Radio Encryption – AES 256

Secured protocols:

- HTTPS
- SNMPv3
- SSH
- SFTP

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/PoE ports)

Safety: EN 60950-1, IEC 60950-1, UL 60950-1, CSA-C22.2 No.60950-1, EN 60950-22, UL 60950-22, CSA C22.2.60950-22

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

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

Technical Specifications

Mechanical Specifications

Dimensions (Direct Mount HW) –
322mm(H), 227/270mm(W), 86mm(D), 6kg
12.67”(H), 8.93”/10.62”(W), 3.38”(D), 13.2 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 Consumption Specifications

Active (Multi core operation) – 75W; Standby – 65W

PoE Injector Mechanical Specifications

Dimensions – 134mm(H), 190mm(W), 62mm(D), 1 kg

PoE Injector Environmental Specifications

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

PoE Injector Power Input Specifications

Standard Input: -48 or +24 VDC (Optional)

DC Input range: $\pm(18/40.5$ to 60) VDC (+18VDC extended range is supported as part of the nominal +24VDC support)

PoE Injector Interfaces

GbE Data Port supporting 10/100/1000Base-T

Power-Over-Ethernet (PoE) Port

DC Power Port –40V to -60V (a PoE supporting two redundant DC feeds each supporting $\pm(18-60)$ V is available)

Product Images

IP-50C



Radio Specifications

Capacity [Mbps]

	Capacity (Mbps)	Capacity De-Dup	Capacity (Mbps)	Capacity De-Dup	Capacity (Mbps)	Capacity De-Dup
Modulation	14 MHz		28 MHz		40 MHz	
BPSK	9-11	10-36	21-25	22-81	28-35	30-111
QPSK	19-24	20-76	43-52	45-167	58-70	61-226
8 QAM	29-36	31-115	62-76	65-243	86-105	90-337
16 QAM	40-49	42-158	87-107	92-342	117-143	123-459
32 QAM	53-65	56-209	115-140	121-450	154-189	162-605
64 QAM	66-80	69-257	141-173	149-554	190-232	199-743
128 QAM	79-97	83-310	170-208	179-667	229-280	241-899
256 QAM	90-110	95-354	196-239	206-767	247-301	259-966
512 QAM	100-122	105-391	209-255	219-818	270-330	284-1059
1024 QAM Strong	106-129	111-414	228-278	239-892	306-375	322-1201
1024 QAM Light	112-137	118-439	241-295	253-945	325-398	342-1275
2048 QAM	–	–	263-321	276-1031	352-430	370-1379
4096 QAM	–	–	280-342	294-1097	369-451	388-1445
	56 MHz		80 MHz		112 MHz	
BPSK	43-52	45-168	57-69	59-222	83-101	87-324
QPSK	87-106	91-340	114-140	120-448	166-203	175-652
8 QAM	127-155	133-496	162-198	171-636	247-302	260-968
16 QAM	176-215	185-689	231-283	243-906	336-410	353-1316
32 QAM	232-283	243-907	304-371	319-1190	442-540	464-1731
64 QAM	284-348	299-1114	371-454	390-1456	542-663	570-2000
128 QAM	344-420	361-1347	439-536	461-1720	655-801	688-2000
256 QAM	397-485	417-1554	505-618	531-1980	749-915	787-2000
512 QAM	426-521	448-1671	555-679	583-2000	813-994	854-2000
1024 QAM Strong	464-567	487-1817	604-738	635-2000	882-1078	927-2000
1024 QAM Light	493-602	518-1931	641-784	674-2000	936-1144	984-2000
2048 QAM	534-653	561-2000	679-829	713-2000	1010-1234	1061-2000
4096 QAM	549-672	577-2000	–	–	–	–

Transmit Power [dBm]

Modulation	Frequency (GHz)	6	7	8	11	13	15	18	23	24	26	28-38	42
BPSK - 8 PSK		28	28	28	29	27	24	22	25	0	21	18	15
16 QAM		28	27	27	29	26	24	22	25	0	20	17	14
32 QAM		27	27	26	29	25	24	22	24	0	19	16	13
64 QAM		27	26	26	27	24	24	22	22	0	19	16	13
128 QAM		27	26	26	26	23	24	22	21	0	19	16	13
256 QAM		27	26	26	25	22	22	20	18	0	17	14	11
512 QAM		25	25	24	25	22	22	20	18	0	17	14	11
1024 QAM		25	24	24	24	20	20	20	17	0	16	13	10
2048 QAM		23	23	22	23	19	20	18	16	0	15	12	9
4096 QAM		21	21	20	21	17	18	16	–	–	–	–	–



Receive Level Threshold [dBm@10E-6]

14 MHz	Frequency (GHz)	6	7-8	10	11	13	15	18	23	24	26	28-31	32	38	42
14 MHz															
BPSK		-91.5	-91.0	-90.5	-91.5	-90.5	-89.5	-91	-90.0	-89.5	-89.5	-89.5	-89.0	-89.0	-88.5
QPSK		-90.5	-90.0	-89.5	-90.5	-89.5	-88.5	-90	-89.0	-88.5	-88.5	-88.5	-88.0	-88.0	-87.5
8 PSK		-84.5	-84.0	-83.5	-85.5	-83.5	-82.5	-84	-83.0	-82.5	-82.5	-82.5	-82.0	-82.0	-81.5
16 QAM		-83.5	-83.0	-82.5	-83.5	-82.5	-81.5	-83	-82.0	-81.5	-81.5	-81.5	-81.0	-81.0	-80.5
32 QAM		-80.5	-79.5	-79.5	-80.5	-79.0	-78.5	-79.5	-79.0	-78.5	-78.5	-78.0	-78.0	-77.5	-77.0
64 QAM		-77.5	-76.5	-76.5	-77.0	-76.0	-75.5	-76.5	-76.0	-75.5	-75.5	-75.0	-75.0	-74.5	-74.0
128 QAM		-74.0	-73.5	-73.0	-74.0	-73.0	-72.0	-73.5	-72.5	-72.0	-72.0	-72.0	-71.5	-71.5	-71.0
256 QAM		-71.5	-70.5	-70.5	-71.0	-70.0	-69.5	-70.5	-69.5	-69.0	-69.5	-69.0	-69.0	-68.5	-68.0
512 QAM		-68.5	-68.0	-67.5	-68.5	-67.5	-66.5	-68.0	-67.0	-66.5	-66.5	-66.5	-66.0	-66.0	-65.5
1024 QAM Strong		-65.5	-65.0	-64.5	-65.5	-64.5	-63.5	-65.0	-64.0	-63.5	-63.5	-63.5	-63.0	-63.0	-62.5
1024 QAM Light		-65.0	-64.0	-64.0	-64.5	-63.5	-63.0	-64.0	-63.5	-63.0	-63.0	-62.5	-62.5	-62.0	-61.5
28 MHz															
BPSK		-88.5	-88.0	-87.5	-88.5	-87.5	-86.5	-88.0	-87.0	-86.5	-86.5	-86.5	-86.0	-86.0	-85.5
QPSK		-87.5	-87.0	-86.5	-87.5	-86.5	-85.5	-87.0	-86.0	-85.5	-85.5	-85.5	-85.0	-85.0	-84.5
8 PSK		-83.0	-82.5	-82.0	-83.0	-82.0	-81.0	-82.5	-81.5	-81.0	-81.0	-81.0	-80.5	-80.5	-80.0
16 QAM		-81.0	-80.5	-80.0	-81.0	-79.5	-79.0	-80.5	-79.5	-79.0	-79	-79.0	-78.5	-78.0	-78.0
32 QAM		-77.5	-77.0	-76.5	-77.5	-76.0	-75.5	-77.0	-76.0	-75.5	-75.5	-75.5	-75.0	-74.5	-74.5
64 QAM		-74.5	-74.0	-73.5	-74.5	-73.0	-72.5	-74.0	-73.0	-72.5	-72.5	-72.5	-72.0	-71.5	-71.5
128 QAM		-71.5	-70.5	-70.5	-71.0	-70.0	-69.5	-70.5	-69.5	-69.0	-69.5	-69.0	-69.0	-68.5	-68.0
256 QAM		-68.5	-67.5	-67.5	-68.0	-67.0	-66.5	-67.5	-66.5	-66.0	-66.5	-66.0	-66.0	-65.5	-65.0
512 QAM		-66.0	-65.0	-65.0	-66.0	-64.5	-64.0	-65.0	-64.5	-64.0	-64.0	-63.5	-63.5	-63.0	-62.5
1024 QAM Strong		-63.0	-62.5	-62.0	-63.0	-61.5	-61.0	-62.5	-61.5	-61.0	-61.0	-61.0	-60.5	-60.0	-60.0
1024 QAM Light		-62.0	-61.5	-61.0	-62.0	-60.5	-60.0	-61.5	-60.5	-60.0	-60.0	-60.0	-59.5	-59.0	-59.0
2048 QAM		-58.5	-58.0	-57.5	-58.5	-57.0	-56.5	-58.0	-57.0	-56.5	-56.5	-56.5	-56.0	-55.5	-55.5
4096 QAM		-55.5	-55.0	-54.5	-55.5	-54.0	-53.5	-55.0	-	-	-	-	-	-	-
40 MHz															
BPSK		-87.0	-86.5	-86.0	-87.0	-86.0	-85.0	-86.5	-85.5	-85.0	-85.0	-85.0	-84.5	-84.5	-84.0
QPSK		-86.0	-85.5	-85.0	-86.0	-85.0	-84.0	-85.5	-84.5	-84.0	-84.0	-84.0	-83.5	-83.5	-83.0
8 PSK		-81.0	-80.5	-80.0	-81.0	-79.5	-79.0	-80.5	-79.5	-79.0	-79.0	-79.0	-78.5	-78.0	-78.0
16 QAM		-79.5	-79.0	-78.5	-79.5	-78.0	-77.5	-79.0	-78.0	-77.5	-77.5	-77.5	-77.0	-76.5	-76.5
32 QAM		-76.0	-75.0	-75.0	-75.5	-74.5	-74.0	-75.0	-74.0	-73.5	-74.0	-73.5	-73.5	-73.0	-72.5
64 QAM		-73.0	-72.0	-72.0	-73.0	-71.5	-71.0	-72.0	-71.5	-71.0	-71.0	-70.5	-70.5	-70.0	-69.5
128 QAM		-70.0	-69.0	-69.0	-70.0	-68.5	-68.0	-69.0	-68.5	-68.0	-68.0	-67.5	-67.5	-67.0	-66.5
256 QAM		-67.0	-66.0	-66.0	-66.5	-65.5	-65.0	-66.0	-65.0	-64.5	-65.0	-64.5	-64.5	-64.0	-63.5
512 QAM		-64.0	-63.5	-63.0	-64.0	-62.5	-62.0	-63.5	-62.5	-62.0	-62.0	-62.0	-61.5	-61.0	-61.0
1024 QAM Strong		-61.5	-61.0	-60.5	-61.5	-60.0	-59.5	-61.0	-60.0	-59.5	-59.5	-59.5	-59.0	-58.5	-58.5
1024 QAM Light		-60.5	-60.0	-59.5	-60.5	-59.5	-58.5	-60.0	-59.0	-58.5	-58.5	-58.5	-58.0	-58.0	-57.5
2048 QAM		-58.0	-57.0	-57.0	-58.0	-56.5	-56.0	-57.0	-56.5	-56.0	-56.0	-55.5	-55.5	-55.0	-54.5
4096 QAM		-55.0	-54.0	-54.0	-55.0	-53.5	-53.0	-54.0	-	-	-	-	-	-	-



56 MHz	Frequency (GHz)	6	7-8	10	11	13	15	18	23	24	26	28-31	32	38	42
BPSK		-85.5	-85.0	-84.5	-85.5	-84.0	-83.5	-85.0	-84.0	-83.5	-83.5	-83.5	-83.0	-82.5	-82.5
QPSK		-84.5	-84.0	-83.5	-84.5	-83.0	-82.5	-84.0	-83.0	-82.5	-82.5	-82.5	-82.0	-81.5	-81.5
8 PSK		-80.0	-79.0	-79.0	-79.5	-78.5	-78.0	-79.0	-78.0	-77.5	-78.0	-77.5	-77.5	-77.0	-76.5
16 QAM		-77.5	-77.0	-76.5	-77.5	-76.0	-75.5	-77.0	-76.0	-75.5	-75.5	-75.5	-75.0	-74.5	-74.5
32 QAM		-74.0	-73.0	-73.0	-73.5	-72.5	-72.0	-73.0	-72.0	-71.5	-72.0	-71.5	-71.5	-71.0	-70.5
64 QAM		-70.5	-70.0	-69.5	-70.5	-69.5	-68.5	-70.0	-69.0	-68.5	-68.5	-68.5	-68.0	-68.0	-67.5
128 QAM		-68.0	-67.0	-67.0	-67.5	-66.5	-66.0	-67.0	-66.0	-65.5	-66.0	-65.5	-65.5	-65.0	-64.5
256 QAM		-64.5	-64.0	-63.5	-64.5	-63.5	-62.5	-64.0	-63.0	-62.5	-62.5	-62.5	-62.0	-62.0	-61.5
512 QAM		-62.5	-62.0	-61.5	-62.5	-61.5	-60.5	-62.0	-61.0	-60.5	-60.5	-60.5	-60.0	-60.0	-59.5
1024 QAM Strong		-59.0	-58.5	-58.0	-59.0	-58.0	-57.0	-58.5	-57.5	-57.0	-57.0	-57.0	-56.5	-56.5	-56.0
1024 QAM Light		-58.0	-57.5	-57.0	-58.0	-57.0	-56.0	-57.5	-56.5	-56.0	-56.0	-56.0	-55.5	-55.5	-55.0
2048 QAM		-55.5	-54.5	-54.5	-55.0	-54.0	-53.5	-54.5	-53.5	-53.0	-53.5	-53.0	-53.0	-52.5	-52.0
4096 QAM		-52.5	-51.5	-51.5	-52.0	-51.0	-50.5	-51.5	-	-	-	-	-	-	-
80 MHz															
BPSK		-85.0	-85.0	-84.5	-85.5	-84.5	-83.5	-85.0	-84.0	-83.5	-83.5	-83.5	-83.0	-83.5	-82.5
QPSK		-82.5	-82.5	-82.5	-83.0	-82.0	-81.5	-82.5	-81.5	-81.0	-81.5	-81.0	-81.0	-81.0	-80.0
8 PSK		-79.0	-79.0	-78.5	-79.5	-78.5	-77.5	-79.0	-78.0	-77.5	-77.5	-77.5	-77.0	-77.5	-76.5
16 QAM		-76.0	-76.0	-75.5	-76.5	-75.0	-74.5	-76.0	-75.0	-74.5	-74.5	-74.5	-74.0	-74.0	-73.5
32 QAM		-72.5	-72.5	-72.0	-73.0	-71.5	-71.0	-72.5	-71.5	-71.0	-71.0	-71.0	-70.5	-70.5	-70.0
64 QAM		-69.0	-69.0	-69.0	-70.0	-68.5	-68.0	-69.0	-68.5	-68.0	-68.0	-67.5	-67.5	-67.5	-66.5
128 QAM		-66.5	-66.5	-66.0	-67.0	-66.0	-65.0	-66.5	-65.5	-65.0	-65.0	-65.0	-64.5	-65.0	-64.0
256 QAM		-63.5	-63.5	-63.0	-64.0	-63.0	-62.0	-63.5	-62.5	-62.0	-62.0	-62.0	-61.5	-62.0	-61.0
512 QAM		-61.0	-61.0	-61.0	-62.0	-60.5	-60.0	-61.0	-60.5	-60.0	-60.0	-59.5	-59.5	-59.5	-58.5
1024 QAM Strong		-58.0	-58.0	-57.5	-58.5	-57.5	-56.5	-58.0	-57.0	-56.5	-56.5	-56.5	-56.0	-56.5	-55.5
1024 QAM Light		-57.0	-57.0	-57.0	-58.0	-56.5	-56.0	-57.0	-56.5	-56.0	-56.0	-55.5	-55.5	-55.5	-54.5
2048 QAM		-54.5	-54.5	-54.5	-55.5	-54.0	-53.5	-54.5	-54.0	-53.5	-53.5	-53.0	-53.0	-	-
112 MHz															
BPSK		-82.0	-81.5	-81.0	-82.0	-80.5	-80.0	-81.5	-80.5	-80.0	-80.0	-80.0	-79.5	-79.0	-79.0
QPSK		-81.0	-80.5	-80.0	-81.0	-79.5	-79.0	-80.5	-79.5	-79.0	-79.0	-79.0	-78.5	-78.0	-78.0
8 PSK		-76.5	-75.5	-75.5	-76.0	-75.0	-74.5	-75.5	-74.5	-74.0	-74.5	-74.0	-74.0	-73.5	-73.0
16 QAM		-74.0	-73.5	-73.0	-74.0	-72.5	-72.0	-73.5	-72.5	-72.0	-72.0	-72.0	-71.5	-71.0	-71.0
32 QAM		-70.5	-69.5	-69.5	-70.0	-69.0	-68.5	-69.5	-68.5	-68.0	-68.5	-68.0	-68.0	-67.5	-67.0
64 QAM		-67.0	-66.5	-66.0	-67.0	-66.0	-65.0	-66.5	-65.5	-65.0	-65.0	-65.0	-64.5	-64.5	-64.0
128 QAM		-64.5	-63.5	-63.5	-64.0	-63.0	-62.5	-63.5	-62.5	-62.0	-62.5	-62.0	-62.0	-61.5	-61.0
256 QAM		-61.0	-60.5	-60.0	-61.0	-60.0	-59.0	-60.5	-59.5	-59.0	-59.0	-59.0	-58.5	-58.5	-58.0
512 QAM		-59.0	-58.5	-58.0	-59.0	-58.0	-57.0	-58.5	-57.5	-57.0	-57.0	-57.0	-56.5	-56.5	-56.0
1024 QAM Strong		-55.5	-55.0	-54.5	-55.5	-54.5	-53.5	-55.0	-54.0	-53.5	-53.5	-53.5	-53.0	-53.0	-52.5
1024 QAM Light		-54.5	-54.0	-53.5	-54.5	-53.5	-52.5	-54.0	-53.0	-52.5	-52.5	-52.5	-52.0	-52.0	-51.5
2048 QAM		-52.0	-51.0	-51.0	-51.5	-50.5	-50.0	-51.0	-50.0	-49.5	-5.00	-49.5	-49.5	-	-

