Datasheet

IP-50EX
IP-50EX-P
IP-50EXA

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IP-50EX is a compact, high-capacity, all-outdoor Ethernet backhaul system designed to operate in the E-Band frequency range. IP-50EX can operate over 250, 500, 1000, and 2000 MHz channels, with modulations of BPSK to 512 QAM and a rich feature set.

IP-50EX-P is a hardware variant of IP-50EX, with high TX power and support for PoE-In and AES-GCM-256 encryption.

IP-50EXA is another hardware variant of IP-50EX, optimized for links requiring high-efficiency Layer 1 Link Aggregation.

All features, configurations, and specifications described in this document apply to IP-50EX, IP-50EX-P, and IP-50EXA except where otherwise noted.

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

Radio

[1]

Supported Frequency Range

71-76 GHz, 81-86 GHz

Radio Configurations

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

Radio Configurations with Link Aggregation[1]

- 2+0 with 2 x IP-50EXA (XPIC optional)
- 3+0 Multiband with IP-50EXA and IP-50CX
- 3+0 Multiband with IP-50EXA and IP-20C
- 3+0 Multiband with IP-50EXA and third-party microwave radio
- 4+0 Multiband with 2 x IP-50EXA and 1 x IP-50CX[2]

Radio Features

- ATPC
- High spectral utilization: BPSK to 512 QAM w/ACMB
- Adaptive Bandwidth Notification (EOAM)
- XPIC
- Multiband (with IP-20 and IP-50 families)
- Layer 1 Link Bonding (as attached unit with IP-50C or IP-20N/IP-20A)

Ethernet

Ethernet Interfaces

Port 1:

- DC port

Port 2:

- RJ-45 – 1 GbE (Management/Traffic/PoE-In[3])

Port 3:

- SFP28 - 1/10/25 GbE

Port 4:

- SFP28 - 1/10/25 GbE

Port 5:

- QSFP (internal)
- Option for SFP+ (1x10 GbE) with adaptor
- Option for 2 x SFP+ (2x1/10 GbE) with adaptor and special cable[1]

Ethernet Features

MTU – 9612 Bytes

Quality of Service

- Multiple Classification criteria (VLAN ID, P-bits, IPv4 DSCP, IPv6 TC)
- 8 CoS queues per port
- WRED
- P-bit marking/remarking

4K VLANs

VLAN add/remove

MSTP, ERP (ITU-T G.8032)

Ethernet OAM (Y.1731)

Ethernet Bandwidth Notification (ETH-BN) (Y.1731)

1 Requires IP-50EXA.

2 Planned for future release.

3 PoE-In requires IP-50EX-P.

Management Protocols

SNMP

REST

SDN Support:

- NETCONF/YANG

Synchronization Protocols

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

PTP Telecom Class A Boundary Clock (T-BC) (G.8273.2)

PTP Telecom Class A 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)

Virtual LAN (VLAN, IEEE 802.1Q)

MAC bridges (IEEE801.D)

Class of service (IEEE 802.1p)

Provider bridges (QinQ – IEEE 802.1ad)

Link aggregation (IEEE 802.1AX)

Auto MDI/MDIX for 1000baseT

RFC 2474: IPv4 DSCP

RFC 2460: IPv6 Traffic Classes

Security

Radio Encryption – AES-GCM-256[4]

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

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/OCT-16, Class A (India)
IEC 61000-4-29

Surge: EN61000-4-5, Class 4 (for PWR port)

Safety: EN 62368-1, IEC 62368-1, UL 62368-1, CAN/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) –
228mm(H), 233mm(W), 76mm(D), 2.77 kg.
9”(H), 9.2”(W), 3”(D), 6.1 lbs.

Dimensions (43dBi Integrated Antenna) –
313mm(H), 276mm(W), 97mm(D), 4.5 kg.
12.3”(H), 10.9”(W), 3.8”(D), 9.9 lbs.

Environmental Specifications

-40°C to +55°C
-40°F to +131°F

Power Input Specifications

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

Power Consumption Specifications

Standard IP-50EX:

- Typical Power – 50W
- Maximum Power – 55W

IP-50EX-P:

- Typical Power – 61W
- Maximum Power – 65W

IP-50EXA:

- Typical Power – 75W
- Maximum Power – 82W
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[4] AES requires IP-50EX-P.