



PRODUCT BRIEF



E-BAND PRODUCTS FOR WIRELESS ISPS

The Broadest PtP Multi-Gigabit Portfolio

Wireless Internet Service Providers (WISPs) are at the forefront of connecting communities, often reaching areas where traditional fiber networks cannot. As customer demand for faster, more reliable Internet skyrockets, WISPs face the constant challenge of upgrading their networks to deliver high capacity and competitive speeds. This is where E-Band PtP technology directly addresses these challenges. E-band mmWave radios deliver fiber-like performance with ultra-high capacity (10–20+ Gbps today, scalable to 100 Gbps) by leveraging the wide 70/80 GHz spectrum. They enable fast, cost-effective deployments compared to fiber, with low latency and strong economics for backhaul. With flexible range options, they provide a future-proof solution to meet escalating bandwidth.

TABLE OF CONTENTS

SOLVING SPECTRUM CONGESTION	3
MEET THE MILLIMETER WAVE FAMILY	4
IP-50EX FAMILY.....	5
EtherHaul-8020FX	7
EtherHaul-8010FX.....	9
IP-50GP	11
IP-100E	13
FINDING THE PERFECT FIT	15
SUMMARY	16



SOLVING SPECTRUM CONGESTION AND ENABLING GROWTH

E-band represents a decisive answer to one of the biggest challenges WISPs face: meeting ever-growing capacity demands. With its wide channel availability, E-band enables multi-gigabit throughput that allows networks to scale seamlessly as subscriber needs increase. At the same time, it alleviates the persistent issue of spectrum congestion—sidestepping crowded, expensive lower bands with a lightly licensed framework that accelerates deployment and reduces administrative overhead. The result is greater flexibility, faster rollouts, and the ability to add bandwidth exactly when it's needed.

Adapting to Diverse Deployment Scenarios

In rural and underserved regions, the range and reliability of E-band make it an attractive choice for bridging the digital divide and extending multi-gigabit services to areas where fiber deployment is not economically viable. In dense urban areas, where physical space is limited and demand for high-capacity is acute, E-band supports ultra-high data rates and tightly focused links that minimize interference with adjacent systems. As Internet use evolves and next-generation applications emerge, incorporating E-band into network infrastructure positions WISPs to keep pace with rapidly shifting technological requirements. Its advanced capabilities and adaptability create a solid foundation for ongoing innovation, equipping service providers to maintain competitiveness now and into the future.

Our mmW PtP family advantages



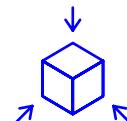
Pay-as-you-grow
multi-gigabit capacity



Abundant available
spectrum



A solution
for any scenario



Fast time-to-market
with small size
& easy installation



THE PRODUCTS



MEET THE MILLIMETER WAVE FAMILY

1-40 Gbps capacity that meets your needs

Ceragon offers the broadest E-band portfolio in the industry, scaling from 1 Gbps up to a market-leading 40 Gbps full duplex capacity. The solutions are smaller and lighter than comparable equipment, enabling easier installation and faster deployment while reducing operational costs. These products offer high capacity in 1+0 and in 2+0 configurations.

Ceragon introduced its E-band solutions after years of delivering traditional microwave solutions. Building on years of experience in traditional microwave, Ceragon introduced its E-band solutions to deliver millimeter wave capacity over microwave distances.

The IP-50EXP is indeed engineered to deliver millimeter-wave capacity across microwave distances. With extended transmit power, low RSL threshold, and optional E-stabilizer antennas, it keeps performance strong even in challenging conditions.

Built to deliver high capacity over long distance, it combines adaptive modulation, precise synchronization, and dual 25 GbE interfaces to ensure secure, resilient, and future-ready connectivity. Easy to align and fast to deploy, the IP-50EXP gives operators the reach, speed, and reliability to grow without compromise.

The IP-50GP was developed with multiband support in mind, enabling Layer-1 aggregation of traditional microwave links with E-band. Ceragon EtherHaul products are also especially easy to install, supporting out-of-the-box operation.



THE PRODUCTS



IP-50EX FAMILY

The smallest form factor, carrier-grade mmW radio

The IP-50EX family provides up to 10 Gbps capacity in 1+0 configurations. In a 2+0 XPIC configuration, it delivers up to 20 Gbps, with seamless traffic distribution and improved link survivability. As a carrier-grade solution, it is equipped with an integrated Carrier Ethernet services switch that includes a 25 GbE traffic interface, making it easier to connect to similar interfaces. The Carrier Ethernet services switch also complies with MEF CE 2.0 and SLA requirements for essential services applications.

The IP-50EX family features adaptive coding modulation and bandwidth (ACMB), providing hitless transmission and efficient modification of the radio's modulation and channel bandwidth to cope with fading conditions. The IP-50EX family's versatile design makes it a great candidate for a diverse range of networking requirements, including everything from macro site backhaul to small cell connectivity and building-to-building connections. Its dependable performance and advanced features make the IP-50EX family an excellent choice for networks requiring enhanced capacity and efficient, compact deployment options.

Meet the IP-50EX Family

IP-50EXP: A powerful radio with 24 dBm high transmit, PoE-in, and user-data AES encryption, enabling longer distance coverage with higher availability.

IP-50EXA: A state-of-the-art, multiband/multi-box radio enabling up to 20 Gbps reliable traffic.



**COST EFFECTIVE, HIGH CAPACITY
WITH CARRIER-GRADE PERFORMANCE**



THE PRODUCTS

IP-50EX FAMILY Product Specifications

RADIO

- Supported frequency bands: 71-86 GHz
- Radio capacity: 10 Gbps/20 Gbps for 2+0 XPIC
- Supported channel spacing: 250-2000 MHz
- High TX power: up to 24 dBm
- Antenna options:
 - Parabolic
 - Integrated flat panel (future release)
 - E-Stabilizer (2, 3 ft)
- HSB protection: 1+1

SOFTWARE FEATURES

- IEEE 802.1d transparent bridging
- Supports XPIIC and multiband
- Networking: Integrated Carrier Ethernet switching capabilities, MEF Carrier Ethernet 2.0 compliant | carrier-grade service resiliency (G.8032, MSTP) | SyncE and 1588 synchronization | ITU-T Y.1731 fault and performance management (MEF 35) | SDN | Layer 3 (using IP-50FX)
- Security: AES radio encryption | secured protocols and management interfaces (HTTPS, TLS, SSH, SNMPv3) | secure architecture and software design

INTERFACES

- 2 x 1/10/25 GbE traffic interface (SFP28)
- 1 GbE management/PoE port
- QSFP protection/XPIIC or 1 x10 GbE (2x10 GbE for IP-50EXA)



THE PRODUCTS



EH-8020FX

The out-of-the-box solution for capacity-hungry applications

Service providers face the growing challenge of delivering higher capacity while keeping costs under control. To address customer demand for an affordable, easy-to-install, high-capacity solution, Ceragon introduced the EH-8020FX. The EH-8020FX was engineered to balance cost-efficiency with high capacity, while ensuring seamless installation and straightforward maintenance.

The EH-8020FX sets a new benchmark for connectivity with 20 Gbps throughput in a 2+0 XPIC configuration, also allowing for more services to be connected through one copper RJ-45 port and two SFP+ 10 Gbps interfaces. Built to endure, its IP67-rated weatherproofing and robust construction ensure reliable performance in harsh conditions. AES-encryption provides secure, wire-speed connectivity, supporting critical applications and delivering peace of mind.

While adding more capacity and interfaces, the 8020FX still inherits all the advantages of E-band: operating within the 71-76/81-86 GHz spectrum, minimizing interference, enabling extensive frequency reuse, and benefiting from low licensing costs and expedited approvals for highly streamlined deployment.

Integrated with advanced networking capabilities like QoS awareness, the EH-8020FX integrates seamlessly into existing infrastructure. By delivering scalable performance, easy deployment, and reliable operation, it drives rapid ROI and ensures a low total cost of ownership (TCO).



**HIGH CAPACITY, EASY DEPLOYMENT,
AND MORE CONNECTION OPTIONS**



THE PRODUCTS

EH-8020FX Product Specifications

RADIO

- Supported frequency bands: 71-76/81-86 GHz (Tx high and low)
- Max capacity: 20 Gbps (2+0 XPIC)
- XPIC (2+0): Supported
- Channel BW: 250, 500, 1250 & 2000 MHz
- Multiband supported: Yes

SOFTWARE FEATURES

- IEEE 802.1d transparent bridging
- VLAN and VLAN stacking
- 4K VLANs, MEF 9, 14 and 21 compliant Ethernet services
- Smart pipes transparent ports mode
- Link aggregation: LAG and LACP (IEEE 802.3ad)
- Ethernet ring protection:
 - 10 KB jumbo frames
 - Configurable QoS-aware forwarding
- 8-level H-QoS with multi-mapping options:
 - L2: 802.1p, VLAN ID, L2½: MPLS EXP, L3: DSCP
- Security: AES encryption

INTERFACES

- 1x 1 Gbps RJ45 PoE-In
- 2x 10 Gbps SFP+
- 48V DC (redundant with PoE-In)
- RSSI measurement
- XPIC signaling



THE PRODUCTS



EH-8010FX

The ultimate out-of-the-box solution

The ultimate solution for out-of-the-box deployment is the 8010FX, a 10 Gbps wireless backhaul radio optimized for high-capacity metro, aggregation, and infrastructure networks. With its long reach, fiber-like performance, ultra-low latency, and small form factor, it provides a flexible and easy-to-deploy fiber extension solution for service providers and enterprises.

Key features include 10 Gbps throughput with the longest reach in its class, IP67 weatherproofing, and bridging, with AES encryption to ensure secure wire-speed connectivity. Its robust design delivers proven reliability even in harsh conditions.

Operating in the 71-76/81-86 GHz E-band, the EH-8010FX leverages 10 GHz of globally available spectrum, ensuring minimal interference. Its high-gain antennas enable extensive frequency reuse, while operators benefit from the E-band's low licensing costs and fast approval processes.

EtherHaul-8010FX supports vendor-agnostic dual-band operation through software capabilities and dual-band antennas, allowing back-up via 5 GHz or 18 GHz radios.

With advanced networking capabilities like QoS awareness, the EH-8010FX integrates seamlessly with existing networks. It provides exceptional value, driving fast ROI and low TCO through scalable performance, easy deployment, and reliable operation.



**SCALABLE PERFORMANCE.
EASY DEPLOYMENT. RELIABLE OPERATION.**



THE PRODUCTS

EH-8010FX Product Specifications

RADIO

- Supported frequency bands: 71-76/81-86 GHz (Tx high and low)
- Max capacity: 10 Gbps
- Channel BW: 250, 500, 1250 & 2000 MHz
- Multiband: Supported

SOFTWARE FEATURES

- IEEE 802.1d transparent bridging
- VLAN and VLAN stacking
- 4K VLANs, MEF 9, 14 and 21 compliant Ethernet services
- Smart pipes transparent ports mode
- Link aggregation: LAG and LACP (IEEE 802.3ad)
- Ethernet ring protection:
 - 10 KB jumbo frames
 - Configurable QoS-aware forwarding
- 8-level H-QoS with multi-mapping options:
 - L2: 802.1p, VLAN ID, L2½: MPLS EXP, L3: DSCP
- Security: AES encryption

INTERFACES

- 48V DC (redundant with the PoE in)
- Aux
- ETH 1 Copper 1 Gbps
- ETH 2 Combo 10 Gbps (Copper / SFP+)



THE PRODUCTS



IP-50GP

The Layer-1 Aggregation Unit

The IP-50GP is a highly-flexible indoor unit that delivers multi-Gbps radio capacity. This state-of-the-art platform represents the next evolution in cost-effective, innovative indoor units designed to elevate network performance. Its compact 1RU form factor makes it both lightweight and environmentally friendly.

The system supports Layer-1 aggregation up to 8+0 with two directions, integrated Carrier Ethernet switching capabilities, multiband support of multi-Gbps, and is MEF Ethernet 2.0 compliant.

The IP-50GP stands out with extensive interface options, featuring 2x1/10/25 GbE ports (SFP28), 6x1/10 GbE ports (SFP+) and 4xBBU ports with two, dual-use 1/10GbE user ports (SFP+). The system includes auxiliary interfaces and supports single or dual-feed DC input for enhanced reliability.

The IP-50GP incorporates payload encryption, secure protocols and secure management interfaces (HTTPS, TLS, SSH, SNMPv3), secure architecture and software design.



**HIGHLY FLEXIBLE INDOOR UNIT
ENABLES MULTI-BAND AND AGGREGATION**



THE PRODUCTS

IP-50GP Products Specifications

RADIO

- Radio Interfaces
 - 2 x SFP+ Radio interfaces
 - 2 x SFP+ Dual-use radio or Ethernet interfaces (1/10G)
- Supported All-Outdoor Units
 - IP-50EX/EXP/EXA; IP-50E
 - EtherHaul 8010/8020
 - IP-50CX, IP-50C
 - Third-party devices
- Supported RFUs
 - RFU-D, RFU-D-HP, RFU-SX

SOFTWARE FEATURES

- Networking capacity: 193 Gbps
- QoS classification based on TOS/DSCP, VLAN ID, VLAN P-bits, MAC DA and SA, SA, and DA IP Addresses (IPv4 and IPv6)
- LAG support with BFD on LAG interfaces, according to RFC7130

INTERFACES

- 6 x SFP+ (1/10G)
- 2 x SFP28 (1/10/25G)
- 2 x SFP+ dual-use radio or Ethernet interfaces (1/10G)
- 1 x RJ-45 management/protection interface (100M)



THE PRODUCTS



IP-100E

The highest capacity dual radio

The IP-100E delivers industry-leading capacity of up to 25 Gbps in a 2+0 configuration using a single unit and up to 40 Gbps with a multi-box setup, making it the most advanced E-band radio available. The IP-100E leverages Layer-1 carrier aggregation to seamlessly integrate this high-capacity carrier with additional microwave, fiber, or leased line connections, ensuring your high-priority services consistently meet SLA targets. It also achieves exceptional multiband performance and features an optional antenna stabilizer supporting 2 ft and 3 ft antennas, providing an optimal mmW solution for digital transformation.

Key features include innovative Adaptive Coding & Modulation and Bandwidth (ACMB) technology, enabling hitless transmission through dynamic modulation and bandwidth adjustment under challenging conditions.

With dual 25 GbE interfaces, the IP-100E delivers future-proof Layer-2 connectivity. It supports diverse applications, from macro-site backhaul to small-cell connectivity and building-to-building links, making it ideal for mobile carriers, ISPs, and enterprise networks.



2+0 E-BAND IN A BOX
WITH 25 GBPS RADIO CAPACITY



THE PRODUCTS

IP-100E Products Specifications

RADIO

- Supported frequency bands: 71-86GHz
- Radio capacity: 25 Gbps (single unit), 40 Gbps (two units)
- Supported channel spacing: 250-2250 MHz

SOFTWARE FEATURES

- Layer-1 traffic aggregation: supports XPIC and multiband with any additional layer connection
- Networking: integrated Carrier Ethernet switching capabilities, MEF Carrier Ethernet 2.0 compliant | carrier-grade service resiliency (G.8032, MSTP) | SyncE and 1588 synchronization | ITU-T Y.1731 fault and performance management (MEF 35) | SDN | Layer-3 (with the IP-50FX)
- Security: AES radio encryption | secured protocols and management interfaces (HTTPS, TLS, SSH, SNMPv3) | secure architecture and software design | advanced authentication and identification management

INTERFACES

- 2 x 1/10/25 GbE traffic interface (SFP28)
- 1/10 GbE traffic interface (SFP+)
- 1 x 100 MbE management port



FINDING THE PERFECT FIT

If you're choosing the right device for your network, begin by narrowing down your options based on spectrum and capacity requirements. Once those are defined, refine your selection by focusing on the devices that provide your must-have features. Keep in mind that costs are always a factor, and higher power and performance often go hand in hand with increased CAPEX and OPEX.

PRODUCT	Highlights	Max rate in single box	Max rate in two boxes	1/10 GbE Network Interfaces	1/10/25 GbE Network Interfaces
E-BAND	IP-50EXP	High power for extended reach	10 Gbps	20 Gbps	1
	IP-50EX	Compact	10 Gbps	20 Gbps	1
	IP-50EXA	Optimized for L1 aggregation & multiband	10 Gbps	20 Gbps	1
	EH-8010FX	Out-of-the-box multiband support	10 Gbps	---	2
	EH-8020FX	High-capacity, out of the box	10 Gbps	20 Gbps	2
	IP-100E	Dual radio	25 Gbps	40 Gbps	1
	IP-50GP	IDU to aggregate multiple radios	Depends on radios	Depends on radios	6 (+2 multi-use)



SUMMARY

Ceragon's family of E-band mmW radios brings cutting-edge innovations, combining the most compact designs with the highest bandwidth support. Engineered for optimized performance, they deliver low latency, high availability and massive capacity. Flexible and future-ready, these solutions help you stay competitive in the digital era and elevate your network to new heights.

4 MAIN VALUES

+ MULTI-GIGABIT CAPACITY

+ ABUNDANT AVAILABLE SPECTRUM

+ A SOLUTION FOR ANY SCENARIO

+ SMALL FORM FACTOR AND EASY INSTALLATION

ABOUT CERAGON NETWORKS

Ceragon Networks Ltd. (NASDAQ: CRNT) is the global innovator and leading solutions provider of end-to-end wireless connectivity, specializing in transport, access, and AI-powered managed & professional services. Through our commitment to excellence, we empower customers to elevate operational efficiency and enrich the quality of experience for their end users.

Our customers include service providers, utilities, public safety organizations, government agencies, energy companies, and more, who rely on our wireless expertise and cutting-edge solutions for 5G & 4G broadband wireless connectivity, mission-critical services, and an array of applications that harness our ultra-high reliability and speed. Ceragon solutions are deployed by more than 600 service providers, as well as more than 1,600 private network owners, in more than 130 countries.

Through our innovative, end-to-end solutions, covering hardware, software, and managed & professional services, we enable our customers to embrace the future of wireless technology with confidence, shaping the next generation of connectivity and service delivery. Ceragon delivers extremely reliable, fast to deploy, high-capacity wireless solutions for a wide range of communication network use cases, optimized to lower TCO through minimal use of spectrum, power, real estate, and labor resources - driving simple, quick, and cost-effective network modernization and positioning Ceragon as a leading solutions provider for the "connectivity everywhere".

For more information please visit: www.ceragon.com

