

CERAGON



Data
Sheet

Release 7.7

FibeAir® IP-20G

Multi-Radio Technology Edge Node



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FibeAir IP-20G is a hybrid, split-mount hauling solution for edge and ring nodes. Supporting all common features of the IP-20 platform, it is powered by a programmable network processor and runs under Ceragon's CeraOS, the high-performance, internetworking operating system.

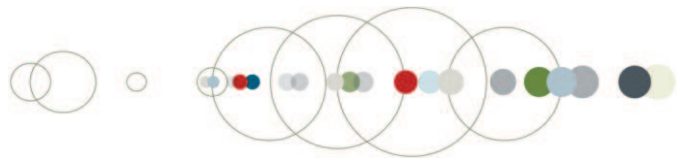
Network operators must ensure that their edge backhaul solutions provide high capacity and the optimal mix of functionality and performance while minimizing cost of ownership. With the rapid pace of technological advancement, solutions implemented today must be versatile and flexible to continue to deliver cost-effective performance evolve with the demands of tomorrow. Operators need to know that they can stay current with emerging standards without incurring the expenses of new hardware. Ceragon's new wireless, split-mount edge node, FibeAir IP-20G, is designed to meet all of these challenges.

FibeAir IP-20G boosts performance in today's networks while providing a cost-effective path to future network requirements. It offers full support for TDM services, as well as a rich set of advanced Carrier Ethernet services providing a wide range of new capabilities that address the diverse and evolving needs of mobile backhaul, ISPs, utilities, government and private networks.

FibeAir IP-20G's fixed-configuration, low power consumption solution is simple to install and maintain. Hosting the advanced features common across the IP-20 platform, it is a cost-effective, reliable, and high-capacity solution for backhauling edge and ring nodes

Multi-Radio Technology Edge Node

- Any radio transmission technology mix
Wireless multi-technology platform optimized for HetNets
- Multi-gigabits radio capacity with high spectral efficiency
Ultra-high capacity over licensed and license-exempt frequency bands (4-86GHz)
- Easy to install, highly reliable
Low footprint, fixed design, quick and simple to set up with reliable operation
- High service granularity enables rollout of new business models
Intelligent service-centric management utilizing Hierarchical QoS and advanced OA&M capabilities
- Common OS & software-defined engine simplify network modernization
Unified CeraOS across entire IP-20 platform
Powered by a programmable network processor



General

Assembly options

- One or two radio interfaces
- One or two power interfaces
- With or without 16 x E1 interfaces

Radio

Supported Frequency Range

- 6-42 GHz

Configurations

- 1+0, 2+0, 1+1, E/W

Radio Features

- Multi-Carrier Adaptive Bandwidth Control (up to 2+0)*
- Protection and Diversity: HSB, SD (BBS)*, FD (BBS)*
- High spectral utilization: QPSK to 1024 QAM (2048QAM*) w/ACM
- XPIC

Ethernet

Ethernet Interfaces

- 2 x 10/100/1000Base-T Electrical (RJ-45)
- 2 x 10/100/1000Base-T Dual Mode Electrical or Cascading (RJ-45)
- 2 x 1000base-X (SFP)
- Management Interfaces – 2 x 10/100 Base-T (RJ-45)
- SFP Types - Optical 1000Base-LX (1310 nm) or SX (850 nm)

Ethernet Features

- MTU – 9600 Bytes
- Quality of Service
 - Multiple Classification criteria (VLAN ID, p-bits, IPv4 DSCP, IPv6 TC, MPLS EXP)
 - 8 priority queues
 - Deep buffering (configurable up to 64 Mbit per queue)
 - WRED
 - Hierarchical QoS – high service granularity *
 - P-bit marking/remarking
- 4K VLANs
- VLAN add/remove/translate
- MSTP*, ERP* (ITU-T G.8032)
- Frame Cut Through – controlled latency and PDV for delay sensitive applications
- Header DeDuplication* – Capacity boosting by eliminating inefficiency in all layers (L2,MPLS, L3,L4, Tunneling – GTP for LTE, GRE)
- Ethernet OAM – EFM (IEEE 802.3ah), CFM (IEEE 802.1ag), ITU-T Y.1731*

* Planned for future release.

** Certification pending.

TDM

TDM Interfaces

- 16 x E1s (optional)

TDM Features

- Native TDM services and TDM PWE using the same hardware
- XC capacity – 512 VCs
- Timing options – Loop timing, system clock, recovered clock
- 1+1 / 1:1 path protection

Synchronization

Synchronization Distribution

- Sync Distribution over any traffic interface (GE/FE, E1)
- Dedicated In/Out synch interface (E1/2MHz, G.703)
- SyncE (ITU-T G.8261, G.8262)
- SSM/ESMC Support for ring/mesh applications (ITU-T G.8264)
- SyncE Regenerator mode, providing PRC grade (ITU-T G.811) performance for smart pipe applications.

IEEE-1588

- Optimized Transport for reduced PDV
- IEEE-1588 TC*
- IEEE-1588 OC/BC*

Standards

MEF

- Carrier Ethernet 2.0 (CE 2.0)**

Supported Ethernet Standards

- 10/100/1000base-T/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

Supported E1 Standards

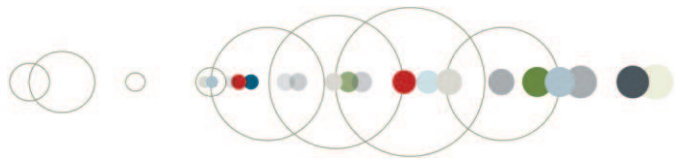
- ITU-T G.703, G.736, G.775, G.823, G.824, G.828, ITU-T I.432, ETSI ETS 300 147, ETS 300 417

TDM Pseudowire Standards

- SAToP – RFC 4553
- CESoP – RFC 5086 *

TDM Pseudowire Encapsulations

- VLAN (MEF-8)
- IP/UDP (IETF)
- MPLS (MFA8)



Standards Compliance

- EMC: EN 301 489-4, EN 301 489-1, FCC 47 CFR, part 15, class B
- 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
- Ingress Protection: IEC 60529 IP56
- Storage: ETSI EN 300 019-1-1 Class 1.2
- Transportation: ETSI EN 300 019-1-2 Class 2.3

Technical Specifications

Mechanical Specifications

- **IDU**: 44mm(H), 426mm(W), 180mm(D), 2.5kg
- **RFU**: 200mm(H), 200mm(W), 85mm(D), 4kg

Environmental Specifications

- **IDU**: -5° to +55°C (-25°C to +65°C extended)
- **RFU**: -33°C to +55°C (-45°C to +60°C extended)

Power Input Specifications

- IDU Standard Input: -48 VDC
- IDU DC Input range: -40 to -60 VDC
- Dual-feed power support

Power Consumption Specifications

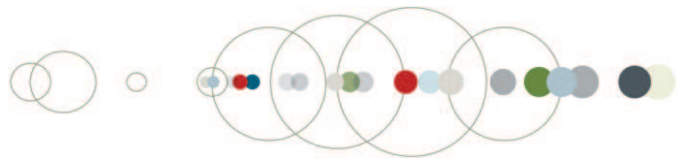
- IDU (Ethernet-only with single RFU): 23.5W
- Addition for second RFU: 2.9W
- Addition for 16 E1s: 11W
- RFU-C – 6-26 GHz (1+0): 22W; 28-42 GHz (1+0): 26W
- RFU-C – 6-26 GHz (1+1): 39W; 28-42 GHz (1+1): 43W



IP-20G

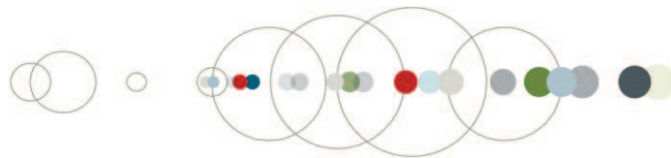


RFU-C



Transmit Power (dBm)	Frequency (GHz)	6-8	11-15	18-23	26	28	31	32-38	42
QPSK/8 PSK		26	24	22	21	14	16	18	15
16 QAM		25	23	21	20	14	15	17	14
32- 128 QAM		24	22	20	19	14	14	16	13
256 QAM		22	20	18	17	12	12	14	11
512 QAM		22	20	18	17	9	12	14	11
1024 QAM		21	19	17	16	8	11	13	10

Frequency (GHz)			6	7-10	11-15	18	23	24	26	28	31-42	Maximum No. of E1s
7 MHz	Capacity (Mbps)	Capacity De-Dup ¹	Receiver Threshold (RSL) (dBm @ BER = 10-6)									
QPSK	8-10	9-32	-95.0	-94.5	-95.0	-94.0	-93.5	-90.5	-92.5	-90.5	-91.5	4
8 PSK	13-16	13-48	-89.0	-88.5	-89.0	-88.0	-87.5	-84.5	-86.5	-84.5	-85.5	5
16 QAM	18-22	19-69	-88.5	-88.0	-88.5	-87.5	-87.0	-84.0	-86.0	-84.0	-85.0	8
32 QAM	24-30	26-92	-85.0	-84.5	-85.0	-84.0	-83.5	-80.5	-82.5	-80.5	-81.5	10
64 QAM	30-37	32-114	-82.0	-81.5	-82.0	-81.0	-80.5	-77.5	-79.5	-77.5	-78.5	12
128 QAM	36-44	38-137	-79.0	-78.5	-79.0	-78.0	-77.5	-74.5	-76.5	-74.5	-75.5	15
256 QAM	42-51	44-158	-75.5	-75.0	-75.5	-74.5	-74.0	-71.0	-73.0	-71.0	-72.0	17
512 QAM	45-54	47-169	-73.5	-73.0	-73.5	-72.5	-72.0	-69.0	-71.0	-69.0	-70.0	18
1024 QAM Strong	48-58	50-182	-70.0	-69.5	-70.0	-69.0	-68.5	-65.5	-67.5	-65.5	-66.5	19
1024 QAM Light	51-62	53-193	-69.5	-69.0	-69.5	-68.5	-68.0	-65.0	-67.0	-65.0	-66.0	21
14 MHz												
QPSK	19-24	20-74	-92.0	-91.5	-92.0	-91.0	-90.5	-87.5	-89.5	-87.5	-88.5	8
8 PSK	29-36	31-112	-86.0	-85.5	-86.0	-85.0	-84.5	-81.5	-83.5	-81.5	-82.5	12
16 QAM	40-49	42-153	-85.0	-84.5	-85.0	-84.0	-83.5	-80.5	-82.5	-80.5	-81.5	16
32 QAM	53-65	56-203	-82.0	-81.5	-82.0	-81.0	-80.5	-77.5	-79.5	-77.5	-78.5	22
64 QAM	66-80	69-249	-79.0	-78.5	-79.0	-78.0	-77.5	-74.5	-76.5	-74.5	-75.5	26
128 QAM	79-97	83-301	-75.5	-75.0	-75.5	-74.5	-74.0	-71.0	-73.0	-71.0	-72.0	32
256 QAM	90-110	95-344	-73.0	-72.5	-73.0	-72.0	-71.5	-68.5	-70.5	-68.5	-69.5	36
512 QAM	100-122	105-380	-70.0	-69.5	-70.0	-69.0	-68.5	-65.5	-67.5	-65.5	-66.5	40
1024 QAM Strong	106-129	111-402	-67.0	-66.5	-67.0	-66.0	-65.5	-62.5	-64.5	-62.5	-63.5	42
1024 QAM Light	112-137	118-426	-66.5	-66.0	-66.5	-65.5	-65.0	-62.0	-64.0	-62.0	-63.0	45



Frequency (GHz)			6	7-10	11-15	18	23	24	26	28	31-42	Maximum No. of E1s
28 MHz	Capacity (Mbps)	Capacity De-Dup ²	Receiver Threshold (RSL) (dBm @ BER = 10-6)									
QPSK	40-49	42-153	-89.0	-88.5	-89.0	-88.0	-87.5	-84.5	-86.5	-84.5	-85.5	16
8 PSK	60-74	63-229	-84.5	-84.0	-84.5	-83.5	-83.0	-80.0	-82.0	-80.0	-81.0	24
16 QAM	82-101	86-313	-82.5	-82.0	-82.5	-81.5	-81.0	-78.0	-80.0	-78.0	-79.0	33
32 QAM	108-132	114-412	-79.0	-78.5	-79.0	-78.0	-77.5	-74.5	-76.5	-74.5	-75.5	43
64 QAM	134-163	140-508	-76.0	-75.5	-76.0	-75.0	-74.5	-71.5	-73.5	-71.5	-72.5	53
128 QAM	161-196	169-611	-72.5	-72.0	-72.5	-71.5	-71.0	-68.0	-70.0	-68.0	-69.0	64
256 QAM	183-224	192-696	-69.5	-69.0	-69.5	-68.5	-68.0	-65.0	-67.0	-65.0	-66.0	73
512 QAM	202-247	212-768	-67.5	-67.0	-67.5	-66.5	-66.0	-63.0	-65.0	-63.0	-64.0	80
1024 QAM Strong	215-262	225-817	-64.5	-64.0	-64.5	-63.5	-63.0	-60.0	-62.0	-60.0	-61.0	85
1024 QAM Light	228-279	239-867	-63.5	-63.0	-63.5	-62.5	-62.0	-59.0	-61.0	-59.0	-60.0	90
56 MHz												
QPSK	83-101	87-314	-85.5	-85.0	-85.5	-84.5	-84.0	-81.0	-83.0	-81.0	-82.0	33
8 PSK	123-150	129-468	-81.5	-81.0	-81.5	-80.5	-80.0	-77.0	-79.0	-77.0	-78.0	49
16 QAM	167-205	176-637	-79.0	-78.5	-79.0	-78.0	-77.5	-74.5	-76.5	-74.5	-75.5	67
32 QAM	220-269	231-838	-75.5	-75.0	-75.5	-74.5	-74.0	-71.0	-73.0	-71.0	-72.0	88
64 QAM	270-331	284-1000	-72.5	-72.0	-72.5	-71.5	-71.0	-68.0	-70.0	-68.0	-69.0	107
128 QAM	327-400	343-1000	-69.5	-69.0	-69.5	-68.5	-68.0	-65.0	-67.0	-65.0	-66.0	130
256 QAM	374-457	393-1000	-66.5	-66.0	-66.5	-65.5	-65.0	-62.0	-64.0	-62.0	-63.0	148
512 QAM	406-496	426-1000	-64.5	-64.0	-64.5	-63.5	-63.0	-60.0	-62.0	-60.0	-61.0	161
1024 QAM Strong	441-540	464-1000	-61.0	-60.5	-61.0	-60.0	-59.5	-56.5	-58.5	-56.5	-57.5	175