

CERAGON



# FibeAir® IP-20S

Compact All-Outdoor Node



Data Sheet **ANSI**

Release 7.7





# FibeAir® IP-20S

## Compact All-Outdoor Node

FibeAir IP-20S is an all-outdoor backhaul solution for access sites. It runs under CeraOS, the high-performance, internetworking operating system, and supports all common features of the IP-20 platform in a compact, environmentally friendly architecture.

With the proliferation of all-outdoor sites, operators require a compact backhaul solution to 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 that can evolve with the demands of tomorrow. Operators need to know that their investment can cope with future standards and requirements. Ceragon's wireless, all-outdoor edge node, FibeAir IP-20S, is designed to meet all of the challenges.

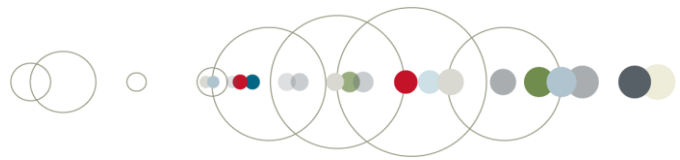
FibeAir IP-20S boosts performance in today's networks while providing a cost-effective path to future network requirements. With an integrated programmable network processor, it offers a rich set of advanced Carrier Ethernet services providing a wide range of new capabilities that address the diverse and evolving needs of mobile operators, ISPs, utilities, government and private networks.

Compact, low power consuming FibeAir IP-20S is simple to install and maintain. Employing the common features of the IP-20 platform provided by CeraOS, the IP-20S is a cost-effective, reliable solution for the hauling of outdoor edge nodes.

## Compact All-Outdoor Node

- Single-core radio node  
Integrated Ethernet switch, MEF Carrier Ethernet 2.0-compliant, MPLS-TP-ready
- High radio capacity and spectral efficiency  
Up to 2048QAM modulation
- Multi-purpose platform, ideal for versatile deployment scenarios  
Compact form-factor, easily deployed in urban and rural locations
- 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 FibeAir IP-20 platform  
Powered by a programmable network processor

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## Radio

### Supported Frequency Range

- 6-38 GHz

### Configurations

- 1+0, 1+1

### Radio Features

- Protection: 1+1 HSB\*
- High spectral utilization: QPSK to 2048 QAM w/ACM

## Ethernet

### Ethernet Interfaces

- Traffic Interfaces – 1 x 10/100/1000Base-T (RJ-45) and 2x1000base-X (Optical SFP) or 10/100/1000Base-T (Electrical SFP)
- Management Interface - 1 x 10/100 Base-T (RJ-45)
- SFP Types - Optical 1000Base-LX (1310 nm) or SX (850 nm)

Note: SFP devices must be of industrial grade (-40°C to +85°C)

### Ethernet Features

- MTU – 9600 Bytes
- Quality of Service
  - Multiple Classification criteria (VLAN ID, p-bits, IP-DSCP, MPLS EXP, CoS)
  - Eight 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
- 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\*

## Synchronization

### Synchronization Distribution

- Sync Distribution over any traffic interface (GE/FE)
- 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\*

## 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

### Standards Compliance

- 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 2.3

## Technical Specifications

### Mechanical Specifications

- Dimensions – 230mm(H), 233mm(W), 98mm(D), 6kg
- Pole Diameter Range (for Remote Mount Installation) – 8.89 cm – 11.43 cm

### Environmental Specifications

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

### Power Input Specifications

- Standard Input: -48 VDC
- DC Input range: -40 to -60 VDC

### Power Consumption Specifications

- Maximum Power Consumption – 32W

### 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

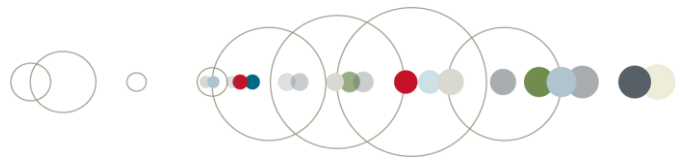
- Standard Input: -48 or +24 VDC (Optional)
- DC Input range: ±(18/40.5 to 60) VDC (+18VDC extended range is supported as part of the nominal +24VDC support)

### 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 ±(18-60)V is available)

\* Planned for future release.

\*\* Certification pending.

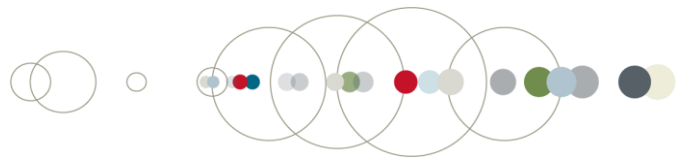


Transmit Power (dBm) (Standard)	Frequency (GHz)	6	7-8	10-11	13-15	18-23	24 UL	26	28-38
QPSK		26	25	24	24	22	-17	21	18
8 QAM		26	25	24	24	22	-18	21	18
16 QAM		25	24	23	23	21	-19	20	17
32 – 256 QAM		24	23	22	22	20	-19	19	16
512 QAM		22	21	21	20	18	-21	17	14
1024 QAM		22	21	20	20	18	-21	17	14
2048 QAM		20	19	18	18	16	-23	15	12
Transmit Power (dBm) (High Power)	Frequency (GHz)								
QPSK – 8 QAM		29	28	27					
16 QAM		28	27	26					
32 – 256 QAM		27	26	25					
512 QAM		25	24	24					
1024 QAM		25	24	23					
2048 QAM		23	22	21					

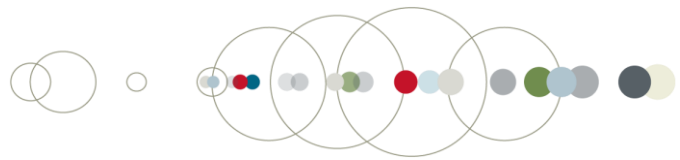
	Capacity (Mbps)	Capacity (Mbps)	Capacity (Mbps)	Capacity De-Dup	Capacity (Mbps)	Capacity De-Dup
	30 MHz		40 MHz		50 MHz	
QPSK	43-52	45-162	58-71	61-220	70-86	74-267
8 PSK	62-76	65-236	86-105	90-328	109-133	114-415
16 QAM	87-107	92-332	117-143	123-446	148-181	155-563
32 QAM	115-140	121-437	154-189	162-588	186-227	195-707
64 QAM	141-173	149-538	190-232	199-722	240-293	252-913
128 QAM	170-208	179-648	229-280	241-873	280-342	294-1000
256 QAM	196-239	206-745	247-301	259-939	332-406	348-1000
512 QAM	209-255	219-794	270-330	284-1000	360-440	378-1000
1024 QAM Strong	228-278	239-866	306-375	322-1000	392-479	411-1000
1024 QAM Light	241-295	253-917	325-398	342-1000	416-509	437-1000
2048 QAM	263-321	276-1000	352-430	370-1000	449-548	471-1000
		Capacity (Mbps)	Capacity De-Dup	Capacity (Mbps)	Capacity De-Dup	
		60 MHz		80 MHz*		
QPSK		87-106	91-331	114-140	120-435	
8 PSK		127-155	133-482	162-198	170-617	
16 QAM		176-215	185-670	230-283	243-880	
32 QAM		232-283	243-881	302-371	319-1000	
64 QAM		284-348	299-1000	369-454	390-1000	
128 QAM		344-420	361-1000	435-536	461-1000	
256 QAM		397-485	416-1000	501-618	531-1000	
512 QAM		426-521	448-1000	551-679	583-1000	
1024 QAM Strong		464-567	487-1000	599-738	634-1000	
1024 QAM Light		493-602	517-1000			
2048 QAM		534-653	561-1000			

**Notes:** The total capacity (including Header De-Duplication) of an IP-20C unit is double the figures in the tables below. It should be noted that there are two IP-20C models, with a different limitation of the top capacity per terminal (unit). An IP-20C model that supports 80 MHz channels will support a total capacity of 1.3 Gbps (per terminal), whereas other models support 1 Gbps.

\* Planned for future release.



Receiver Threshold (RSL) (dBm @ BER = 10 <sup>-6</sup> )															
Frequency (GHz)	6	7	8	10	11	13	15	18	23	24UL	26	28-31	32	36	38
<b>30 MHz</b>															
QPSK	-87.5	-85.5	-85.0	-85.5	-86.5	-86.0	-85.0	-86.0	-84.5	-84.0	-84.0	-84.5	-85.5	-83.0	-82.5
8 PSK	-82.5	-80.5	-80.0	-80.5	-81.5	-81.0	-80.0	-81.0	-79.5	-79.0	-79.0	-79.5	-80.5	-78.0	-77.5
16 QAM	-81	-79.0	-78.5	-79.0	-80	-79.5	-78.5	-79.5	-78.0	-77.5	-77.5	-78.0	-79.0	-76.5	-76.0
32 QAM	-77	-75.0	-74.5	-75.0	-76	-75.5	-74.5	-75.5	-74.0	-73.5	-73.5	-74.0	-75.0	-72.5	-72.0
64 QAM	-74.5	-72.5	-72.0	-72.5	-73.5	-73.0	-72.0	-73.0	-71.5	-71.0	-71.0	-71.5	-72.5	-70.0	-69.5
128 QAM	-71.5	-69.0	-68.5	-69.0	-70.5	-69.5	-68.5	-69.5	-68.0	-67.5	-67.5	-68.0	-69.0	-66.5	-66.0
256 QAM	-68.5	-66.0	-65.5	-66.0	-67.5	-66.5	-65.5	-66.5	-65.0	-64.5	-64.5	-65.0	-66.0	-63.5	-63.0
512 QAM	-66.5	-64.0	-63.5	-64.0	-65.5	-64.5	-63.5	-64.5	-63.0	-62.5	-62.5	-63.0	-64.0	-61.5	-61.0
1024 QAM Strong	-63	-61.0	-60.5	-61.0	-62	-61.5	-60.5	-61.5	-60.0	-59.5	-59.5	-60.0	-61.0	-58.5	-58.0
1024 QAM Light	-62	-60.0	-59.5	-60.0	-61	-60.5	-59.5	-60.5	-59.0	-58.5	-58.5	-59.0	-60.0	-57.5	-57.0
2048 QAM	-58.5	-56.0	-55.5	-56.0	-57.5	-56.5	-55.5	-56.5	-55.0	-54.5	-54.5	-55.0	-56.0	-53.5	-53.0
<b>40 MHz</b>															
QPSK	-85.5	-84.0	-83.5	-84.0	-85	-84.5	-83.5	-84.5	-83.0	-82.5	-82.5	-83.0	-84.0	-81.5	-81.0
8 PSK	-80.5	-79.0	-78.5	-79.0	-79.5	-79.5	-78.5	-79.5	-78.0	-77.5	-77.5	-78.0	-79.0	-76.5	-76.0
16 QAM	-79.0	-77.5	-77.0	-77.5	-78.5	-78.0	-77.0	-78.0	-76.5	-76.0	-76.0	-76.5	-77.5	-75.0	-74.5
32 QAM	-75.5	-74.0	-73.5	-74.0	-75	-74.5	-73.5	-74.5	-73.0	-72.5	-72.5	-73.0	-74.0	-71.5	-71.0
64 QAM	-72.5	-71.0	-70.5	-71.0	-72	-71.5	-70.5	-71.5	-70.0	-69.5	-69.5	-70.0	-71.0	-68.5	-68.0
128 QAM	-69.5	-68.0	-67.5	-68.0	-69.5	-68.5	-67.5	-68.5	-67.0	-66.5	-66.5	-67.0	-68.0	-65.5	-65.0
256 QAM	-66.5	-65.0	-64.5	-65.0	-67	-65.5	-64.5	-65.5	-64.0	-63.5	-63.5	-64.0	-65.0	-62.5	-62.0
512 QAM	-63.5	-62.0	-61.5	-62.0	-64.5	-62.5	-61.5	-62.5	-61.0	-60.5	-60.5	-61.0	-62.0	-59.5	-59.0
1024 QAM Strong	-61.0	-59.5	-59.0	-59.5	-61	-60.0	-59.0	-60.0	-58.5	-58.0	-58.0	-58.5	-59.5	-57.0	-56.5
1024 QAM Light	-60.0	-58.5	-58.0	-58.5	-60	-59.0	-58.0	-59.0	-57.5	-57.0	-57.0	-57.5	-58.5	-56.0	-55.5
2048 QAM	-57.5	-56.0	-55.5	-56.0	-57	-56.5	-55.5	-56.5	-55.0	-54.5	-54.5	-55.0	-56.0	-53.5	-53.0
<b>50 MHz</b>															
QPSK	-85.0	-83.5	-83.0	-83.5	-84.5	-84.0	-83.0	-84.0	-82.5	-79.0	-82.0	-82.5	-83.5	-81.0	-80.5
8 PSK	-79.5	-78.0	-77.5	-78.0	-79.0	-78.5	-77.5	-78.5	-77.0	-73.5	-76.5	-77.0	-78.0	-75.5	-75.0
16 QAM	-78.0	-76.5	-76.0	-76.5	-77.5	-77.0	-76.0	-77.0	-75.5	-72.0	-75.0	-75.5	-76.5	-74.0	-73.5
32 QAM	-74.0	-72.5	-72.0	-72.5	-73.5	-73.0	-72.0	-73.0	-71.5	-68.0	-71.0	-71.5	-72.5	-70.0	-69.5
64 QAM	-71.0	-69.5	-69.0	-69.5	-70.5	-70.0	-69.0	-70.0	-68.5	-65.0	-68.0	-68.5	-69.5	-67.0	-66.5
128 QAM	-68.0	-66.5	-66.0	-66.5	-67.5	-67.0	-66.0	-67.0	-65.5	-62.0	-65.0	-65.5	-66.5	-64.0	-63.5
256 QAM	-65.5	-64.0	-63.5	-64.0	-65.0	-64.5	-63.5	-64.5	-63.0	-59.5	-62.5	-63.0	-64.0	-61.5	-61.0
512 QAM	-63.0	-61.5	-61.0	-61.5	-62.5	-62.0	-61.0	-62.0	-60.5	-57.0	-60.0	-60.5	-61.5	-59.0	-58.5
1024 QAM Strong	-59.5	-58.0	-57.5	-58.0	-59.0	-58.5	-57.5	-58.5	-57.0	-53.5	-56.5	-57.0	-58.0	-55.5	-55.0
1024 QAM Light	-58.5	-57.0	-56.5	-57.0	-58.0	-57.5	-56.5	-57.5	-56.0	-52.5	-55.5	-56.0	-57.0	-54.5	-54.0
2048 QAM	-56.5	-55.0	-54.5	-55.0	-56.0	-55.5	-54.5	-55.5	-54.0	-50.5	-53.5	-54.0	-55.0	-52.5	-52.0



Frequency (GHz)	6	7	8	10	11	13	15	18	23	24UL	26	28-31	32	36	38
<b>60 MHz</b>															
QPSK	-84.5	-82.5	-82.0	-82.5	-83.5	-83.0	-82.0	-83.0	-81.5	-81.0	-81.0	-81.5	-82.5	-80.0	-79.5
8 PSK	-80	-78.0	-77.5	-78.0	-79.0	-78.5	-77.5	-78.5	-77.0	-76.5	-76.5	-77.0	-78.0	-75.5	-75.0
16 QAM	-77.5	-75.5	-75.0	-75.5	-76.5	-76.0	-75.0	-76.0	-74.5	-74.0	-74.0	-74.5	-75.5	-73.0	-72.5
32 QAM	-74	-72.0	-71.5	-72.0	-73.0	-72.5	-71.5	-72.5	-71.0	-70.5	-70.5	-71.0	-72.0	-69.5	-69.0
64 QAM	-70.5	-68.5	-68.0	-68.5	-69.5	-69.0	-68.0	-69.0	-67.5	-67.0	-67.0	-67.5	-68.5	-66.0	-65.5
128 QAM	-68	-66.0	-65.5	-66.0	-67.0	-66.5	-65.5	-66.5	-65.0	-64.5	-64.5	-65.0	-66.0	-63.5	-63.0
256 QAM	-65	-62.5	-62.0	-62.5	-63.5	-63.0	-62.0	-63.0	-61.5	-61.0	-61.0	-61.5	-62.5	-60.0	-59.5
512 QAM	-63	-60.5	-60.0	-60.5	-61.5	-61.0	-60.0	-61.0	-59.5	-59.0	-59.0	-59.5	-60.5	-58.0	-57.5
1024 QAM Strong	-59.5	-57.0	-56.5	-57.0	-58.0	-57.5	-56.5	-57.5	-56.0	-55.5	-55.5	-56.0	-57.0	-54.5	-54.0
1024 QAM Light	-58.5	-56.0	-55.5	-56.0	-57.0	-56.5	-55.5	-56.5	-55.0	-54.5	-54.5	-55.0	-56.0	-53.5	-53.0
2048 QAM	-55.5	-53.5	-53.0	-53.5	-54.5	-54.0	-53.0	-54.0	-52.5	-52.0	-52.0	-52.5	-53.5	-51.0	-50.5
<b>80 MHz*</b>															
QPSK	-83.0	-81.5	-81.0	-81.5	-82.5	-82.0	-81.0	-82.0	-80.5	-77.0	-80.0	-80.5	-81.5	-79.0	-78.5
8 PSK	-78.0	-76.5	-76.0	-76.5	-77.5	-77.0	-76.0	-77.0	-75.5	-72.0	-75.0	-75.5	-76.5	-74.0	-73.5
16 QAM	-76.0	-74.5	-74.0	-74.5	-75.5	-75.0	-74.0	-75.0	-73.5	-70.0	-73.0	-73.5	-74.5	-72.0	-71.5
32 QAM	-72.5	-71.0	-70.5	-71.0	-72.0	-71.5	-70.5	-71.5	-70.0	-66.5	-69.5	-70.0	-71.0	-68.5	-68.0
64 QAM	-69.5	-68.0	-67.5	-68.0	-69.0	-68.5	-67.5	-68.5	-67.0	-63.5	-66.5	-67.0	-68.0	-65.5	-65.0
128 QAM	-67.0	-65.5	-65.0	-65.5	-66.5	-66.0	-65.0	-66.0	-64.5	-61.0	-64.0	-64.5	-65.5	-63.0	-62.5
256 QAM	-64.0	-62.5	-62.0	-62.5	-63.5	-63.0	-62.0	-63.0	-61.5	-58.0	-61.0	-61.5	-62.5	-60.0	-59.5
512 QAM	-61.0	-59.5	-59.0	-59.5	-60.5	-60.0	-59.0	-60.0	-58.5	-55.0	-58.0	-58.5	-59.5	-57.0	-56.5
1024 QAM Strong	-58.5	-57.0	-56.5	-57.0	-58.0	-57.5	-56.5	-57.5	-56.0	-52.5	-55.5	-56.0	-57.0	-54.5	-54.0
1024 QAM Light	-57.5	-56.0	-55.5	-56.0	-57.0	-56.5	-55.5	-56.5	-55.0	-51.5	-54.5	-55.0	-56.0	-53.5	-53.0
2048 QAM	-55.5	-54.0	-53.5	-54.0	-55.0	-54.5	-53.5	-54.5	-53.0	-49.5	-52.5	-53.0	-54.0	-51.5	-51.0

\* Planned for future release.