



**Datasheet**

# FibeAir IP-20S

Rev. B | May 2019  
ETSI Version



## Radio

### Supported Frequency Range

5.7-42 GHz

### Radio Configurations

1+0, 1+1, 2+0 SP or DP (No XPIC)

### Radio Features

Protection: 1+1 HSB

High spectral utilization: QPSK to 2048 QAM w/ACM

Advanced Frequency Reuse (AFR) (Tail Site)

## Ethernet

### Ethernet Interfaces

Traffic Interfaces – 1 or 2 x 10/100/1000Base-T (RJ-45) and 2x1000Base-X (Optical SFP) or 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, IPv4 DSCP, IPv6 TC, MPLS EXP)
- 8 priority queues per port
- Deep buffering (configurable up to 64 Mbit per queue)
- WRED
- P-bit marking/remarking

4K VLANs

VLAN add/remove

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)

Y.1731 Ethernet OAM

Adaptive Bandwidth Notification ABN, also known as EOAM)

## 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

## Security

Radio Encryption – AES 256

Secured protocols:

- HTTPS
- SNMPv3
- SSH
- SFTP

RADIUS authentication and authorization



## 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 – 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 (1+0 Operation) – 5.7-11 GHz: 35W; 13-42 GHz: 42W

### 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 VDC

DC Input range: -(18/40.5 to 60) VDC

### 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)

## Product Images

IP-20S



## Radio Specifications

### Capacity

**Notes:** For full specifications, please contact your Ceragon sales representative.

	Capacity (Mbps)	Capacity De-Dup	Capacity (Mbps)	Capacity De-Dup	Capacity (Mbps)	Capacity De-Dup
<b>Modulation</b>	<b>3.5 MHz</b>		<b>7 MHz</b>		<b>14 MHz</b>	
QPSK	3-4	4-13	8-10	9-32	19-24	20-74
8 PSK	-	-	13-16	13-48	29-36	31-112
16 QAM	8-10	9-32	18-22	19-69	40-49	42-153
32 QAM	11-14	12-43	24-30	26-92	53-65	56-203
64 QAM	14-17	15-54	30-37	32-114	66-80	69-249
128 QAM	17-21	18-65	36-44	38-137	79-97	83-301
256 QAM	19-24	20-74	42-51	44-158	90-110	95-344
512 QAM	-	-	45-54	47-169	100-122	105-380
1024 QAM Strong	-	-	48-58	50-182	106-129	111-402
1024 QAM Light	-	-	51-62	53-194	112-137	118-426
<b>Modulation</b>	<b>28 MHz</b>		<b>40 MHz</b>		<b>56 MHz</b>	
QPSK	43-52	45-162	58-71	61-220	87-106	91-331
8 PSK	62-76	65-236	86-105	90-328	127-155	133-482
16 QAM	87-107	92-332	117-143	123-446	176-215	185-670
32 QAM	115-140	121-437	154-189	162-588	232-283	243-881
64 QAM	141-173	149-538	190-232	199-722	284-348	299-1000
128 QAM	170-208	179-648	229-280	241-873	344-420	361-1000
256 QAM	196-239	206-745	247-302	259-939	397-485	416-1000
512 QAM	209-255	219-794	270-330	284-1000	426-521	448-1000
1024 QAM Strong	228-278	239-866	306-375	322-1000	464-567	487-1000
1024 QAM Light	241-295	253-917	325-398	342-1000	493-602	517-1000
2048 QAM	263-321	276-1000	352-430	370-1000	534-653	561-1000
	<b>Capacity (Mbps)</b>	<b>Capacity De-Dup</b>			<b>Capacity (Mbps)</b>	<b>Capacity De-Dup</b>
<b>Modulation</b>	<b>80 MHz</b>				<b>Modulation</b>	<b>80 MHz</b>
QPSK	114-140	120-435			256 QAM	505-618
8 PSK	162-198	170-618			512 QAM	555-679
16 QAM	231-283	243-880			1024 QAM Strong	604-738
32 QAM	304-371	319-1000			1024 QAM Light	641-784
64 QAM	371-454	390-1000			2048 QAM	679-829
128 QAM	439-536	461-1000				713-1000

### Transmit Power

Transmit Power (dBm)	Freq. (GHz)	5.7-6	7	8	10-11	13-15	18	23	24 UL	26	28-38	42
QPSK – 8 QAM		28	28	28	26	24	22	20	-17	21	18	15
16 QAM		28	27	27	26	23	21	20	-17	20	17	14
32- 128 QAM		27	26	26	25	22	20	20	-17	19	16	13
256 QAM		27	26	24	25	20	20	18	-17	17	14	11
512 QAM		25	24	24	24	20	18	18	-17	17	14	11
1024 QAM		25	24	24	23	20	18	17	-17	16	13	10
2048 QAM		23	22	22	21	18	16	16	-17	15	12	9



## Receiver Threshold (RSL) (dBm @ BER = 10<sup>-6</sup>)

Frequency (GHz)	5.7-6	7	8	10	11	13	15	18	23	24UL	26	28-31	32	38	42
<b>3.5 MHz</b>															
QPSK	-96.5	-96.0	-96.0	-95.5	-96.5	-95.5	-94.5	-96.0	-95.0	-94.5	-94.5	-94.5	-94.0	-94.0	-93.5
16 QAM	-90.0	-89.0	-89.0	-89.0	-89.5	-88.5	-88.0	-89.0	-88.0	-87.5	-88.0	-87.5	-87.5	-87.0	-86.5
32 QAM	-86.5	-85.5	-85.5	-85.5	-86.0	-85.0	-84.5	-85.5	-84.5	-84.0	-84.5	-84.0	-84.0	-83.5	-83.0
64 QAM	-83.0	-82.5	-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
128 QAM	-79.5	-79.0	-79.0	-78.5	-79.5	-78.5	-77.5	-79.0	-78.0	-77.5	-77.5	-77.5	-77.0	-77.0	-76.5
256 QAM	-76.5	-75.5	-75.5	-75.5	-76.5	-75.0	-74.5	-75.5	-75.0	-74.5	-74.5	-74.0	-74.0	-73.5	-73.0
<b>7 MHz</b>															
QPSK	-93.5	-93.0	-93.0	-92.5	-93.5	-92.5	-91.5	-93.0	-92.0	-91.5	-91.5	-91.5	-91.0	-91.0	-90.5
8 PSK	-87.5	-87.0	-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
16 QAM	-87.0	-86.5	-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
32 QAM	-83.5	-83.0	-83.0	-82.5	-83.5	-82.5	-81.5	-83.0	-82.0	-81.5	-81.5	-81.5	-81.0	-81.0	-80.5
64 QAM	-80.5	-80.0	-80.0	-79.5	-80.5	-79.5	-78.5	-80.0	-79.0	-78.5	-78.5	-78.5	-78.0	-78.0	-77.5
128 QAM	-77.5	-76.5	-76.5	-76.5	-77.5	-76.0	-75.5	-76.5	-76.0	-75.5	-75.5	-75.0	-75.0	-74.5	-74.0
256 QAM	-74.0	-73.5	-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
512 QAM	-72.0	-71.5	-71.5	-71.0	-72.0	-71.0	-70.0	-71.5	-70.5	-70.0	-70.0	-70.0	-69.5	-69.5	-69.0
1024 QAM Strong	-68.5	-68.0	-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 Light	-68.0	-67.0	-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
<b>14 MHz</b>															
QPSK	-90.5	-90.0	-90.0	-89.5	-90.5	-89.5	-88.5	-90.0	-89.0	-88.5	-88.5	-88.5	-88.0	-88.0	-87.5
8 PSK	-84.5	-84.0	-84.0	-83.5	-85.5	-83.5	-82.5	-84.0	-83.0	-82.5	-82.5	-82.5	-82.0	-82.0	-81.5
16 QAM	-83.5	-83.0	-83.0	-82.5	-83.5	-82.5	-81.5	-83.0	-82.0	-81.5	-81.5	-81.5	-81.0	-81.0	-80.5
32 QAM	-80.5	-79.5	-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	-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	-73.5	-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	-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	-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	-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	-64.0	-64.5	-63.5	-63.0	-64.0	-63.5	-63.0	-63.0	-62.5	-62.5	-62.0	-61.5
<b>28 MHz</b>															
QPSK	-87.5	-87.0	-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	-82.5	-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	-80.5	-80.0	-81.0	-79.5	-79.0	-80.5	-79.5	-79.0	-79.0	-79.0	-78.5	-78.0	-78.0
32 QAM	-77.5	-77.0	-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	-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	-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	-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	-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	-62.5	-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	-61.5	-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	-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



Frequency (GHz)	5.7-6	7	8	10	11	13	15	18	23	24UL	26	28-31	32	38	42
<b>40 MHz</b>															
QPSK	-86.0	-85.5	-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	-80.5	-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	-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	-75.0	-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	-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	-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	-66.0	-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	-63.5	-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	-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	-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	-57.0	-58.0	-56.5	-56.0	-57.0	-56.5	-56.0	-56.0	-55.5	-55.5	-55.0	-54.5
<b>56 MHz</b>															
QPSK	-84.0	-83.5	-83.5	-83.0	-84.0	-83.0	-82.0	-83.5	-82.5	-82.0	-82.0	-82.0	-81.5	-81.5	-81.0
8 PSK	-80.0	-79.5	-79.5	-79.0	-80.0	-79.0	-78.0	-79.5	-78.5	-78.0	-78.0	-78.0	-77.5	-77.5	-77.0
16 QAM	-77.5	-77.0	-77.0	-76.5	-77.5	-76.5	-75.5	-77.0	-76.0	-75.5	-75.5	-75.5	-75.0	-75.0	-74.5
32 QAM	-74.5	-73.5	-73.5	-73.5	-74.0	-73.0	-72.5	-73.5	-72.5	-72.0	-72.5	-72.0	-72.0	-71.5	-71.0
64 QAM	-71.0	-70.5	-70.5	-70.0	-71.0	-70.0	-69.0	-70.5	-69.5	-69.0	-69.0	-69.0	-68.5	-68.5	-68.0
128 QAM	-68.5	-67.5	-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
256 QAM	-65.0	-64.5	-64.5	-64.0	-65.0	-64.0	-63.0	-64.5	-63.5	-63.0	-63.0	-63.0	-62.5	-62.5	-62.0
512 QAM	-63.0	-62.5	-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 Strong	-59.5	-59.0	-59.0	-58.5	-59.5	-58.5	-57.5	-59.0	-58.0	-57.5	-57.5	-57.5	-57.0	-57.0	-56.5
1024 QAM Light	-58.5	-58.0	-58.0	-57.5	-58.5	-57.5	-56.5	-58.0	-57.0	-56.5	-56.5	-56.5	-56.0	-56.0	-55.5
2048 QAM	-54.0	-53.5	-53.5	-53.0	-54.0	-53.0	-52.0	-53.5	-52.5	-52.0	-52.0	-52.0	-51.5	-51.5	-51.0
<b>80 MHz</b>															
QPSK	-82.5	-82.0	-82.0	-81.5	-82.5	-81.5	-80.5	-82.0	-81.0	-80.5	-80.5	-80.5	-80.0	-80.0	-79.5
8 PSK	-78.5	-78.0	-78.0	-77.5	-78.5	-77.5	-76.5	-78.0	-77.0	-76.5	-76.5	-76.5	-76.0	-76.0	-75.5
16 QAM	-76.0	-75.5	-75.5	-75.0	-76.0	-75.0	-74.0	-75.5	-74.5	-74.0	-74.0	-74.0	-73.5	-73.5	-73.0
32 QAM	-73.0	-72.0	-72.0	-72.0	-72.5	-71.5	-71.0	-72.0	-71.0	-70.5	-71.0	-70.5	-70.5	-70.0	-69.5
64 QAM	-69.5	-69.0	-69.0	-68.5	-69.5	-68.5	-67.5	-69.0	-68.0	-67.5	-67.5	-67.5	-67.0	-67.0	-66.5
128 QAM	-67.0	-66.0	-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
256 QAM	-63.5	-63.0	-63.0	-62.5	-63.5	-62.5	-61.5	-63.0	-62.0	-61.5	-61.5	-61.5	-61.0	-61.0	-60.5
512 QAM	-61.5	-61.0	-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 Strong	-58.0	-57.5	-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
1024 QAM Light	-57.0	-56.5	-56.5	-56.0	-57.0	-56.0	-55.0	-56.5	-55.5	-55.0	-55.0	-55.0	-54.5	-54.5	-54.0
2048 QAM	-54.0	-53.5	-53.5	-53.0	-54.0	-53.0	-52.0	-53.5	-52.5	-52.0	-52.0	-52.0	-51.5	-51.5	-51.0

