

# FibeAir<sup>®</sup> IP-10

## System Specifications

### Introducing FibeAir IP-10

FibeAir IP-10 is Ceragon's next generation carrier-grade wireless Ethernet backhaul product family. Combining advanced TDM and Ethernet networking, FibeAir IP-10 facilitates cost effective, risk-free migration to IP and can be integrated in any TDM, hybrid or pure IP/Ethernet network. This versatile solution supports the entire licensed spectrum – from 6GHz up to 38GHz – and offers a wide capacity range of 10Mbps - 500Mbps along with enhanced Adaptive Coding & Modulation for maximum spectral efficiency in any deployment scenario. With FibeAir IP-10, Ceragon offers risk-free migration with the highest possible capacities at the lowest overall cost

### FibeAir IP-10 Radio Specifications

#### General

##### 6-18 GHz

Specification	6L,6H GHz	7,8 GHz	11 GHz	13 GHz	15 GHz	18 GHz
Standards	ETSI, FCC	ETSI	ETSI, FCC	ETSI	ETSI	ETSI, FCC
Operating Frequency Range (GHz)	5.85-6.45, 6.4-7.1	7.1-7.9, 7.7-8.5	10.7-11.7	12.75-13.3	14.4-15.35	17.7-19.7
Tx/Rx Spacing (MHz)	252.04, 240, 266, 300, 340, 160, 170, 500	154, 161, 168, 182, 196, 245, 300, 119, 311.32	490, 520, 530	266	315, 420, 644, 490, 728	1010, 1120, 1008, 1560
Frequency Stability	+0.001%					
Frequency Source	Synthesizer					
RF Channel Selection	Via EMS/NMS					
System Configurations	Non-Protected (1+0), Protected (1+1), Space Diversity					
Tx Range (Manual/ATPC)	20dB dynamic range					

##### 23-38 GHz

Specification	23 GHz	24-26 GHz	28 GHz	32 GHz	38 GHz
Standards	ETSI, FCC	ETSI, FCC	ETSI, FCC	ETSI, FCC	ETSI, FCC
Operating Frequency Range (GHz)	21.2-23.65	24.2-26.5	27.35-31.3	31.8-33.4	37-40
Tx/Rx Spacing (MHz)	1008, 1200, 1232	800, 900, 1008	350, 500, 1008	812	1000, 1260, 700
Frequency Stability	+0.001%				
Frequency Source	Synthesizer				
RF Channel Selection	Via EMS/NMS				
System Configurations	Non-Protected (1+0), Protected (1+1), Space Diversity				
Tx Range (Manual/ATPC)	20dB dynamic range				



## RFU support

Split-Mount installation	FibeAir RFU-C (6 - 38 GHz) <sup>1</sup> FibeAir RFU-P (11 - 38 GHz) FibeAir RFU-SP (6 - 8 GHz) FibeAir RFU-HP (6 - 11 GHz)
All-Indoor installation	FibeAir RFU-HP (6 - 11 GHz)
IDU to RFU connection	Coaxial cable RG-223 (100 m/300 ft), Belden 9914/RG-8 (300 m/1000 ft) or equivalent, N-type connectors (male)
Antenna Connection	Direct or remote mount using the same antenna type. Remote mount: standard flexible waveguide (frequency dependent)

Note: For more details about the different RFUs refer to the RFU documentation.

## Capacity

### 7 MHz (ETSI)

Profile	Modulation	Minimum required capacity license	Number of Supported E1s	Ethernet Throughput	
				Min	Max
1	QPSK	10	4	9.5	13.5
2	8 PSK	25	6	14	20
3	16 QAM	25	8	19	28
4	32 QAM	25	10	24	34
5	64 QAM	25	12	28	40
6	128 QAM	50	13	32	46
7	256 QAM	50	16	38	54
8	256 QAM	50	16	42	60

Note: Ethernet throughput depends on average packet size.

### 10 MHz (FCC)

Profile	Modulation	Minimum required capacity license	Number of Supported T1s	Ethernet Throughput	
				Min	Max
1	QPSK	10	7	13	18
2	8 PSK	25	10	19	27
3	16 QAM	25	16	28	40
4	32 QAM	50	16	32	46
5	64 QAM	50	16	42	61
6	128 QAM	50	16	50	71
7	256 QAM	50	16	54	78
8	256 QAM	50	16	60	85

Note: Ethernet throughput depends on average packet size.

### 14 MHz (ETSI)

Profile	Modulation	Minimum required capacity license	Number of supported E1s	Ethernet Throughput	
				Min	Max
1	QPSK	25	8	20	29
2	8 PSK	25	12	29	41
3	16 QAM	50	16	42	60
4	32 QAM	50	16	49	70
5	64 QAM	50	16	57	82
6	128 QAM	100	16	69	98
7	256 QAM	100	16	81	115
8	256 QAM	100	16	87	125

Note: Ethernet throughput depends on average packet size.

<sup>1</sup>Refer to RFU-C roll-out plan for availability of each frequency.



## 20 MHz (FCC)

Profile	Modulation	Minimum required capacity license	Number of supported T1s	Ethernet Throughput	
				Min	Max
1	QPSK	25	16	28	40
2	8 PSK	50	16	39	56
3	16 QAM	50	16	57	81
4	32 QAM	100	16	67	96
5	64 QAM	100	16	93	133
6	128 QAM	100	16	102	146
7	256 QAM	100	16	118	169
8	256 QAM	150	16	129	185

Note: Ethernet throughput depends on average packet size.

## 28 MHz (ETSI)

Profile	Modulation	Minimum required capacity license	Number of Supported E1s	Ethernet Throughput	
				Min	Max
1	QPSK	50	16	38	54
2	8 PSK	50	16	53	76
3	16 QAM	100	16	77	110
4	32 QAM	100	16	103	148
5	64 QAM	150	16	127	182
6	128 QAM	150	16	156	223
7	256 QAM	150	16	167	239
8	256 QAM	200	16	183	262

Note: Ethernet throughput depends on average packet size.

## 30 MHz (FCC)

Profile	Modulation	Minimum required capacity license	Number of Supported T1s	Ethernet Throughput	
				Min	Max
1	QPSK	50	16	39	55
2	8 PSK	50	16	62	89
3	16 QAM	100	16	93	133
4	32 QAM	100	16	120	171
5	64 QAM	150	16	142	202
6	128 QAM	150	16	164	235
7	256 QAM	200	16	185	264
8	256 QAM	200	16	204	292

Note: Ethernet throughput depends on average packet size.

## 40 MHz (ETSI/FCC)

Profile	Modulation	Minimum required capacity license	Number of Supported E1/T1s	Ethernet Throughput	
				Min	Max
1	QPSK	50	16	56	80
2	8 PSK	100	16	82	117
3	16 QAM	100	16	122	174
4	32 QAM	150	16	153	219
5	64 QAM	200	16	188	269
6	128 QAM	200	16	214	305
7	256 QAM	300	16	239	342
8	256 QAM	300	16	262	374

Note: Ethernet throughput depends on average packet size.



## 50 MHz (FCC)

Profile	Modulation	Minimum required capacity license	Number of Supported T1s	Ethernet Throughput	
				Min	Max
1	QPSK	100	16	65	93
2	8 PSK	100	16	104	148
3	16 QAM	150	16	130	186
4	32 QAM	150	16	169	241
5	64 QAM	200	16	218	312
6	128 QAM	300	16	262	374
7	256 QAM	300	16	306	437
8	256 QAM	"All capacity"	16	322	461

Note: Ethernet throughput depends on average packet size.

## 56 MHz (ETSI)

Profile	Modulation	Minimum required capacity license	Number of Supported E1s	Ethernet Throughput	
				Min	Max
1	QPSK	100	16	76	109
2	8 PSK	100	16	114	163
3	16 QAM	150	16	151	217
4	32 QAM	200	16	202	288
5	64 QAM	300	16	251	358
6	128 QAM	300	16	301	430
7	256 QAM	"All capacity"	16	343	490
8	256 QAM	"All capacity"	16	362	517

Note: Ethernet throughput depends on average packet size.



## Transmit Power with RFU-C<sup>1</sup> (dBm)

Modulation	6-8 GHz	11-15 GHz	18 GHz	23-28 GHz	32-38 GHz
QPSK	26	24	22	21	18
8 PSK	26	24	22	21	18
16 QAM	25	23	21	20	17
32 QAM	24	22	20	19	16
64 QAM	24	22	20	19	16
128 QAM	24	22	20	19	16
256 QAM	22	20	18	17	14

## Transmit Power with RFU-P (dBm)

Modulation	11-15 GHz	18 GHz	23-26 GHz	28-32 GHz	38 GHz
QPSK	23	23	22	21	20
8 PSK	23	23	22	21	20
16 QAM	23	21	20	20	19
32 QAM	23	21	20	20	19
64 QAM	22	20	20	19	18
128 QAM	22	20	20	19	18
256 QAM	21 <sup>2</sup>	19	19	18	17

## Transmit Power with RFU-SP/HP<sup>3</sup> (dBm)

Modulation	RFU-SP 6-8 GHz	RFU-HP Split-Mount		RFU-HP All-Indoor	
		6-8 GHz	11 GHz	6-8 GHz	11 GHz
QPSK	24	30	27	33	30
8 PSK	24	30	27	33	30
16 QAM	24	30	27	33	30
32 QAM	24	30	26	33	29
64 QAM	24	29	26	33 <sup>4</sup>	29
128 QAM	24	29	26	32	29
256 QAM	22	27	24	30	27

<sup>1</sup> Refer to RFU-C roll-out plan for availability of each frequency.

<sup>2</sup> 20dBm for 11GHz.

<sup>3</sup> RFU-HP supports channels with up to 30 MHz occupied bandwidth.

<sup>4</sup> 32dBm for 6H-GHz



## Receiver Threshold (RSL) with RFU-C<sup>1</sup> (dBm @ BER = 10<sup>-6</sup>)

Profile	Modulation	Channel Spacing	Occupied Bandwidth	Frequency (GHz)			
				6-8	11-15	18-28	32-38
1	QPSK	7 MHz (ETSI)	6.2 MHz	-92.0	-91.5	-91.0	-90.5
2	8 PSK			-89.5	-89.0	-88.5	-88
3	16 QAM			-86.5	-86.0	-85.5	-85.0
4	32 QAM			-84.5	-84.0	-83.5	-83
5	64 QAM			-82.0	-81.5	-81.0	-80.5
6	128 QAM			-79.5	-79.0	-78.5	-78.0
7	256 QAM			-76.5	-76.0	-75.5	-75.0
8	256 QAM			-74.5	-74.0	-73.5	-73.0
1	QPSK	10 MHz (FCC)	8.4 MHz	-91.0	-90.5	-90.0	-89.5
2	8 PSK			-88.5	-88.0	-87.5	-87.0
3	16 QAM			-85.0	-84.5	-84.0	-83.5
4	32 QAM			-84.0	-83.5	-83.0	-82.5
5	64 QAM			-80.0	-79.5	-79.0	-78.5
6	128 QAM			-77.0	-76.5	-76.0	-75.5
7	256 QAM			-75.5	-75.0	-74.5	-74.0
8	256 QAM			-73.5	-73.0	-72.5	-72.0
1	QPSK	14 MHz (ETSI)	12.2 MHz	-89.0	-88.5	-88.0	-87.5
2	8 PSK			-87.0	-86.5	-86.0	-85.5
3	16 QAM			-83.5	-83.0	-82.5	-82.0
4	32 QAM			-81.5	-81.0	-80.5	-80.0
5	64 QAM			-79.5	-79.0	-78.5	-78.0
6	128 QAM			-76.5	-76.0	-75.5	-75.0
7	256 QAM			-73.5	-73.0	-72.5	-72.0
8	256 QAM			-72.0	-71.5	-71.0	-70.5
1	QPSK	20 MHz (FCC)	17.4 MHz	-88.0	-87.5	-87.0	-86.5
2	8 PSK			-86.0	-85.5	-85.0	-84.5
3	16 QAM			-83.0	-82.5	-82.0	-81.5
4	32 QAM			-81.0	-80.5	-80.0	-79.5
5	64 QAM			-76.5	-76.0	-75.5	-75.0
6	128 QAM			-75.0	-74.5	-74.0	-73.5
7	256 QAM			-72.0	-71.5	-71.0	-70.5
8	256 QAM			-70.0	-69.5	-69.0	-68.5
1	QPSK	28 MHz (ETSI)	24.9 MHz	-86.5	-86.0	-85.5	-85.0
2	8 PSK			-85.0	-84.5	-84.0	-83.5
3	16 QAM			-82.0	-81.5	-81.0	-80.5
4	32 QAM			-78.5	-78.0	-77.5	-77.0
5	64 QAM			-75.5	-75.0	-74.5	-74.0
6	128 QAM			-72.0	-71.5	-71.0	-70.5
7	256 QAM			-70.5	-70.0	-69.5	-69.0
8	256 QAM			-68.5	-68.0	-67.5	-67.0
1	QPSK	30 MHz (FCC)	26.9 MHz	-86.5	-86.0	-85.5	-85.0
2	8 PSK			-84.0	-83.5	-83.0	-82.5
3	16 QAM			-80.5	-80.0	-79.5	-79.0
4	32 QAM			-77.5	-77.0	-76.5	-76.0
5	64 QAM			-75.0	-74.5	-74.0	-73.5
6	128 QAM			-72.5	-72.0	-71.5	-71.0
7	256 QAM			-70.0	-69.5	-69.0	-68.5
8	256 QAM			-68.0	-67.5	-67.0	-66.5

<sup>1</sup>Refer to RFU-C roll-out plan for availability of each frequency.



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

Profile	Modulation	Channel Spacing	Occupied Bandwidth	Frequency (GHz)			
				6-8	11-15	18-28	32-38
1	QPSK	40 MHz (ETSI/FCC)	35.6 MHz	-85.5	-85.0	-84.5	-84.0
2	8 PSK			-83.0	-82.5	-82.0	-81.5
3	16 QAM			-79.5	-79.0	-78.5	-78.0
4	32 QAM			-76.5	-76.0	-75.5	-75.0
5	64 QAM			-73.5	-73.0	-72.5	-72.0
6	128 QAM			-71.5	-71.0	-70.5	-70.0
7	256 QAM			-69.0	-68.5	-68.0	-67.5
8	256 QAM			-67.0	-66.5	-66.0	-65.5
1	QPSK	50 MHz (FCC)	44.3 MHz	-84.5	-84.0	-83.5	-83.0
2	8 PSK			-82.0	-81.5	-81.0	-80.5
3	16 QAM			-80.0	-79.5	-79.0	-78.5
4	32 QAM			-77.5	-77.0	-76.5	-76.0
5	64 QAM			-74.0	-73.5	-73.0	-72.5
6	128 QAM			-71.0	-70.5	-70.0	-69.5
7	256 QAM			-67.5	-67.0	-66.5	-66.0
8	256 QAM			-66.0	-65.5	-65.0	-64.5
1	QPSK	56 MHz (ETSI)	49.1 MHz	-84.0	-83.5	-83.0	-82.5
2	8 PSK			-81.5	-81.0	-80.5	-80.0
3	16 QAM			-79.5	-79.0	-78.5	-78.0
4	32 QAM			-76.0	-75.5	-75.0	-74.5
5	64 QAM			-73.0	-72.5	-72.0	-71.5
6	128 QAM			-70.0	-69.5	-69.0	-68.5
7	256 QAM			-67.5	-66.5	-66.0	-65.5
8	256 QAM			-65.5	-65.0	-64.5	-64.0

Note: RSL values are typical



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

Profile	Modulation	Channel Spacing	Occupied Bandwidth	Frequency (GHz)			
				11-18	23-28	31	32-38
1	QPSK	10 MHz (FCC)	8.4 MHz	-90.5	-90.5	-90.0	-89.5
2	8 PSK			-88.0	-88.0	-87.5	-87.0
3	16 QAM			-84.5	-84.5	-84.0	-83.5
4	32 QAM			-83.5	-83.5	-83.0	-82.5
5	64 QAM			-79.5	-79.5	-79.0	-78.5
6	128 QAM			-76.5	-76.5	-76.0	-75.5
7	256 QAM			-75.0	-75.0	-74.5	-74.0
8	256 QAM			-73.0	-73.0	-72.5	-72.0
1	QPSK	14 MHz (ETSI)	12.2 MHz	-88.5	-88.5	-88.0	-87.5
2	8 PSK			-86.5	-86.5	-86.0	-85.5
3	16 QAM			-83.0	-83.0	-82.5	-82.0
4	32 QAM			-81.0	-81.0	-80.5	-80.0
5	64 QAM			-79.0	-79.0	-78.5	-78.0
6	128 QAM			-76.0	-76.0	-75.5	-75.0
7	256 QAM			-73.0	-73.0	-72.5	-72.0
8	256 QAM			-71.5	-71.5	-71.0	-70.5
1	QPSK	20 MHz (FCC)	17.4 MHz	-87.5	-87.5	-87.0	-86.5
2	8 PSK			-85.5	-85.5	-85.0	-84.5
3	16 QAM			-82.5	-82.5	-82.0	-81.5
4	32 QAM			-80.5	-80.5	-80.0	-79.5
5	64 QAM			-76.0	-76.0	-75.5	-75.0
6	128 QAM			-74.5	-74.5	-74.0	-73.5
7	256 QAM			-71.5	-71.5	-71.0	-70.5
8	256 QAM			-69.5	-69.5	-69.0	-68.5
1	QPSK	28 MHz (ETSI)	24.9 MHz	-86.0	-86.0	-85.5	-85.5
2	8 PSK			-84.5	-84.5	-84.0	-83.5
3	16 QAM			-81.5	-81.5	-81.0	-80.5
4	32 QAM			-78.0	-78.0	-77.5	-77.0
5	64 QAM			-75.0	-75.0	-74.5	-74.0
6	128 QAM			-71.5	-71.5	-71.0	-70.5
7	256 QAM			-70.0	-70.0	-69.5	-69.0
8	256 QAM			-68.0	-68.0	-67.5	-67.0
1	QPSK	30 MHz (FCC)	26.9 MHz	-86.0	-86.0	-85.5	-85.0
2	8 PSK			-83.5	-83.5	-83.0	-82.5
3	16 QAM			-80.0	-80.0	-79.5	-79.0
4	32 QAM			-77.0	-77.0	-76.5	-76.0
5	64 QAM			-74.5	-74.5	-74.0	-73.5
6	128 QAM			-72.0	-72.0	-71.5	-71.0
7	256 QAM			-69.5	-69.5	-69.0	-68.5
8	256 QAM			-67.5	-67.5	-67.0	-66.5
1	QPSK	40 MHz (ETSI/FCC)	35.6 MHz	-85.0	-85.0	-84.5	-84.0
2	8 PSK			-82.5	-82.5	-82.0	-81.5
3	16 QAM			-79.0	-79.0	-78.5	-78.0
4	32 QAM			-76.0	-76.0	-75.5	-75.0
5	64 QAM			-73.0	-73.0	-72.5	-72.0
6	128 QAM			-71.0	-71.0	-70.5	-70.0
7	256 QAM			-68.5	-68.5	-68.0	-67.5
8	256 QAM			-66.5	-66.5	-66.0	-65.5

Note: RSL values are typical



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

Profile	Modulation	Channel Spacing	Occupied Bandwidth	Frequency (GHz)			
				11-18	23-28	31	32-38
1	QPSK	50 MHz (FCC)	44.3 MHz	-84.0	-84.0	-83.5	-83.0
2	8 PSK			-81.5	-81.5	-81.0	-80.5
3	16 QAM			-79.5	-79.5	-79.0	-78.5
4	32 QAM			-77.0	-77.0	-76.5	-76.0
5	64 QAM			-73.5	-73.5	-73.0	-72.5
6	128 QAM			-70.5	-70.5	-70.0	-69.5
7	256 QAM			-67.0	-67.0	-66.5	-66.0
8	256 QAM			-65.5	-65.5	-65.0	-64.5
1	QPSK	56 MHz (ETSI)	49.1 MHz	-83.5	-83.5	-83.0	-82.5
2	8 PSK			-81.0	-81.0	-80.5	-80.0
3	16 QAM			-79.0	-79.0	-78.5	-78.0
4	32 QAM			-75.5	-75.5	-75.0	-74.5
5	64 QAM			-72.5	-72.5	-72.0	-71.5
6	128 QAM			-69.5	-69.5	-69.0	-68.5
7	256 QAM			-66.5	-66.5	-66.0	-65.5
8	256 QAM			-65.0	-65.0	-64.5	-64.0

Note: RSL values are typical



## Receiver Threshold (RSL) with RFU-SP/HP<sup>1</sup> (dBm @ BER = 10<sup>-6</sup>)

Profile	Modulation	Channel Spacing	Occupied Bandwidth	RFU-SP (6-8 GHz)	RFU-HP (6-11 GHz)
1	QPSK	10 MHz (FCC)	8.4 MHz	-91.5	-91.5
2	8 PSK			-89.0	-89.0
3	16 QAM			-85.5	-85.5
4	32 QAM			-84.5	-84.5
5	64 QAM			-80.5	-80.5
6	128 QAM			-77.5	-77.5
7	256 QAM			-76.0	-76.0
8	256 QAM			-74.0	-74.0
1	QPSK	14 MHz (ETSI)	12.2 MHz	-89.5	-89.5
2	8 PSK			-87.5	-87.5
3	16 QAM			-84.0	-84.0
4	32 QAM			-82.0	-82.0
5	64 QAM			-80.0	-80.0
6	128 QAM			-77.0	-77.0
7	256 QAM			-74.0	-74.0
8	256 QAM			-72.5	-72.5
1	QPSK	20 MHz (FCC)	17.4 MHz	-88.5	-88.5
2	8 PSK			-86.5	-86.5
3	16 QAM			-83.5	-83.5
4	32 QAM			-81.5	-81.5
5	64 QAM			-77.0	-77.0
6	128 QAM			-75.5	-75.5
7	256 QAM			-72.5	-72.5
8	256 QAM			-70.5	-70.5
1	QPSK	28 MHz (ETSI)	24.9 MHz	-87.0	-87.0
2	8 PSK			-85.5	-85.5
3	16 QAM			-82.5	-82.5
4	32 QAM			-79.0	-79.0
5	64 QAM			-76.0	-76.0
6	128 QAM			-72.5	-72.5
7	256 QAM			-71.0	-71.0
8	256 QAM			-69.0	-69.0
1	QPSK	30 MHz (FCC)	26.9 MHz	-87.0	-87.0
2	8 PSK			-84.5	-84.5
3	16 QAM			-81.0	-81.0
4	32 QAM			-78.0	-78.0
5	64 QAM			-75.5	-75.5
6	128 QAM			-73.0	-73.0
7	256 QAM			-70.5	-70.5
8	256 QAM			-68.5	-68.5
1	QPSK	40 MHz (ETSI/FCC)	35.6 MHz	-86.0	Not supported
2	8 PSK			-83.5	Not supported
3	16 QAM			-80.0	Not supported
4	32 QAM			-77.0	Not supported
5	64 QAM			-74.0	Not supported
6	128 QAM			-72.0	Not supported
7	256 QAM			-69.5	Not supported
8	256 QAM			-67.5	Not supported

<sup>1</sup>RFU-HP supports channels with up to 30 MHz occupied bandwidth.



## Receiver Threshold (RSL) with RFU-SP/HP<sup>1</sup> (dBm @ BER = 10<sup>-6</sup>) - continued


Working point	Modulation	Channel Spacing	Occupied Bandwidth	RFU-SP (6-8 GHz)	RFU-HP (6-11 GHz)
1	QPSK	50 MHz (FCC)	44.3 MHz	-85.0	Not supported
2	8 PSK			-82.5	Not supported
3	16 QAM			-80.5	Not supported
4	32 QAM			-78.0	Not supported
5	64 QAM			-74.5	Not supported
6	128 QAM			-71.5	Not supported
7	256 QAM			-68.0	Not supported
8	256 QAM			-66.5	Not supported
1	QPSK	56 MHz (ETSI)	49.1 MHz	-84.5	Not supported
2	8 PSK			-82.0	Not supported
3	16 QAM			-80.0	Not supported
4	32 QAM			-76.5	Not supported
5	64 QAM			-73.5	Not supported
6	128 QAM			-70.5	Not supported
7	256 QAM			-67.5	Not supported
8	256 QAM			-66.0	Not supported

Note: RSL values are typical



## Interfaces

### Ethernet

Supported Ethernet interfaces	5 x 10/100base-T (RJ45) 1 x 10/100/1000Base-T (RJ45) 1 x 1000base-X (SFP)
Supported SFP types	1000Base-LX (1310 nm) or SX (850 nm) or 1000base-T
Latency over the radio link	< 0.2 mSeconds @ 400 Mbps
"Baby jumbo" frames support	Up to 1632Bytes
Supported Ethernet/IP standards	802.3 - 10base-T 802.3u - 100base-T 802.3ab - 1000base-T 802.3z - 1000base-X 802.3ac - Ethernet VLANs 802.1Q - Virtual LAN (VLAN) 802.1p - Class of service 802.1ad - Provider bridges (QinQ) 802.3x - Flow control 802.3ad - Link aggregation 802.1ag - Ethernet network OA&M 802.1w - RSTP RFC 1349 - IPv4 TOS RFC 2474 - IPv4 DSCP RFC 2460 - IPv6 Traffic Classes
MEF certification	MEF-9 & MEF-14 certified for all service types (EPL, EVPL & E-LAN) 

### E1/T1

Interface Type	E1/T1
Number of ports	16 per unit (optional)
Connector Type	MDR 69-pin
Framing	Unframed (full transparency)
Coding	E1: HDB3 T1: AMI/B8ZS
Line Impedance	120 ohm/100 ohm balanced. Optional 75 ohm unbalanced.
Compatible 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, ANSI T1.105, T1.102-1993, T1.231, Bellcore GR-253-core, TR-NWT-000499

### Auxiliary Channels

Wayside Channel	2 Mbps or 64 Kbps, Ethernet 10/100BaseT
Engineering Order Wire	Audio channel (64 Kbps) G.711
User Channel	Asynchronous V.11/RS-232 up 19.2 kbps



## Network Management, Diagnostics, Status, and Alarms

Network Management System	Ceragon PolyView NMS
NMS interface protocol	SNMPv1/v3 XML over HTTP/HTTPS toward PolyView
Element Management	Web based EMS, CLI
Management channels & Protocols	HTTP/HTTPS Telnet/SSH-2 FTP/SFTP
Authentication, Authorization & Accounting	User access control SYSLOG RADIUS Client support X-509 Certificate
Management Interface	Dedicated Ethernet interfaces (up to 3) or in-band
Local Configuration and Monitoring	Standard ASCII terminal, serial RS-232
In-Band Management	Support dedicated VLAN for management
TMN	Ceragon NMS functions are in accordance with ITU-T recommendations for TMN
External Alarms	4 Inputs: TTL-level or contact closure to ground. 1 output: Form C contact, software configurable.
RSL Indication	Accurate power reading (dBm) available at IDU, RFU <sup>1</sup> , and NMS
Performance Monitoring	Integral with onboard memory per ITU-T G.826/G.828

## Mechanical

Dimensions	Height: 1RU Width: 19" Depth: 188 mm, without mounting ears and connectors
Weight	2.5 kg/5.5 lbs

## Standard compliance

Specification	IDU	RFU
EMC	EN 301 489-4, Class B	EN 301 489-4, Class B
Safety	IEC 60950	IEC 60950
Ingress Protection	IEC 60529 IP20	IEC 60529 IP56
Operation	ETSI 300 019-1-3, Class 3.2	ETSI 300 019-1-4, Class 4.1E/ Class 4M5[4]
Storage	ETSI 300 019-1-1, Class 1.2	
Transportation	ETSI 300 019-1-2, Class 2.3	

## Environmental

Specification	IDU	RFU
Operating Temperature	-5°C to +55°C (23°F to 131°F)	-45°C to +55°C (-49°F to 131°F)
Relative Humidity	0 to 95%, Non-condensing	0 to 100%
Altitude	3,000m (10,000ft)	



## Power Input

Standard Input	-48 VDC
DC Input range	-40.5 to -57.5 VDC (up to -57 VDC for USA market)
Optional	110-220 VAC 24 VDC

## Power Consumption

Max Power consumption IP-10 IDU	25W
Max System Power Consumption - RFU-P+IDU	1+0: 65W 1+1: 105W
Max System Power Consumption - RFU-SP+IDU	1+0: 80W 1+1: 130W
Max System Power Consumption - RFU-HP+IDU	1+0: 105W 1+1: 150W
Max System Power Consumption - RFU-C+IDU	1+0 with RFU-C 6-26 GHz: 47W 1+0 with RFU-C 28-38 GHz: 51W 1+1 with RFU-C 6-26 GHz: 84W 1+1 with RFU-C 28-38 GHz: 88W

Note: All specifications are subject to change without prior notification

## Ceragon Networks Ltd.

Ceragon Networks Ltd. (NASDAQ and TASE: CRNT) is a leading provider of high-capacity LTE-ready wireless backhaul solutions. We provide a broad portfolio of innovative, field-proven, high capacity wireless backhaul solutions for cellular operators, fixed/wireless service providers as well as private network applications. These solutions are designed to deliver voice and premium data services, eliminate the backhaul capacity bottleneck, significantly reduce backhaul costs and transition to next generation IP-based networks.

Ceragon designs its FibeAir® solutions to provide fiber-like connectivity for circuit-switched, or SONET/SDH networks, next generation Ethernet/Internet Protocol, or IP-based, networks, and hybrid networks that combine circuit-switched and IP-based networks. Ceragon's solutions support all wireless access technologies, including GSM, CDMA, EV-DO, WiMAX and LTE. These solutions address wireless service providers' need to cost-effectively build-out and scale their infrastructure to meet the increasing demands placed on their networks by growing numbers of subscribers and the increasing demand for premium data services. Ceragon also provides its solutions to businesses and public institutions that operate their own private communications networks.

Ceragon's solutions are deployed by more than 150 service providers of all sizes, as well as in hundreds of private networks, in nearly 100 countries. More information is available at [www.ceragon.com](http://www.ceragon.com)

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