



Datasheet

IP-20G

February 2024 | Rev. D.01
ETSI Version



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

Radio Configurations

- 1+0, 2+0, 1+1, E/W
- 1+1 unit redundancy (external protection)

Radio Features

- Multi-Carrier Adaptive Bandwidth Control (up to 2+0)
- Protection and Diversity: HSB, SD (BBS)
- High spectral utilization: QPSK to 2048 QAM 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 per port
 - Deep buffering (configurable up to 64 Mbit per queue)
 - WRED
 - P-bit marking/remarking
- 4K VLANs
- VLAN add/remove
- 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)

Y.1731 Ethernet OAM

Y.1731 Ethernet Bandwidth Notification (ETH-BN)

TDM

TDM Interfaces

16 x E1s (optional)

TDM Features

- Native TDM services and TDM PWE using the same hardware
- XC capacity – 256 VCs
- Timing options – Loop timing, system clock, recovered clock
- 1+1 / 1:1 path protection

Management Protocols

- SNMP
- REST
- SDN Support:
 - NETCONF/YANG

Synchronization

Synchronization Distribution

- Sync Distribution over any traffic interface (GE/FE, E1*)
- Dedicated In/Out synch interface (E1/2 MHz)
- 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 BC

* Planned for future release.



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

Security

Radio Encryption – AES 256

Secured protocols:

- HTTPS
- SNMPv3
- SSH
- SFTP

RADIUS authentication and authorization

TACACS+ Authentication, Authorization, and Accounting (session-based)

Standards Compliance

Radio Spectral Efficiency: EN 302 217-2

EMC: EN 301 489-4, EN 301 489-1, FCC 47 CFR, part 15, subpart B, ICES-003, TEC/SD/DD/EMC-221/05/OCT-16, IEC 61000-4-29

Safety: EN 62368-1, IEC 62368-1, UL 62368-1 CSA-C22.2 No.62368-1

Ingress Protection:

- RFU-D: IP67
- RFU-D-HP: IP67
- RFU-E: IP67
- RFU-S: IP67
- RFU-C: IP66
- 1500HP/RFU-HP: 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-C – 200mm(H), 200mm(W), 85mm(D), 4kg;

1500HP/RFU-HP – 490mm(H), 144mm(W), 280mm(D), 7kg(W) (excluding Branching)

1500HP/RFU-HP OCB Branching (Split Mount and Compact All-Indoor) – 420mm(H), 110mm(W), 380mm(D), 7kg per carrier

Environmental Specifications

IDU: -5° to +45°C

RFU: -33°C to +55°C

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+0/1+1): 22W/39W; 28-42 GHz (1+0/1+1): 26W/43W

RFU-HP (6-8 GHz) – Max Bias: 73W; Mid Bias: 48W; Min Bias: 34W; Mute: 18W

RFU-HP (11 GHz) – Max Bias: 74W; Mid Bias: 64W; Mute: 21W

1500HP – Max Bias: 85W; Mid Bias: 72W; Mute: 29W



Product Images

IDU

IP-20G IDU



Radio Units

RFU-C



1500HP/RFU-HP



Radio Specifications

Capacity and Maximum Number of E1s

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

	Capacity (Mbps)	Capacity De-Dup	Max. No. of E1s	Capacity (Mbps)	Capacity De-Dup	Max. No. of E1s	Capacity (Mbps)	Capacity De-Dup	Max. No. of E1s
Modulation	1.75 MHz*			3.5 MHz			7 MHz		
QPSK	1.5-2	-	0	3-4	4-13	2	8-10	9-32	4
8 QAM	-	-	-	-	-	-	13-16	13-48	6
16 QAM	4-5	-	1	8-10	9-32	4	18-22	19-69	8
32 QAM	5.5-7	-	2	11-14	12-43	5	24-30	26-92	11
64 QAM	7-8.5	-	2	14-17	15-54	6	30-37	32-114	14
128 QAM	8.5-10.5	-	3	17-21	18-65	8	36-44	38-137	16
256 QAM	9.5-12	-	3	19-24	20-74	9	42-51	44-158	19
512 QAM	-	-	-	-	-	-	45-54	47-169	20
1024 QAM Strong	-	-	-	-	-	-	48-58	50-182	21
1024 QAM Light	-	-	-	-	-	-	51-62	53-194	23
Modulation	14 MHz			28 MHz			40 MHz		
QPSK	19-24	20-74	9	43-52	45-162	19	58-71	61-220	26
8 QAM	29-36	31-112	13	62-76	65-236	28	86-105	90-328	39
16 QAM	40-49	42-153	18	87-107	92-332	39	117-143	123-446	53
32 QAM	53-65	56-203	24	115-140	121-437	52	154-189	162-588	69
64 QAM	66-80	69-249	29	141-173	149-538	64	190-232	199-722	85
128 QAM	79-97	83-301	36	170-208	179-648	77	229-280	241-873	103
256 QAM	90-110	95-344	41	196-239	206-745	88	247-302	259-939	111
512 QAM	100-122	105-380	45	209-255	219-794	94	270-330	284-1000	122
1024 QAM Strong	106-129	111-402	48	228-278	239-866	102	306-375	322-1000	138
1024 QAM Light	112-137	118-426	50	241-295	253-917	108	325-398	342-1000	146
2048 QAM	-	-	-	263-321	276-1000	118	352-430	370-1000	158
Modulation	56 MHz								
QPSK	87-106	91-331	39						
8 QAM	127-155	133-482	57						
16 QAM	176-215	185-670	79						
32 QAM	232-283	243-881	104						
64 QAM	284-348	299-1000	128						
128 QAM	344-420	361-1000	155						
256 QAM	397-485	416-1000	178						
512 QAM	427-521	448-1000	192						
1024 QAM Strong	464-567	487-1000	209						
1024 QAM Light	493-602	517-1000	222						
2048 QAM	534-653	561-1000	240						

* Channel bandwidth of 1.75 MHz is planned for future release, and will be supported with RFU-C for 6 and 13 GHz.



Transmit Power

RFU-C

Transmit Power (dBm)	Frequency (GHz)	6-8	11-15	18-23	24	26	28	31	32	36	38	42
QPSK/8 QAM		26	24	22	0	21	14	16	18	12	1	12
16 QAM		25	23	21	0	20	14	15	17	11	1	12
32 QAM		24	22	20	0	19	14	14	16	10	1	12
64 QAM		24	22	20	0	19	14	14	16	10	1	12
128 QAM		24	22	20	0	19	14	14	16	10	1	12
256 QAM		22	20	18	0	17	12	12	14	8	1	11
512 QAM		22	20	18	-1	17	9	12	14	10	1	11
1024 QAM		21	19	17	-3	16	8	11	13	9	1	10
2048 QAM		19	17	15	0	14	6	9	11	7	1	8

RFU-HP 1RX

Modulation	Frequency (GHz)	6L&H	7	8	11
QPSK – 16 QAM		33	33	33	30
32 QAM		33	33	33	29
64 QAM		32	32	32	29
128 QAM		31	31	31	29
256 QAM		30	30	30	27
512 QAM		28	28	28	25
1024 QAM		27	27	27	24
2048 QAM		25	25	25	22

RFU-HP 2RX (1500HP)

6L&H	7	8	11
33	33	33	30
33	33	33	29
32	32	32	29
32	32	32	29
30	30	30	27
28	28	28	25
27	27	27	24
25	25	25	22

Receiver Threshold (RSL) (dBm @ BER = 10⁻⁶)

RFU-C

1.75 MHz	Frequency (GHz)	6	7-10	11-15	18	23	24	26	28	31-42
QPSK		-101.0	–	-101.0	–	–	–	–	–	–
16 QAM		-94.0	–	-94.0	–	–	–	–	–	–
32 QAM		-90.5	–	-90.5	–	–	–	–	–	–
64 QAM		-87.5	–	-87.5	–	–	–	–	–	–
128 QAM		-83.5	–	-83.5	–	–	–	–	–	–
256 QAM		-80.5	–	-80.5	–	–	–	–	–	–
3.5 MHz										
QPSK		-98.0	-97.5	-98.0	-97.0	-96.5	-93.5	-95.5	-93.5	-94.5
16 QAM		-91.0	-90.5	-91.0	-90.0	-89.5	-86.5	-88.5	-86.5	-87.5
32 QAM		-87.5	-87.0	-87.5	-86.5	-86.0	-83.0	-85.0	-83.0	-84.0
64 QAM		-84.5	-84.0	-84.5	-83.5	-83.0	-80.0	-82.0	-80.0	-81.0
128 QAM		-80.5	-80.0	-80.5	-79.5	-79.0	-76.0	-78.0	-76.0	-77.0
256 QAM		-77.5	-77.0	-77.5	-76.5	-76.0	-73.0	-75.0	-73.0	-74.0



7 MHz	Frequency	6	7-10	11-15	18	23	24	26	28	31-42
QPSK		-95.0	-94.5	-95.0	-94.0	-93.5	-90.5	-92.5	-90.5	-91.5
8 QAM		-90.0	-89.5	-90.0	-89.0	-88.5	-85.5	-87.5	-85.5	-86.5
16 QAM		-88.5	-88.0	-88.5	-87.5	-87.0	-84.0	-86.0	-84.0	-85.0
32 QAM		-85.0	-84.5	-85.0	-84.0	-83.5	-80.5	-82.5	-80.5	-81.5
64 QAM		-82.0	-81.5	-82.0	-81.0	-80.5	-77.5	-79.5	-77.5	-78.5
128 QAM		-78.5	-78.0	-78.5	-77.5	-77.0	-74.0	-76.0	-74.0	-75.0
256 QAM		-75.0	-74.5	-75.0	-74.0	-73.5	-70.5	-72.5	-70.5	-71.5
512 QAM		-73.0	-72.5	-73.0	-72.0	-71.5	-68.5	-70.5	-68.5	-69.5
1024 QAM Strong		-69.5	-69.0	-69.5	-68.5	-68.0	-65.0	-67.0	-65.0	-66.0
1024 QAM Light		-68.5	-68.0	-68.5	-67.5	-67.0	-64.0	-66.0	-64.0	-65.0
14 MHz										
QPSK		-92.0	-91.5	-92.0	-91.0	-90.5	-87.5	-89.5	-87.5	-88.5
8 QAM		-87.0	-86.5	-87.0	-86.0	-85.5	-82.5	-84.5	-82.5	-83.5
16 QAM		-85.5	-85.0	-85.5	-84.5	-84.0	-81.0	-83.0	-81.0	-82.0
32 QAM		-82.0	-81.5	-82.0	-81.0	-80.5	-77.5	-79.5	-77.5	-78.5
64 QAM		-78.5	-78.0	-78.5	-77.5	-77.0	-74.0	-76.0	-74.0	-75.0
128 QAM		-75.5	-75.0	-75.5	-74.5	-74.0	-71.0	-73.0	-71.0	-72.0
256 QAM		-72.5	-72.0	-72.5	-71.5	-71.0	-68.0	-70.0	-68.0	-69.0
512 QAM		-69.5	-69.0	-69.5	-68.5	-68.0	-65.0	-67.0	-65.0	-66.0
1024 QAM Strong		-66.5	-66.0	-66.5	-65.5	-65.0	-62.0	-64.0	-62.0	-63.0
1024 QAM Light		-65.5	-65.0	-65.5	-64.5	-64.0	-61.0	-63.0	-61.0	-62.0
28 MHz										
QPSK		-89.0	-88.5	-89.0	-88.0	-87.5	-84.5	-86.5	-84.5	-85.5
8 QAM		-84.0	-83.5	-84.0	-83.0	-82.5	-79.5	-81.5	-79.5	-80.5
16 QAM		-82.5	-82.0	-82.5	-81.5	-81.0	-78.0	-80.0	-78.0	-79.0
32 QAM		-79.0	-78.5	-79.0	-78.0	-77.5	-74.5	-76.5	-74.5	-75.5
64 QAM		-76.0	-75.5	-76.0	-75.0	-74.5	-71.5	-73.5	-71.5	-72.5
128 QAM		-73.0	-72.5	-73.0	-72.0	-71.5	-68.5	-70.5	-68.5	-69.5
256 QAM		-70.0	-69.5	-70.0	-69.0	-68.5	-65.5	-67.5	-65.5	-66.5
512 QAM		-67.0	-66.5	-67.0	-66.0	-65.5	-62.5	-64.5	-62.5	-63.5
1024 QAM Strong		-64.0	-63.5	-64.0	-63.0	-62.5	-59.5	-61.5	-59.5	-60.5
1024 QAM Light		-63.5	-63.0	-63.5	-62.5	-62.0	-59.0	-61.0	-59.0	-60.0
2048 QAM		-60.5	-60.0	-60.5	-59.5	-59.0	-56.0	-58.0	-56.0	-57.0
40 MHz										
QPSK		-88.0	-87.5	-88.0	-87.0	-86.5	-83.5	-85.5	-83.5	-84.5
8 QAM		-82.5	-82.0	-82.5	-81.5	-81.0	-78.0	-80.0	-78.0	-79.0
16 QAM		-81.0	-80.5	-81.0	-80.0	-79.5	-76.5	-78.5	-76.5	-77.5
32 QAM		-77.5	-77.0	-77.5	-76.5	-76.0	-73.0	-75.0	-73.0	-74.0
64 QAM		-74.5	-74.0	-74.5	-73.5	-73.0	-70.0	-72.0	-70.0	-71.0
128 QAM		-71.5	-71.0	-71.5	-70.5	-70.0	-67.0	-69.0	-67.0	-68.0
256 QAM		-69.0	-68.5	-69.0	-68.0	-67.5	-64.5	-66.5	-64.5	-65.5
512 QAM		-66.5	-66.0	-66.5	-65.5	-65.0	-62.0	-64.0	-62.0	-63.0
1024 QAM Strong		-63.0	-62.5	-63.0	-62.0	-61.5	-58.5	-60.5	-58.5	-59.5
1024 QAM Light		-62.0	-61.5	-62.0	-61.0	-60.5	-57.5	-59.5	-57.5	-58.5
2048 QAM		-59.0	-58.5	-59.0	-58.0	-57.5	-54.5	-56.5	-54.5	-55.5



56 MHz	Frequency	6	7-10	11-15	18	23	24	26	28	31-42
QPSK		-86.0	-85.5	-86.0	-85.0	-84.5	-81.5	-83.5	-81.5	-82.5
8 QAM		-81.0	-80.5	-81.0	-80.0	-79.5	-76.5	-78.5	-76.5	-77.5
16 QAM		-79.0	-78.5	-79.0	-78.0	-77.5	-74.5	-76.5	-74.5	-75.5
32 QAM		-76.0	-75.5	-76.0	-75.0	-74.5	-71.5	-73.5	-71.5	-72.5
64 QAM		-72.5	-72.0	-72.5	-71.5	-71.0	-68.0	-70.0	-68.0	-69.0
128 QAM		-70.0	-69.5	-70.0	-69.0	-68.5	-65.5	-67.5	-65.5	-66.5
256 QAM		-67.0	-66.5	-67.0	-66.0	-65.5	-62.5	-64.5	-62.5	-63.5
512 QAM		-64.5	-64.0	-64.5	-63.5	-63.0	-60.0	-62.0	-60.0	-61.0
1024 QAM Strong		-61.0	-60.5	-61.0	-60.0	-59.5	-56.5	-58.5	-56.5	-57.5
1024 QAM Light		-60.5	-60.0	-60.5	-59.5	-59.0	-56.0	-58.0	-56.0	-57.0
2048 QAM		-58.0	-57.5	-58.0	-57.0	-56.5	-53.5	-55.5	-53.5	-54.5

RFU-HP

Frequency (GHz)	14 MHz		28 MHz		40 MHz		56 MHz	
	6 GHz	7-11 GHz	6 GHz	7-11 GHz	6 GHz	7-11 GHz	6 GHz	7-11 GHz
QPSK	-91.5	-91.0	-88.5	-88.0	-87.0	-86.5	-85.5	-85.0
8 QAM	-86.5	-86.0	-83.5	-83.0	-82.0	-81.5	-80.5	-80.0
16 QAM	-85.0	-84.5	-82	-81.5	-80.5	-80.0	-79.0	-78.5
32 QAM	-81.5	-81.0	-78.5	-78.0	-77.0	-76.5	-75.5	-75.0
64 QAM	-78.5	-78.0	-75.5	-75.0	-74.0	-73.5	-72.0	-71.5
128 QAM	-75.0	-74.5	-72.5	-72.0	-71.0	-70.5	-69.5	-69.0
256 QAM	-72.0	-71.5	-69.5	-69.0	-68.5	-68.0	-66.5	-66.0
512 QAM	-69.5	-69.0	-67	-66.5	-66.0	-65.5	-64.0	-63.5
1024 QAM Strong	-66.5	-66.0	-64	-63.5	-63.0	-62.5	-61.0	-60.5
1024 QAM Light	-65.5	-65.0	-63.5	-63.0	-62.0	-61.5	-60.0	-59.5
2048 QAM	-	-	-59.5	-59.0	-58.5	-58.0	-56.5	-56.0

1500HP

Frequency (GHz)	14 MHz		28 MHz		40 MHz	
	6 GHz	7-11 GHz	6 GHz	7-11 GHz	6 GHz	7-11 GHz
QPSK	-91.0	-91.0	-88.0	-88.0	-86.5	-86.5
8 QAM	-86.0	-86.0	-83.0	-83.0	-81.5	-81.5
16 QAM	-84.5	-84.5	-81.5	-81.5	-80.0	-80.0
32 QAM	-81.0	-81.0	-78.0	-78.0	-76.5	-76.5
64 QAM	-78.0	-78.0	-75.0	-75.0	-73.5	-73.5
128 QAM	-74.5	-74.5	-72.0	-72.0	-70.5	-70.5
256 QAM	-71.5	-71.5	-69.0	-69.0	-68.0	-68.0
512 QAM	-69.0	-69.0	-66.5	-66.5	-65.5	-65.5
1024 QAM Strong	-66.0	-66.0	-63.5	-63.5	-62.5	-62.5
1024 QAM Light	-65.0	-65.0	-63.0	-63.0	-61.5	-61.5
2048 QAM	-	-	-59.0	-59.0	-58.0	-58.0

