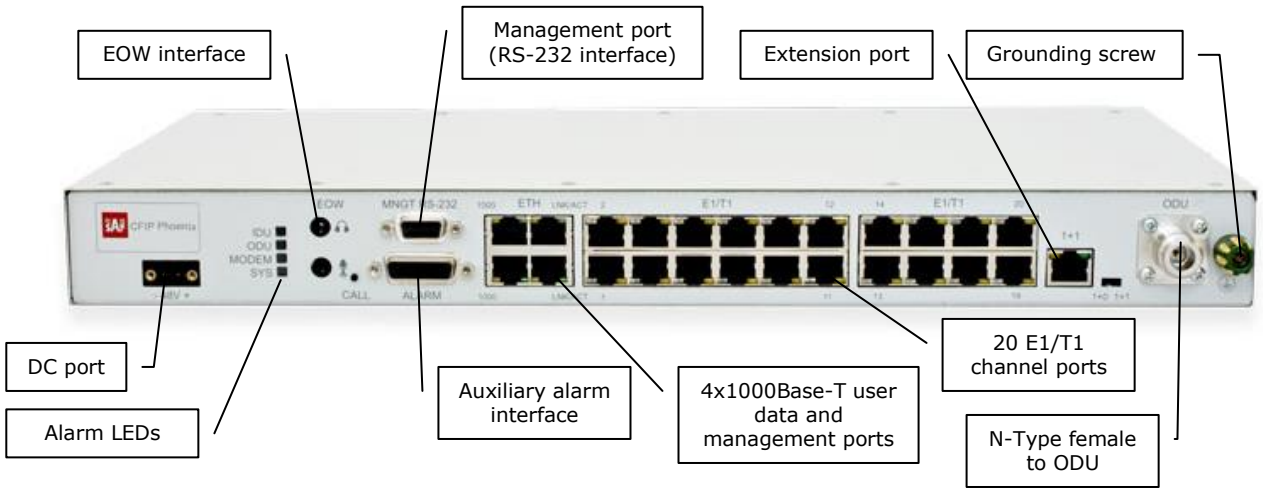
CFIP PhoeniX IDU Technical Specification



Modem	
Channel Bandwidths	3.5, 7, 14, 28, 40, 56 MHz
Modulations	4QAM, 16QAM, 32QAM, 64QAM, 128QAM, 256QAM
Capacity	9 - 366 Mbps
Supported radios	CFIP ODU CFIP PhoeniX IRFU
Applications	
Configuration	1+0, 1+1 (HSB, SD, FD), Ring/Mesh (with RSTP), 2+0, 3+0, 4+0 (built-in Ethernet aggregation)
Protection switching	Hot Stand-by (<50ms), Space/Frequency diversity (hitless, errorless)
Ports	
Ethernet	4x1000Base-T, RJ-45
E1/T1	20 E1/T1, RJ-45
Serial port for configuration	RS-232, DB-9 connector
Alarm port	4 digital inputs, 4 relay outputs (26 pin hi-density D-SUB)
ODU port	N-Type Female
EOW port	3.5mm headset and mic, 64 Kbps
Extension/protection port	RJ-45
DC power connector	2ESDV-02 with screw locks
Management features	
Management port	Ethernet with VLAN support or serial (RS-232)
Monitoring	via Telnet, WEB GUI, NMS, SNMP Manager, Serial interface
SNMP	Yes, SNMP traps, MIB, SNMP v1/v2c, RMON
Performance graphs	Uptime, Rx level, Tx level, System temperature, Radial MSE, LDPC decoder stress, constellation diagram, equalizer graph
EMS	Web based, HTTP
ATPC feature	Yes
ACM feature	Hitless 0ms

Ethernet	
Switch type	Managed Gigabit Ethernet Layer 2
Max frame size	9728 bytes
MAC table	4K entries; automatic learning and aging
Packet buffer	128KB; non-blocking store&forward
Flow Control	IEEE 802.3x
VLAN support	IEEE 802.1Q (up to 4K VLAN entries)
QinQ (Double Tagging)	Yes, IEEE 802.1ad (Providing Bridging Technique)
QoS	64 level DiffServ (DSCP) or 8 level 802.1p mapped in 4 prioritization queues with VLAN support
QoS queuing	Fixed or weighted (configurable ratio)
Spanning Tree Protocol	IEEE 802.1D-2004 RSTP IEEE 802.1Q-2005 MSTP
MEF	MEF 9, MEF 14
Mechanical & Electrical	
Operational use	Conforms to ETSI EN 300 019 Class 3.1E, IP20, NEMA 1
Temperature Range / Humidity	-5°C to +55°C / 5% to 95%
Dimensions: HxWxD / weight	1U (45x430x240 mm) / 3.1 kg
Max. power consumption	20-30 W
IDU-ODU connection	Belden 9914/RG-8 cable (300 m), RG213 cable (200 m), N-Type connectors
DC port	-40.5V to -57V DC (conforms to ETSI EN 300 132-2)
Built-in DC and IF port surge protection	Conforms to ETSI EN 301 489-1; EN 61000-4-5; IEC 61000-4-5

CFIP PhoeniX ODU, CFIP PhoeniX IRFU

Ports	CFIP PhoeniX ODU	CFIP PhoeniX IRFU
Antenna	N-Type or flange	A) N-Type or flange B) Tx and Rx ports[5]
IF to IDU	N-Type	SMA
RSSI	BNC	2-port for multi-meter
Power	--- (over IF port)	2-pin power port (alternative to IF port)
Mechanical & Electrical		
Operational use	Conforms to ETSI EN 300 019 Class 4.1, IP65, NEMA 4X	Conforms to ETSI EN 300 019 Class 3.1E, IP20, NEMA 1
Temperature Range	-33°C to +55°C	-33°C to +55°C
Dimensions: HxWxD / weight	288x288x80 mm / 3.5 kg	19" 2U rack 90x430x260 / 5.8 kg
IF port surge protection	Conforms to ETSI EN 301 489-1; EN 61000-4-5; IEC 61000-4-5	
Input DC voltage	-40.5V to -57V DC (conforms to ETSI EN 300 132-2)	
Max. power consumption	SP: 13-27 W; HP: 21-39 W	

Max Tx Power

Modulation	Standard / High / Very High[1] Tx Power[5], dBm							
	4, U4 GHz	L6, U6 GHz	7GHz	8 GHz	10, 11, 15 GHz	13 GHz	18, 23, 26 GHz	38 GHz
4QAM	+33	+19/+27/+33	+19/+27/+32	+19/+27/+31	+19/+25	+19/+25/+29	+19	+17
16QAM	+32	+18/+26/+32	+18/+26/+31	+18/+26/+30	+18/+24	+18/+24/+28	+18	+16
32QAM	+31	+17/+25/+31	+17/+25/+30	+17/+25/+29	+17/+23	+17/+23/+27	+17	+15
64QAM	+29	+15/+23/+29	+15/+23/+28	+15/+23/+27	+15/+21	+15/+21/+25	+15	+13
128QAM	+29	+15/+23/+29	+15/+23/+28	+15/+23/+27	+15/+21	+15/+21/+25	+15	+13
256QAM	+26	+12/+20/+26	+12/+20/+25	+12/+20/+24	+12/+18	+12/+18/+22	+12	+10

Band	Frequency range	Duplex offset
4 GHz	3.6 – 4.2 GHz	213 MHz, 320 MHz
U4 Ghz	4.4 – 5.0 GHz	100 MHz, 300 MHz, 312 MHz
L6 GHz	5.925 – 6.425 GHz	252.04 MHz, 266 MHz
U6 GHz	6.425 – 7.125 GHz	160 MHz, 170 MHz, 200 MHz, 340 MHz
7 GHz	7.110 – 7.900 GHz	154 MHz, 161 MHz, 168 MHz, 196 MHz, 245 MHz
8 GHz	7.725 – 8.5 GHz	119 MHz, 126 MHz, 151.614 MHz, 154 MHz, 160 MHz, 208 MHz, 266 MHz, 300 MHz, 310 MHz, 311.32 MHz, 525 MHz, 550 MHz
10 GHz	10.15 – 10.68 GHz	65 MHz, 91 MHz, 300 MHz, 350 MHz
11 GHz	10.7 – 11.7 GHz	490 MHz, 500 MHz, 530 MHz
13 GHz	12.75 – 13.25 GHz	225 MHz, 266 MHz
15 GHz	14.4 – 15.35 GHz	315 MHz, 322 MHz, 420 MHz, 475 MHz, 490 MHz, 644 MHz, 728 MHz

Band	Frequency range	Duplex offset
18 GHz	17.7 – 19.7 GHz	1008 MHz, 1010 MHz, 1560 MHz
23 GHz	21.2 – 23.6 GHz	1008 MHz, 1036 MHz, 1200 MHz, 1232 MHz
26 GHz	24.25 – 27.5 GHz	800 MHz, 1008 MHz
38 GHz	38.6 – 40 GHz	700 MHz, 1260 MHz

CFIP ODU waveguide flange sizes						
4, U4, L6, U6 GHz	**7, 8 GHz**	**10, 11 GHz**	**13, 15 GHz**	**18, 23 GHz**	**26 GHz**	**38 GHz**
N-type	UBR84	UBR100	UBR140	UBR220	UBR260	UBR320

CFIP ODU RSL at 10^{-6} (dBm) [5] and Total Payload Capacity (Mbps)															
BW[3], MHz	Modulation	FEC[4]	4, U4 GHz[6]	6 GHz	7 GHz	8 GHz	10 GHz	11 GHz	13 GHz	15 GHz	18 GHz	23 GHz	26 GHz	38 GHz	Bit rate, Mbps
3.5	4QAM	Strong	-	-97	-95	-95	-97	-96	-95	-93,5	-95	-97	-96,5	-93,5	3
	16QAM	Strong	-	-90,5	-88	-88	-90	-89	-88	-88	-88,5	-90	-89,5	-86,5	7
	32QAM	Strong	-	-87	-85	-85,5	-87	-86	-85	-85	-85,5	-87	-86,5	-83,5	9
	64QAM	Strong	-	-84	-81,5	-82	-84	-83	-82	-82	-82	-83,5	-83	-80	13
		Weak	-	-81,5	-79	-79,5	-81	-80	-79,5	-79	-79,5	-81	-81	-78	14
7	4QAM	Strong	-	-93	-92	-92	-94	-93	-92,5	-91	-92	-94	-93,5	-90,5	8
	16QAM	Strong	-	-86,5	-85	-85,5	-87,5	-86,5	-85,5	-85	-85,5	-87,5	-87	-84	17
	32QAM	Strong	-	-83,5	-82,5	-83	-84,5	-83,5	-83	-82,5	-83	-84,5	-84	-81	21
	64QAM	Strong	-	-80	-79	-80	-81,5	-80,5	-79,5	-79,5	-79,5	-81,5	-80,5	-77,5	28
	128QAM	Strong	-	-77	-76	-76,5	-78	-77	-76	-76,5	-76	-78	-77,5	-74,5	34
		Weak	-	-75	-73,5	-75	-76	-75	-74,5	-74	-74	-75,5	-75,5	-72,5	36
14	4QAM	Strong	-91.5	-90	-90,5	-90	-91	-90	-90	-89	-90,5	-91	-90,5	-87,5	17
	16QAM	Strong	-85	-83,5	-83,5	-83,5	-84,5	-83,5	-83,5	-83	-84	-84	-83,5	-80,5	34
	32QAM	Strong	-81.5	-80	-80	-80,5	-81,5	-80,5	-80	-80	-80,5	-80,5	-80,5	-77,5	45
	64QAM	Strong	-79.5	-77,5	-77,5	-78	-79	-78	-77,5	-77,5	-78	-78,5	-78	-75	57
	128QAM	Strong	-76	-74,5	-74,5	-75	-75,5	-74,5	-74,5	-74	-75	-75	-75	-72	68
	256QAM	Strong	-72.5	-71	-71	-71,5	-72	-71	-70,5	-70,5	-72	-71,5	-71,5	-68,5	79
		Weak	-69	-67,5	-67,5	-68	-69	-68	-67,5	-67	-68	-65,5	-68	-65	86
28	4QAM	Strong	-88.5	-90.5	-89.5	-89	-88.5	-89.5	-89.5	-89	-90	-89	-91.5	-85	35
	16QAM	Strong	-82.5	-84.5	-83	-83	-82.5	-83.5	-83.5	-83	-84	-83	-85	-79	69
	32QAM	Strong	-79.5	-81.5	-80	-80	-80	-80.5	-80.5	-80.5	-80.5	-80	-82	-76	88
	64QAM	Strong	-77.5	-79	-77.5	-77.5	-77	-78	-77.5	-77	-78	-77.5	-79.5	-73.5	115
	128QAM	Strong	-74.5	-75.5	-74.5	-74	-73.5	-74.5	-74.5	-74	-75.5	-74	-76.5	-70	138
	256QAM	Strong	-70.5	-72.5	-71	-70.5	-70.5	-71	-71	-70.5	-72	-71	-73	-67	161
		Weak	-68.5	-69	-67	-66	-66	-67	-67	-66.5	-69	-67.5	-70	-63.5	174

CFIP PhoeniX series

Digital Microwave Radio Systems

CFIP ODU RSL at 10^{-6} (dBm) [5] and Total Payload Capacity (Mbps)

BW[3], MHz	Modulation	FEC[4]	4, U4 GHz[6]	6 GHz	7 GHz	8 GHz	10 GHz	11 GHz	13 GHz	15 GHz	18 GHz	23 GHz	26 GHz	38 GHz	Bit rate, Mbps
40	4QAM	Strong	-86.5	-89	-87.5	-88	-87.5	-88	-88	-88	-88	-87.5	-89.5	-83.5	49
	16QAM	Strong	-80.5	-82.5	-81.5	-81.5	-81	-82	-82	-81.5	-82.5	-81	-83.5	-77	98
	32QAM	Strong	-78	-80	-78.5	-79	-78.5	-79.5	-79.5	-79	-79.5	-78.5	-80.5	-74.5	127
	64QAM	Strong	-75.5	-77	-76	-75.5	-75.5	-76.5	-76	-76	-77	-75.5	-78	-71.5	163
	128QAM	Strong	-72.5	-74	-73	-72.5	-72.5	-73.5	-73	-72.5	-73.5	-72.5	-74.5	-68.5	196
	256QAM	Strong	-68.5	-70.5	-69.5	-69	-68.5	-69.5	-69.5	-69	-70.5	-69	-71	-65	229
		Weak	-66.5	-68	-67	-64.5	-64.5	-65.5	-65	-65	-67.5	-66.5	-68.5	-62.5	245
56	4QAM	Strong	-	-87	-85.5	-86	-85.5	-87	-86.5	-86	-87	-85.5	-88	-81.5	72/67 [2]
	16QAM	Strong	-	-81	-80	-79.5	-79.5	-80.5	-80	-79.5	-80.5	-79.5	-82	-75.5	145/135 [2]
	32QAM	Strong	-	-78	-77	-77.5	-77	-78	-77.5	-77	-77.5	-76.5	-79	-72.5	182
	64QAM	Strong	-	-75.5	-74.5	-74	-73.5	-74.5	-74.5	-74	-75.5	-74	-76	-70	240
	128QAM	Strong	-	-72	-71	-71	-70.5	-71.5	-71.5	-71	-72	-70.5	-73	-66.5	287
	256QAM	Strong	-	-68.5	-67.5	-67	-66.5	-68	-67.5	-67	-68.5	-67	-69.5	-63	335
		Weak	-	-64	-63	-63	-62.5	-63.5	-63	-62.5	-64.5	-62.5	-65	-58.5	363

Notes:

[1] Preliminary data
[2] Higher capacity is available in 16QAM and 4QAM if using 32QAM-256QAM with ACM enabled
[3] According to ETSI channel plan
[4] Forward Error Correction (FEC) can be optimized either for sensitivity (Strong FEC) or for capacity (Weak FEC)
[5] For CFIP PhoeniX IRFU with Tx and Rx ports (without diplexer), Tx Power is increased by 1dBm and RSL figures for improve by up to 1.5 dBm
[6] For 4GHz and U4GHz radios there are two hardware revision standard bandwidth (up to 40MHz) and wide bandwidth (up to 56MHz) channels

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