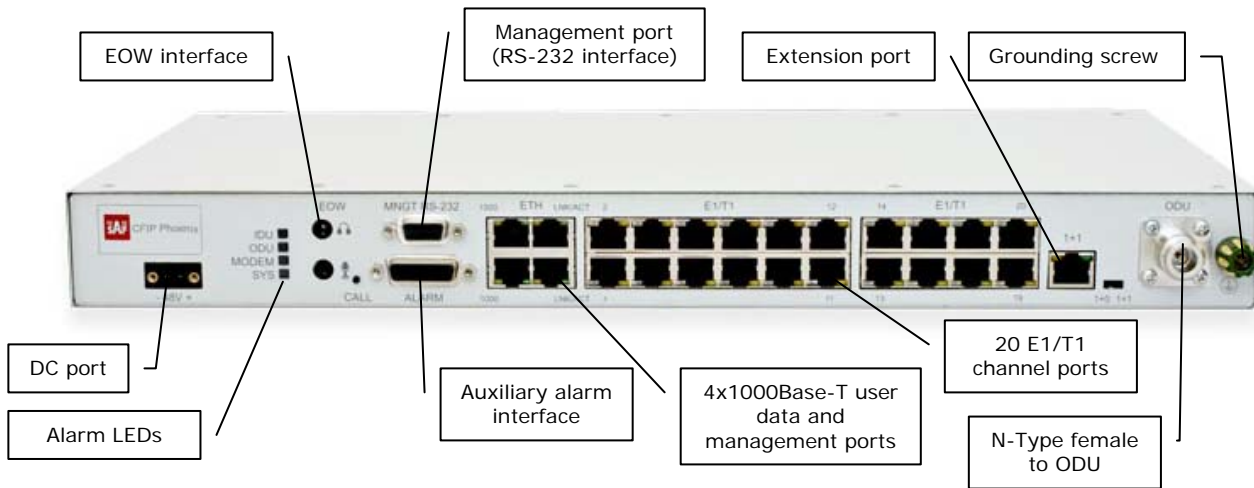


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## CFIP Phoenix IDU Technical Specification



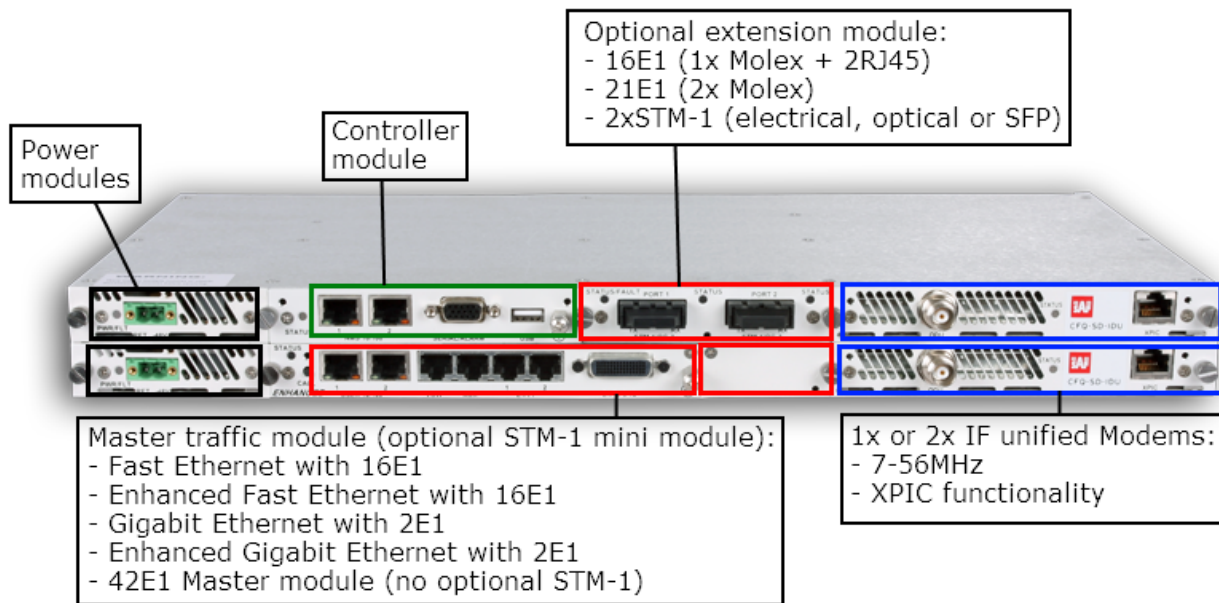
<b>Modem</b>	
Channel Bandwidths	3.5, 7, 14, 28, 40, 56 MHz
Modulations	QPSK, 16APSK, 32APSK, 64QAM, 128QAM, 256QAM
Capacity	9 - 366 Mbps
Supported ODUs	CFIP ODU
<b>Applications</b>	
Configuration	1+0, 1+1 (HSB, SD, FD), Ring/Mesh (with RSTP), 2+0, 3+0, 4+0 (built-in Ethernet aggregation)
Protection switching	Hot Stand-by (<50ms), Space/Frequency diversity (hitless, errorless)
<b>Ports</b>	
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
EMS	Web based, HTTP
ATPC feature	Yes
ACM feature	Hitless Oms
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	802.3x
VLAN support	802.1Q (up to 4K VLAN entries)
QinQ (Double Tagging)	Yes
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	802.1D-2004 RSTP 802.1Q-2005 MSTP
Mechanical & Electrical	
Temperature Range / Humidity	-5°C to +55°C / 5% to 95%
Dimensions: HxWxD, mm / weight, kg	1U (45x430x240) / 3.1
Max. power consumption	20-30W
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 M IDU Technical Specification

Data modules	
Expanded Base	<ul style="list-style-type: none"> <li>- 14 x E1, high-density Molex connector</li> <li>- 2 x E1, RJ-48C connector</li> <li>- Voice, Data ORW RJ-48C connectors</li> <li>- 100BaseTX, 1-100 Mbps, two RJ-45 ports</li> </ul>
42E1 Base	<ul style="list-style-type: none"> <li>- 42 x E1, 3x high-density Molex connector</li> <li>- Voice, Data ORW RJ-48C connectors</li> <li>- 100BaseTX, 1-100 Mbps, two RJ-45 ports</li> </ul>
GigE Base	<ul style="list-style-type: none"> <li>- 4x10/100/1000Base-T ports with RJ-45 connector</li> <li>- Ethernet SFP connector</li> <li>- 2 x E1, RJ-48C connector</li> <li>- Voice, Data ORW RJ-48C connectors</li> </ul>
Optional modules	
16E1 Expansion module	<ul style="list-style-type: none"> <li>- 14 x E1, high-density Molex connector</li> <li>- 2 x E1, RJ-48C connector</li> </ul>
21E1 Expansion module	<ul style="list-style-type: none"> <li>- 21 x E1, 2x high-density Molex connector</li> </ul>
STM-1 Optical mini module	STM-1, Single mode 1310 nm, SC Duplex Transceiver, Unconditionally eyesafe laser IEC 825/CDRH Class 1 Compliant
STM-1 Electrical mini module	STM-1, 2xBNC, ITU-T Rec. G.703, 75Ohm
Unified Modem	
Modulation	QPSK, 16QAM, 32QAM, 128QAM, 256QAM
Channel bandwidth	7 – 56 MHz
Capacity	up to 348 Mbps
Configurations	<ul style="list-style-type: none"> <li>- 1+0, 1+1 (HSB/SD/FD)</li> <li>- East-West repeater within single unit</li> <li>- Ethernet Ring/Mesh (with RSTP)</li> <li>- E1 ring protection</li> <li>- STM-1 ADM (up to 63E1 per STM-1)</li> <li>- 2+0, 3+0, 4+0 (Ethernet aggregation)</li> </ul>
ACM	Yes
Connectors	TNC (Female) and RJ45 (for XPIC)
Intermediate Freq. Range	Tx carrier: 350 MHz, Rx carrier: 140 MHz
IDU-ODU cable	300m
Emissions mask	ETC 300 234, ETSI EN 301 216, FCC Part 101.111
FEC	concatenated Reed-Solomon Coding with Trellis Coded Modulation, or Convolutional code
Gigabit Ethernet	
Switch type	Managed Gigabit Ethernet Layer 2
Max frame size	9728 bytes
MAC table	4K entries; automatic learning and aging
Flow Control	802.3x
VLAN support	802.1Q (up to 4K VLAN entries)
QinQ (Double Tagging)	Yes
QoS	Port priority, 802.1Q VLAN Tag Priority, IPv4 TOS priority, DiffServ (DSCP) priority
Spanning Tree Protocol	802.1D-2004 RSTP

<b>Network Management</b>	
<b>SNMP</b>	Supports management via SNMP protocol (supports SNMP v1, v2 and v3 specifications)
<b>GUI and CLI</b>	Supports an onboard web-browser based GUI for control/status/provisioning, and menu-driven Command Line Interface (CLI).
<b>Connector</b>	10/100Base-TX (RJ-45)
<b>Voice Orderwire</b>	RJ-45 for PTT handset. We recommend using the Walker PTT-K Series w/EM-95 Transmitter Type.
<b>Alarm Port</b>	2 Form C (SPDT), 2 TTL Output, 4 TTL Input, DB-15HD
<b>Auxiliary Data</b>	RS422 via RJ-45; 64 kbps
<b>Environmental requirements/Power</b>	
<b>IDU Temperature</b>	-5° to +55° C
<b>IDU Humidity</b>	0 to 95%, non-condensing
<b>Altitude</b>	4570 meters maximum (above sea level)
<b>DC Power</b>	-48 Volts ±10%, min. 90 W
<b>Mechanical/Dimensions</b>	
<b>IDU Size</b>	(WxHxD) 445x44.5x238.5 mm
<b>IDU Weight</b>	3.4 kg
<b>IDU Mounting/Installation</b>	
<b>EIA Rack Mount</b>	48.2 cm (19 inch), 1 rack unit (1U)



**Overall configuration:**

- All 1+0 IDUs have: 1xManagement Board & 1xPSU & 1xmodem/IF
- All 1+1 IDUs have: 2xManagement Board & 2xPSU & 2xmodem/IF
- CFIP Phoenix M: Modular IDU
- Any STM-1 may have Electrical or Optical interface
- Enhanced IDU supports up to 63xE1 mux/demux via STM-1

# CFIP Phoenix series

Digital Microwave Radio Systems

## CFIP Phoenix ODU



CFIP ODU RSL at 10 <sup>-6</sup> (dBm) and Total Payload Capacity (Mbps)															
BW <sup>***</sup> , MHz	Modulation	FEC <sup>****</sup>	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	QPSK	Strong	-97	-95	-95	-97	-96	-95	-93,5	-95	-97	-96,5	-93,5	3	
	16APSK	Strong	-90,5	-88	-88	-90	-89	-88	-88	-88,5	-90	-89,5	-86,5	7	
	32APSK	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	
7	QPSK	Strong	-81,5	-79	-79,5	-81	-80	-79,5	-79	-79,5	-81	-81	-78	14	
	16APSK	Strong	-93	-92	-92	-94	-93	-92,5	-91	-92	-94	-93,5	-90,5	8	
	32APSK	Strong	-86,5	-85	-85,5	-87,5	-86,5	-85,5	-85	-85,5	-87,5	-87	-84	17	
	64QAM	Strong	-83,5	-82,5	-83	-84,5	-83,5	-83	-82,5	-83	-84,5	-84	-81	21	
	128QAM	Strong	-80	-79	-80	-81,5	-80,5	-79,5	-79,5	-79,5	-81,5	-80,5	-77,5	28	
		Weak	-77	-76	-76,5	-78	-77	-76	-76,5	-76	-78	-77,5	-74,5	34	
14	QPSK	Strong	-75	-73,5	-75	-76	-75	-74,5	-74	-74	-75,5	-75,5	-72,5	36	
	16APSK	Strong	-90	-90,5	-90	-91	-90	-90	-89	-90,5	-91	-90,5	-87,5	17	
	32APSK	Strong	-83,5	-83,5	-83,5	-84,5	-83,5	-83,5	-83	-84	-84	-83,5	-80,5	34	
	64QAM	Strong	-80	-80	-80,5	-81,5	-80,5	-80	-80	-80,5	-80,5	-80,5	-77,5	45	
	128QAM	Strong	-77,5	-77,5	-78	-79	-78	-77,5	-77,5	-77,5	-78	-78,5	-78	-75	57
	256QAM	Strong	-74,5	-74,5	-75	-75,5	-74,5	-74,5	-74	-75	-75	-75	-75	-72	68
		Weak	-71	-71	-71,5	-72	-71	-70,5	-70,5	-72	-71,5	-71,5	-68,5	79	



# CFIP Phoenix series

Digital Microwave Radio Systems

CFIP ODU RSL at 10 <sup>-6</sup> (dBm) and Total Payload Capacity (Mbps)														
BW***, MHz	Modulation	FEC****	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
28	QPSK	Strong	-90.5	-89.5	-89	-88.5	-89.5	-89.5	-89	-90	-89	-91.5	-85	35
	16APSK	Strong	-84.5	-83	-83	-82.5	-83.5	-83.5	-83	-84	-83	-85	-79	69
	32APSK	Strong	-81.5	-80	-80	-80	-80.5	-80.5	-80.5	-80.5	-80	-82	-76	88
	64QAM	Strong	-79	-77.5	-77.5	-77	-78	-77.5	-77	-78	-77.5	-79.5	-73.5	115
	128QAM	Strong	-75.5	-74.5	-74	-73.5	-74.5	-74.5	-74	-75.5	-74	-76.5	-70	138
	256QAM	Strong	-72.5	-71	-70.5	-70.5	-71	-71	-70.5	-72	-71	-73	-67	161
40	QPSK	Weak	-69	-67	-66	-66	-67	-67	-66.5	-69	-67.5	-70	-63.5	174
	QPSK	Strong	-89	-87.5	-88	-87.5	-88	-88	-88	-88	-87.5	-89.5	-83.5	49
	16APSK	Strong	-82.5	-81.5	-81.5	-81	-82	-82	-81.5	-82.5	-81	-83.5	-77	98
	32APSK	Strong	-80	-78.5	-79	-78.5	-79.5	-79.5	-79	-79.5	-78.5	-80.5	-74.5	127
	64QAM	Strong	-77	-76	-75.5	-75.5	-76.5	-76	-76	-77	-75.5	-78	-71.5	163
	128QAM	Strong	-74	-73	-72.5	-72.5	-73.5	-73	-72.5	-73.5	-72.5	-74.5	-68.5	196
56	256QAM	Strong	-70.5	-69.5	-69	-68.5	-69.5	-69.5	-69	-70.5	-69	-71	-65	229
	256QAM	Weak	-68	-67	-64.5	-64.5	-65.5	-65	-65	-67.5	-66.5	-68.5	-62.5	245
	QPSK	Strong	-87	-85.5	-86	-85.5	-87	-86.5	-86	-87	-85.5	-88	-81.5	72/67**
	16APSK	Strong	-81	-80	-79.5	-79.5	-80.5	-80	-79.5	-80.5	-79.5	-82	-75.5	145/135**
	32APSK	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
56	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
	256QAM	Weak	-64	-63	-63	-62.5	-63.5	-63	-62.5	-64.5	-62.5	-65	-58.5	363



CFIP ODU Tx Power				
Modulation	Standard/High Tx Power, dBm			
	6, 7, 8 GHz	10, 11, 13, 15 GHz	18, 23, 26* GHz	38* GHz
QPSK	+19 / +27	+19 / +25	+19	+17
16APSK	+18 / +26	+18 / +24	+18	+16
32APSK	+17 / +25	+17 / +23	+17	+15
64QAM	+15 / +23	+15 / +21	+15	+13
128QAM	+15 / +23	+15 / +21	+15	+13
256QAM	+12 / +20	+12 / +18	+12	+10

CFIP ODU waveguide flange sizes						
6 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
<b>Max. Power consumption</b>			SP: 13-27 W; HP: 21-39 W			

\* Preliminary data

\*\* Higher capacity is available in 16APSK and QPSK if using 32APSK-256QAM with ACM enabled

\*\*\* According to ETSI channel plan

\*\*\*\* Forward Error Correction (FEC) can be optimized either for sensitivity (Strong FEC) or for capacity (Weak FEC)

## CFIP Phoenix M ODU

CFIP ODU with CFIP Phoenix M IDU RSL at  $10^{-6}$  (dBm) and Total Payload Capacity (Mbps) \*

Modulation	Channel bandwidth (MHz)									
	7		14		28		40		56	
	RSL dBm	Bit rate Mbps	RSL dBm	Bit rate Mbps	RSL dBm	Bit rate Mbps	RSL dBm	Bit rate Mbps	RSL dBm	Bit rate Mbps
QPSK	-91	8	-89	17	-87	36	-85	52	-83	74
16APSK	-86	16	-83	36	-80	74	-78	108	-76	144-152
32APSK	-83	21	-80	46	-76	94	-75	132	-73	192
64QAM	-	-	-76	55	-73	112	-72	164	-70	232
128QAM	-	-	-	-	-71	128-136	-69	188	-67	264
256QAM	-	-	-	-	-67	144-160	-66	224	-62	312-348

### CFIP ODU Tx Power

Modulation	Standard/High Tx Power, dBm			
	6, 7, 8 GHz	10, 11, 13, 15 GHz	18, 23, 26* GHz	38* GHz
QPSK	+19 / +27	+19 / +25	+19	+17
16APSK	+18 / +26	+18 / +24	+18	+16
32APSK	+17 / +25	+17 / +23	+17	+15
64QAM	+15 / +23	+15 / +21	+15	+13
128QAM	+15 / +23	+15 / +21	+15	+13
256QAM	+12 / +20	+12 / +18	+12	+10

### CFIP ODU waveguide flange sizes

6 GHz	7, 8 GHz	10, 11 GHz	13, 15 GHz	18, 23 GHz	24 GHz	26 GHz	38 GHz
N-type	UBR84	UBR100	UBR140	UBR220	Circular 10mm	UBR260	UBR320

Max. Power consumption

SP: 13-27 W; HP: 21-39 W

\* Under development. Actual data may differ by a small margin