

Microwave Radio (MW) Low Cost Microwave Radio Overview



About CableFree

Founded in 1997 and with headquarters in London, UK, CableFree is a leading designer and supplier of broadband Wireless communication equipment.

With a complete range of solutions including Radio, Microwave, Millimetre-Wave, Free Space Optics, WiFi and WiMax solutions, customers in over 60 countries have chosen CableFree as the “one stop shop” solution of choice for dependable wireless networking.

About Microwave

Using the latest RF technology, our microwave links operate in all the popular bands from 6-38GHz, distances over 40km and net throughput up to 311 and 622Mbps. Our advanced indoor units provide a common platform with flexible IP/Ethernet, Gigabit Ethernet, PDH (16xE1/T1) and optional SDH interfaces, to which traffic can be allocated under software control.

Flexibility, performance and low cost of ownership are ensured.

Low Cost PDH/IP Radios 6-38GHz

CableFree Solutions is offering a range of high performance low cost microwave radios using licensed frequencies in the common 6-38GHz bands. Using advanced modulation techniques, mixed PDH and native IP/Ethernet traffic up to 130Mbps capacity can be transmitted reliably.

Microwave radio is an established technology used by telecommunication operators and organizations where quality of service is ensured through careful frequency and link planning. CableFree Microwave Radios are distinguished by high performance, advanced radio features and flexible reconfigurable network interfaces.



◀ Typical 1+0 ODU deployment

Typical 1+1 ODU deployment ▶



System Features

- Compact, split Indoor-Outdoor configuration
- Spectrally Efficient, Software-Defined IDU
- Powerful Forward Error Correction (FEC)
- Adaptive Power Control
- Capacity up to 130Mbps
- Mix PDH and IP/Ethernet Interfaces
- Rugged & proven telecom-grade design
- 1+0, 1+1, ring, star and mesh architectures

Applications

- Point-to-Point Wireless networking
- Corporate backbone or Telecom service provider
- Resilience for Fibre links
- Fast Roll-out & Temporary Deployment

CableFree Microwave radios are high performance, modern generation wireless networking platforms supporting mixed IP/Ethernet and PDH interfaces, operating from 3.5 to 38GHz frequency bands and payloads from 16 to 130Mbps. CableFree has pioneered the use of Software-Defined Radio, which enables in-service upgrades, remote configuration, low equipment costs. CableFree Microwave systems offer users maximum useful lifespan and minimal capital and operating expenditure (CAPEX and OPEX).

Advanced networking features in the CableFree Microwave IDU include scalable Ethernet capacities up to 130Mbps and PDH interfaces up to 16E1/T1 channels. High availability configurations include 1+1 protection.

Operating distances vary depending on local weather conditions, specifically link frequency and rain intensity. Planning for microwave wave spectrum use must take into account the propagation characteristics of radio signals at this frequency range. While signals at lower frequency bands can propagate for tens of miles, higher frequency microwave signals can travel only a few miles or less. Higher frequency microwaves can permit more densely packed communications links, with very efficient spectrum utilization.

Flexible Modular System Configuration

CableFree Low Cost Microwave radios feature software-programmable Indoor Unit platform. Indoor units can be configured with single or dual ODU uplinks for 1+1 resilient links; Choices of Ethernet+PDH or 32E1/T1 fixed-function versions are available. The Low cost IDUs operate with the same range of ODUs that our fully featured, modular IDUs hence allowing for future upgrade by replacing IDUs to Gigabit Ethernet with over 311/622Mbps available. This flexibility is unprecedented anywhere in the microwave radio industry with "mix and match" choice of network components. The low cost IDUs come in the following formats

- 1-100 Mbps full duplex Fast Ethernet (scalable to multiple rates) + 4xE1/T1
- 1-100 Mbps full duplex Fast Ethernet (scalable to multiple rates) + 16xE1/T1, 1+0 configuration
- 1-100 Mbps full duplex Fast Ethernet (scalable to multiple rates) + 16xE1/T1, 1+1 configuration
- Swap-out low cost IDU to modular versions for higher capacity networking up to 311/622Mbps



- ↑ DC Power
- ↑ IF/Rf Uplink
- ↑ Modem CLI
- ↑ OH/ Hsby
- ↑ 10/100 Ethernet
- ↑ 4xE1/T1 PDH
- ↑ 1+1 crossconnect

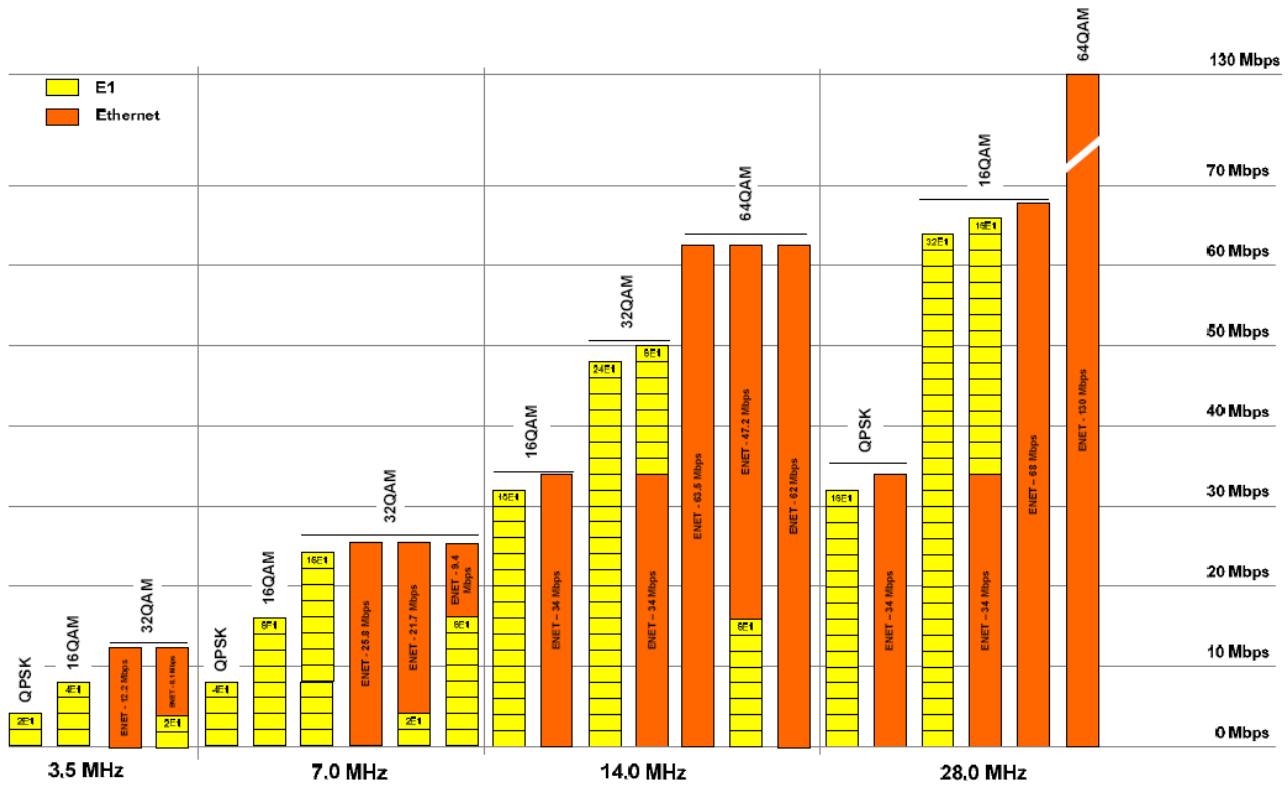
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picture here shows the base 2x Fast Ethernet + 4xE1/T1 IDU. Note 16xE1/T1 layout is different

The CableFree Low Cost Microwave IDU works alongside a complete range of Outdoor Units (ODU) for various frequency bands. The ODU determines the frequency band supported. Examples include:

	Frequency Band (GHz)											
Band	6	7	8	11	13	15	18	23	26	28	32	38
Frequency Range	6.5-7.1	7.1-7.9	7.9-8.5	10.7-11.7	12.7-13.3	14.4-15.4	17.7-19.7	21.2-23.6	24.2-26.5	27.5-29.5	31.8-33.4	37.0-40.0

Example available capacities using ETSI-recommended modes of operation for PDH and Ethernet/IP payloads:



Specifications

System Variant	CFMW-LC-64QAM
System Parameters	
Frequency Band	7, 8, 10/11, 13, 15, 18, 23, 38GHz depends on ODU
Bandwidth	CEPT/ETSI: 1.75, 3.5, 7, 14, 28MHz depends on ODU ANSI/FCC: 1.25, 2.5, 5, 10, 20, 30MHz depends on ODU
Capacity	2 up to 130Mbps Full duplex
Modulation Type	QPSK, 8PSK, 16QAM, 32QAM, 64QAM
Rx Sensitivity	Depends on specific ODU and modulation
Output Power	Up to 27dm – depends on specific ODU and modulation
Forward Error Correction	Trellis-Coded Modulation concatenated with Reed-Solomon Coding.

Network Management	SNMP Enabled
Remote Parameters Monitoring	Full range of SNMP, HTTP/web, CLI, serial
Data and Aux Interface	
IP/Ethernet Interface	100Base-T (Standard IEEE 802.3),
PDH	Nx E1/T1 120ohm twisted pair (ITU G.703)
SDH	Future feature – contact CableFree for details
Diagnostics Port	10/100Base-T and RS-232
Antenna	
Antenna Type	Cassegrain type antenna with radome
Antenna Gain/beamwidth	Depends on specific antenna and frequency chosen
Power / Environment	
DC Power	18 to 75 Volts DC
Power Consumption	50-75W (depends on ODU type)
Operational Temperature (IDU)	-5°C to 55°C
Operational Temperature (ODU)	-33°C to 55°C ETS 300 019-2-4 Class 4M5
Humidity	0 to 95%, non-condensing
Physical Dimensions	
Dimensions (IDU)	1RU, ETSI compliant
Dimensions (ODU w/o antenna)	267 diameter x 89mm
Weight (IDU)	5 kg max
Weight (ODU w/o antenna)	5 kg max

Product Code	Description
CFMW-LC-64QAM-2ETH+4E1/T1-1+0-xxxx	CableFree Low Cost Microwave radio link 1+0 configuration including IP54-rated indoor unit with 2x Ethernet plus 4xE1/T1 interfaces, IP67-rated outdoor unit, antennas, management software, Power supplies with mains -48Vdc input. Does not include RF or network cables. Frequency License required
CFMW-LC-64QAM-2ETH+16E1/T1-1+0-xxxx	CableFree Low Cost Microwave radio link 1+0 configuration including IP54-rated indoor unit with 2x Ethernet plus 16xE1/T1 interfaces, IP67-rated outdoor unit, antennas, management software, Power supplies with mains -48Vdc input. Does not include RF or network cables. Frequency License required
CFMW-LC-64QAM-2ETH+16E1/T1-1+1-xxxx	CableFree Low Cost Microwave radio link 1+1 configuration including IP54-rated indoor unit with 2x Ethernet plus 16xE1/T1 interfaces, IP67-rated outdoor unit, antennas, management software, Power supplies with mains -48Vdc input. Does not include RF or network cables. Frequency License required

Note – precise product code depends on frequency, band, antennas, resilience and other options. Please contact CableFree Solutions for more information

T: +44 (020) 8941 7975
F: +44 (020) 8941 2410
E : info@cablefreesolutions.com
W: www.cablefreesolutions.com

CableFree Solutions Limited
Holly House, St Clare Business Park
Holly Road, Hampton Hill
Middlesex. TW12 1QH