

# Microwave Radio (MW)

## CableFree LCR - Fixed Form Factor Microwave Radio

### Overview



### About Wireless Excellence

Founded in 1996 and with headquarters in Oxford UK, Wireless Excellence Limited is a leading designer and supplier of outdoor and indoor Broadband Wireless communication products.

With a complete range of solutions including Radio, Microwave, Millimeter-Wave, Free Space Optics, WiFi and 4G/5G/LTE, customers in over 80 countries have chosen Wireless Excellence 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 4-42GHz, distances over 100km and net throughput up to 170Mbps up to 3.5Gbps. 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.

## CableFree LCR: Low Cost PDH/IP Radios 4-42GHz

Wireless Excellence LCR is a range of high performance low cost microwave radios using licensed frequencies in the common 4-42GHz bands. Using advanced modulation techniques, mixed PDH and native IP/Ethernet traffic up to 170Mbps 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. Wireless Excellence 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 170Mbps
- 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

Wireless Excellence Microwave radios are high performance, modern generation wireless networking platforms supporting mixed IP/Ethernet and PDH interfaces, operating from 3.5 to 42GHz frequency bands and payloads from 16 to 170Mbps. Wireless Excellence has pioneered the use of Software-Defined Radio, which enables in-service upgrades, remote configuration, low equipment costs. Wireless Excellence Microwave systems offer users maximum useful lifespan and minimal capital and operating expenditure (CAPEX and OPEX).

Advanced networking features in the Wireless Excellence Microwave IDU include scalable Ethernet capacities up to 170Mbps 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

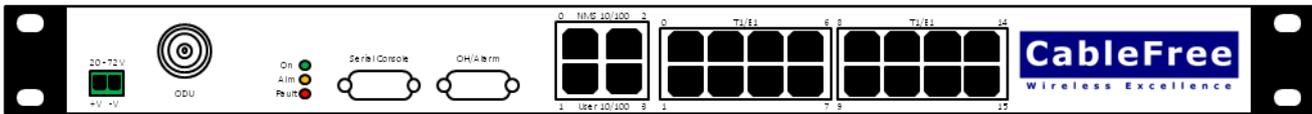
Cablefree Low Cost Microwave radios feature software-programmable Indoor Unit platform. Indoor units can be configured with single or dual ODU uplinks for 1+1 resilient links; Choices of Ethernet+PDH or 32E1/T1 fixed-function versions are available. The Low cost IDUs operate with the same range of ODUs 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
- Upgrade low cost IDU to modular versions for higher capacity networking up to 364/728Mbps

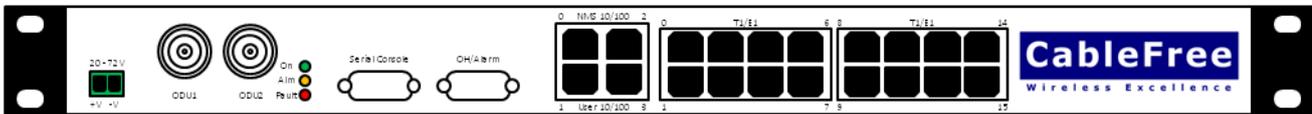
LC IDU version with 4x Fast Ethernet only, 1+0



LC IDU version with 4x Fast Ethernet + 16xE1/T1 1+0



LC IDU version with 4x Fast Ethernet + 16xE1/T1 1+1

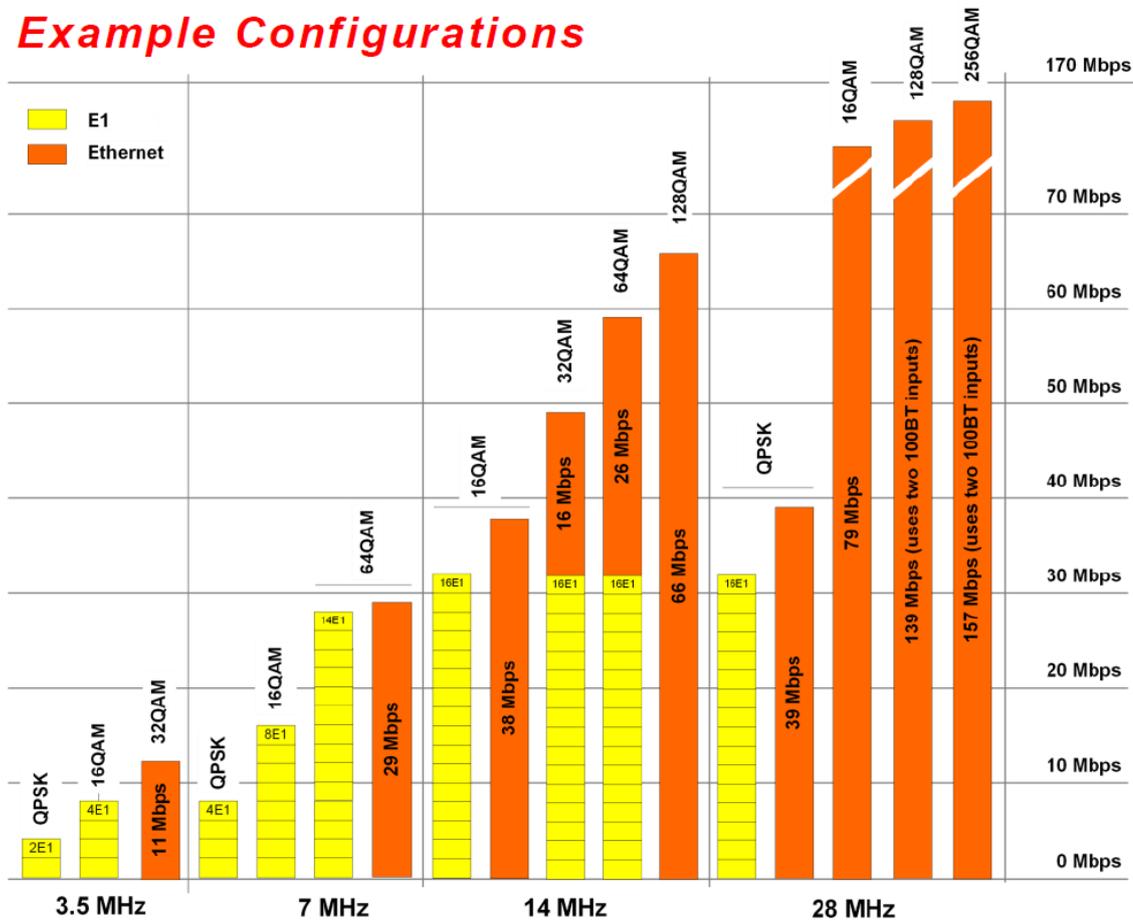


The Wireless Excellence Low Cost Microwave IDU works alongside a complete range of Outdoor Units (ODU) for various frequency bands. The ODU determines the frequency band supported. Examples include:

|                 | Frequency Band (GHz) |         |         |         |         |           |           |           |           |           |           |           |           |           |           |
|-----------------|----------------------|---------|---------|---------|---------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|
| Band            | 4                    | 6L      | 6U      | 7       | 8       | 11        | 13        | 15        | 18        | 23        | 26        | 28        | 32        | 38        | 42        |
| Frequency Range | 4.4-5.0              | 5.9-6.4 | 6.4-7.1 | 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 | 40.5-43.5 |

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

## Example Configurations



## Specifications

| System Variant                | CFMW-LC-XX  |
|-------------------------------|---|
| <b>System Parameters</b>      |   |
| Frequency Band                | 4, 6L, 6U, 7, 8, 10/11, 13, 15, 18, 23, 26, 28, 32, 38, 42GHz depends on ODU                              |
| Bandwidth                     | CEPT/ETSI: 1.75, 3.5, 7, 14, 28MHz depends on ODU<br>ANSI/FCC: 1.25, 2.5, 5, 10, 20, 30MHz depends on ODU |
| Capacity                      | 2 up to 170Mbps Full duplex   |
| Modulation Type               | QPSK, 8PSK, 16QAM, 32QAM, 64QAM, 128QAM, 256QAM   |
| 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   |
| <b>Data and Aux Interface</b> |   |
| IP/Ethernet Interface         | 100Base-T (Standard IEEE 802.3),  |
| PDH                           | Nx E1/T1 120ohm twisted pair (ITU G.703)  |
| Diagnostics Port              | 10/100Base-T and RS-232   |
| <b>Antenna</b>                |   |
| Antenna Type                  | Cassegrain type antenna with radome   |
| Antenna Gain/ beamwidth       | Depends on specific antenna and frequency chosen  |
| <b>Power / Environment</b>    |   |
| DC Power                      | 20 to 72s Volts DC. Optional Mains 115-265V AC-DC Power supply available                                  |
| 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  |
| <b>Physical Dimensions</b>    |   |
| 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-4ETH - 1+0-xxxx        | Low Cost Microwave radio link 1+0 configuration including IP54-rated indoor unit with 4x Ethernet only, IP67-rated outdoor unit, antennas, management software, Power supply - 48Vdc input. Does not include RF or network cables. Frequency License required                    |
| CFMW-LC-4ETH+16E1/T1- 1+0-xxxx | Low Cost Microwave radio link 1+0 configuration including IP54-rated indoor unit with 4x Ethernet plus 16xE1/T1 interfaces, IP67-rated outdoor unit, antennas, management software, Power supply -48Vdc input. Does not include RF or network cables. Frequency License required |
| CFMW-LC-4ETH+16E1/T1- 1+1-xxxx | Low Cost Microwave radio link 1+1 configuration including IP54-rated indoor unit with 4x Ethernet plus 16xE1/T1 interfaces, IP67-rated outdoor unit, antennas, management software, Power supply -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 Wireless Excellence for more information

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