

## Microwave Radio (MW)

### CableFree AMR - Broadcast DVB-ASI 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 40km and net throughput up to 880Mbps up to 6Gbps. 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 Broadcast ASI Microwave Radios 4-42GHz

## System Features

- Compact, split Indoor-Outdoor configuration
- Spectrally Efficient, Software-Defined IDU
- Powerful Forward Error Correction (FEC)
- Adaptive Power Control (APC, ATPC)
- ACM (Adaptive Coding & Modulation)
- Capacities of 364, 728Mbps and higher
- Mix DVB-ASI and IP/Ethernet Interfaces
- Modular: Up to 16x ASI ports per link
- Rugged & proven telecom-grade design
- 1+0, 1+1, ring, star and mesh architectures

## Applications

- Broadcast DVB-ASI Media Links
- Mobile DVB-ASI Links for Outside Broadcast
- Camera-to-Truck and Truck-to-Truck DVB-ASI Links
- Native DVB-ASI Links between Studio and Edit Facilities
- Wide Area Media Networks
- Campus Area Media Networks
- City Wide Media Networks
- Fast Roll-out & Temporary Deployment

## Enhanced Performance, Flexibility & Features

Wireless Excellence Broadcast ASI Microwave radios are high performance, modern generation wireless networking platforms supporting mixed ASI and IP/Ethernet, interfaces, operating from 4 to 42GHz frequency bands and payloads from 16 to 364, 728Mbps and higher with N+0 carrier aggregation. Wireless Excellence 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 ASI and Ethernet capacities up to 728Mbps. The Broadcast-specific ASI interface features are modular and expand in multiples of 4x ASI ports up to a total of 16x ASI interfaces over a link, with between 8 and 214Mbps per ASI stream to support the latest DVB and HD video standards. 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.

The ATPC feature adapts transmit power to fade conditions, increasing transmit power in high “fade” (e.g. rainfall). The optional ACM (Adaptive Coding and Modulation) feature increases link availability by adjusting modulation scheme in heavy fade to ensure link remains “up” but with reduced throughput. This enables operators to offer high availabilities or to use smaller antennas especially on sites where antenna sizes may be constrained by aesthetics, tower loading, cost or landlord permissions.

## Flexible Modular System Configuration

CableFree Microwave radios from Wireless Excellence feature a scalable, flexible Indoor Unit platform. The ASI IDUs can be configured with single or dual ODU uplinks for 1+1 resilient links or 2+0 repeater sites; Dual Redundant power options; multiple ASI expansion modules. The modular design allows for Gigabit Ethernet capacities with per-carrier capacities of up to 364Mbps available. The flexible “mix and match” choice of network interfaces allows for any combination of:

- 4x ASI interfaces (Up to 214Mbps per ASI channel)
- Gigabit Ethernet Interfaces (up to 364 or 728Mbps)



Above: DVB-ASI Module

## Common customer configuration examples include:

- 4x ASI interfaces
- 8, 12 or 16x ASI interfaces
- 4x ASI interfaces + Fractional Gigabit Ethernet

There are a large number of combinations, which can be upgraded in the field via plug-in modular units. This flexibility is ideal in a modern broadcast service provider environment, handling mixed ASI and IP traffic, for example broadcast, edit suite, .

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

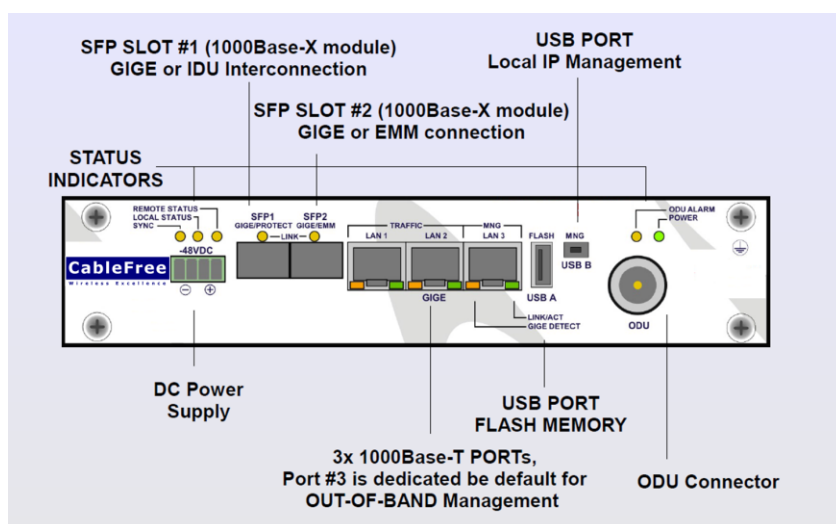
	Frequency Band (GHz)																
Band	4	6L	6U	7	8	10	10.5	11	13	15	18	23	26	28	32	38	42
Frequency Range	4.4-5.0	5.9-6.4	6.4-7.1	7.1-7.9	7.9-8.5	10.15-10.65	10.5-10.68	10.7-11.7	12.7-13.3	14.4-15.4	17.7-19.7	21.2-23.6	24.2-26.5	27.5-29.5	31.8-33.4	37.0-40.0	40.5-43.5

Full Support for ETSI-recommended modes of operation.

Modulation Type	Channel Bandwidth (MHz)			
	7	14	28	40-56
QPSK	YES	YES	YES	YES
8-PSK	YES	YES	YES	YES
16QAM	YES	YES	YES	YES
32QAM	YES	YES	YES	YES
64QAM	YES	YES	YES	YES
128QAM	YES	YES	YES	YES
256QAM	YES	YES	YES	YES

Full Support for ANSI-recommended modes of operation.

Modulation Type	Channel Bandwidth (MHz)					
	10	20	30	40	50	60
QPSK	YES	YES	YES	YES	YES	YES
8-PSK	YES	YES	YES	YES	YES	YES
16QAM	YES	YES	YES	YES	YES	YES
32QAM	YES	YES	YES	YES	YES	YES
64QAM	YES	YES	YES	YES	YES	YES
128QAM	YES	YES	YES	YES	YES	YES
256QAM	YES	YES	YES	YES	YES	YES



Above: Microwave Modem and IP Interface Module

## Specifications

System Variant	CF-AMR-256QAM
<b>System Parameters</b>	
Frequency Band	4, 6L, 6U, 7, 8, 10, 10.5, 11, 13, 15, 18, 23, 26, 28, 32, 38, 42GHz set by ODU
Bandwidth	7, 14, 28-38, 40-56MHz depends on ODU
Capacity	16 up to 364 or 728Mbps Full duplex, multiple-IDU aggregation up to 2.9Gbps
Modulation Type	QPSK, 8PSK, 16 up to 256QAM
Rx Sensitivity	Depends on specific ODU and modulation
Output Power	Up to 31dm – depends on specific ODU type, band and modulation
Forward Error Correction	Trellis-Coded Modulation concatenated with Reed-Solomon Coding.
ACM Support	Adaptive Coding and Modulation – fully supported – optional feature
XPIC support	Cross Polar Interference Cancellation - fully supported - optional feature
Network Management	SNMP Enabled
Remote Parameters Monitoring	Full range of SNMP, HTTP/web, CLI
<b>Data Interface</b>	
IP/Ethernet Interface	100Base-T (Standard IEEE 802.3), optional 1000Base-T Gigabit Ethernet
DVB-ASI	4x 75ohm coaxial (SMPTE), each channel 8-216Mbps, expands up to 16x
Diagnostics Management	10/100/1000Base-T
<b>Antenna</b>	
Antenna Type	Cassegrain type antenna with radome. Single and Dual-polarised options.
Antenna Gain/ beamwidth	Depends on specific antenna and frequency chosen
<b>Power / Environment</b>	
DC Power	36 to 60 Volts DC
Power Supply AC	Input 88-132 / 176-264 Volts, 50/60 Hz [with manual voltage range switch]
Power Consumption	50-75W (depends on ODU type)
Power Connector Ethernet / Power Connector	IP-65 [optional IP-68]
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)	Modem and ASI Unit each 210x44x250mm, both can be mounted in 1U Rack
Dimensions (ODU no antenna)	267 diameter x 89mm
Weight (IDU)	5 kg max
Weight (ODU no antenna)	5 kg max

## Product codes

Product Code	Description
CFMW-AMR-256QAM-IO-xxx - N+M-xxxx	CableFree Modular Microwave Radio, please specify configurations including N+M options, ASI and Ethernet interfaces, Space Diversity and other resilience options, Frequency band, Power supplies. Frequency License required

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

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