

## Millimeter-Wave Radio (MMW)

CableFree Platinum MMW Radio – Gigabit Ethernet  
57-64GHz V-Band SmartNode™ CPE Multi-Band 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 Millimeter Wave

CableFree MMW links offer high performance connections using Millimeter Wave frequencies. MMW is a high frequency microwave technology offering bandwidths of up to 10Gbps Full Duplex capacity or higher.

Millimeter Wave technology is complimentary to FSO (Free Space Optics) and ideal for dense urban areas where radio spectrum is congested. Planning for Millimeter Wave is based on rainfall, giving useful transmission distances of many kilometres.

## CableFree Platinum V-Band CPE Solutions

CableFree offers a range of high performance radios using millimeter-wave frequencies. Using high frequency microwave signals at 58GHz and above, large bandwidths of up to 1 Gbps Full Duplex Gigabit Ethernet capacity can be provided.

CableFree Platinum CPE is available in several versions to suit exact customer requirement. Platinum V-band offers P2MP connectivity with up to 8 V-Band CPEs connected simultaneously per sector. With the added value of optional 2.4GHz, 5GHz as standard; & LTE CPE options for additional connectivity. CableFree Platinum CPE has a 1 GBE data interface for backhaul connectivity, management and optional additional interfaces for connectivity for LTE CPE

### System Features

- Connect as CPE, up to 8 connections per sector, options for short P2P
- Supports OFDM MIMO; as well as LTE (CPE)
- Ability to Mesh with V-Band or OFDM MIMO
- Supports 1 GBE Backhaul
- Multiple connectivity options
- "Pencil beams" of 0.5 - 0.8 degrees, with beam forming technology
- Rugged outdoor grade waterproof enclosure
- 1 Gbps interface with POE (802.11af/at)

### Applications

- 4G/LTE Small Cell Infrastructure
- Wireless Internet Service Providers (WISP)
- Point-to-Point Mesh Wireless networking
- Smart/Safe Deployments (City, Ports, Mines etc.)
- Short range dense deployment
- Resilience for Fibre links
- Fast Roll-out & Temporary Deployment

## Gigabit Ethernet using V-Band 57-64/55-66 GHz Millimeter Waves

CableFree offers a range of high performance radios using millimeter-wave frequencies. Using high frequency microwave signals at 60GHz and above, large bandwidths of up to Full Duplex Gigabit Ethernet capacity can be provided.

Millimeter wave is a technology complimentary to the CableFree established range of FSO (Free Space Optical) communication systems. Planning for Millimeter wave is based on rainfall, compared to FSO which is based on visibility, predominantly fog.

CableFree Platinum Solutions are full-duplex Gigabit point-to-point & point to multi-point links especially designed according to FCC and ETSI requirements. They provide interconnection between remote LAN segments at ultra high speed and utilize Gigabit Ethernet protocols, which is the evolving standard for switches and routers available from a variety of telecommunication equipment manufacturers.

CableFree Platinum operating distances can be up to 200m or 1 km or more for varying weather conditions depending of the link frequency and rain intensity. Planning for millimeter 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 many miles and penetrate more easily through buildings, millimeter wave signals can travel only a few miles or less. However, these characteristics of millimeter wave propagation are not necessarily disadvantageous. Millimeter waves can permit more densely packed communications links, thus providing very efficient spectrum utilization, and they can increase security of communication transmissions.

### Product Features and Benefits

CableFree MMW products are highly robust and ruggedized for operation in harsh climates.

The highly integrated Full-Outdoor radio units are shipped with a choice of options to support your projects

1 GBE connection with POE interfaces for devices, Optional OFDM MIMO (2.4GHz & 5GHz AP, Client and Mesh)

The links are supplied with mounting brackets to mount the units on poles which are typically installed on walls, towers or roof top locations to ensure clear Line of Sight (LOS) between the end points of the wireless link.

Alignment of the links is achieved due to beam forming support within radios for V-Band operation.

When installed the links provide "fit and forget" connectivity between the nodes on the network and can be remotely managed and monitored using a choice of Web-based NMS and SNMP Management platforms.

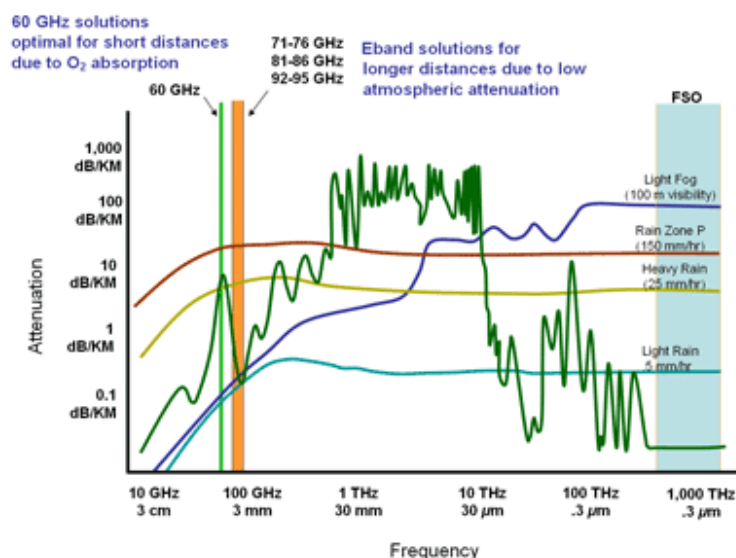


## Latest in MMW Technology

The millimeter wave spectrum at 30-300 GHz is of increasing interest to service providers and systems designers because of the wide bandwidths available for carrying communications at this frequency range. Such wide bandwidths are valuable in supporting applications such as high speed data transmission and video distribution. Planning for millimeter 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 many miles and penetrate more easily through buildings, millimeter wave signals can travel only a few miles or less.

However, these characteristics of millimeter wave propagation are not necessarily disadvantageous. Millimeter waves can permit more densely packed communications links, thus providing very efficient spectrum utilization, and they can increase security of communication transmissions.

The following graph shows the relative performance merits of 60GHz compared to E-band 70/80GHz and FSO. 60GHz is ideal for shorter links sub-1 km where dense re-use of the spectrum is intended



## CableFree Sector options

The CableFree Platinum range is available as a number of CPE types these are listed below:

- MINI: Panel antenna with beam forming, optional 5GHz 2x2 MIMO directional, GBE PoE input
- MAXI: Panel antenna with beam forming, optional 5GHz 2x2 MIMO directional, GBE PoE input, optional LTE for management

## Product Codes

Product Code	Description
CF-Platinum-SmartNode-CPE-MINI-x-U	CableFree V Band CPE, optional 5GHz 2x2 MIMO, GBE PoE Input (PSU and PoE Included)
CF-Platinum-SmartNode-CPE-MAXI-x-U	CableFree V Band CPE, optional 5GHz 2x2 MIMO, GBE PoE Input (PSU and PoE Included); Optional LTE CPE for management
Options	Optional GBE can be added OFDM can be 5GHz, 2.4GHz

X = Variable for that feature

## Specifications

System Variant	CF- Platinum-SmartNode-CPE-xxxxx
<b>System Parameters</b>	
Frequency Band	V-Band; 60GHz band, Optional: 2.4GHz, 5GHz AP, Client or Mesh radio, Optional LTE CPE (various bands supported)
Bandwidth	57-64 (FCC) or 59-66 (TELEC) GHz; Optional: 2.3-2.4GHz, 4.9-6.1GHz; Optional LTE CPE in 400MHz-6GHz
Capacity	V-Band Up to 1250 Mbps Full duplex per connection, shared capacity on BTS, Optional OFDM MIMO up to 867Mbps HD depending on chipset; Optional LTE up to 1Gb with suitable service and Category CPE (Standard cat6 offers up to 450Mbps DL with 3 CA)
Modulation Type	QPSK-64QAM (V-Band); BPSK-256QAM (OFDM), Release 10+ (LTE)
Output Power	Combined <1W
Forward Error Correction (FEC)	RS(255, 239) Optional Feature
Network Management	Web based NMS, SNMP Features
<b>Data and Aux Interface</b>	
Ethernet Interface	POE 1GBE; 10/100/1000BaseT RJ45
Antenna	Internal Panel, within IP67 case
60GHz Antenna Type	Beam-forming Sector (V-Band); 2x2 MIMO Patch antenna (2.4 or 5GHz radio options), 2x2 or 4x4 MIMO (LTE)
LTE Antenna Gain	1-9dBi depending on band
Connectors	Optional SMA connectors for external antenna options (MIMO & LTE)
<b>Power</b>	
External AC Power Supply	Input 88-264 Volts, 50/60 Hz
Power Consumption	5 W
Unit Power (POE)	POE, 802.3af/at, 11 to 57 Volts DC, external AC-DC POE included
Operational Temperature	-30°C to +55°C
Humidity	0 to 95%, non-condensing
<b>Physical Dimensions</b>	
Unit Size	90 x 70 x 150 mm
Weight	< 5 kg

Notice: SmartNode, SmartP2P, SmartMesh are trademarks of Wireless Excellence Ltd

T: +44 (0870) 495 9169  
E: sales@cablefree.net  
W: www.cablefree.net

Wireless Excellence Limited  
The Oxford Science Park,  
G6, Magdalen Centre  
Robert Robinson Avenue,  
Oxford OX4 4GA