

WIRELESS EXCELLENCE

Case Study

CableFree Last-Mile for Telecom Carriers

Cellular Wireless Networks



About Wireless Excellence

Founded in 1995 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 WiMax solutions, customers in over 60 countries have chosen Wireless Excellence as the "one stop shop" solution of choice for dependable wireless networking.

CableFree Last-Mile for Telecom Carriers

CableFree wireless links are used extensively by telecom operators to provide last-mile connections in locations where traditional leased-line and fibre-optic links are impractical.

Though telecommunication operators have made huge investment in fixed infrastructure, providing long-distance and metro rings in urban and industrial areas with voice, data and video services connected usually from a backbone SDH fibre network using copper, fibre or wireless technologies.

Cable digging, increasingly unpopular in cities, is regulated by the local authority who may restrict re-digging frequency of roads – and the cost may be prohibitive in any case, especially if a river or railway is in the way.



Last-mile application for China Unicom in Tibet. Shown here is a repeater site to provide non-line-of-sight connection from fibre ring to end-user site. Potala palace features in background.

Typical PDH connection using copper telephone wires provide 1.5 or 2Mbps access per pair – traditional access solutions ‘multiply’ capacity using parallel circuits to provide 4x2 (8Mbps) or 16x2 (32Mbps) throughput. However, these are ‘slow’ compared to modern network demands of Ethernet at 10/100Mbps or ATM services at 155 or 622Mbps.

Cable Modems and xDSL (8Mbps maximum) are often not reliable on all installations, depending on the age and condition of the copper cables. ‘Availability’ of xDSL connections is typically low, limited also by DSLAM and other network equipment and back-haul.

Though operators make optimal use from long-distance and metro fibre rings, last-mile links only carry traffic for a single user or building – making return-on-investment problematic. Not only is the cost of digging in fibre in urban areas is high, but end-user loyalty or long-term commitment is never certain. ROI from fibre depends on long-term amortisation of assets from long-term customer income, which cannot always be guaranteed.

By comparison wireless links can be removed when the customer moves, and redeployed elsewhere, thus preserving capital investment in equipment.



Parapet-wall installation of CableFree’s FSO takes a few hours, compared to days or weeks for cable/fibre digs.

CableFree wireless links can be located on walls, towers, masts and even behind windows, to give maximum flexibility of deployment.

In case of customer relocation, wireless equipment can be redeployed on new sites without loss of investment.

For temporary deployment, FSO can be mounted on tripods either on buildings or vehicles. An ideal application is ‘disaster recovery’ when wireless equipment can be driven to a site where there is a ‘fibre cut’ and deployed to restore communications immediately.

CableFree’s FSO solutions occupy small ‘footprint’ and do not cause objection on grounds of aesthetics.

Historically, FSO has been considered ‘suspect’ choice of technology by telecom carriers, with often-cited problems of beam alignment and performance in adverse weather such as thick fog.



Flexible deployment options include Pole-mount installation of CableFree FSO units. Wide-beam optics makes tower deployments possible, unlike narrow-beam competitive solutions

CableFree has reversed a 'low performance' trend by developing novel technologies and products designed for rugged and harsh environments.

Wide-beam optics ensure stability against building movement, vibration, wind loading and tower/mast sway. Where other vendors are constrained to use narrow beams by lower output powers, CableFree pioneered the use of eyesafe Class1M high-power transmitters, enabling wider beam divergences and hence stability against movement.

High link margin by use of quality optics and ultra-sensitive enhanced APD receivers give 10-20dB advantage over competing solutions.

Unique to CableFree, Automatic Transmit Power Control (ATPC) reduces transmit power in clear conditions and increases in high-fade, with 16x (12dB) dynamic range – another 12dB improvement on older, competing solutions.

As part of professional services, CableFree has developed extensive Link Engineering tools, using a global weather database of 2,700

cities, to provide accurate prediction of link availabilities for all of the world's major cities. For other users, CableFree has access to local higher-resolution metrological data, to predict the 'four nines' and 'five nines' distances for required locations.

Summary

Wireless Excellence's diverse range of CableFree wireless solutions have been deployed in over 60 countries and with some of the world's major telecom carriers including Cable & Wireless, China Unicom, Vodafone, Nextel and Orange. With latest generation wireless technology plus professional planning tools, reliability is high and customer satisfaction assured.

Recommended Products

CableFree Access	FSO Connectivity up to 155Mbps, range up to 4km
CableFree 622	FSO Connectivity up to 622Mbps, range up to 2km
CableFree Gigabit	FSO Gigabit Ethernet and Fibre Channel up to 1.5km
CableFree HPR-MIMO	Radio links up to 220Mbps, range up to 40km
CableFree HPR	Radio links up to 72Mbps, range up to 40km
CableFree MPR	Radio links up to 30Mbps, range up to 40km
CableFree MW	Licensed Microwave links up to 1Gbps, range up to 100km
CableFree MMW	60/70GHz Millimeter Wave links up to 1Gbps, range up to 100km

For More Information

Please contact Wireless Excellence Ltd for information on the complete range of CableFree products and services



CableFree FSO deployed in Hunan Province, China. Industrial smog produces high attenuation which limits transmission distances to 1km. Sophisticated planning tools are used to predict link availability.

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