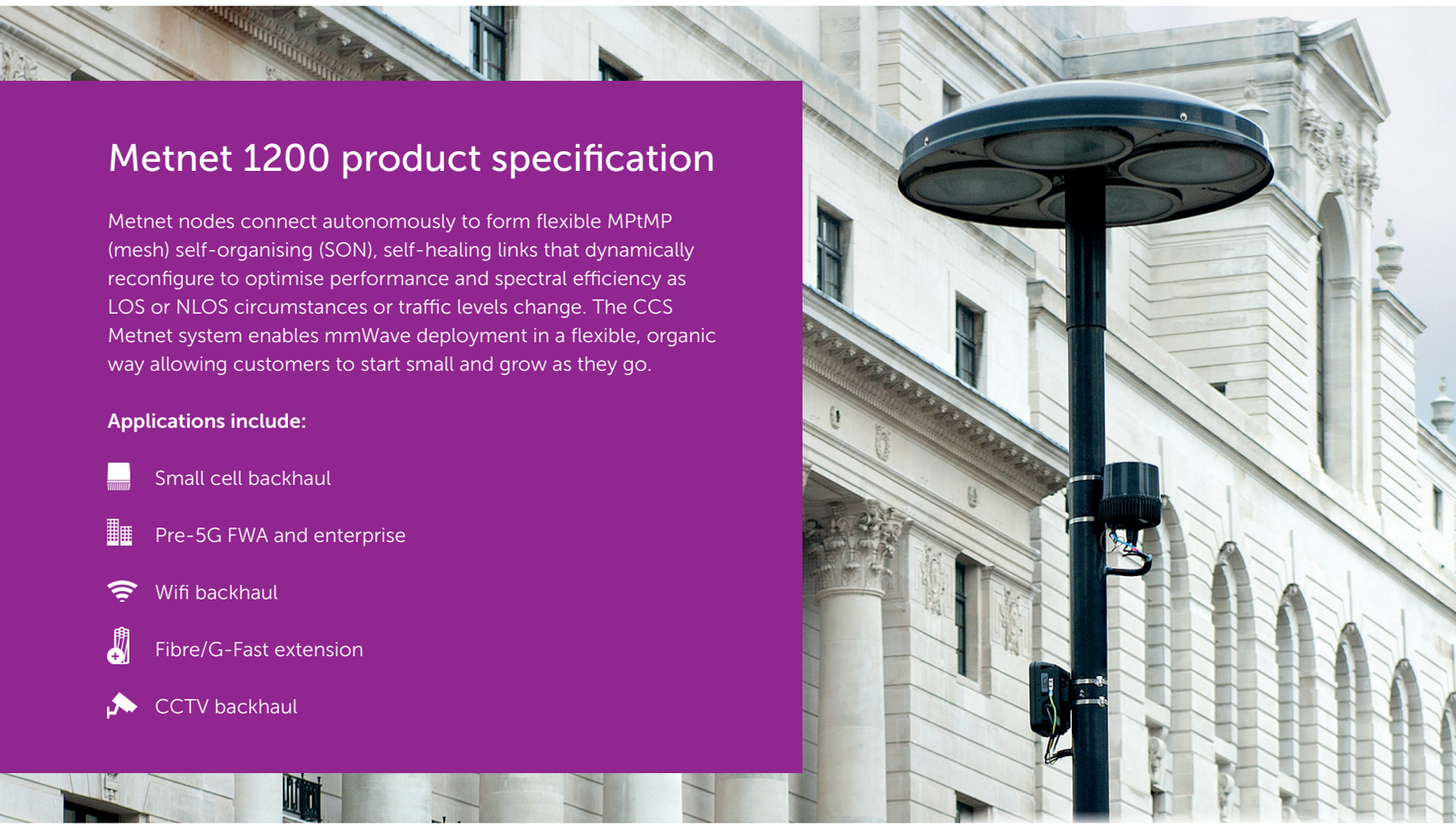
CCS Enabling 5G

Self-organising mmWave access and backhaul



Metnet 1200 product specification

Metnet nodes connect autonomously to form flexible MPtMP (mesh) self-organising (SON), self-healing links that dynamically reconfigure to optimise performance and spectral efficiency as LOS or NLOS circumstances or traffic levels change. The CCS Metnet system enables mmWave deployment in a flexible, organic way allowing customers to start small and grow as they go.

Applications include:

- Small cell backhaul
- Pre-5G FWA and enterprise
- Wifi backhaul
- Fibre/G-Fast extension
- CCTV backhaul

The Metnet system operates in a single frequency channel with no radio frequency planning required. Frequency reuse in the entire network is 1. Each node has a wide 270-degree field of view, so only one unit is required per site, rather than multiple radios. There's no need for any manual alignment and each node supports multiple connections for higher resilience.

The nodes poll the network continually and automatically determine the optimal topology to deliver capacity where needed. Each cluster runs a Spatial-TDMA transmission schedule, which allows links to operate simultaneously to increase the overall capacity delivered to each node.

1.2 Gbps throughput is achieved by using a dual channel TDD radio (in a single 112 MHz channel pair) operating at 256 QAM modulation. The radio features a wideband diplexer which is SW configurable for any channel between 24-29 GHz.

Metnet 1.2 Gbps	
Technology	Self-organising (SON) multipoint-to-multipoint (MPtMP) and point-to-multipoint (PtMP)
Capacity	1.2 Gbps single node 2.4 Gbps dual node UL and DL ratio 100% dynamically configured
Latency	<1mS
Topology	Flexible MPtMP (Mesh), MultiHop, PtMP or PtP
Scalability	Interference management enables the system to scale infinitely

Radio	
Frequency bands	26 GHz band (24.25-26.5 GHz) 28 GHz band (27.5-29.5 GHz) Future: 32-43GHz, 60GHz unlicensed
Channel sizes	56 MHz and 112 MHz ETSI, and 100 MHz FCC Single frequency channel used across all nodes
Radio access method	Dual-TDD
Radio transmit power	+18.5 dBm with adaptive power control
Modulation and coding	Hitless Adaptive Modulation QPSK ½ FEC to 256 QAM 4/5 FEC
Services	
Ethernet services and QoS	Native Ethernet 802.1Q (VLAN tagging) 802.1p (Class of service) Differentiated Services Code Point (DSCP) 802.1ad (QinQ)
Synchronisation	GPS-derived synchronisation providing local master SyncE and 1588v2 PTP clock to the small cell (G.826x/G.827x) 1588v2 Transparent Clock (G.8273.2) Recovery from core network SyncE and 1588v2 PTP Proprietary distributed radio synchronisation to overcome GPS failures
Antenna	
Antenna gain	Standard node: +19 dBi integrated sectors High gain node: +33 dBi (20 cm) or +43 dBi (60 cm)
Antenna coverage	Standard node: 270° horizontal x 20° vertical using 16 antenna array Each sector azimuth is 34° High gain node: 4° horizontal x 4° vertical
Range	Standard node: 2km High gain node: 6km
Node characteristics	
Size	Standard node: 185 mm height; 202 mm diameter, 2.3 litres High gain node: 260 mm height; 535 width; 270 mm length
Weight	Standard node: 4.2 kg High gain node: 6.8 kg
Power requirements	100V – 240V AC / 50 – 60 Hz 48 V DC and PoE (1 x PD interface IEEE 802.3bt) 35W consumption Power connection via IP67-rated connector
Interfaces	2 x GE electrical interfaces via IP67-rated connectors
Node MTBF	25+ years. System MTBF approaching infinity due to self-healing mesh

November 2017

Cambridge Communication Systems Ltd,
Cambridge, UK
+44 1223 314197 | info@ccsl.com | ccsl.com