

WiMax / Wireless FLEX4G™ - UHA

ULTRA HIGH AVAILABILITY WIRELESS BACKHAUL SOLUTION FOR 4G/LTE NETWORKS

As mobile data consumption increases exponentially, operators are looking for backhaul solutions that provide the lowest Total Cost of Ownership (TCO) with the flexibility to easily scale to meet tomorrow's bandwidth demands.

The Flex4G-UHA from Case Communications has been designed to alleviate the strain on backhaul connections by combining advanced radio and modem capabilities with carrier-grade Ethernet features. Implementing BPSK modulation achieves improved link budget compared to high-QAM systems. Furthermore, incorporating the patented AdaptRate™ technology achieves an additional 10dB link budget gain during periods of inclement weather.



The FLEX 4G Silicon Germanium (SiGe) integration reduces complexity and increases reliability. Carrier Ethernet services are provided through the use of an integrated low-latency switch supporting jumbo frames while including Quality of Service (QoS), VLAN support, Provider Bridge (Q-in-Q) along with Ethernet OAM management.

Flex4G-UHA provides comprehensive timing support required for 4G/LTE deployments, including Synchronous Ethernet and IEEE 1588.v2 with hardware-based time stamping for one-step or two-step clocks. With low power consumption and PoE capability, Flex4G-UHA provides all of the above in an environmentally friendly, compact and lightweight, zero-footprint all-outdoor solution.

Flex4G-UHA with its carrier-class milli-meter wave solutions has been accepted and used in thousands of installations worldwide.

WIRELESS VIRTUAL FIBRE SOLUTION FOR	PERFORMANCE
<p>MOBILE BACKHAUL Future proof multi-Gigabit backhaul for next generation 4G/LTE networks</p> <p>SERVICE PROVIDER High capacity business services, fibre extensions, cellular/Wi-Fi / WiMax backhaul' redundant Fibre overlays, mesh</p> <p>EDUCATION High- performance seamless campus connectivity, Wi-Fi and security camera backbone</p> <p>ENTERPRISE Leased line replacement, LAN Extensions, Server Centralisation, remote data storage and backup</p> <p>GOVERNMENT / MUNICIPALITIES Inter-building connections – Video surveillance systems, traffic control, and monitoring, Wi-Fi / 4.9Ghz backhaul</p> <p>HEALTHCARE Secure, HIPAA-Compliant medical office, lab network access, real-time imaging & records, application connectivity</p>	<ul style="list-style-type: none"> Outstanding RF Performance benefitting from highly integrated SiGe architecture Longest Link Distances 1Gbps full-duplex user data rate Adapt rate Automatic Transmit Power Control Zero-Footprint ODU with low power consumption support Power-Over Ethernet <p>CARRIER-GRADE</p> <ul style="list-style-type: none"> Carrier Ethernet services enabled via built in low latency switch Quality of Service (802.1p) traffic prioritisation VLAN 802.1q): Provider Bridge (Q-in Q 802.1ad) Synchronous Ethernet per G.8261, G.8262 and G.8264 PTP per IEEE 1588.v2 – Transparent clock support Ethernet OAM support per 802.3ah, 802.1ag and Y.1731 1+0 Non-Protected, 1+1 HSB fully redundant, or 2+0 link configurations <p>SECURITY</p> <ul style="list-style-type: none"> Highly Secure narrow beam width antennas FIPS-Certified 256-bit AES Encryption provides the ultimate in data protection at full line rate Gigabit speed with minimal latency <p>PROVEN RELIABILITY</p> <ul style="list-style-type: none"> Based on proven design – thousands of systems deployed world-wide Integrated SiGe decreases component count for exceptional reliability and MTBF Rigorous HALT / HASS testing Carrier-grade 99.999% availability

FACT SHEET

WiMax / Wireless

FLEX4G™ - UHA



FLEX4G™ – UHA SPECIFICATIONS

FREQUENCY	Range 71-76Ghz / 81-86Ghz T/R Spacing: 10Ghz full duplex operation RF Interface: 4.125 / 84.125Ghz, BPSK modulated signal Stability: +/- 10ppm												
CONFIGURATIONS	1 + 0 Non-Protected, 2+0 Utilising Orthogonal Mode Transducer (OMT) 1+ 1 Hot Standby – dual antenna or single antenna with unequal loss coupler												
DATA RATE	Up to 1Gbps full-duplex. Ethernet: Two pluggable SFP Slots plus one RJ45 1000base-T supports line rate speeds up to Gigabit Ethernet												
Range	99.990% Availability with a 30cm Antenna = 2.4km, with a 60cm Antenna = 3.4km												
F.E.C	Reed-Solomon												
SYSTEM PERFORMANCE													
	<table border="1"> <thead> <tr> <th>Operating Mode</th> <th>Normal</th> <th>Adapt rate</th> </tr> </thead> <tbody> <tr> <td>User Data Rate</td> <td>1000 Mbps</td> <td>100 Mbps</td> </tr> <tr> <td>Link Budget for 10-6 B.E.R w/12" (30cm) Antenna</td> <td>168dB</td> <td>178dB</td> </tr> <tr> <td>Link Budget for 10-6 B.E.R w/24" (60cm) Antenna</td> <td>182dB</td> <td>192dB</td> </tr> </tbody> </table>	Operating Mode	Normal	Adapt rate	User Data Rate	1000 Mbps	100 Mbps	Link Budget for 10-6 B.E.R w/12" (30cm) Antenna	168dB	178dB	Link Budget for 10-6 B.E.R w/24" (60cm) Antenna	182dB	192dB
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INTERFACES	Ethernet Physical layer: SFP, 1000Base-X, Single Mode (-SX) or multi-mode (-LX) fibre, 1000BaseT with RJ45 connector – CAT 5e or CAT 6 Cable												
NETWORKING	<ul style="list-style-type: none"> Quality of Service per IEEE 802.1p, DSCP and Port based Scheduling: 8 queues allowing user configurable Strict Priority or Shaped Deficit Weighted Round Robin (SDWRR) MEF Compliant traffic policing (two rate, three colour scheme) VLAN per IEEE 802.1q, up to 4096 VLANs Provider Bridge Q-in-Q per IEEE 802.1ad Synchronous Ethernet (SyncE) per ITU-T G.8261, G.8262 and DNU section G.8264 Precision Time Protocol (PTP) per IEEE 1588.v2 (-2008) Distributed transfer of clock to avoid variable asymmetric link delays. Congestion Management; WRED and Tail Dropping Ethernet Protection; Ring per G.8032, Linear per G.8031 Maximum Ethernet frame length: Jumbo packets 10,000 bytes MAC Layer: Supports MAC Learning, MAC Switching, Mac Ageing Link State Propagation: Rapid Link Shutdown (RSP), supports remote port LSP 												
LATENCY	<ul style="list-style-type: none"> Dependent on configuration as low as 30 Micro seconds 												
SECURITY	<ul style="list-style-type: none"> Inherently secure ultra-narrow beam width antennas for low probability of detection and interception Option: FIPS 197 Certified 256-bit AES Encryption (export controlled) 												
MANAGEMENT	<ul style="list-style-type: none"> Web-based (HTTP/HTTPS) embedded management agent; Console Interface (CLI/SSH): IPv6 SNMP Support: MIB-II and Bridgewave enterprise MIB, SNMP V1, V2C, V3 SysLog (RFC3164, RFC3195) event support, RADIUS RFC2865 Client support Ethernet OAM per 802.3ah (Link OAM), 802.1ag (Configuration Fault Management) Y.1731 (Performance management) Loopbacks: Ethernet (per port, per direction) Local Modem test 												
POWER	<ul style="list-style-type: none"> -48VDC Input, -37.5v to -70v range: 35 watts power consumption (dependent on number & Type of SFPs) Power Over Ethernet up to 328ft (100m) cat 5e / cat6 cable separation 												
PHYSICAL	<ul style="list-style-type: none"> 13.0"wx 8.6"h x 2.5"d (33.0cm x 21.9cm x 6.4cm) 6.5lbs (3Kg) (Excluding antenna and mount) 												
ENVIRONMENT	<ul style="list-style-type: none"> Operating Temperature: -33°C to +55°C (-27°F to +131°F) per EN 300 019-2-4 Humidity: 100% all weather operation Operating Attitude: Up to 5,000 (16,405 ft): Water Ingress: IP66 RoHS & WEEE Compliant 												
REGULATORY	<ul style="list-style-type: none"> RF Certifications: US. FCC Part 101, Subpart C: EN 302 217-3 Safety: CE Mark, 60950-1, EN 60950-22, EN 60950-22, Meets FCC1:307. General Population & EN62311 RF MPE Limits EMC/EMI: EN 301 489-4; FCC Part 15 Class B Surge and Immunity: EN 301-489-1 												

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