NetKrom

WaveKROM | Backhaul 4000 Series

WaveKROM 4000 is a carrier-class product providing high-capacity, long-range connectivity at the most competitive prices in the market.

The WaveKROM 4000 offers carrier-class link connectivity, delivering up to 450 Mbps throughput in licensed and unlicensed bands for carrier-class solutions, ideal for dedicated access and backhaul applications (including Video and VOIP). The WaveKROM 4000 features advanced software mechanisms that provide optimal point-to-point and point-to-multipoint connectivity for high-throughput at long distance links.

WaveKROM 4000 utilizes proprietary PTP and PTM mechanisms and techniques such as Time Division Multiple Access – TDMA and Frequency Division Duplexing – FDD. TDMA improves the throughput, latency and distance range while FDD allows deploying full duplex communications. TDMA dynamically allocate bandwidth in the direction needed, thus increasing link efficiency and greatly decreasing the impact that distance has on throughput of the link. The WaveKROM 4000 also features selective repeat ARQ technology, an enhanced error correction software mechanism that optimizes data traffic to provide very high throughput over highbandwidth long-range links even in the presence of interference.

WaveKROM 4000 is suitable for providing QoS for Real Time traffic. The scheduler engine is responsible for the optimal and fair allocation of uplink/downlink resources according to the specific requirements of each traffic class. The goal is to maintain high throughput connections while satisfying the delay/jitter constraints for Real Time traffic as well.

WaveKROM 4000 links have class-leading sensitivity and power output, which enable the links to go on long distances. WaveKROM 4000 combines MIMO Technology, OFDM and our advanced proprietary technology to obtain more bandwidth and spectrum efficiency.

Features:

- TDMA and FDD proprietary protocols for throughput optimization
- ARQ (Selective Repeat) for very high throughput
- Throughput up to 450 Mbps
- High Output Power 27 dBm
- Multiple Configurations 1+0, 2+0, 4+0, 1+1, 2+2 frequency and space diversity, East-West (EW) and XPIC (Cross Polarization Interference Canceller)
- Throughput Optimization for long range links

- Long Range Link Applications
- Carrier-Class QoS architecture
- Frequencies from 6 Ghz to 38 GHz
- High Throughput in narrow channels for High Availability and Spectrum Efficiency
- Carrier class radio for extreme environment -60 to 230 C°

Applications:

- High speed Wireless Backhaul
- Building-to-building connectivity
- T1/E1 leased-line replacement
- Single-hop, long-range line-of-sight links

- Cost-effective network redundancy
- GSM,3G and 4G Backhaul
- CCTV - Video Surveillance and IPTV Backhaul

3G, 4G Backhaul

Building to building connectivity

DSLAM Backhaul

Long-range link

Video Surveillance

WiMAX Backhaul
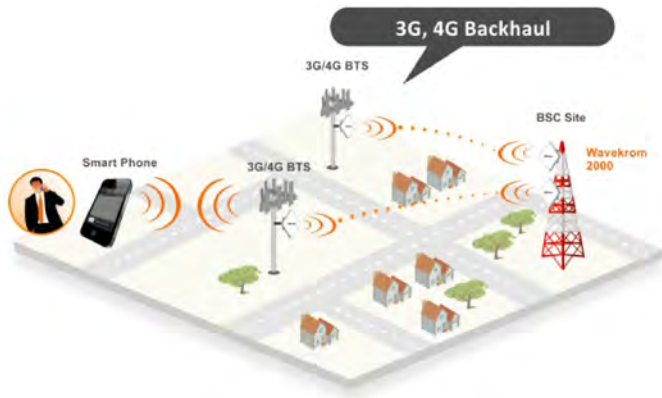
Specifications WAVEKROM BACKHAUL 4000 SERIES:

RADIO SPECIFICATIONS - IDU

Operating Frequency Range	6 GHz - 38 GHz (Depends on country regualtions)
Capacity Range Options (E1)	4x, 8x, 13x, 18x, 27x E1
Channel Size	Configurable en 7, 14, 28 y 56 MHz
Capacity Range Options (Ethernet)	10, 20, 40, 60, 80, 100, 125, 150, 300, 450 Mbps
Max Transmit Power	27dBm
Modulation	OFDM (QPSK, 16QAM, 32QAM, 64QAM, 128QAM & 256QAM)
Receiver Sensitivity	Adaptive, varying between -90 dBm and -63 dBm according to modulation and channel width -90dBm@7MHz, -88dBm@14MHz, -87dBm@28MHz, -83dBm@56MHz
Error Correction	FEC, ARQ

ADVANCED ROUTING FEATURES

Enrutamiento	RIP v1 y v2, OSPF v2, BGP v4 & MPLS
Forwarding	Ring, WDS, STP, RSTP, HWMP (Hybrid Wireless Mesh Protocol)
VPN	Ipsec – tunnel and transport mode, certificate or PSK, AH and ESP security protocols Point to point tunneling (OpenVPN, PPTP, PPPoE, L2TP) Advanced PPP features (MLPPP, BCP) Simple tunnels (IPIP, EoIP) 6to4 tunnel support (IPv6 over IPv4 network) VLAN – IEEE802.1q Virtual LAN support, Q-in-Q support MPLS based VPNs
QoS	Hierarchical Token Bucket (HTB) QoS system with CIR, MIR, burst and priority support
Web Proxy	Regular HTTP proxy Transparent proxy Access list by source, destination, URL and requested method (HTTP firewall)

SECURITY

Data Encryption	Hardware Based AES
Ethernet Protocol	IEEE802.3
Interfaces	3 three Ethernet 10 / 100/ 1000 Mbps (RJ-45)–auto MDI/MDIX 4 RF Module Interfaces 1 to 16 x 2.048 Mbps (E1)

WIRELESS PERFORMANCE

Throughput	450 Mbps
System Capacity	Double capacity per given channel bandwidth using XPIC
Packet Latency	< 2 ms
Range	Up to 75 miles (120Km) Antenna dependent

MANAGEMENT

System Management	Web HTTP User GUI, Terminal, Telnet, SSH, SNMP v1/2c/3 with traps supporting MIBs

SYSTEM MANAGEMENTS

Dimensions	12in x 12in x 12in (30.5cm x 30.5cm x 30.5cm)
Weight	16lb (7.26 kg)

SYSTEM MANAGEMENTS

Console Port	One Serial DB9 standard
Power Connections	802.3af Power over Ethernet 48v DC with surge protector
Operating Temperature	Enclosure Seal -60C° to 230C°
Enclosure	Industrial Die-Cast Thermal Aluminum, NEMA-6 / IP-67
Mount	Pole or tower mounting brackets
EMC Certificate	FCC Parte 15/UL y ETSI 300/328/CE

Ordering Information:

- **BH-4000UHC-S**   WaveKROM 4000 Series Ultra High Capacity Point to Point Microwave Radio with 32.1dBi Gain Antenna for Short links 10km.

- **BH-4000UHC-M**   WaveKROM 4000 Series Ultra High Capacity Point to Point Microwave Radio with 36.8dBi Gain Antenna for Medium links 20km.

- **BH-4000UHC-L**   WaveKROM 4000 Series Ultra High Capacity Point to Point Microwave Radio with 41.1dBi Gain Antenna for Long links 30km.