Backhaul 2000 SERIES

WaveKROM Backhaul 2000 Series is a carrier-class product providing high-capacity, long-range connectivity at the most competitive prices in the market.

The **WaveKROM Backhaul 2000 Series** offers carrier-class link connectivity, over 200+ Mbps effective throughput in licensed and unlicensed bands for PTP and PTMP solutions, ideal for dedicated access and backhaul applications (including Video and VOIP). The **WaveKROM Backhaul 2000 Series** features advanced software mechanisms that provide optimal point-to-point connectivity for high-throughput at long distance links.

WaveKROM Backhaul 2000 Series utilizes proprietary PTP &PTMP mechanisms and techniques such as Dynamic Time Division Duplexing - TDD and Frequency Division Duplexing – FDD to 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 Backhaul 2000 Series** also features selective repeat enhanced ARQ technology, an enhanced error-correction software mechanism that optimizes data traffic to provide very high throughput over high-bandwidth long-range links even in the presence of interference.

WaveKROM Backhaul 2000 Series transports native TDM and Ethernet over a single wireless link (Up to 16 E1/T1 & Ethernet); it is new-generation TDM/Hybrid/Packet integrated microwave transmission system. It provides a solution where TDM, Hybrid, and Packet microwaves can be integrated. **WaveKROM Backhaul 2000 Series** supports the processing and access of native TDM services and native Ethernet services.

WaveKROM Backhaul 2000 Series links have class-leading sensitivity and power output, which enable the links to go up to 100 miles (160 km). **WaveKROM Backhaul 2000 Series** combines Multiple Antenna – MIMO Technology, Advanced OFDM modulation for robust communications and avoid multipath fading obtain more bandwidth and spectrum efficiency.

Features:

- Dynamic TDD and FDD for Bandwidth Optimization
- Enhanced ARQ (Selective Repeat) for very high throughput
- Effective throughput of 200+ Mbps
- High Output Power 25 dBm
- Advanced Security Technologies: AES 128 & 256 bit
- Adaptive Modulation for link optimization
- Throughput Optimization for long range links
- Advanced modulation techniques for NLOS and Optical LOS support

- Asymmetric/Symmetric Bandwidth management
- Long Range Link Applications up to 100 miles (160 Km)
- Native TDM transport
- Carrier class radio for extreme environment -40 to 65°C
- Multiple Diversity Systems Supported
- Intelligent Interference Sensitivity (IIS) for interference mitigation

Applications:

- High-speed Wireless Backhaul
- T1/E1 leased-line replacement
- Single-hop, long-range line-of-sight links
- Cost-effective network redundancy
- Point to Point and Point to MultiPoint
- CCTV - Video Surveillance and IPTV Backhaul

RADIO ESPECIFICATIONS:

RF Band	**4.9GHz Band:** 4940-4990MHz (public Safety Band) **5GHz Band:** 5150-5850MHz (*) **6GHz Band:** 6005 – 6100MHz(*) (*)programmable for different country regulations
Channel Size	Configurable 5, 10,15, 20, 30 & 40MHz with Dynamic Frequency Selection (DFS) enabled
Max Transmit Power	25 dBm with TPC functionality (*) (*)programmable for different country regulations
Modulation	2x2 MMO-OFDM (BPSK, QPSK, 16QAM, 64QAM) With Hitless Dynamic Adaptive Modulation & Coding Scheme
System Capacity	LOS, Optical-LOS and nLOS
Receiver Sensitivity	Adaptive, varying between -98 dBm and -72 dBm according to modulation selected
Error Correction	FEC 1/2; 2/3; 3/4; 5/6 & Fast ARQ
Duplexing Scheme	TDD - Dynamic Time Division Duplex (Single RF) FDD - Dynamic Frequency Division Duplex (Multiple RF)
Automatic Channel Selection (ACS)	Enabled

WIRELESS PREFORMANCE

Cluster Synchronization	Master & Slave for Dedicated Links Enabled TDD synchronization for interference mitigation Coaxial RF Cables for synchronization included
Data Rate	300Mbps / 150Mbps
Effective Throughput	200+ Mbps aggregate
PPS	250,000
Packet Latency	< 1 ms
Range	Up to 100 miles (160Km)
Diversity Configuration	1+1 configuration: 1+1 HSB, 1+1 FD, 1+1 SD, XPIC 1+1

ANTENNA

Type	Dual Polarized Directional Antenna
Gain	23 dBi integrated
F/B Ratio	-35dB
3dbm Beamwidth V/H	8 / 8 degrees
3dBm Beamwidth (Azimuth)	90° or 120°
VSWR	1.5:1
Connector	N-Type Female Connectorized for External Antenna
Lightening Protection	DC grounded
ESD Protection	Grounded incorporated

INTERFACE RADIO ESPECIFICATIONS:

Data Encryption	AES 128 & 256 bit
User Access	Password Levels for Access
Maximum Information Rate (MIR)	Supported
QoS	4 Queues Packets Prioritization 802.1p & DiffServ; IEEE 802.1Q Uplink / Downlink configuration of network traffic for better performance

INTERFACE TDM

Number of Ports	16, 8, 4 ports
E1 Interface	TDM E1 up to 16xE1
Framing	Unframed (transparent)
Standards Compliance	ITU-T G.703, G.826
Line Code	E1: HDB3 @ 2.048 Mbps; T1: B8ZS/AMI @ 1.544 Mbps
Jitter & Wander	According to ITU-T G.823, G.824

ETHERNET INTERFACE

Protocol	IEEE802.3 / 802.3u
FastEthernet	1x 10/100 Mbps (RJ-45)–auto MDI/MDIX switching
Gigabit Ethernet	2X10/100/1000BaseT with PoE Passthrough supported and external PoE device redundancy
Traffic Parameters	Multicast & Unicast
VLAN Support	Transparent, 802.1Q, 802.1P & QinQ Tagging
Bridge	Layer 2, self-learning of up to 2047 MAC addresses (IEEE 802.1Q), Hub/Bridge selectable
Ethernet Functionality	Flow control (IEEE 802.3x), DHCP Pass-Through , Link Aggregation Group (LAG), Adding, deletion

MANAGEMENT

System Management	Web GUI, Telnet, Terminal, SSH, SNMP v1/2c/3 with traps supporting MIBs, HTTP &HTTPS File Transfer Protocol (FTP) support Access Control device via MAC
Software	Netkrom NMS proprietary software upgradable via wireless and local
Link Parameters & Utilities	Antenna audio alignment and RSSI Signal levels RF Site Survey Ethernet Traffic Statistics: Web based, Logs, Events RF Performance: Logs, TX & RX Power Indicators, System Gain, Link and Distance Parameters Incorporated Spectrum analyzer

PHYSICAL

Dimensions	16in x 16in x 16in (40.6cm x 40.6cm x 40.6cm)
Weight	25lb (11.34kg)
Console Port	One Serial DB9 standard for Terminal Mode
Power Connections	Power over Ethernet – PoE 802.3af.
Optional Adapter	110/240VAC
Power Consumption	< 35W
Operating Temperature	Enclosure Seal -40°C to 65°C
Enclosure	Industrial Die-Cast Thermal Aluminum, NEMA-6 / IP-67
Indoor/Outdoor Cable	100m 10/100BaseT ; 75m 1000BaseT
Heat Dissipation	Fan cooling
EMC Certificate	FCC Part 15/UL and ETSI 300/328/CE
Humidity	10 – 80%

Ordering Information:

- **BH-2010** WaveKROM Backhaul 200Mbps TDD Wideband 4.9 to 6GHz GHz 600mW Single Radio (Integrated 23dBi Antenna) Complete PtP Link

- **BH-2010-C** WaveKROM Backhaul 200Mbps TDD Wideband 4.9 to 6GHz 600mW Single Radio (Connectorized for External Antenna) Complete PtP Link

- **BH-2020** WaveKROM Backhaul 300Mbps TDD/FDD Wideband 4.9 to 6GHz 600mW Single Radio (Integrated 23dBi Antenna) Complete PtP Link

- **BH-2020-C** WaveKROM Backhaul 300Mbps TDD/FDD Wideband 4.9 to 6GHz 600mW Single Radio (Connectorized for External Antenna) Complete PtP Link