



**DragonWave**

# DRAGONWAVE PRODUCT GUIDE

BUILDING BETTER BACKHAUL SOLUTIONS

[www.dragonwaveinc.com](http://www.dragonwaveinc.com)

# BUILDING BETTER BACKHAUL SOLUTIONS

As service providers and enterprises scale their wireless access networks to enable powerful new applications and services, many existing backhaul solutions are rapidly becoming a major bottleneck. DragonWave's packet microwave and packet convergence backhaul solutions hold the key to unleashing true broadband: delivering the capacity, flexibility and cost efficiency needed for a smooth evolution to high-bandwidth packet networks.

## 4G-Optimized Backhaul

Engineered for the requirements of tomorrow's networks, DragonWave's solutions respond to the needs of WiMAX and LTE service providers, delivering native packet transport, sub 0.1 ms latency, multi-Gigabit capacity and convergence of existing TDM traffic.

## Multi-Generation Mobile Backhaul

DragonWave's backhaul solutions offer a smooth transition from 2G to next generation 3G or 4G networks by offering TDM and packet interfaces and a single end-to-end management framework.

## Leased Line Replacement

Replace TDM leased line services and eliminate expensive recurring telecom costs while improving capacity and availability with an Ethernet packet network.

## Last Mile Fiber Extension

Extend high-speed IP services beyond your existing network. DragonWave products are ideal for network hardening and disaster recovery, as well as for applications that require both legacy TDM services and carrier-grade, high-capacity native Ethernet.

## Network Evolution

With TDM and packet interfaces, DragonWave's converged packet network solutions offer a simple progression to an IP-optimized network, while seamlessly carrying legacy TDM services.

## New Service Enablement

Cable MSOs, fiber providers and other packet network operators gain immediate new revenue opportunities by offering profitable traditional services such as T1/E1 private line and PBX voice backhaul, as well as advanced Carrier Ethernet services.

## Private and Enterprise Networks

Municipalities, healthcare facilities, financial institutions, schools, government institutions and other organizations can build carrier-grade private networks, achieving payback within the first year.

## Public Safety

DragonWave provides essential inter-site connectivity and backhaul solutions for first responders, city facilities, wireless mesh networks, surveillance systems, city fleets and sensor networks.



# PRODUCT PORTFOLIO

## DRAGONWAVE HORIZON PACKET MICROWAVE

DragonWave's Horizon packet microwave solutions deliver new levels of capacity, spectral efficiency, reliability and operational simplicity...all at the lowest total cost of ownership.

- Massive capacity – 1 to 2 Gbps per 56-MHz channel with DragonWave's Bandwidth Accelerator and XPIC
- Hybrid TDM/Ethernet interface options for network evolution
- Intelligent nodal ring and mesh switching
- Service aware Hitless Automatic Adaptive Modulation (HAAM)
- Network synchronization with SyncE and 1588v2
- Zero footprint, all-outdoor options
- Pay-as-you-grow with automatic remote scalability
- Advanced security with integrated 256-bit AES encryption
- Comprehensive Ethernet OAM support (802.3ah, 802.1ag, Y.1731)
- MEF certified



### HORIZON COMPACT+

Do More Outdoors

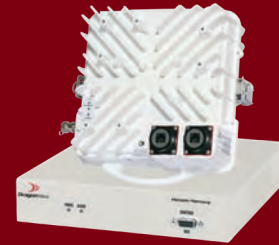
Service providers can now do more outdoors with the Horizon Compact+. This 4G-optimized packet microwave system delivers big performance in a small package. Because the radio and modem are integrated into a single outdoor unit, Horizon Compact+ is a zero footprint solution—eliminating rack congestion and minimizing collocation space. The combination of simple installation and operation, as well as sophisticated remote management and troubleshooting, means significant lifecycle cost savings for service providers and enterprises alike. This innovative, carrier-grade packet microwave solution operates in licensed or unlicensed spectrum from 6 to 60 GHz.



### HORIZON QUANTUM

Massive Capacity, Less Spectrum

Delivering from 2 to 4 Gbps per link, Horizon Quantum represents the next generation in packet microwave technology, and sets a new benchmark for performance. With dual-channel capability, this split-mount system is a step change in spectral efficiency, capacity, nodal intelligence, and operational simplicity, all while occupying only half a rack unit and consuming the lowest power per bit of any solution today. As a result, operators can stay thin in the air and in the rack, achieving the lowest possible total cost of ownership through minimized spectrum cost and the lowest CAPEX per bit. With 8 GbE ports and integrated Ethernet switching, Horizon Quantum can provide aggregation and restoration in a single unit.



### HORIZON HARMONY

Evolve Your Network

The Horizon Harmony enables operators to seamlessly backhaul existing T1/E1 traffic, as well as rapidly-growing packet-based traffic, all within a single platform. This split-mount system achieves significant efficiencies by converging TDM, ATM, Frame Relay, IP and Ethernet traffic onto a single packet-based transport layer and a single management plane. Simplified operations, reduced capital cost and significantly lower total cost of ownership are the result. The Horizon Harmony meets the most stringent network requirements for highly time-sensitive applications. This system's innovative and highly flexible radio unit can be deployed in either link or nodal applications.



## DRAGONVISION NETWORK AND ELEMENT MANAGEMENT SYSTEM

DragonVision is a carrier-class, comprehensive management solution for both the network and the element system levels (NMS/EMS). DragonVision offers the network operator a broad set of tools that simplify the operation, administration, maintenance and provisioning of DragonWave's products. These tools also provide extensive fault management, performance monitoring, and security management capabilities.



# DRAGONWAVE FUSION

## PACKET CONVERGENCE

DragonWave Fusion solutions provide a smooth migration strategy to a converged packet network, driving greater efficiency, lower cost, simplified operations and new revenue-generation opportunities for service providers.

- A single packet-based network to operate and manage
- Eliminates the need for distributed Add/Drop/Mux or cross-connects
- Multiservice pseudowire capabilities
- High Precision Clock Recovery (HPCR®) — the industry's most robust adaptive clock recovery technology
- Industry-leading CES including enhanced jitter management
- Comprehensive QoS and Ethernet OAM support
- Field-replaceable line cards and power supply
- Carrier-grade redundancy
- Multiple interfaces (T1/E1, OC-3/STM-1, GbE)
- MEF certified



### DRAGONWAVE FUSION A1 & A10

Pseudowire Access Gateway

With the DragonWave Fusion A1 and A10, operators can converge their voice and data services over a unified packet-based network to simplify operations, cut costs, and increase revenues with efficient new service offerings. Migration to 3G and 4G mobile networks is handled smoothly and cost effectively by leveraging existing infrastructure and avoiding multiple overlay networks. Wireline service providers can preserve customer revenue from traditional services while migrating to next-generation networks. Carrier Ethernet service providers can deliver profitable new services such as T1/E1 private line and PBX voice backhaul, as well as advanced Ethernet services.

### DRAGONWAVE FUSION A20

Multi-Service Packet Node

The DragonWave Fusion A20 simplifies the transport of multi-generation voice and data traffic over packet networks for cost-effective mobile backhaul and business services delivery. It is the only nodal solution that combines legacy services, Ethernet Services, and Ethernet demarcation capabilities in a single, powerful, 1RU platform. With the A20, telecommunications providers gain the versatility to expand their service offerings and smoothly migrate networks to a converged packet network, while preserving revenue streams from profitable legacy services. Completely modular, with field replaceable line cards, the A20 can be tailored to specific site requirements and easily adjusted without costly changes—a pay-as-you-grow solution, offering significant investment protection.

### DRAGONWAVE FUSION A800 & A1600

Pseudowire Aggregation Hub

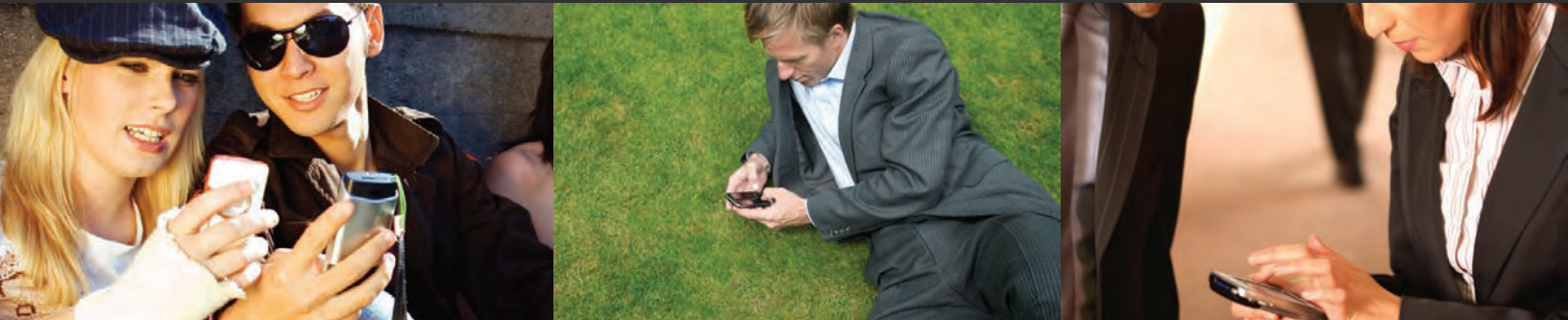
DragonWave's Fusion A1600 and A800 Pseudowire Aggregation Hubs are flexible, modular, carrier-class platforms that enable service providers and other operators to convert any packet access network (Carrier Ethernet, broadband wireless including WiMAX, cable HFC, xDSL, xPON) into a full-service alternative to TDM access and layer-2 services. The result is greater operational efficiency, new revenue opportunities and a smooth migration path to a single cost-effective converged network, without losing any revenue streams from profitable legacy services.

## DRAGONVISION

### NETWORK AND ELEMENT MANAGEMENT SYSTEM

- Simple and intuitive point-and-click, graphical user interface (GUI)
- End-to-end service provisioning
- Network-wide device discovery
- Real-time dashboard with performance monitoring, statistics and charting
- Bandwidth utilization indicators
- Advanced fault isolation and management
- Real-time configuration and security management
- Simple integration with external OSS
- Platform-independent architecture – Microsoft Windows and Unix
- Innovative and scalable application server architecture

# DRAGONWAVE FEATURES AND BENEFITS



## Unparalleled Capacity

- DragonWave's Bandwidth Accelerator drives 1 to 2 Gbps per 56 MHz channel
- Highest capacity XPIC
- Maximum throughput at the lowest cost per bit

## Flexible Deployment

- Available in all-indoor, all-outdoor or split-mount implementations
- Licensed and unlicensed deployment options from 6 to 60 GHz
- Hybrid solutions for TDM/Ethernet convergence
- Modular, pay-as-you-grow platforms

## Spectral Efficiency

- Bandwidth Accelerator drives more capacity within existing spectrum allocations
- 7 to 56 MHz channel size options
- 256QAM modulation across all channel sizes
- XPIC enables channel reuse

## Extended Reach

- Hitless Automatic Adaptive Modulation (HAAM) for longer link spans, smaller antennas and fewer sites
- Provides up to 111 dB system gain, enabling link lengths beyond 50 km (30 mi)

## Eco-Friendly

- Zero footprint
- No trenching or traffic disruption required
- Lowest power consumption per bit

## Advanced Security

- Advanced security with integrated 256-bit AES encryption
- Narrow beamwidth, directional point-to-point communications
- Bit-level data stream with Horizon synchronization and framing
- Horizon authentication
- Leading network management security

## Network Intelligence and Protection

- Intelligent nodal switching for simplified operation
- Advanced ring and mesh configurations with 50 ms switching for carrier class services
- Active use of both working and protection channels eliminates wasted capacity
- Offers 1+0, 1+1, space diverse, and frequency diverse options
- Integrated bandwidth management features include advanced prioritization and flow control

## Seamless Multiservice Convergence

- Converged packet solutions for microwave and fiber networks

- T1/E1, nxE1 ATM IMA, Ethernet convergence
- Integrated bandwidth management
- Simplified operations and management
- Comprehensive services, including TDM, ATM, HDLC/PPP, Frame Relay, Ethernet
- True packet network convergence—no need to manage TDM connections at intermediate network points

## Timing and Clock Recovery

- HPCR® – the industry's most robust adaptive clock recovery technology
- IEEE 1588-2008 (Precision Time Protocol)
- External clock (BITS)
- Clock protection
- Loopback timing
- Synchronous Ethernet (SyncE) support

## Comprehensive Management

- End-to-end management and provisioning with DragonVision NMS
- Advanced Ethernet OAM & PM support (802.3ah, 802.1ag, Y.1731)
- TDM and Layer-2 OAM & PM

## Advanced QoS

- Advanced traffic management
- 8 levels of prioritized queuing
- Service-aware HAAM



Connect with us today!

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