



Wireless Broadband Ethernet





Delivering High Capacity
Broadband Wireless Ethernet
to Global Voice, Video and Data
Networks with Scalability and
Superior Network Economics

key features

- Carrier Class, Full Duplex up to 500 Mbps CIR
- Simple “Plug and Play” Deployment
- Ultra Low Latency
- Next-Generation Gigabit Ethernet Connectivity
- User Scalable Bandwidth via Software
- Mesh and Ring Support with 50 ms Restoration
- Licensed and Unlicensed Options

High Capacity Native IP Wireless Ethernet

AirPair was designed from the ground up to meet the critical needs demanded by carrier class customers. AirPair delivers a wireless GigE/100bT connection of up to 200 Mbps full duplex over either licensed or unlicensed frequency allocations. With a native IP design and ultra low latency, AirPair is optimized for next generation services.

Fixed & Scalable Bandwidth Operations

Developed specifically for customers with rapid scalability requirements, AirPair is a Flexible bandwidth radio platform which can scale from 10 to 200 Mbps in 10 Mbps increments via a simple software configuration. In small frame applications such as VOIP, this provides >250 mbps user bandwidth. Intelligent network interface allows 100 BT or 1000 BT auto-negotiation. For higher bandwidth requirements two radios can be polarization multiplexed on a single antenna to provide 400 - 500 mbps of capacity in a single link.

TDM and Ethernet Interface

The DragonWave APX-104E/108E delivers a standards compliant N x T1/E1 port extension capability to the AirPair Ethernet platform. This service adaptation seamlessly transports T1/E1 traffic over the low latency, wireless link, enabling customers an easy migration to native IP networks while still supporting legacy TDM services. Using timing over packet, the APX is able to meet the stringent timing requirements of cellular backhaul applications.

Configuration Options

Uniquely available in both full outdoor and indoor/outdoor configurations, AirPair can be installed to match any customer requirements. The outdoor unit (ODU) is designed in a compact, weatherproof all-outdoor packaging that requires no indoor space. The indoor option unit (IDU) is mountable in a standard 19" rack, 1U high. In addition the AirPair family has a number of shroud options to provide antenna concealment and multi-antenna installations.

Enhanced Network Management

AirPair is designed with flexible, carrier grade management requirements in mind. Using industry standard MIBs with RF extensions to monitor radio and network parameters, AirPair integrates directly into any SNMP management environment. Management traffic may be carried in-band over an 802.1q VLAN accessed via serial port or 10BaseT console port. User interface is via CLI or a web based GUI.

Improved Reach

AirPair enables bandwidth extension over extended distances by providing up to 98 dB system gain in its base configuration or up to 108 dB in a High Power configuration. The High Power systems use the standard AirPair modem with a high power radio and can support antenna sizes up to 6 feet. This combination of features enables link lengths up to 50 km/31 mi. AirPair's dynamic modulation allows a link to be engineered to the highest availability, while maximizing throughput during good weather conditions.

Network Protection

Using AirPair's Rapid Link Shutdown (RLS), AirPair supports mesh and ring configurations with ~ 50 ms switching time, enabling 99.999% available carrier class services. In addition, AirPair supports 0:1 or 1+1 fully redundant configurations. For radio redundancy only, AirPair has an upmast switch which will provide radio protection using a single modem.



DragonWave

Wireless Broadband Ethernet

applications

Mobile Convergence

High capacity wireless Multi-point systems are quickly evolving from fixed technologies to nomadic and will soon offer full mobility. This is being enabled through the emergence of standards such as 802.16. Due to the limited range of these technologies a backhaul solution is required to connect to the rest of the network. AirPair is an ideal answer for these wireless based access networks. AirPair provides native Ethernet transport for these IP-based solutions, while enabling rapid bandwidth expansion for network growth.

Solution Features:

- Native Ethernet platform well suited for IP-based access technologies
- Ultra-Low Latency enables voice and video over IP (< 0.2 ms)
- Remotely Software Scalable Bandwidth
- 99.999% Availability
- 1 +1 Redundancy, Ring and Mesh options
- Legacy TDM support

3G Cellular Backhaul

With the emergence of 3G cellular deployments, there is a growing backhaul requirement for increased capacity, and data transport. AirPair provides cost effective, low capacity TDM services today, while providing remote upgradeability to high-capacity native Ethernet services with ultra-low latency, as they become a requirement from 3G basestations.

Solution Features:

- Native Ethernet for services evolution
- T1/E1 service support
- Remotely Software Scalable Bandwidth
- Ultra-Low Latency
- 1 +1 Redundancy, Ring and Mesh options

Leased Line Replacement

Many enterprises and service providers have only one option for last mile access, the ILEC. These services are provided on an aging copper infrastructure with long MTTR. The leased line cost is quickly becoming the largest recurring telecom expense for many businesses. Using AirPair to replace leased services, businesses can eliminate recurring costs while improving service availability, and enabling future growth and services with a scalable IP ready network.

Solution Features:

- 99.999% Availability through AirPair Mesh
- T1/E1 and Ethernet service support
- Interference-Free using licensed spectrum
- Ultra-Low Latency supporting voice and video over IP (< 0.2 ms)
- IP Network ready for Next-Generation services

Last-Mile Fiber Extension

With the greatest demand for broadband services coming from within the core metro markets, AirPair presents an ideal complementary networking solution to rapidly extend high speed IP services from locations that are already attached to the service provider's network. AirPair is well-suited for network hardening, disaster recovery and Legacy TDM services requiring carrier grade, high capacity, native Ethernet systems. Support for Ring/Mesh configurations enables 99.999% availability, for carrier grade SLAs. With ultra-low latency, voice and video over IP are both supported.

Solution Features:

- 99.999% Availability through AirPair Mesh
- Legacy TDM support with T1/E1 interface options
- Native Ethernet support up to GigE
- Ultra-Low latency (< 0.2 ms)
- All-outdoor deployment option
- High Bandwidth extension

Wireless Broadband Ethernet

Wireless Broadband | Mobile Convergence | 3G Backhaul | Wireless Triple Play | Video Over IP | WiMax Infrastructure

AIRPAIR

Frequencies

11 GHz	FCC/IC
13 GHz	ETSI
15 GHz	IC/ETSI/Mexico/AUS/NZ
18 GHz	FCC/IC /ETSI/AUS/NZ
23 GHz	FCC/IC/ETSI/AUS/NZ
24 GHz UL	FCC/IC/ETSI
24 GHz DEMS	FCC/IC
26 GHz	ETSI

Mechanical

Radio (without antenna)	12 cm x 19 cm (diameter); 3.2 kg 4.7 in x 7.5 in (diameter); 7 lbs
Modem (ODU) - Post/Mast Mount	40 cm x 19.6 cm x 8.1 cm; 5.4 kg 15.7 in x 7.7 in x 3.2 in; 12 lbs
Modem (IDU) - Rack Mountable	4.3 cm x 25.4 cm x 42.5 cm; 4.1 Kg 1.7 in x 10 in x 16.7 in; 9 lbs
Antenna Wind Loading	110 kph (70 mph) Operational 200 kph (125 mph) Survival
Antenna Mount Adjustment	+/- 45° Az; +/- 22° El

Payloads

Capacity	Variable from 10 to 200 Mbps full duplex CIR (1522 Byte Packet); 250 Mbps (64 Byte Packet)
Max Capacity (1522 Byte Packet)	(28 MHz-27.5 MHz) 120 Mbps (40 MHz) 170 Mbps (50/55/56 MHz) 200 Mbps
Interface	1000/100/10 BaseT
Latency 100 BT	< 400µs, Typical < 200µs FastE
Latency GigE	< 200µs, Typical 120µs GigE
Packet Size	64 to 1600 Bytes, up 9600 (GigE Model)
Flow Control	Yes (GigE mode only)
802.1p	Yes – 8 levels served by 4 queues
802.1q	Yes
Modulation Shifting	Current to Lowest – 5 sec

Power

Input	-36 VDC to -60 VDC
Optional Adapter	110/240 VAC
Consumption	50 Watts (per link end) 70 Watts High Power (per link end)

Environmental

ODU Operating Temperature (Modem + Radio)	Standard Power -40°C to +50°C (-40°F to +122° F) High Power -40°C to +45°C (-40°F to +113° F) Standard Power + Solar Shield -40°C to +60°C (-40°F to +140° F)
IDU Operating Temperature (Modem Only)	0°C to +40°C (0°F to +104° F)
Humidity	100 % Condensing
Altitude	4500 m (14,760 ft)

Connections ODU

Power	-48V, Cable Supplied
Payload (+ Inband NMS)	MIL Circular (outdoor) RJ45 (indoor)
Craft Terminal	RS 232
IF Cable	N-Type Connector
NMS (when out-of-band)	MIL Circular (outdoor) RJ45 (indoor)

Connections IDU

Power	Dual 48V
Payload (+ Inband NMS)	RJ45 (1000/100 BaseT) or MM Fiber
Craft Terminal	RS 232
IF Cable	N-Type Connector
NMS (when out-of-band)	RJ45 (10 BaseT)

Network Management (NMS)

Alarm Management	SNMP Traps, Enterprise MIB
NMS Compatibility	OpenView, or any SNMP based network manager
Security	3 Level Authentication; Any NOC, Unique Peer to Peer
S/W Update	Remote update to flash, via management channel
EMS	Web Based Management System, SSL HTTP

System Gain

AirPair 50	Up to 98 dB
AirPair 50 High Power	Up to 108 dB
AirPair 100	Up to 90 dB
AirPair 100 High Power	Up to 100 dB
AirPair 200	Up to 82 dB
AirPair 200 High Power	Up to 92 dB

APX

General

Receiver Range	0 to 36 dB loss
Clock Mode	Configurable as Loopback or recovered
Loopback	Supports per channel local analog remote digital dual loopback modes
Encoding/Decoding	B8ZS, AMI or HDB3
Line Buildout	0-133 ft, 133-266 ft, 266-399 ft, 399-533 ft, 533-655 ft
TDM Latency	< 3 mSec Egress, < 200 µs Ingress
Delay Tolerance	+/- 2 Frames @ 100 mbps
Buffer Size	User Programmable (2-30 msec)
Timing Performance	H.823 compliant stratum 3 performance option for 50 ppB frequency stability

Environmental

Operating Temp	0°C to +40°C (32°F to +104°F)
Humidity	95 % Non Condensing
Altitude	4500 m (14,760 ft)

Management/System

Type	Command Line Interface (CLI) – In-band Management
Interfaces	RS 232 Craft Port, In-Band 100 BaseT port
Loopback	T1/E1 Port Loopback
Statistics	T1/E1 Stats and logging
System	Software upgrade through Craft Port

Connections

Primary Power (option 1) (option 2)	90-240 VAC (Converter Supplied) - 48 VDC
TDM	4 x T1/E1 Ports or 8 x T1/E1 ports
Ethernet (In/Out)	2 x 100 BaseT Wirespeed full duplex (IEEE 802.3 compliant)

Mechanical

Dimensions	19 cm x 14 cm x 4 cm 7.4 in x 5.5 in x 1.5 in
Weight	680 g (1.5 lbs)



DragonWave

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