

AirVantage™ 4000 Series Base Station & 802.16 & WiMAX Sector Controllers



Key Features:

- Speeds up to 200Mbps
- OFDM BPSK to 64QAM
- Complete Security
- QoS for Voice & Video
- Modular Design
- Scalable Architecture
- Full IP Services
- AES IPsec

WiMAX in a BOX

The AirTegrity AirVantage™ 802.16-2004 compliant product is designed for WiMAX applications that specifically meet the current and evolving requirements of Telco's and Service Providers for the delivery of secure voice, data and video services. More than simply an IP Services Management Platform, the 4000 Series product is a next generation, secure perimeter Base Station designed to address a broad spectrum of user applications. The 4000 Series aggregates Firewall support, per-subscriber and per-link Bandwidth Management and Traffic Shaping, IP Routing, VoIP support via SIP, VPN and Encryption Services, as well as WiFi and WiMAX support, into a single unit. Available in a desktop or rack-mounted enclosure and modular in design, the 4000 Series uses industry standard PMC (PCI Mezzanine Card) slots for flexible configuration options. Any combination from the list of PMC cards below can be used

- Quad or Single 10/100 Ethernet ports PMC card
- 1,2, or 4 Port T1/E1 clear channel PMC card
- 1 or 2 Port DS3/E3 clear channel PMC card

High Performance Split System Architecture

The AirTegrity 4000 Series provides outstanding RF performance and convenient mounting options using sector controllers mounted at the antenna locations. Four port Ethernet cards are used to connect up to 12 sector controllers to an AT4000. The 4000 Series system is ideally suited for point-to-point and point-to-multipoint edge aggregation and meshed applications including:

- Residential or business customer aggregation
- Enterprise/Campus Inter-building Connectivity
- Wireless Backhaul/Circuit Replacement

Reduced Cost of Deployment

As an integral component of the AirTegrity family of secure wireless broadband access products, the 4000 series introduces a new paradigm in prod-



uct capability by combining specific features and functionality from Wireless, Wireline, LAN, VPN, VoIP, Security, and Management products into a single cohesive solution negating the need for multiple devices and technologies to be configured into the network. This facilitates a dramatic shift in capital and operating expenditures, significantly reducing the cost of deployment.

Secure, Bandwidth-Managed Wireless Networks

Wireless links are managed and bandwidth usage is controlled over routed links using powerful, flexible traffic shaping and bandwidth management software. Security is assured with AirTegrity's integrated IPsec based VPN functionality via hardware assisted encryption engine and supporting the strongest commercially available encryption techniques including AES. VPN functionality is supported on all wireless and wireline links and supports a total throughput up to 80 Mbps. Subscriber access rates are configurable and are allocated in 64 Kbps blocks, and powerful firewall support is available on all links.

Voice over IP

Toll quality voice is supported via AirTegrity's industry standard SIP implementation and STUN (Simple Traversal of UDP through Network Address Translation) server (RFC 3489), an implementation of the STUN protocol that enables SIP-based communication through Firewalls. The STUN protocol enables a SIP client to discover whether it is behind a NAT, to determine the type of NAT, and to cleanly traverse it while maintaining your Firewall protection.

Non-Line of Sight (NLOS) and Meshed Solutions

The entire AirTegrity product family was designed to support Non Line of Sight (NLOS) connectivity via AirTegrity's RamJet™ technology, eliminating the need for each host to have a direct line of sight access to the 4000 acting as the perimeter base station. In addition, the 4000 series supports auto-configuration of AirTegrity's 1500 Subscriber Station and 3100 series Gateway devices greatly simplifying system installation and configurations.

AirVantage™ 4000 Series Specifications

Feature	AV4000	AV4005
Integrated Wireline Interface	4 x Switched 10/100 Ethernet	2 x 10/100 Ethernet
Management Interfaces	CLI & Web, async terminal, USB	CLI & WEB
Routing	Static RIPv1/v2 OSPFv2	Static RIPv1/v2 OSPFv2
VPN Services	AES, 3DES, DES, Blowfish, CAST, AH, ESP, PPTP; L2TP, User Defined	AES, 3DES, DES, Blowfish, CAST, AH, ESP, PPTP; L2TP, User Defined
Network Services	NAT, NAT, DHCP (Client, Server, Relay), DNS Proxy, SNMP	NAT, NAT, DHCP (Client, Server, Relay), DNS Proxy, SNMP, NTP
Diagnostics	Event Log View, IP Route Display, ARP, Ping, Traceroute	Event Log View, IP Route Display, ARP, Ping, Traceroute
Statistics	Link monitoring and statistics for all links	Link monitoring and statistics for all links
Operating Mode	Point to Point, Point to Multipoint, Fully Meshed Network	Point to Point, Point to Multipoint, Fully Meshed Network
Power Supply	110/240VAC Power Pack to 12VDC 30W	- 48VDC 30W
PMC (PCI Mezzanine Card) Slots	3	2
Dimensions	W 12 x H 1.8 x D 8 inches	W 6.5 x H 1.8 x D 8 inches
Temperature	-40° to +55° C, -40° to 131° F	-40° to +55° C, -40° to 131° F
Humidity	5% - 95% non-condensing	5% - 95% non-condensing
Compliance		
Safety	UL 60950, EN 60950, SABS IEC 950 (SA)	UL 60950, EN 60950, SABS IEC 950 (SA)
EMI / EMC	FCC part 15, EN 55022, EN 61000, and EN 301-489-1/489-3 (EU), SABS CISPR 22 and CISPR 24 (SA)	FCC part 15, EN 55022, EN 61000, and EN 301-489-1/489-3 (EU), SABS CISPR 22 and CISPR 24 (SA)

AirVantage™ 3600 Series Sector Controller Specifications

The AirVantage™ 3600 Series Sector Controllers provide outstanding RF performance and dynamically adjust the modulation scheme for each subscriber to ensure the highest bandwidth and performance possible.



Feature	AV3605	AV3610
Capability	LOS, non LOS, TDD (Time Division Duplex)	LOS, non LOS, TDD (Time Division Duplex)
Frequency	5.150 - 5.850 GHz	5.150 - 5.850 GHz
Channel size	1.75, 3.5, 7, and 10MHz	1.75, 3.5, 7, and 10MHz
Receiver input range	-98 to -20 dBm	-98 to -20 dBm
Spectral Efficiency	Up to 5bits per Hz	Up to 5its per Hz
Latency	6-15 ms	6-15 ms
Maximum Transmit Power	+26dBm	+30dBm
Receiver Sensitivity	-90 dBm @ BPSK 1/2 with BER 1x10 ⁻⁶	-90 dBm @ BPSK 1/2 with BER 1x10 ⁻⁶
Power / Data	PoE 30W / 100 Mbps Ethernet	PoE 30W / 100 Mbps Ethernet
Modulation	Auto Select BPSK, QPSK, 16 QAM, 64 QAM	Auto Select BPSK, QPSK, 16 QAM, 64 QAM
Coding Rates	Auto Select 1/2, 2/3, 3/4	Auto Select 1/2, 2/3, 3/4
Encryption	DES, 3DES, AES	DES, 3DES, AES, User Defined
MAC	Point to Point, Point to Multi Point and Mesh 802.16-2004 Compliant 802.16-2004 packet convergence sub layer	Point to Point, Point to Multi Point and Mesh 802.16-2004 Compliant 802.16-2004 packet convergence sub layer
LOS Range	30 Miles (48 Kilometers)	30 Miles (48 Kilometers)
Non LOS Range	2 Miles	2 Miles
PHY	OFDM, 256 point FFT	OFDM, 256 point FFT
Dimensions	W 7.5 x H 11 x D 4 inches	W 7.5 x H 11 x D 4 inches
Temperature	-10° to +55° C, 14° to 131° F	-10° to +55° C, 14° to 131° F
Humidity	100% condensing, NEMA 4X	100% condensing, NEMA 4X
Regulatory	FCC Part 15 subpart C including 15.205/207 and 247, EN 300.328	FCC Part 15 subpart C including 15.205/207 and 247, EN 300.328

Sector Controller Performance

Range	Less than 4 Miles	4-6 Miles	Greater than 6 Mile
Adaptive Modulation	64 QAM	16 QAM	BPSK to 16 QAM
Raw Throughput	50 Mbps	25 Mbps	8 Mbps
Business Users (5x Over subscription) @ 1.5Mbps	65	40	15 - 20
Residential Users (12.5x Over subscription) @ 512kbps	625	300	100 - 200

5GHz License Exempt Bands & 802.16h

There are four License Exempt Bands defined for the 5GHz spectrum. These consist of one Industrial Scientific & Medical (ISM) and three Unlicensed National Information Infrastructure (U-NII). The maximum power levels and antenna gains is listed in the table below.

Band	Frequency (GHz)	Maximum Power	Maximum Antenna Gain	EIRP
ISM	5.725 - 5.850	1 W +30dBm	+6dBi	4 W +36dBi
UNII 1	5.150 - 5.250	50mW +17dBm	+6dBi	500mW +23dBi
UNII 2	5.250 - 5.350	250mW +24dBm	+6dBi	1W +30dBi
UNII 3	5.725 - 5.825	1 W +30dBm	+6dBi	4 W +36dBi

The UNII band 1 is restricted for indoor use only. The ISM and UNII band 3 can use antennas with up to +23dBi gain in point to point systems. Note: Trees absorb wireless signals at the rate of about 1.2dB per meter. A typical tree with a diameter of 10 meters will absorb 12dB of signal.

Using the AirTegrity Wireless products for Licensed Exempt bands using WiMAX systems allows operators to quickly install broadband wireless systems that can support thousands of customers from a low cost Base Station. License Exempt operation can have pitfalls due to the unregulated nature of the systems. AirTegrity Wireless is working on the development of procedures used to reduce the potential coexistence issues. As a member of the new IEEE 802.16 License Exempt Task Group, 802.16h, AirTegrity continues to show leadership in the development of License Exempt (LE) WiMAX systems.

About AirTegrity Wireless

AirTegrity™ Wireless is a market leader providing a secure wireless broadband platform that encompasses all networking and security requirements for the delivery of voice and data services in a single cohesive product.

AirTegrity's award winning wireless modules operating in both licensed and unlicensed frequencies, an AirTegrity™ smart network dramatically reduces the cost of network deployment, ownership and management by integrating Multi-Channel Radio and Antenna technology with powerful routing, switching and security functions into each AirTegrity™ system.

The AirTegrity base station solution includes modules that to directly connect the system into DS3/E3, T1/E1 and ADSL wire-line systems, negating the need for additional interface conversion equipment.

AirTegrity™ systems are ideally suited to Telco, Service Provider, Wireless ISP and Enterprise environments.



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