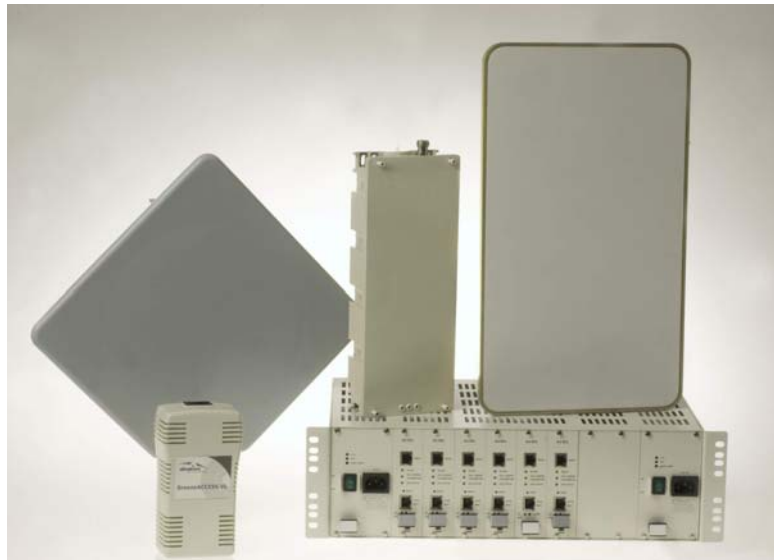




---

## Product Announcement

# BreezeACCESS VL 5.4GHz



**May 2004**

## Introduction

The BreezeACCESS family of products provides a comprehensive solution for broadband wireless access in the unlicensed bands – 2.4GHz as well as 5GHz. BreezeACCESS VL 5.4, the newest addition to the BreezeACCESS VL family, is an OFDM based system, operating in the 5.47 - 5.725GHz band and is best suited for service providers, operating in the unlicensed bands. Incorporating the same mature, feature-rich and well-established BreezeACCESS access suite, BreezeACCESS VL is the ideal network access as well as backhauling for broadband wireless access operators offering voice and IP-based services.

## System Description

### ***Customer Premises Equipment***

The Subscriber Unit (SU), installed at the customer premises, provides data connections to the Access Unit. The Subscriber Unit provides bridge functionality and can support up to 1024 MAC addresses.

The Subscriber Unit provides an efficient platform for high speed Internet and Intranet services. The system provides its subscribers with fast access to IP based services at a burst data rate according to the CPE model. The use of packet switching technology provides the user with a connection to the network that is practically always on, allowing for immediate access to services. Several CPE models are available:

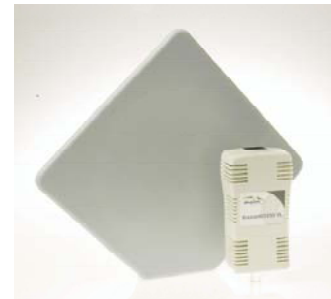
- The SU-A-5.4-3-1D-VL supports a CPE gross rate of up to 3 Mbps, connected to a single user
- The SU-A-5.4-6-1D-VL supports a CPE gross rate of up to 6 Mbps, connected to a single user
- The SU-A-5.4-6-BD-VL supports a CPE gross rate of up to 6 Mbps, connected to a multiple users
- The SU-A-5.4-54-BD-VL supports a CPE gross rate of up to 54 Mbps, connected to a multiple users

6Mps CPE models are SW upgradeable to 54Mbps rates. The data connection is a standard IEEE 802.3 Ethernet 10/100BaseT (RJ 45) interface.

The Subscriber Unit components are:

- SU-NI - Indoor unit comprising RJ45 (10/100baseT) and Power connectors
- Indoor-outdoor CAT-5
- SU-RA - Outdoor unit with RJ45 connector (10/100BaseT) and attached antenna

The indoor unit provides the interface to the user's equipment and is powered from the mains via its power supply unit. The indoor unit is connected to the outdoor unit via a CAT-5, which also serves for transferring power, management and control signals. The unit provides bridge functionality and can support up to 1024 MAC addresses.



## **Base Station Equipment**

The BreezeACCESS Access Units (AU), installed at the base station site, provide all the functionality necessary to communicate with the Remote Units and to connect to the backbone of the service provider. The AU serves all SU models. Each AU connects to the network through a standard IEEE 802.3 Ethernet 10/100BaseT (RJ 45) interface.

There are 2 lines of Access Units with different architectures:

- Modular Base Station Access Unit
- Stand-Alone “Micro-Cell” Access Unit



### **Modular Base Station Access Unit**

#### **• The Base Station Shelf (BS-SH)**

The Base Station equipment is based on the BreezeACCESS Base Station’s 3U chassis, which is suitable for installation in 19” racks. Each Base Station shelf (BS-SH) can hold up to seven AU modules, of all frequency bands (2.4GHz, 3.5GHz, 5GHz – BA GFSK as well as BA VL), providing reliable access to maximum numbers of subscribers and full-scale redundancy.

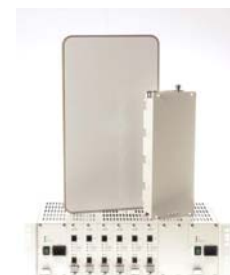


Two power supply modules can be used in a BS-SH chassis (either AC or DC) for fail-safe operation through power supply redundancy.

#### **• The AU-BS Access Unit**

Each Access Unit that serves a single sector is comprised of a BS-AU indoor module and an outdoor radio unit. The outdoor unit contains the radio module and an interface to an external antenna.

The AU-D-BU modules connect to the network through standard IEEE 802.3 Ethernet 10/100BaseT (RJ 45) interfaces. The indoor unit is connected to the outdoor unit via a CAT-5, which also serves for transferring power, management and control signals.



AU-D-BU series includes:

- AU-D-BU-5.4-VL-60 - a complete AU system including plugged in indoor unit, outdoor unit & 60° detached antenna
- AU-D-BU-5.4-VL-90 - a complete AU system including plugged in indoor unit, outdoor unit & 90° detached antenna
- AU-D-BU-5.4-VL-120 - an complete AU system including plugged in indoor unit, outdoor unit & 120° detached antenna

The modular Access Unit components are:

- AU-BS – Plugged-in indoor unit comprising 10/100baseT
- AU-RE - Outdoor unit with RJ45(10/100baseT) and antenna connectors
- RF cable and detached antenna

## AU Stand-Alone “Micro-Cell” Access Unit

The AU-D-SA line includes stand alone Access Units that are very similar to the AU-BS units, the only difference being that the indoor part, is a stand-alone desktop or wall-mountable unit rather than a 19” module. The indoor unit is powered from the mains (100-250 VAC). The indoor unit connects to the network through a standard IEEE 802.3 Ethernet 10/100BaseT (RJ 45) interfaces. A CAT-5 connects between the AU indoor unit and the outdoor unit. It also serves for transferring power, management and control signals from the indoor unit to the outdoor unit.



AU-D-BS series includes:

- AU-D-NI-5.4-VL-60 - a complete AU system including standalone indoor unit, outdoor unit & 60° detached antenna
- AU-D-NI-5.4-VL-90 - a complete AU system including standalone indoor unit, outdoor unit & 90° detached antenna
- AU-D-NI-5.4-VL-120 - an complete AU system including standalone indoor unit, outdoor unit & 120° detached antenna

The standalone base station components are :

- AU-NI - Indoor unit comprising RJ45(10/100baseT) and Power connectors
- AU-RE - Outdoor unit with RJ45 (10/100baseT) and antenna connectors
- RF cable and External antenna

## System Highlights

Frequency	5.47 - 5.725 GHz	
Operation Mode	Time Division Duplex	
Radio Access Method	OFDM	
Channel Bandwidth	20 MHz	
Antenna	SU Antenna	21dBi, 10.5° horizontal x 10.5° vertical, EN 302 085, Class TS 1,2,3,4,5 compliant
	Sector Antenna	16dBi, 60° horizontal x 10° vertical, EN 302 085, Class CS 3 compliant
		17dBi, 90° horizontal x 6° vertical, EN 302 085, Class CS 3 compliant
		15dBi, 120° horizontal x 6° vertical, EN 302 085, Class CS 3 compliant

AU Output Power (@ antenna port)	-10 to 21dBm, Adjustable in 1dB steps Note: the output power is limited according to the antenna gain in order to comply with 30dBm with EIRP regulation							
SU Output Power (@ antenna port)	-10 to 21dBm, ATPC							
Modulation <sup>1</sup>	BPSK, QPSK, 16QAM, 64QAM							
Modulation levels	1	2	3	4	5	6	7	8
Sensitivity (dBm)	-89	-88	-86	-84	-81	-77	-73	-71

<sup>1</sup>A modulation level represents the modulation and transmit rate. BreezeACCESS VL has 8 modulation levels representing 8 modulation rates.

## Feature Set

BreezeACCESS VL delivers a comprehensive range of product features, ensuring fast, consistent and reliable data and voice service.

- Robust OFDM modulation including BPSK, QPSK, 16QAM, 64QAM, delivering unmatched cell capacity and ensuring NLOS (Non-Line-of sight) capability for best coverage per cell
- Automatic Transmit Power Control (ATPC) enables ease of installation and cell transmission optimization, which allows for better network deployment and interference control
- Adaptive modulation facilitates superior performance and automatically adjusts transmission to enable continuous & robust link
- DFS (Dynamic Frequency Selection), a spectrum-sharing mechanism that allows wireless access equipment to coexist with radar systems. It automatically selects a frequency that does not interfere with certain radar systems while operating in the 5 GHz band.
- Provides the highest level of security using authentication and WEP128 & AES based data encryption as well as MAC address deny list and numerous access control options
- Enhanced filtering options for optimal transmission over the air
- CPE rates: 3Mbps, 6Mbps, 54Mbps
- Flexible Base Station structure using standalone or chassis based Access Units.
- Designed to integrate with other BreezeACCESS bands in the same chassis
- Flexible base station structure allowing for single sector as well as modular & scalable solution with a robust, chassis based solution, which is common for all BreezeACCESS family, providing a demand based build-out.
- Easy-to-use SNMP-based remote management system, enabling simple unit configuration and multiple simultaneous units upgrading.
- Over the air SW upgrade and configuration upload/download

## Key Benefits and Advantages

- Superior coverage with Non-Line-Of-Sight capability allows for more approachable customers with less installation fees.

- Simple, Cost saving installation and maintenance with NLOS capability, Low cost IDU-ODU cable, Automatic Transmit Power Control (ATPC), adaptive modulation & over the air SW upgrade.
- Alvarion's unique, feature rich, access suite which includes prioritization, advanced security and access control options, transmission optimization by the use of filtering options, best AU and more.
- Advanced security including WEP 128 and AES encrypted authentication and transmission, Deny list, protocol filtering, and 802.1Q VLAN functionality.
- CPE variants optimizing customer requirements with 3Mbps, 6Mbps and 54Mbps, which can be mixed in a single sector.
- Unsurpassed resilience and robustness featuring robust OFDM technology, which provides NLOS capabilities that eases installations and allows for better coverage and carrier-grade features including a rack mount chassis base station with redundancy, hot swap capability and UPS facilities.

## Product Availability

BreezeACCESS VL version 2.0 is officially released and commercially available.

## Ordering Information

Following are the BreezeACCESS VL part numbers and product descriptions. A full list of all BreezeACCESS VL items, including accessories can be found in the formal BreezeACCESS price list.

Product Name	Product number	Description
<b>Subscriber Units</b>		
SU-A-5.4-3-1D-VL	854261	Complete Subscriber Unit, Indoor Network Interface Unit and Power supply, + Outdoor radio unit, Integrated antenna, IOC Cat5 20 Meter cable included, 5.47-5.725GHz, 1 Data User, 3Mbps data rate
SU-A-5.4-6-1D-VL	854198	Complete Subscriber Unit, Indoor Network Interface Unit and Power supply, + Outdoor radio unit, Integrated antenna, IOC Cat5 20 Meter cable included, 5.47-5.725GHz, 1 Data User, 6Mbps data rate
SU-A-5.4-6-BD-VL	854197	Complete Subscriber Unit, Indoor Network Interface Unit and Power supply, + Outdoor radio unit, Integrated antenna, IOC Cat5 20 Meter cable included, 5.47-5.725GHz, Full Data Bridge, 6Mbps data rate
SU-A-5.4-54-BD-VL	854190	Complete Subscriber Unit, Indoor Network Interface Unit and Power supply, + Outdoor radio unit, Integrated antenna, IOC Cat5 20 Meter cable included, 5.47-5.725GHz, Full Data Bridge, 54Mbps data rate

<b>SU upgrades</b>		
SU-24 to SU 54-upgrade	858270	Upgrade SU-24, 24Mbps raw data to SU-54, 54Mbps raw data
SU-6 to SU 54-upgrade	858177	Upgrade SU-6, 6Mbps raw data to SU-54, 54Mbps raw data
<b>Access Units</b>		
AU-D-BS-5.4-60-VL	854263	Base station Equipment, Complete AU system, Indoor Network Interface Card to be plugged in chassis+ Outdoor radio unit, 5.47-5.725GHz. Detached 60 degrees antenna and RF cable are included - IOC Cable NOT INCLUDED
AU-D-BS-5.4-90-VL	854192	Base station Equipment, Complete AU system, Indoor Network Interface Card to be plugged in chassis+ Outdoor radio unit, 5.47-5.725GHz. Detached 90 degrees antenna and RF cable are included - IOC Cable NOT INCLUDED
AU-D-BS-5.4-120-VL	854193	Base station Equipment, Complete AU system, Indoor Network Interface Card to be plugged in chassis+ Outdoor radio unit, 5.47-5.725GHz. Detached 120 degrees antenna and RF cable are included - IOC Cable NOT INCLUDED
AU-D-SA-5.4-60-VL	854265	Base station Equipment, Complete AU system, stand alone Indoor Network Interface + Outdoor radio unit, 5.47-5.725GHz. External 60 degrees antenna and RF cable are included - IOC Cable NOT INCLUDED
AU-D-SA-5.4-90-VL	854194	Base station Equipment, Complete AU system, stand alone Indoor Network Interface + Outdoor radio unit, 5.47-5.725GHz. External 90 degrees antenna and RF cable are included – IOC Cable NOT INCLUDED
AU-D-SA-5.4-120-VL	854195	Base station Equipment, Complete AU system, stand alone Indoor Network Interface + Outdoor radio unit, 5.47-5.725GHz. External 120 degrees antenna and RF cable are included - IOC Cable NOT INCLUDED
<b>Base Station shelf</b>		
BS-SH-VL	858156	Base Station shelf, ready for BreezeACCESS VL. 19" rack. Accepts up to: 7 (seven) AU-BS cards (BA II,V,VL). Power supply is not included. Should be ordered separately
BS-PS-AC-VL	858158	Power Supply module for BS-VL Required power supply: 110/220VAC. To be used only with BreezeACCESS VL units
BS-PS-DC-VL	858159	Power Supply card for BS-VL rack Required power supply: 48VDC. To be used only with BreezeACCESS VL units Pending Availability

## **Sales & Marketing Material**

The following sales & marketing material is available:

- BreezeACCESS VL 5GHz solution presentation
- BreezeACCESS VL Brochure
- BreezeACCESS VL System Description
- BreezeACCESS VL – Beyond the Line of Sight – 5GHz NLOS white paper
- BreezeACCESS VL – Security technical paper