



BreezeACCESS™ VL

Beyond the Line-of-Sight

Service providers and operators can dramatically improve their business models by increasing the percentage of reachable subscribers using BreezeACCESS VL, Alvarion's 5GHz expansion of the BreezeACCESS solution.

Ideally suited to connect large enterprises, campuses, MTUs/MDUs as well as small business and residential users, BreezeACCESS VL, with its proven Non-Line-Of-Sight (NLOS) capabilities, enables cost-effective wireless broadband access for commercial customers in any terrain and environment.

BreezeACCESS VL is the latest evolution of BreezeACCESS, the world's most trusted and best-selling wireless broadband platform.





Product Highlights

With BreezeACCESS VL, Alvarion has leveraged its experience in wireless broadband to offer a solution that solves NLOS challenges. The system also overcomes the deployment complexities of point-to-multipoint wireless access, and addresses the market's requirement for high security and advanced networking solutions.

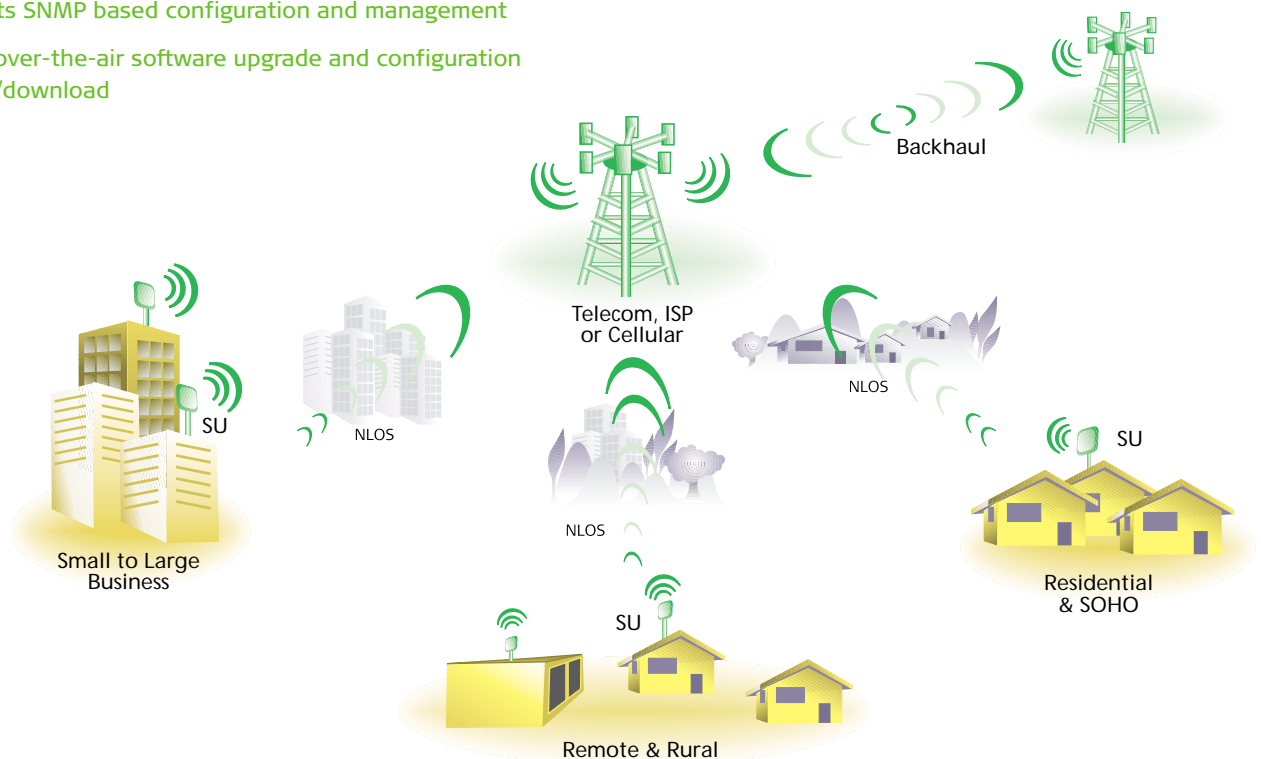
The BreezeACCESS VL solution:

- Offers NLOS high capacity point-to-multipoint access
- Leverages the 5GHz band: 5.725-5.850GHz, 5.47-5.725GHz, 5.15-5.35GHz and 5.03-5.091GHz
- Features OFDM adaptive modulation (BPSK, QPSK, 16QAM, 64QAM)
- Offers 20 MHz channel bandwidth
- Features 10/100BaseT interfaces
- Supports CPE rates of 3Mbps, 6Mbps, 24Mbps and 54Mbps
- Supports Dynamic Frequency Selection (DFS) and Automatic Transmit Power Control (ATPC)
- Offers advanced access suite features, including QoS, security and extensive management
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- Supports SNMP based configuration and management
- Offers over-the-air software upgrade and configuration upload/download

Key Advantages

BreezeACCESS VL offers service providers:

- Economical broadband access for deployment in urban and rural areas, overcoming NLOS obstacles.
- Reduced CAPEX resulting from high capacity base stations as well as NLOS capabilities.
- Reduced OPEX resulting from fewer base station leases and cell sites.
- A variety of CPEs for efficiently serving a wide range of customers with different bandwidth requirements.
- Alvarion's Complete Spectrum™ solution for seamless integration with other BreezeACCESS bands in the same chassis to preserve existing investments.
- Enhanced Quality of Service (QoS) featuring CIR/MIR, 802.1P, ToS based prioritization and CPE prioritizing.
- Advanced security mechanisms including WEP128 and AES encryption, access control and VLAN capabilities.
- Quick and effortless installation and configuration using extensive LEDs, ATPC and adaptive modulation capabilities.
- Optimal performance and connectivity through adaptive modulation.
- Flexible topology allowing stand-alone or chassis based configurations for modular and scalable solutions.





Broadband Wireless Access that Breaks Barriers

BreezeACCESS VL offers an unmatched combination of coverage, capacity and access features for providing point-to-multipoint wireless access to a wide variety of terrains. It enables service providers to extend broadband access to lucrative commercial customers, including those with obstructed or blocked line of sight. As a wireless broadband point-to-multipoint system offering high capacity and advanced OFDM technology, the BreezeACCESS VL reliably connects customers even in LOS-challenged cells. OFDM technology overcomes obstacles, such as trees and buildings, for quick and effortless NLOS deployments. With over a million and a half units installed globally, Alvarion is the most trusted provider of wireless broadband solutions worldwide.

Extensive Access Suite

As part of the BreezeACCESS solution, the BreezeACCESS VL leverages the advanced feature set and system management enjoyed by hundreds of thousands of existing BreezeACCESS operators worldwide. With over a decade of wireless experience, Alvarion's access suite provides unmatched capabilities, including:

- Effortless installation and configuration processes using Automatic Transmit Power Control (ATPC) to simplify installation and ensure optimal link transmission.
- Adaptive modulation for superior performance and automatic transmission adjustment to enable a continuous and robust link.
- Exceptional QoS mechanisms including bandwidth management and traffic prioritization.
- Advanced security capabilities including authentication, WEP and AES based Encrypted transmission and VLAN capabilities.
- Enhanced access control including protocol filtering and wireless transmission optimization.
- Superior management options including SNMP based management using BreezeCONFIG ACCESS and AlvariSTAR NMS management utility, remote software upgrade and version control as well as remote configuration upload and download.

Complete Spectrum™ Solution

Alvarion's complete spectrum solution enables the BreezeACCESS VL to integrate into existing BreezeACCESS networks to leverage existing investments and create the market's most flexible solution. Supporting concurrent LOS, NLOS and multi-frequencies with subscriber speeds from 3 to 54 Mbps, the Complete Spectrum™ permits operators to customize networks for their unique market demographics, topographic environments and business models to achieve the highest revenue per cell.

The Complete Spectrum™ solution supports 900 MHz, 2.4 GHz, 3.5 GHz and the entire 5 GHz band with a range of technologies, including OFDM, Frequency Hopping and Hybrid Digital Modulation. Delivering carrier-class service in any environment, including urban and foliage-related NLOS, the Complete Spectrum means operators can efficiently support more subscribers and larger networks, maximizing revenue opportunities and growth potential.

System Components

The BreezeACCESS VL is a solution consisting of a base station access unit and customer premises equipment (CPE) units. Base station access units are available as modular or stand-alone units. Customer premises equipment is available in various models for differing bandwidths and single or multiple-user configurations.

The Access Units (AUs)

Installed at the base station site, AUs communicate with the Subscriber Units (SUs). Each AU connects to the network through a standard IEEE 802.3 Ethernet 10/100BaseT (RJ-45) interface and connects to the outdoor units via a CAT-5 cable.

Alvarion offers two types of Access Units:

- A Modular Base Station Access Unit (BS-SH-VL), which is part of the BreezeACCESS 19" 3U Universal Chassis. Each Base Station shelf can hold up to six AU modules of all frequency bands, providing reliable access to a maximum number of subscribers. Two power supply modules can be used in a BS-SH-VL chassis (either AC or DC) for fail-safe operation through power supply redundancy. The AU-D-BL includes a chassis based indoor unit, pole-mounted outdoor unit and a variety of sector antennas.
- A Stand-Alone "Micro Cell" Access Unit (AU-D-SA), includes a small indoor unit, pole-mounted outdoor unit and a variety of sector antennas.



The Subscriber Units (SUs)

Installed at the customer premises, SUs enable customer data connection to Access Units and support single or multiple end users. Subscriber Units provide an efficient platform for always-on, high speed Internet and Intranet services. Each SU connects to the network through a standard IEEE 802.3 Ethernet 10/100BaseT (RJ-45) interface and connects to the outdoor unit via CAT-5 cable. Each SU includes a small indoor unit, CAT5 indoor-outdoor cable, pole-mounted outdoor unit and integrated antenna. Several CPE models are available:

- The SU-A-ff-3-1D-VL supports a CPE gross rate of up to 3 Mbps for a single user
- The SU-A-ff-6-1D-VL supports a CPE gross rate of up to 6 Mbps for a single user
- The SU-A-ff-6-BD-VL supports a CPE gross rate of up to 6 Mbps for multiple users
- The SU-A-ff-24-BD-VL supports a CPE gross rate of up to 24 Mbps for multiple users
- The SU-A-ff-54-BD-VL supports a CPE gross rate of up to 54 Mbps for multiple users



Note: SU-6 and SU-24 models are upgradeable to SU-54
ff refers to the frequency band

Specifications

Radio

Frequency	5.725 - 5.850 GHz, 5.47 - 5.725 GHz, 5.15 - 5.35 GHz, 5.03 - 5.091 GHz								
Radio Access Method	Time Division Duplex (TDD)								
Channel Spacing	20 MHz								
Central Frequency Resolution	10 MHz								
Output Power (at antenna port)	AU: -10 dBm to 21 dBm, 1 dB steps								
Max Input Power (at ant. port)	SU: -10 dBm to 21 dBm, automatically adjusted by ATPC								
Sensitivity, typical (dBm at antenna port, @10 ⁻⁶)	Modulation Level*	1	2	3	4	5	6	7	8
	dBm	-89	-88	-86	-84	-81	-77	-73	-71
* Modulation Level indicates the coded radio transmission rate and the modulation scheme.									
Modulation	OFDM: BPSK, QPSK, QAM 16, QAM 64								
Antenna Port (AU-RE)	N-Type 50 ohm								
Subscriber Integrated Antenna AU Antennas	21 dBi, 10.5° H/V, Integrated flat panel								
	60°: 16dBi, Sector 60° horizontal, 10° vertical								
	90°: 16dBi, Sector 90° horizontal, 6° vertical								
	120°: 15dBi, Sector 120° horizontal, 6° vertical ,								
	360°: 8dBi, Sector 360° horizontal, 9° vertical (AU-SA 5.8 GHz only)								

Data Communication

VLAN support	Based on IEEE 802.1q
Layer-2 Traffic Prioritization	Based on IEEE 802.1p
Layer-3 Traffic Prioritization	IP ToS according to RFC791

Configuration and Management

Local & Remote Management	Monitor via Telnet, SNMP and Configuration Upload/Download
Remote Management Access	From Wired LAN, Wireless Link
Management Access Protection	Multilevel Password Configuration of remote direction (From Ethernet only, Wireless only, or both sides) Configuration of IP addresses of authorized stations
Security	WEP 128-bit, Authentication AES, Data encryption
Software upgrade	Via TFTP and FTP
Configuration Up/Download	Via TFTP and FTP
SNMP Agents	SNMP v1 client, MIB II, Bridge MIB, Private BreezeACCESS VL MIB

Physical and Electrical

Type	Connectors		Electrical
SU-NI, AU-NI	Ethernet	10/100BaseT RJ-45, 2 embedded LEDs	Power consumption 25W AC input: 100-240VAC, 50/60Hz
	Radio	10/100BaseT Ethernet RJ-45	
SU-RA, AU-RE	AC IN	3-pin AC power plug	54 VDC from indoor to outdoor
	Indoor	10/100Base RJ-45 with waterproof sealing assembly	
AU-BS	Ethernet	10/100BaseT RJ-45, 2 embedded LEDs	Power consumption 30W (module plus outdoor unit) AC input: 100-240VAC, 50/60Hz 3.3VDC, 54V from power supply in backplane
	Radio	10/100BaseT Ethernet RJ-45	
BS-PS-AC-VL (AC power supply)	AC-IN	3-pin power plug	Power consumption: 240W, full chassis (1 PS, 6 AU) AC input: 85-265VAC, 47-65Hz DC output: 54V, 3.3V
BS-PS-DC-VL (DC power supply)	-48 VDC	3-pin DC D-Type 3 power pin plug Amphenol	Power consumption: 240W, full chassis (1 PS, 6 AU) DC input: -48 VDC nominal (-34 to -72), 10 A max. DC output: 54V, 3.3V

Standards Compliance

Type	Standard	
EMC	FCC Part 15 class B, CE EN55022 class B	
Safety	UL 1950, EN 60950	
Environmental	Operation	ETS 300 019 part 2-3 class 3.2E for indoor units ETS 300 019 part 2-4 class 4.1E for outdoor units
	Storage	ETS 300 019-2-1 class 1.2E
	Transportation	ETS 300 019-2-2 class 2.3
Lightning Protection	EN 61000-4-5, class 3 (2kV)	
Radio	FCC Part 15	EN 301 753 EN 301 021 EN 301 893