Specifications

Radio

| Frequency | 4.900 - 5.100 GHz, 5.15 - 5.35 GHz, 5.47 - 5.725 GHz, 5.725 - 5.850 GHz |
| Channel | 10 MHz, 20 MHz |
| Modulation | OFDM, BPSK, QPSK, QAM 16, QAM 64 |

Data Communication

| Data Link | Based on IEEE 802.11g, 802.11n, 802.11a |
| Layer-2 traffic prioritization | Based on IEEE 802.1p |
| Layer-3 traffic prioritization | IP ToS according to RFC791 and DSCP according to RFC2474 |
| Security | WEP 128-bit authentication, AES 128, WEP 128, certified FIPS-197 mode |

Configuration and Management

| Configuration of | DHCP based MHM and windows based configuration utility, TFTP, FTP |
| Management access protection | Multilevel password, Configuration of remote access (from Ethernet only, wireless only, or both sides), Configuration of IP addresses of authorized stations |
| Software upgrade | Via TFTP and MIP |

Remote Management Access

| Management access protection | SNMP, iNet, wired Ethernet, wireless access |
| Security | WEP 128-bit authentication, AES 128, WEP 128, certified FIPS-197 mode |

Physical and Electrical

| Power consumption | 240W, full chassis (1 PS, 6 AU) |
| Power consumption | 30W (module plus outdoor unit) |
| Power consumption | 25W (DC output) |

Standards Compliance

| Standard | FCC Part 15 class B, CE (EN 301 489-1-14) |
| ETSI Standards | ETS 300 019 part 2-3 class 3.26 for indoor units, ETS 300 019 part 2-4 class 4.10 for outdoor units |
| Storage | ETS 300 019 class 1.21 |
| Lighting protection | EN 61051-4-5, class 3 (4kV) |
| Radio | FCC part 15, EN 301 793, EN 301 222 (V 1.1.1) |

Note: Not all options are available in all regions and some features require software licensing key. Please contact your local representative for further information.
Choose BreezeACCESS VL for:

- Economic Advantages
  - Wide coverage, more customers with fewer base stations
  - Multi-subscriber profiles in same sector
  - Easy to maintain, no need for extra staff
  - Lower CAPEX tomorrow - protect your investment for co-location

- Management Advantages
  - Multifunctionality - simple configuration, fast installation
  - Over-the-air software upgrade for easy, cost-saving installation
  - Best access unit (AU) selection - for fast and simple SU
  - Access control with IP address protocol and MAC based

- Technological Advantages
  - Wide coverage, more customers with fewer base stations
  - Multimedia Application Priority (MAP) using wireless link prioritization for full end-to-end QoS
  - Unique dynamic resource allocation protocol (DRAP) with Alvarion's voice gateways ensuring high quality voice, while maintaining residual capacity for best effort data services
  - Very high capacity and packet processing for best network performances and high number of VoIP calls
  - DFS+ (dynamic frequency selection) for countries that require it, plus an Alvarion only algorithm to improve channel management under certain conditions of low radar activity
  - Best access unit (AU) support for fast and simple SU association with best AU detected, also acts as a redundancy mechanism that automatically selects second best AU if best AU fails
  - Flexible network planning - Supports 10 and 20 MHz subchannel options for radio planning and interference avoidance with automatic subchannel search
  - Rugged, widely deployed robust solution in 5 GHz

- System Components
  - The BreezeACCESS VL solution consists of a base station and customer premises equipment (CPE) units. The base stations are available as either modular or stand-alone micro cell units. CPEs are available in various models for different bandwidths and single or multiple user configurations.

Access Units (AUs)

- Installed at the base station site, each AU includes indoor and outdoor units. The indoor connects to the network through a standard Ethernet 10/100BaseT (RJ-45) interface and to the outdoor unit is connected to the indoor unit through a CAT-5 cable. Alvarion offers two types of base stations:
  - The modular shelf base station (BS-SH-VL) 19" universal chassis holding up to 6 AU modules. Two power supply modules can be used in a BS-SH-VL chassis (either AC or DC) for fail-safe operation. The AU-D-BS kit includes a bypass module with outdoor unit and sector antennas.
  - The stand-alone micro base station (AU-D-SA) kit includes a small indoor unit, pole mounted outdoor unit and a sector antenna.

A variety of antennas can be used with the base station: 360, 120, 90 and 60 degrees.

Subscriber Units (SUs)

- The subscriber unit (SU) enables connection with the base station and supports single or multiple end users. SUs provide an efficient platform for always-on, high-speed Internet and Intranet, VoIP, VPN and other services.

Each SU connects to the network through a standard Ethernet 10/100BaseT (RJ-45) interface and connects to its outdoor part via CAT-5 cable. Each SU kit includes a single data port indoor unit, CAT-5 indoor-outdoor cable, pole mounted outdoor unit and integrated antenna in most cases. Several subscriber unit add-on modules are available including; the networking gateway that offers residential, SOHO and SME subscribers a flexible range of wireless and wireline networking services and the voice gateway that offers the efficient provision of voice and data.

Several CPE models are available (8- frequency band):
- The SU-A-F-3-1D-VL supports gross rate of up to 3 Mbps for a single user, includes integrated antenna
- The SU-A-F-6-8D-VL supports gross rate of up to 6 Mbps for multiple users, includes integrated antenna
- The SU-A-F-54-8D-VL supports gross rate of up to 54 Mbps for multiple users, includes integrated antenna
- The SU-E-F-54-8D-VL supports gross rate of up to 54 Mbps for multiple users, does not include antenna
Choose BreezeACCESS VL for:

- Video and voice with end-to-end quality of service supporting an unmatched number of toll quality calls per sector
- Connecting communities for cost-effective access within communities, municipalities and educational institutions
- Hotspot feeding - high throughput, reliable service
- Security and surveillance - wireless camera transmitting bandwidth hungry video and requiring secure reliable services
- Last mile access - services for both residential and business users with NLOS capabilities for all environments, rural and urban
- Enterprise networks - leased line replacement for cost effective connectivity, providing VoIP and data services in enterprises and campuses

Reasons for Choosing BreezeACCESS VL

Economic Advantages
- More revenues by providing subscribers toll quality voice and video services with differentiated price packages for multiple speeds and upgrade options
- Less infrastructure investment future - NLOS, high capacity, outstanding coverage, multi-subscriber profiles in same sector and network, modular and flexible “pay-as-you-grow” enables fewer base stations and site constructions
- Lower CAPEX tomorrow - protect your investment for co-location with future WIMAX systems. Both sets of CPEs (BreezeACCESS VL and BreezeMAX™) are able to operate at the same sector. Alvarion’s management tool will support all Alvarion WMAX, BreezeACCESS VL and BreezeNET B® platforms with seamless management migration
- Out-of-the-box low cost installation -
  - 10 LEDs SIR BAR display on outdoor unit for fast antenna alignment without external tools or monitors, standard CAT-5 cable and best AU mode for fast association
  - Optimal performance through always-on adaptive modulation and automatic transmit power control (ATPC)
  - On-the-air software upgrade for easy, cost-saving installation
  - Lower OPEx - fewer base stations, remote management and remote firmware upgrade, effective diagnostic tools, self adaptive to environmental changes

Technological Advantages
- Wide coverage, more customers with fewer base stations
- Multimedia Application Prioritization (MAP) using wireless link prioritization for full end-to-end QoS
- Unique dynamic resource allocation protocol (DRAF) with Alvarion’s voice gateways ensuring high quality voice, while maintaining residual capacity for best effort data services
- Very high capacity and packet processing for best network performances and high number of VoIP calls
- DPs4 (dynamic frequency selection) for countries that require it, plus an Alvarion only algorithm to improve channel management under certain conditions of low radar activity
- Best access unit (AU) selection - for fast and simple SU association with best SU detected, also acts as a redundancy mechanism that automatically selects second best AU if best AU fails
- Flexible network planning - Supports 10 and 20 MHz subchannel options for radio planning and interference avoidance with automatic subchannel search
- Rugged, widely deployed robust solution in 5 GHz

Management Advantages
- Alvarion® - a comprehensive network management support tool with scalable architecture, topology management, configuration and monitoring, fault management, and performance monitoring
- BreezeCONF™ - a configuration and monitoring utility that is intuitive and simple to use and enables simultaneous firmware upgrades for multiple CPEs

Extensive Access Suite Features
- Bridging functionality - simple configuration, fast installation
- 802.1Q VLAN support with trunk, access and hybrid and QinQ 802.1ad modes
- QoS - end-to-end QoS with MAP using packet prioritization
- SLA enforcement - supports committed information rates (CIR) and maximum information rates (MIR) per user, per direction, packet prioritization with IP TOS, VLAN, DiffServ and UDP/TCP port range classification, and graceful degradation in case of congestion

Security and Filtering Options
- AES 128 and WEP 128 encryption options - and new FIPS-197 encryption mode, certified according to Federal Information Processing Standards, access list enabling only authorized CPEs to connect
- Access control with IP address protocol and MAC based filtering, offering better control including being able to limit the number of authorized IP addresses, enabling an additional source of revenue or for preventing local broadcasts from flooding the wireless link

Flexibility and Modularity
- Flexible topology allowing stand-alone or chassis based configurations for modular and scalable solutions enabling "pay as you grow". Deployable in multiple sectors using various antenna choices
- AC and DC power supply options
- Supports 3, 6, and 54 Mbps CPE rates with attached and external antenna options
- Upgradable CPE bandwidth over the air

The Complete Spectrum™ Solution
- Covers the entire 5 GHz band and easily integrates with BreezeACCESS’s 900 MHz, 2.4 GHz, 3.5 and 4.9 GHz bands using the same infrastructure and range of technologies
- Supports concurrent LOS, NLOS and multi-frequencies with subscriber speeds from 3 to 54 Mbps
- Permits operators to customize networks for various market segments to achieve the highest revenue per cell

Robustness and Reliability
- Adaptive modulation with 8 rates schemes and smooth changes between rates responding to link conditions, facilitating link robustness, set at the highest per customer rate possible
- Automatic transmit power control (ATPC) - the access unit automatically measures and adjusts the subscriber unit’s transmission power, enabling easier installation and optimizing network performance
- Supports various redundancy options
- Built-in Forward Error Correction and retransmission correcting lost and damaged bits
- Full outdoor rated equipment option with OPS-AC-HD

System Components
The BreezeACCESS VL solution consists of a base station and customer premises equipment (CPE) units. The base stations are available as either modular or stand-alone micro cell units. CPEs are available in various models for differing bandwidths and single or multiple user configurations.

Access Units (AUs)
Installed at the base station site, each AU includes indoor and outdoor units. The indoor connects to the network through a standard Ethernet 10/100BaseT (RJ-45) interface and to the outdoor unit is connected to the indoor unit through a CAT-5 cable. Alvarion offers two types of base stations:
- The modular shelf base station (BS-SH-VL) 19” 3U universal chassis holding up to 6 AU modules. Two power supply modules can be used in a BS-SH-VL chassis (either AC or DC) for fail-safe operation. The AU-D-BS kit includes a chassis based indoor unit, pole mounted outdoor unit and sector antennas.
- The stand-alone micro base station (AU-D-SA) kit includes a small indoor unit, pole-mounted outdoor unit and a sector antenna.

A variety of antennas can be used with the base station: 360, 120, 90 and 60 degrees.

Subscriber Units (SUs)
The subscriber unit (SU) enables customer connection with the base station and supports single or multiple end users. SUs provide an efficient platform for always-on, high-speed Internet and Intranet, VoIP, VPN and other services. Each SU connects to the network through a standard Ethernet 10/100BaseT (RJ-45) interface and connects to its outdoor part via CAT-5 cable. Each SU kit includes a single data port indoor unit, CAT-5 indoor-outdoor cable, pole mounted outdoor unit and integrated antenna in most cases. Several subscriber unit add on modules are available including; the networking gateway that offers residential, SOHO and SME subscribers a flexible range of wireless and wired networking services and the voice gateway that offers the efficient provision of voice and data.

Several CPE models are available (9 kHz frequency band):
- The SU-A-F-3-1D-VL supports gross rate of up to 3 Mbps for a single user, includes integrated antenna
- The SU-A-F-6-8D-VL supports gross rate of up to 6 Mbps for multiple users, includes integrated antenna
- The SU-A-F-54-SD-VL supports gross rate of up to 54 Mbps for multiple users, includes integrated antenna
- The SU-E-F-54-SD-VL supports gross rate of up to 54 Mbps for multiple users, does not include antenna
Specifications

Radio

- Frequency: 4.900 - 5.100 GHz, 5.15 - 5.35 GHz, 5.47 - 5.725 GHz, 5.725 - 5.825 GHz
- Radio access method: Time Division Duplex (TDD)
- Channel: 10 MHz, 20 MHz
- Center frequency resolution: ±0.1 MHz
- Max output power (at antenna port): 1.8 dBm
- Sensitivity, typical (dBm at antenna port): 0 dBm
- Modulation scheme (modulation at antenna port): OFDM
- Modulation scheme (Europe): 40 MHz
- Modulation schemes (Asia Pacific): 20 MHz
- Subscriber integrated antenna: 0 dBu at 4.9 GHz band, 0 dBv, 2-antenna Integrated True Diversity
- All antennas: 0 dBu, 10 dBi, 70° horizontal, 10° vertical
- Modulation scheme (Europe): OFDM: BPSK, QPSK, QAM 16, QAM 64
- Modulation scheme (Asia Pacific): BPSK, QPSK, QAM 16, QAM 64
- 16 x 16 dB steerable horizontal, 16° vertical
- 360°: 8 dBi, Sector 360°, horizontal, 16° vertical (AU-SA only)

Data Communication

- SC/10 support: Based on IEEE 802.1q, QIHQ 802.3ad
- Layer-2 traffic prioritization: Based on IEEE 802.1p
- Layer-3 traffic prioritization: IP ToS according to RFC791 and DSCP according to RFC2474
- Layer-4 traffic prioritization: QoS
- Security: WEP 128-bit authentication, AES 128, WEP 128, and certified FIPS-197 mode built in encryption

Configuration and Management

- Local & remote management: SNMP based MIB and windows based configuration utility, Telnet
- Management access protection: Multilevel password
- Configuration of remote direction (from Ethernet only, wireless only, or both sides)
- Configuration of IP addresses of authorized stations
- Software upgrades: Via TFTP and FTP
- Configuration upload/download: Via TFTP and FTP
- SNMP agents: SNMP v1 client, MIB II, Bridge MIB, Private BreezeACCESS VL MIB

Physical and Electrical

- Type: ALU-36, ALU-96
- Connector: 3-pin power plug
- Acoustic output: 54V, 3.3V
- Acoustic input: 85-265VAC, 47-65Hz
- Power consumption: 240W, full
- Power consumption: 54 VDC from indoor to outdoor
- Power consumption: 25W, full
- Power consumption: 30W

Standards Compliance

- Frequency band: Global
- EMI: FCC Part 15 Class B, CE, VCCI
- Environmental: Operation: ETS 300 019 part 2-3 class 3.2E for indoor units
- Storage: ETS 300 019 part 1-2 class 1.2E
- Lightning protection: EN 61000-4-5, class 3 (UXI)
- Radio: FCC part 15

Note: Not all options are available in all regions and some features require software/licensing key. Please contact your local representative for further information.