Premium License-Exempt Broadband Wireless Solutions

alvarion®
Your Open WiMAX Choice

BreezeACCESS® VL

Alvarion's BreezeACCESS VL is a flexible and field proven Point-to-Multipoint (PtMP) solution providing broadband wireless outdoor connectivity for a variety of applications in urban and rural deployments. Available in a range of frequencies in the 5 GHz and 900 MHz bands, this widely deployed platform offers a carrier-class outdoor link with enhanced security and capacity as well as top QoS for data, voice and video services.

BreezeACCESS VL supports a wide range of subscriber units, providing an optimized solution for the performance and cost requirements of various markets and customers. It enables operators, municipalities, enterprises and communities around the world to quickly and cost-effectively benefit from an array of top quality broadband services.

System Advantages

- **Powerful Access:** Proven robust system enabling best-of-class service delivery, including long range and high-capacity service. The Access Unit (AU) automatically selects algorithm for best possible service, rapid antenna alignment and SLA enforcement.
- **Quality Connectivity:** Optimized bandwidth allocation, including over-the-air and traffic prioritization, to best fit the needs of a wide variety of applications such as data, voice and video streaming and providing cost-effective quality connectivity.
- **Flexibility:** Subscriber units can be located exactly where required and transferred when necessary, since the system is free of wired infrastructure restraints and ensures full tactical communications in every possible configuration.
- **Quick Installation:** Subscriber units can be easily deployed using the SNR alignment LED bar, enabling operators to minimize OPEX and expedite deployment rate.
- **Compelling Business Case:** Combination of reduced CAPEX and OPEX supported by maximized efficiency and the need for less equipment with scalable pay-as-you-grow support.
- **Maximizes Modularity:** Non-Line-of-Sight (NLOS) support, high bandwidth capacity, increased coverage, multi-subscriber profiles in same sector and network.
- **Reliability and Availability:** Ruggedized, carrier-class outdoor solution operating over an extended temperature range.
- **Security:** Built-in encryption and a host of secure management and authentication functions.
- **Complete Offering:** Seamless integration with BreezeACCESS Wi² for urban WiFi services.

Feature Highlights

- Premium 5 GHz and 900 MHz PtMP solution
- QoS for data, voice and video applications
- Coverage range of up to 30 km Line of Sight (LOS)
- Capacity of up to 32 Mbps per sector
- 900 MHz with near/NLOS support, and excellent propagation capabilities
- Secure connectivity - FIPS-140-2* and HW-based FIPS-197 and AES 128
- TDD OFDM NLOS technology
- Configurable MIR/CIR per SU per direction
- Scalable license-based pay-as-you-grow configurations
- Wide range of subscriber units supporting various applications and customer requirements

* Certification in future release

AM ACUICOLA MARINA S.L.

"Our Alvarion network is priceless in its functionality and business impact. Production is up, profits are up and all as a result of a cost-effective network that took only a day to build."

Tahiche Lacomba, CEO
Acuicola Marina, Spain

Lenexa KANSAS

"Alvarion equipment is robust and extremely reliable."

Dan Carr, General Manager,
Electronic Technology Inc.

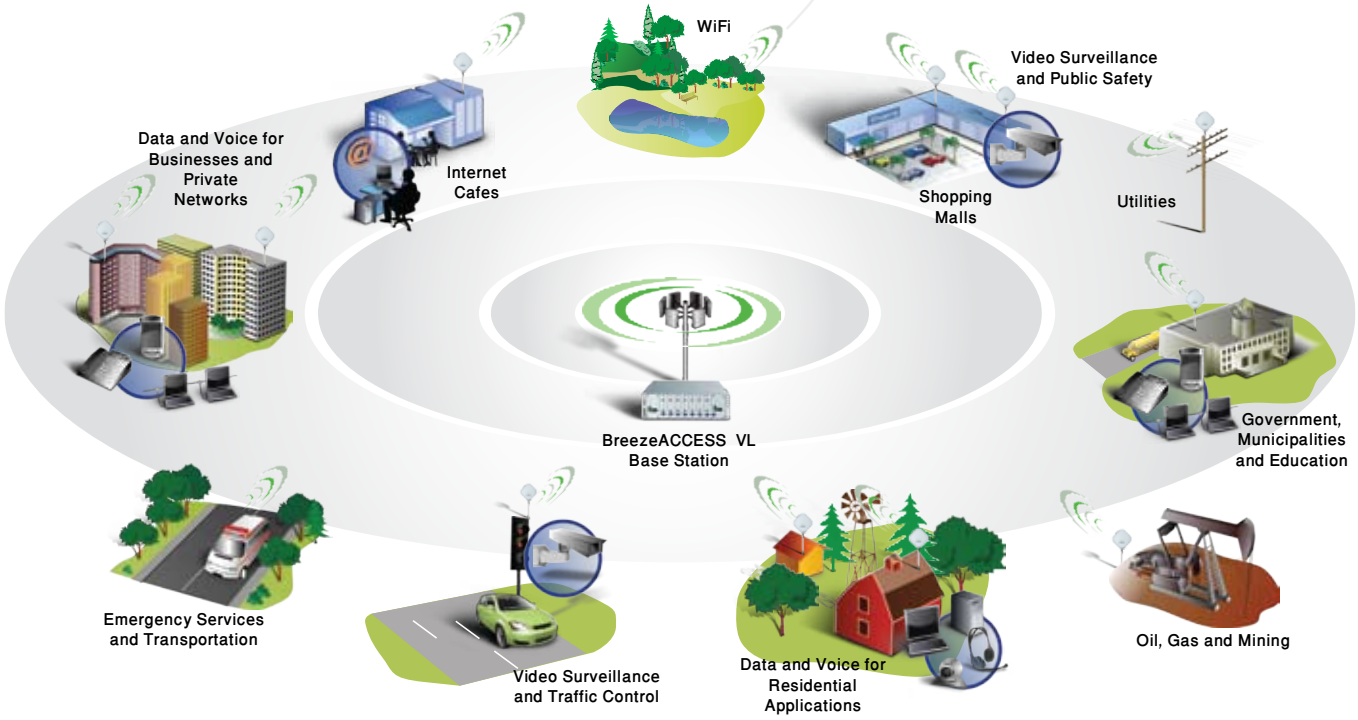
Unit	Unit Type	Main Attributes
AU (Access Unit)	Chassis-based base station 	Modular shelf base station with a universal chassis. Can host up to 6 AU modules • Carrier grade 19" chassis • 1 to 6 sectors per chassis • Outdoor unit (ODU) for each sector • Mix and match different bands • Optional redundant power supply • Total net capacity > 192 Mbps (32 x 6 sectors)
	Stand-alone base station 	• Single sector AU comprised of an indoor unit (IDU) and outdoor unit (ODU) • Optional all-outdoor or DC solution
SU (Subscriber Unit) Comprised of an indoor unit (IDU) and outdoor unit (ODU). The IDU connects to the network via a standard Ethernet 10/100BaseT (RJ-45) interface and to the ODU via a CAT-5 cable.	SU-3[1], SU-6, SU-54 	• Net aggregated throughput: SU-3: 3 Mbps SU-6: 6 Mbps SU-54: 32 Mbps • Different part numbers for each frequency (0.9, 4.9, 5.2, 5.3, 5.4, 5.8) • Quick installation using LEDs for fast alignment • Supports 2 different services per SU (2 priority levels) • Coverage range of up to 30 km (LOS)
	SU-Lite 	• Net aggregated throughput: SU-3L: 3 Mbps SU-6L: 6 Mbps SU-12L:12 Mbps • Single part number for the entire 5 GHz band • Coverage range of up to 12 km (FCC LOS)
	SU-Video 	• Fixed asymmetric throughput: 8 Mbps uplink and 2 Mbps downlink • Available in 5.4 GHz and 5.8 GHz • Quick installation using LEDs for fast alignment • Supports 2 different services per SU (2 priority levels) • Coverage range of up to 30 km (LOS)
Management System		• All AUs and SUs are managed by Alvaristar NMS and AlvariCRAFT configuration tool • All AU types are interoperable with all SU types • All SU types can be deployed in the same sector

1. In VL900 - SU3 only

Selling Model and Deployment Options	Benefits	Accessories
Multi-sector: AUS–BS • Entry level price • Supports up to 8 SUs per sector • SW can be upgraded to full AU-BS	• Supports a pay-as-you-grow business model • Optimized configuration for vertical applications • Supports any SU model in the same sector • Superior NLOS performance for public safety applications in urban deployments	External antenna OMNI/60/90/120
Multi-sector: AU-BS • Supports up to 512 SUs per sector		
Single-sector: AUS–SA • Entry level price • Supports up to 8 SUs per sector • SW can be upgraded to full AU-SA		• External antenna OMNI/60/90/120 • All-outdoor configuration: outdoor PS + ODU The AU-SA can operate optionally with an all-outdoor AC or DC power supply
Single-sector: AU-SA • Supports up to 512 SUs per sector		
• Data, voice and video applications • Extended range • Pay-as-you-grow business model with software upgrades: SU-3⇨SU6 SU-3⇨SU-Video SU-3⇨SU8[2] SU-6⇨SU-Video SU-6⇨SU54 SU-Video⇨SU-54	• Supports a pay-as-you-grow business model • Optimized configuration for vertical applications • Supports any SU model in the same sector	Integral \ external antenna H/V flat panel
• Primarily residential data and voice[3] applications • Pay-as-you-grow business model with software upgrades: SU-3L⇨SU-6L SU-6L⇨SU-12L	• Cost-effective solution for residential market. All VL-SU models can be deployed in the same sector • Extended coverage over the entire 5 GHz band	Integral antenna
	• Optimized bandwidth support for video applications	• Integral antenna • All-outdoor configuration: replaces the IDU with an all-outdoor power supply (OPS-HD-AC)

2. Only in VL900
3. Future support

Range of Applications



Specifications

Radio

Frequency
902-927 MHz, 4.9-5.1 GHz,
5.15-5.35 GHz, 5.47-5.725 GHz,
5.725-5.875 GHz
4.9-5.875 GHz (SU-L)

Radio access method
Time Division Duplex TDD

channel
AU/SU: 5 MHz (900 MHz), 10 MHz, 20 MHz
SU-L: 20 MHz, 10MHz[2]

Central frequency resolution
1 MHz (900 MHz), 5 MHz, 10 MHz

Max input power (at ant. port)
-48 dBm typical

Max output power (at antenna port)
AU: -10 dBm to 21 dBm, 1 dB steps
AU (900 MHz): -10 dBm to 27 dBm, 1 dB steps
SU: -10 dBm to 21 dBm, automatically adjusted by ATPC
SU (900 MHz): -10 dBm to 27 dBm, automatically adjusted by ATPC
SU-L: -9 dBm to 18 dBm, 3 dB steps

Modulation scheme (adaptive)
OFDM: BPSK, QPSK, QAM 16, QAM 64

Antenna port (AU-E)
N-Type 50 ohm

Subscriber integrated antenna
20 dBi (19 dBi in 4.9-5.1 GHz band), 14° H/V, integrated flat panel
17 dBi, 24°AZ x 18°EL, integrated flat panel (SU-L)

AU antennas
60°: 16dBi, sector 60° vertical
90°: 16dBi, sector 90° vertical
120°: 15dBi, sector 120° vertical ,
360°: 8dBi, Omni horizontal,

Data Communications

VLAN and QoS support
QinQ 802.1ad[1], 802.1Q
WLP over the air traffic prioritization
MIR/CIR per SU per direction (UL/DL)
Concatenation, burst mode, small packet optimization to support voice[2]
Advanced automatic transmit power control (ATPC)

Traffic prioritization[2]
Layer 2: Based on IEEE 802.1p
Layer 3: IP ToS according to RFC791 and DSCP according to RFC2474
Layer 4: UDP/TCP port range

Security
WEP 128-bit authentication, AES 128, WEP 128, certified built-in encryption
FIPS-197 mode and FIPS-140-2[1 3]

1. **Not supported currently in SU-L**
2. **Planned for future SU-L support**
3. **Certification in future release**

Specifications (Continued)

Electrical Characteristics

Power consumption

SU/ AU-SA:	25W
AU-BS:	30W (module plus outdoor unit)
SU-L:	Typical 10W, maximum 40W
BS-PS-AC-VL (AC power supply):	240W, full chassis (1PS, 6 AU)
BS-PS-DC-VL (DC power supply):	240W, full chassis (1PS, 6 AU)

Input power

SU / AU-SA:	AC input 100-240 VAC, 50-60 Hz
AU-BS:	AC input 100-240 VAC, 50-60 Hz
SU-L:	AC Input 85-265 VAC, 50-60 Hz DC output 55 VDC, 1A MAX
PS (IDU):	54 VDC from indoor to outdoor 3.3 VDC, 54V from power supply in backplane
BS-PS-AC-VL (AC power supply):	AC input 85-265 VAC, 47-65 Hz DC output 54V, 3.3V
BS-PS-DC-VL (DC power supply):	DC input -48 VDC nominal (-34 to -72), 10 A max. DC output 54V, 3.3V

Connectors

ODU
SU / AU-SA:
Ethernet: 10/100BaseT RJ-45
Radio: 10/100BaseT Ethernet RJ-45
AC IN: 10/100BaseT Ethernet RJ-45

SU-L:
Ethernet: 10/100 BaseT RJ-45
Radio: 10/100 BaseT Ethernet RJ-45
AC IN: 3-pin AC power plug

AU-BS:
Ethernet: sealing assembly
Radio: 10/100BaseT Ethernet RJ-45

IDU
SU / SU-L / AU-SA:
Indoor: 3-pin AC power plug
10/100Base RJ-45 (waterproof)

AU-BS:
BS-PS-AC-VL (AC power supply):
AC IN: 3-pin power plug
BS-PS-DC-VL (DC power supply):
-48 VDC: 3-pin DC D-Type 3 power pin plug Amphenol

Configuration and Management

Local and remote management
Local and remote management
Monitor via Telnet, SNMP and configuration upload/download
Web and SSH V2 (only in SU-L)

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

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 Environmental

Dimensions

SU ODU with integrated antenna:	30.5 x 30.5 x 6.2 cm (0.55 kg) / 12 x 12 x 2.4 in (1.21 lb)
SU ODU without integrated antenna:	30.6 x 12 x 4.7 cm (1.85 kg) / 12 x 4.7 x 1.8 in (4.07 lb)
SU-L outdoor unit:	195 x 190 x 74 mm (1.47 kg) / 7.6 x 7.4 x 2.9 in (3.24 lb)
SU-L indoor unit:	140 x 66 x 35 mm (0.3 kg) / 5.5 x 2.6 x 1.3 in (0.66 lb)

Operating temperature

SU/AU outdoor units:	-40°C to 55°C
SU/AU indoor units:	0°C to 40°C
SU-L outdoor unit:	-40°C to 55°C
SU-L indoor unit:	0°C to 40°C

Operating humidity

SU/AU outdoor units:	5%-95% non condensing, weather protected
SU/AU indoor units:	5%-95% non condensing
SU-L outdoor unit:	Maximum 95% non condensing

Standard Compliance

Type
Standard

EMC
FCC Part 15 class B, EN55022 class B, EN 301 489-1/4

Safety
EN 60950-1, UL 60950-1

Environmental
EN 300 019 part 2-3 class 3.2E for indoor units
EN 300 019 part 2-4 class 4.1E for outdoor units IP-65, SU integral antenna IP-65

Storage
EN 300 019-2-1 class 1.2E

Hazardous substances
RoHS compliant

Transportation
EN 300 019-2-2 class 2.3

Lightning protection
EN 61000-4-5, class 3 (2kV)

Radio
EN 301 893 (V 1.5.1)
EN 302 502 (V 1.2.1)
FCC part 15, FCC P.90,
IC RSS-210 (Canada)

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

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