



# Premium License-Exempt Broadband Wireless Solutions

## BreezeACCESS® VL

### 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

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.



Unit	Unit Type	Feature Highlights	Deployment Options	Benefits	
<b>AU (Access Unit)</b>  	<b>Chassis-based base station</b>  	<ul style="list-style-type: none"> <li>Carrier grade chassis</li> <li>1 to 6 sectors per chassis</li> <li>Outdoor unit (ODU) for each sector</li> <li>Mix and match support for different bands</li> <li>Optional redundant power supply</li> <li>Total net capacity &gt; 192 Mbps (32 x 6 sectors)</li> </ul>	<b>Multi-sector: AUS-BS</b> <ul style="list-style-type: none"> <li>Entry level price</li> <li>Supports up to 8 SUs per sector</li> <li>Upgradable to full AU-BS</li> </ul>	<ul style="list-style-type: none"> <li>Pay-as-you-grow support</li> <li>Optimized configuration for vertical applications</li> <li>Supports any SU model in the same sector</li> <li>Superior NLOS performance for public safety applications in urban deployments</li> </ul>	
	<b>Standalone base station</b>  	<ul style="list-style-type: none"> <li>Single sector AU comprised of an indoor unit (IDU) and outdoor unit (ODU)</li> <li>Optional all-outdoor or DC solution</li> </ul>	<b>Multi-sector: AU-BS</b> <ul style="list-style-type: none"> <li>Supports up to 512 SUs per sector</li> </ul>		
			<b>Single-sector: AUS-SA</b> <ul style="list-style-type: none"> <li>Entry level price</li> <li>Supports up to 8 SUs per sector</li> <li>Upgradable to full AU-SA</li> </ul>		
			<b>Single-sector: AU-SA</b> <ul style="list-style-type: none"> <li>Supports up to 512 SUs per sector</li> </ul>		
<b>SU (Subscriber Unit)</b>  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.	<b>SU-3<sup>1</sup>, SU-6, SU-54</b>  	<ul style="list-style-type: none"> <li>Net aggregated throughput:               <ul style="list-style-type: none"> <li>SU-3: 3 Mbps</li> <li>SU-6: 6 Mbps</li> <li>SU-54: 32 Mbps</li> </ul> </li> <li>Different part numbers for each frequency (0.9, 4.9, 5.2, 5.3, 5.4, 5.8 GHz)</li> <li>Quick installation using LEDs for fast alignment</li> <li>Supports 2 different services per SU (2 priority levels)</li> <li>Coverage range of up to 30 km (LOS)</li> </ul>	<ul style="list-style-type: none"> <li>Data, voice and video applications</li> <li>Extended range</li> <li>Pay-as-you-grow upgrade options:               <ul style="list-style-type: none"> <li>SU-3⇒SU6</li> <li>SU-3⇒SU-Video</li> <li>SU-3⇒SU8<sup>2</sup></li> <li>SU-6⇒SU-Video</li> <li>SU-6⇒SU54</li> <li>SU-Video⇒SU-54</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>Pay-as-you-grow support</li> <li>Optimized configuration for vertical applications</li> <li>Supports any SU model in the same sector</li> </ul>	
	<b>SU-Lite</b>  	<ul style="list-style-type: none"> <li>Net aggregated throughput:               <ul style="list-style-type: none"> <li>SU-3L: 3 Mbps</li> <li>SU-6L: 6 Mbps</li> <li>SU-12L:12 Mbps</li> </ul> </li> <li>Single part number for the entire 5 GHz band</li> <li>Coverage range of up to 12 km (FCC LOS)</li> </ul>	<ul style="list-style-type: none"> <li>Primarily residential data and voice applications</li> <li>Pay-as-you-grow upgrade options:               <ul style="list-style-type: none"> <li>SU-3L⇒SU-6L</li> <li>SU-6L⇒SU-12L</li> </ul> </li> </ul>		<ul style="list-style-type: none"> <li>Cost-effective solution for residential markets. All VL-SU models can be deployed in the same sector</li> <li>Extended coverage over the entire 5 GHz band</li> </ul>
	<b>SU-Video</b>  	<ul style="list-style-type: none"> <li>Fixed asymmetric throughput: 8 Mbps uplink and 2 Mbps downlink</li> <li>Available in 5.4 GHz and 5.8 GHz</li> <li>Quick installation using LEDs for fast alignment</li> <li>Supports 2 different services per SU (2 priority levels)</li> <li>Coverage range of up to 30 km (LOS)</li> </ul>	<ul style="list-style-type: none"> <li>Optimized bandwidth support for video applications</li> </ul>		
<b>Management System</b>	<ul style="list-style-type: none"> <li>All AUs and SUs are managed by AlvariStar NMS and AlvariCRAFT configuration tool</li> <li>All AU types are interoperable with all SU types</li> <li>All SU types can be deployed in the same sector</li> </ul>				

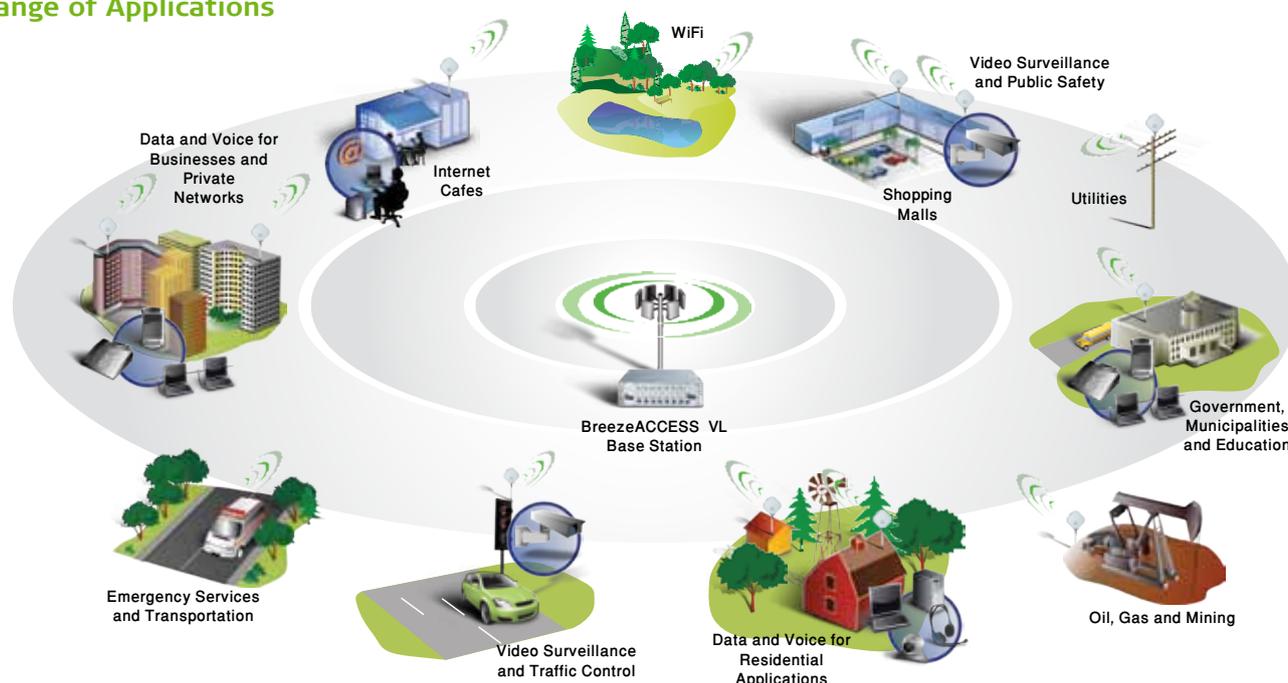
1. In VL900 - SU3 only

2. Only in VL900

## 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 Wi<sup>2</sup> for urban WiFi services.

## 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  
5.15-5.875 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

**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  
(Wall/pole mount with tilting  
option)

**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

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## 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
BS-PS-DC-VL (DC power supply):	DC output 54V, 3.3V 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

### 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

### About Alvarion

Alvarion (NASDAQ:ALVR) is a global 4G communications leader with the industry's most extensive customer base, including hundreds of commercial 4G deployments. Alvarion's industry leading network solutions for broadband wireless technologies WiMAX, TD-LTE and WiFi, enable broadband applications for service providers and enterprises covering a variety of industries such as mobile broadband, residential and business broadband, utilities, municipalities and public safety agencies. Through an open network strategy, superior IP and OFDMA know-how, and ability to deploy large scale end-to-end turnkey networks, Alvarion is delivering the true 4G broadband experience today ([www.alvarion.com](http://www.alvarion.com))

### 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

### Data Communications

#### VLAN and QoS support

QinQ 802.1ad<sup>1</sup>, 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  
Advanced automatic transmit power  
control (ATPC)

#### Traffic prioritization

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<sup>1,2</sup>

1. Not supported currently in SU-L
2. Certification in future release