

# BreezeACCESS™

Seamless wireless broadband infrastructure  
for carriers, ISPs, and network operators.



## Wireless DSL - Broadband IP

- Access, backhauling and mobility
- Field proven in over 130 countries worldwide
- Complete spectrum: 900MHz, 2.4, 3.5, 5GHZ
- Technology excellence
- Deployment flexibility and network scalability
- Low entry level, pay-as you grow

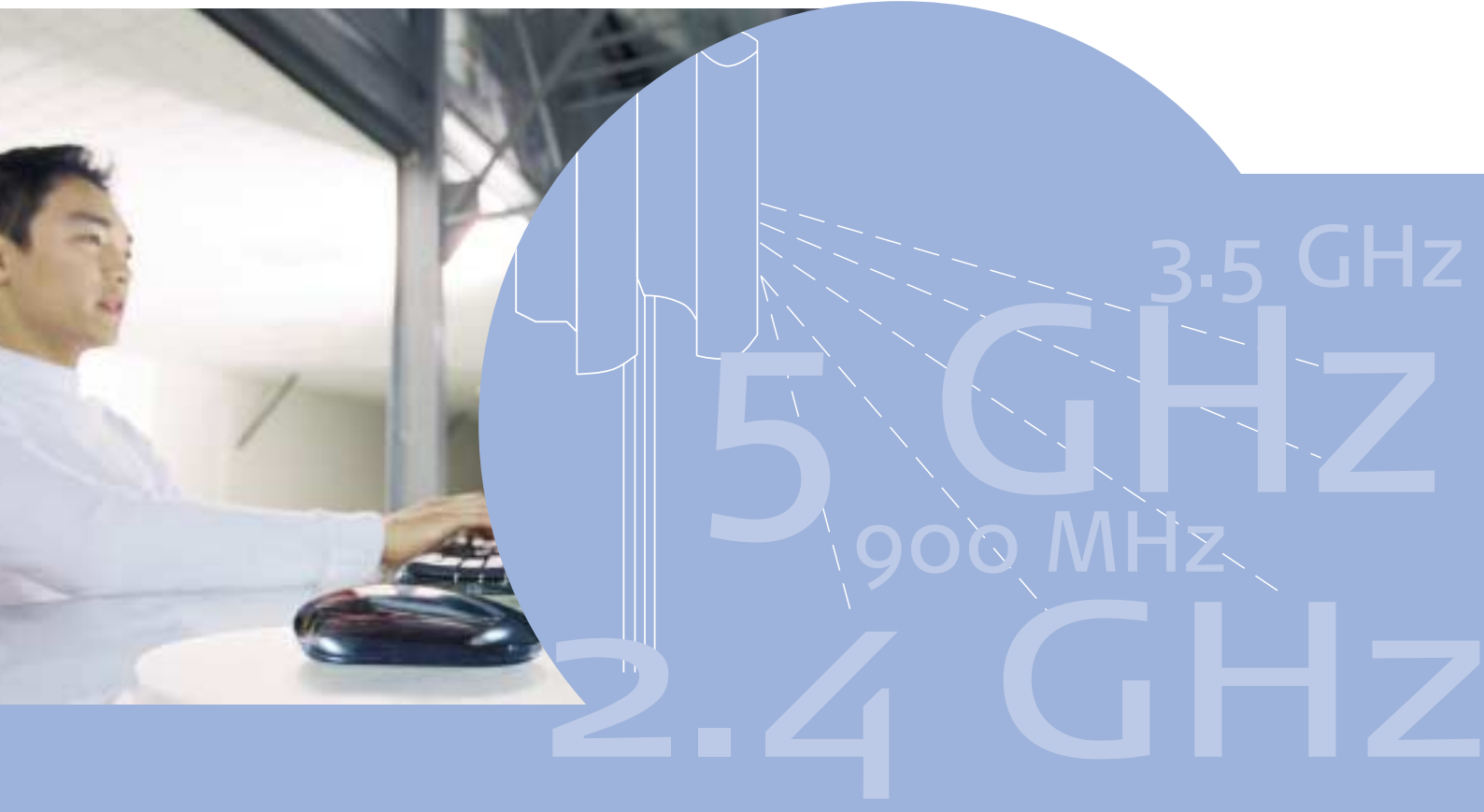
# BreezeACCESS

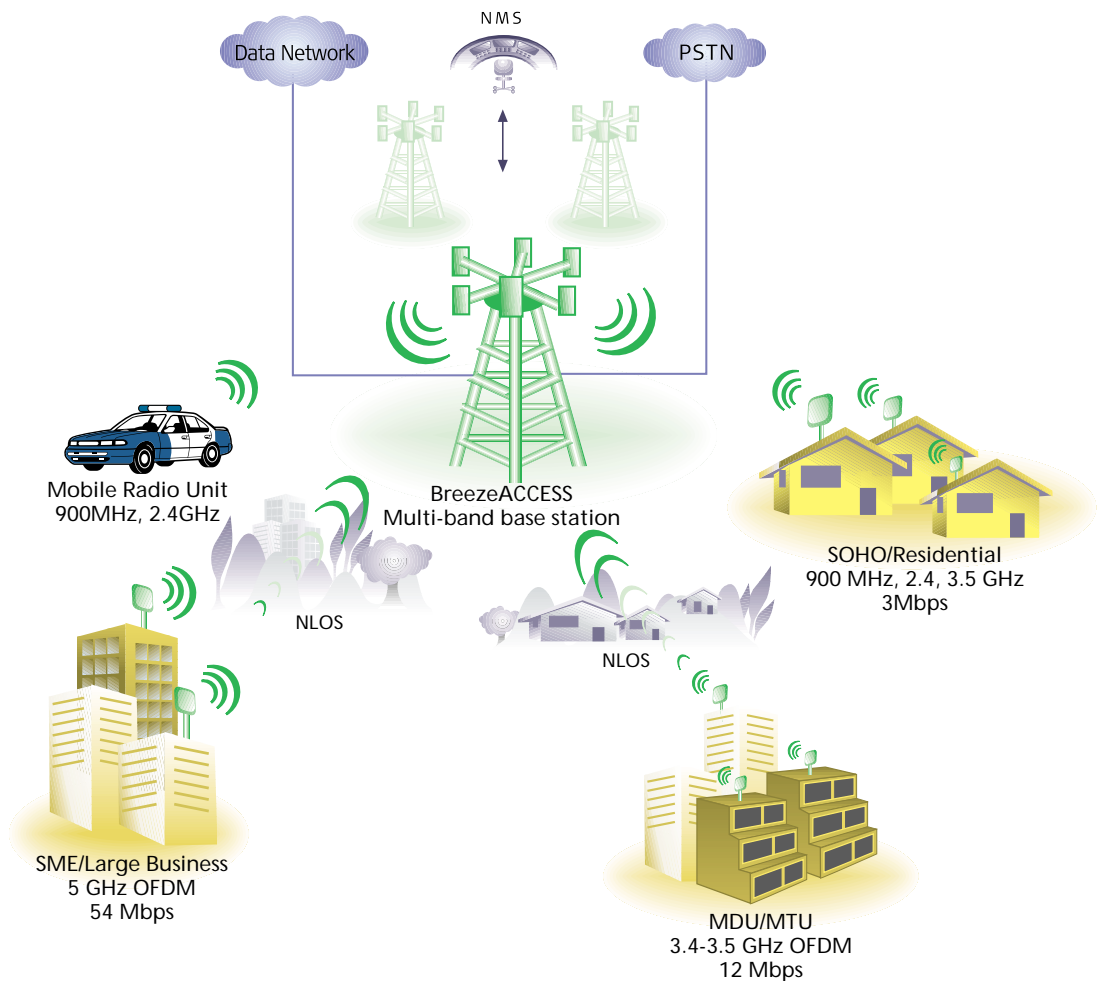


Leveraging broadband wireless technology to bring operators and service providers a new class of wireless DSL, BreezeACCESS ensures consistently robust, high-speed wireless Internet and a full complement of value-added service options, including Voice over Internet Protocol (VoIP), Virtual Private Networks (VPN) and superior Quality of Service (QoS).

With the most wireless broadband deployments, Alvarion integrates expertise and experience to offer customers simple business advantages. BreezeACCESS provides operators with the ability to capture revenue opportunities by addressing all subscriber profiles and service offerings and overcoming NLOS obstacles. This means an operator can generate more revenue per cell with BreezeACCESS than any other platform. The wide range of BreezeACCESS wireless solutions enable customers to optimize their network to suit their unique environment and business model with a superior broadband network infrastructure.

Independent of landline infrastructure and using standard IP-based components, BreezeACCESS solutions feature rapid roll out, minimal initial investment and low installation costs. Scalable and rapidly deployable anywhere, BreezeACCESS enables operators and service providers to deliver sustainable voice and data services to every market segment and reap the benefits of rapid return on investment, substantially enhanced revenues and increased profitability.





## The Power of BreezeACCESS

BreezeACCESS operates in the broadest choice of bands and is available with a mobility option. Using packet switching technology optimized for IP-based applications and featuring LOS and NLOS capabilities, BreezeACCESS ensures dependable, interference resistant fast packet-based data transmission and “always on” connectivity. BreezeACCESS provides CPEs to suit every type of customer, such as residential, SOHO, SME, MDU and enterprises and provides the highest total CPE population per cell.

Operating in 900MHz, 2.4GHz, 2.5GHz, 3.5GHz and the entire 5GHz band,  
BreezeACCESS includes:

- Adaptive Circuit Switched Emulation (ACSE) air protocol to maintain the efficiency of IP transmission, while reserving specific time slots for active voice call traffic
- Time Division Duplex (TDD) and Frequency Division Duplex (FDD) modes
- Toll quality voice with integrated RJ-11 voice ports in subscriber units
- Enhanced Quality of Service (QoS) features, such as 802.1Q based VPN, 802.1p based prioritization, CIR/MIR setting
- Easy-to-use SNMP-based remote management system



# Breeze**ACCESS**

## System Components

### Base Station Equipment

#### Base Station Shelf

The 19" base station shelf (BS-SH) accommodates up to six access unit (BS-AU) modules to supply reliable access to the maximum numbers of subscribers. The base station shelf incorporates up to two redundant power supply modules, which are served by either a -48 VDC or a 110/220 VAC power source. When using frequency hopping spread spectrum the BS-AU cards can be synchronized using a GPS module to ensure optimal utilization of the available frequency spectrum.

#### Access Units (AU)

The access units contain an indoor module that is inserted into the base station shelf and an outdoor unit.

- AU-A units: Comprise an indoor module and an outdoor unit that includes a radio unit and integrated panel antenna
- AU-E units: Feature an indoor module and an outdoor unit that includes a radio unit with an RF connector for a separate external antenna

#### Mini Base Station

The micro cell access units (AU) are stand-alone modules operating as mini base stations. The mains powered indoor units are designed to fit conveniently on a desktop or mounted on a wall. Data, power, management and control signals are transmitted from the indoor unit to the outdoor unit via cable.

The outdoor units feature two antenna options: integrated or separate.

# Subscriber Units (SU)

- SU-A units comprise an indoor unit and an outdoor radio unit with an integrated panel antenna
- SU-E units feature an indoor unit and an outdoor unit that includes a radio unit with an RF connector for a separate external antenna
- SU-R units allow for simple and low-cost indoor installation. The high power SU-R unit is designed to fit conveniently on a desktop or mounted on a wall
- SU-C units combine the low-cost indoor installation of the SU-R units together with a high-gain (uni-directional) antenna for longer coverage range
- SU-I-D units feature an indoor unit with two RF connectors for detached diversity antennas

## SU-M - The Mobile Concept

The BreezeACCESS SU-M Mobile Radio Unit is the first wireless access product designed to provide reliable, easy, and quick access to data for mobile-bound services. Featuring robust, Frequency Hopping Spread Spectrum radio architecture, the SU-M operates on 12-volt automotive electrical power and is able to transfer large amounts of data at speeds of up to 3 Mbps.

## BreezeACCESS CX - Cell Extender

The BreezeACCESS CX Cell Extender redistributes broadband coverage from a primary wireless base station while serving as a local subscriber. It connects users who were previously unreachable due to obstacles such as foliage or hills. BreezeACCESS CX eliminates the need to install costly new backhuls and base stations thus significantly improving the economics of wireless broadband deployments.

### Access Units

### Subscriber Units



**BreezeACCESS** unique system flexibility  
allows for **any AU** to be connected  
to **any SU**



Unlicensed

# BreezeACCESS II

## Frequency – 900 MHz & 2.4 GHz

### Throughput – 3 Mbps

BreezeACCESS II is the unmatched broadband wireless access system for service providers operating in the unlicensed 900 MHz and 2.4 GHz ISM bands. Leveraging Frequency Hopping Spread Spectrum technology in Time Division Duplex (TDD) mode, BreezeACCESS II bypasses unusable copper to deliver dependable and consistent wireless broadband data services to remote locations.

The independent BreezeACCESS II infrastructure is immediately deployable with lower construction and operating costs than any other available solution.

Operating in the 900MHz and 2.4 GHz bands, BreezeACCESS II features include:

- Frequency Hopping Spread Spectrum (FHSS) radio technology to provide unlimited cell overlay capacity and seamless integration between cells, thus eliminating capacity planning or performance degradation when adding new subscribers
- Resistance to interference from other technologies operating in the same ISM band
- Available 900 MHz CPE types: SU-I, SU-M
- Available 2.4 GHz CPE types: SU-I, SU-R, SU-M, SU-A and SU-E



# BreezeACCESS V

## Frequency – 5 GHz

### Throughput – 3 Mbps

BreezeACCESS V incorporates the same components as BreezeACCESS II and is the ideal network expansion solution for service providers offering voice and IP-based services.

Operating in the 5.725-5.850 GHz and 5.15-5.35 GHz unlicensed bands, BreezeACCESS V features include:

- Frequency Hopping Spread Spectrum radio technology to provide unlimited cell overlay capacity and seamless

integration between cells, thus eliminating capacity planning or performance degradation when adding new subscribers

- Resistance to interference from other technologies operating in the same 5GHz ISM band
- Toll quality voice with integrated RJ-11 voice ports in subscriber units
- Available CPE type: SU-A

Wireless DSL      easy deployment  
Wireless expertise      Access  
Technology excellence      m

# BreezeACCESS VL

## Frequency – 5 GHz

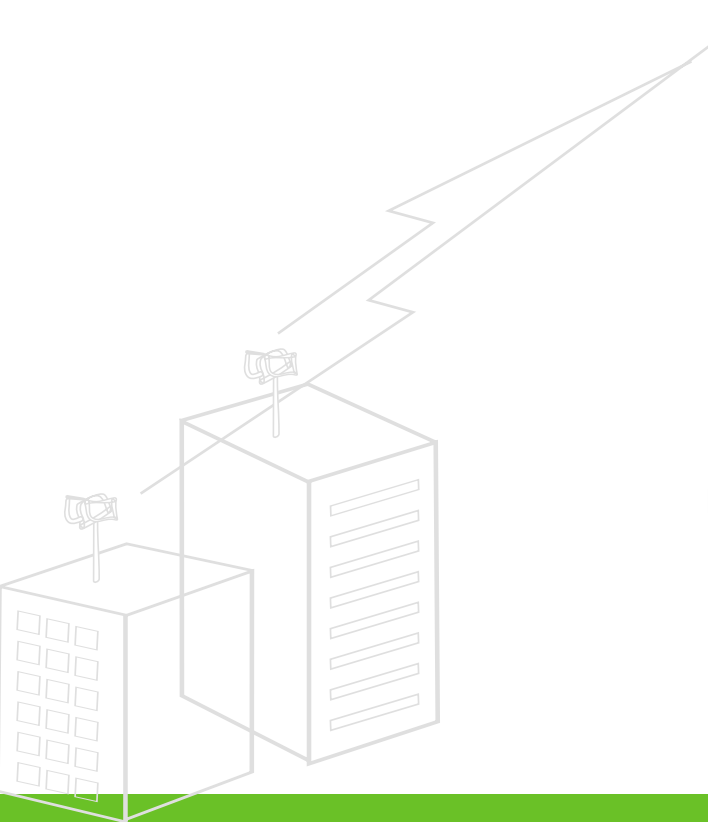
## Throughput – 54 Mbps

BreezeACCESS VL, the newest addition to the BreezeACCESS solution, is an advanced OFDM based PMP system, incorporating a comprehensive range of access features and developed to overcome the multiple challenges generally associated with Line of Sight (LOS) products.

BreezeACCESS VL ensures fast, consistent and reliable data services with highly efficient over-the-air rate, enabling operators to expand their approachable customer base, significantly increase revenue opportunities and generate a new and improved business model.

Operating in the 5GHz bands and facilitating data rates of up to 54Mbps with gross bandwidth yields from 3Mbps to 54Mbps, BreezeACCESS VL features include:

- Full 5GHz band support
- NLOS capability
- Enhanced QoS mechanisms, such as bandwidth management, dynamic BW allocation and prioritization
- Advanced security options, including WEP and AES based encryption, authentication and 802.1Q based VLANs
- Optimal installation and performance using Automatic Transmit Power Control (ATPC), automatic distance measuring and remote software upgrade and upload/download configuration files
- Adaptive modulation
- Dynamic Frequency Selection (DFS) for specific regions
- Available CPE type: SU-A



Field proven  
modularity  
mobility  
maximum revenues

# BreezeACCESS XL

Frequency – 3.5 GHz

Throughput – 3 Mbps

BreezeACCESS XL is the unrivaled broadband wireless access system for carriers seeking to exploit the full potential of their network infrastructure and extend their service offerings to previously unreachable potential subscribers located in remote or digitally-deprived locations. BreezeACCESS XL provides a comprehensive wireless infrastructure solution, developed to reach remote locations by eliminating the need for existing copper or fiber infrastructure and overcoming the limitations associated with xDSL and cable.

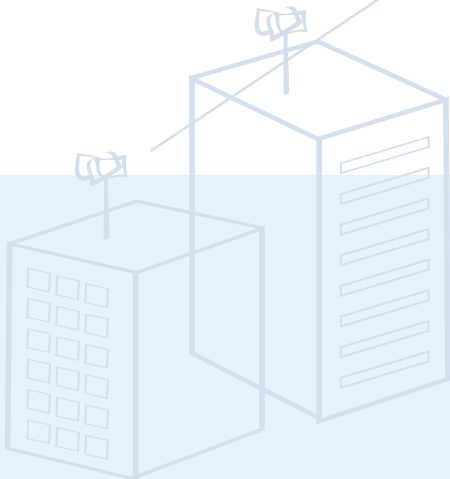
Based on FDD technology and operating in licensed frequency bands, BreezeACCESS XL provides a wide range of advanced IP-based services, including:

- Frequency Hopping Spread Spectrum (FHSS) radio technology to provide unlimited cell overlay capacity and seamless integration between cells, thus eliminating capacity planning or performance degradation when adding new subscribers
- Toll quality voice with integrated RJ-11 voice ports in subscriber units
- Available CPE types: SU-A, SU-E, SU-R and SU-C

## Radio Frequency

Series	Uplink (GHz)	Uplink-Downlink Separation (MHz)
2.6b	2.551 - 2.593	74
3.3a	3.300 - 3.324	76
3.5a1	3.400 - 3.450	100
3.5b	3.450 - 3.500	100
3.5ab	3.400 - 3.500	100 (for SU-R / SU-C only)
3.5e	3.425 - 3.450	50
3.6b	3.660 - 3.710	100
3.8	3.925 - 4.015	-320

Other bands are available upon commercial agreement.





# BreezeACCESS OFDM

Frequency – 3.5 GHz

Throughput – 12 Mbps

BreezeACCESS OFDM is a point-to-multipoint broadband wireless access system for operators offering high-bandwidth IP-based services. Leveraging the superb multi-path resistance capabilities of OFDM technology, BreezeACCESS OFDM facilitates efficient and reliable operation in near and non line of sight (NLOS) conditions, while ensuring high data rates, high spectral efficiency and immunity to interference and multi-path conflicts.

Featuring demand-based build-out, easy installation and low cost of ownership, BreezeACCESS OFDM enables rapid and cost effective market penetration, increased subscription potential and enhanced value added services.

The advanced FDD-based BreezeACCESS OFDM enables operators to reach previously inaccessible and broader segments of the subscriber population with fewer Base Stations, thus radically increasing revenue and profitability opportunities.

BreezeACCESS OFDM features include:

- High base station data capacity through the inherent ability of OFDM technology for high data rates and high spectral efficiency coupled with the BreezeACCESS OFDM system capability for frequency re-usability
- Raw data capacity of 72/192 Mbps over typical frequency allocations of 10.5/28 MHz respectively
- Packet switching technology optimized for IP-based applications and “always on” connectivity
- Independent uplink/downlink transmission settings for CIR/MIR, enabling assured and differentiated SLAs
- Adaptive modulation -maximize throughput according to radio performance: BPSK, QPSK, 16QAM, 64QAM sub-carrier modulation
- Available CPE types: SU-A and SU-E

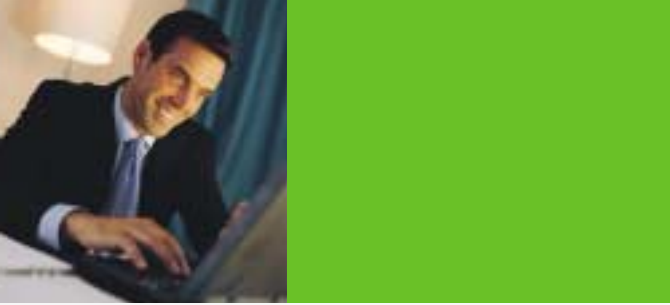
## AlvariBase™

AlvariBase has been developed to give operators unprecedented flexibility in the choice of customers served and services provided. Combining the very best of Alvarion solutions, AlvariBase enables operators to create a BWA system that delivers the multiple advantages of BreezeACCESS and WALKair in a single infrastructure.

BreezeACCESS systems deliver fast packet data and high quality VoIP telephony services, with the advantages of quick, simple and cost-effective BWA deployment. In addition, BreezeACCESS provides IP and POTS services to businesses and residences, with non line of sight operation and simple CPE installation.

WALKair systems are based on cell transport technology and deliver carrier-class TDM services as well as highly efficient IP connectivity.





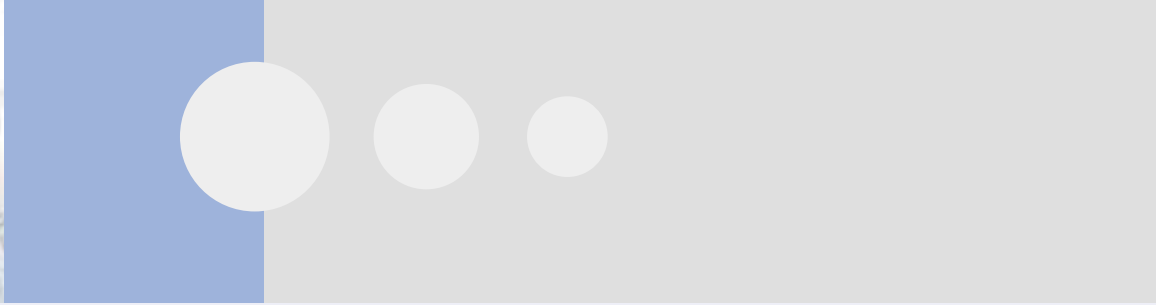
# AlvariSTAR™ Network Management System

In order to fully reap the benefits of their specific network technology and sustain minimal operating costs while maximizing revenues, service providers need an efficient, high quality carrier-class management solution to effectively monitor, maintain and provision their network.

Developed to maximize network potential, the AlvariSTAR network management solution incorporates extensive state-of-the-art feature-rich functionality including:

- Device Discovery
- Device Inventory
- Topology
- Fault Management
- Configuration Management
- Performance Monitoring
- Device embedded software upgrade
- Security Management
- Northbound interface to other Network Management Systems





Complementary Solutions for Wireless Applications

# BreezeACCESS RG Residential Gateway

The BreezeACCESS RG system allows operators and service providers to deliver high-quality IP-telephony and Ethernet access with enhanced security to residences and enterprises. Offering plug & play operation and simple remote management, BreezeACCESS RG adds feature-rich telephony options to any network.



## BreezeACCESS offers a complete range of Service Options

Customer Premises Equipment	Data only			Data & Voice	
	1D One data user	4D Four data users	BD Full bridge connection	1D1V One data user/ One voice line	BD1V Full bridge/One voice line
BreezeACCESS 900	○		○		
BreezeACCESS II	○		○	○	○
BreezeACCESS V	○		○	○	○
BreezeACCESS VL			○	via BreezeACCESS RG	
BreezeACCESS XL	○		○	○	○
BreezeACCESS OFDM		○	○	via BreezeACCESS RG	



## About Alvarion

With more than 2 million units deployed in 130 countries, Alvarion is the worldwide leader in wireless broadband providing systems to carriers, ISPs and private network operators. Leading the WiMAX revolution, Alvarion has the most extensive deployments and proven product portfolio in the industry covering the full range of frequency bands. Alvarion's products enable the delivery of business and residential broadband access, corporate VPNs, toll quality telephony, mobile base station feeding, Hotspot coverage extension, community interconnection, and public safety communications. Alvarion works with several top OEM providers

and over 200 local partners to support its diverse global customer base in solving their last-mile challenges. As a wireless broadband pioneer, Alvarion has been driving and delivering innovations for over 10 years from core technology developments to creating and promoting industry standards. Leveraging its key roles in the IEEE and HiperMAN standards committees and experience deploying OFDM-based systems, the company's prominent work in the WiMAX Forum™ is focused on increasing widespread adoption of standards-based products in the wireless broadband market.

### Alvarion Customer Service

Designed to complement its leading Wireless Broadband solution, Alvarion Customer Service provides the best ratio of cost-effective support to its customers. Our customer support includes overall cooperation in fields like network planning, installation engineering and technical education. Customer Service for us means partnership, shared experience and total commitment.



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Alvarion offers the industry's most-comprehensive line of broadband wireless access systems serving the full range of frequencies, markets, and carrier needs.

- **BreezeACCESS**
  - Broadband IP systems for wireless DSL
  - Access, backhaul, and mobility
  - Complete Spectrum™ Solution
  - 900 MHz, 2.4, 3.5, 5.0, 5.2, 5.4, 5.7 GHz
- **MGW/eMGW**
  - Wideband voice and data systems
  - Toll quality voice and data access
  - 1.5, 1.9, 2.4, 3.4-3.8, 5.7 GHz
- **WALKair**
  - Multi-service wireless broadband systems
  - Access and mobile base station feeding, backhaul
  - Licensed spectrum solutions: 3.5, 10.5, 26, 28 GHz
- **BreezeNET**
  - Wireless networking system
  - Bridging and backhauling connectivity
  - 2.4 and 5.8 GHz
- **BreezeMAX**
  - 802.16 / HiperMAN Design
  - IP based at 3.5 GHz
  - Non Line of Sight
  - WiMAX Platform



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