

Future-Proof  
WiMAX™ with  
802.16e-Based  
Solution

# BreezeMAX<sup>®</sup> 3650

BreezeMAX 3650 is a 802.16e-based WiMAX solution for the US FCC 3.65-3.70 GHz frequency band allocated for wireless broadband, which includes macro and micro base stations. Incorporating Alvarion's field-proven and mature WiMAX technology, which is one of the market's most popular 802.16e-based, WiMAX solutions, BreezeMAX 3650 provides superior coverage and capacity that results in fewer cell sites for reduced CAPEX and OPEX and an improved business case. Furthermore, as an 802.16e-based solution, BreezeMAX 3650 offers a future-proof network with optimized value of investment.



## BreezeMAX 3650 Main Features

- Advanced antenna technology, including 2<sup>nd</sup> and 4<sup>th</sup> order diversity and MIMO for increased coverage and capacity and improved operator business case
- Range of BreezeMAX base station configurations
- Variety of CPEs, for both outdoor and indoor use
- Self-install CPE with patent-pending technology for stable connections
- Future accessibility of WiMAX 802.16e standard equipment
- Fixed and portable services to residential and business customers located in rural, suburban and urban areas

## Advanced, Self-Install Solution

Using high-power Orthogonal Frequency Division Multiplexing Access (OFDMA) technology and six industry-leading, fast-switching antennas, the BreezeMAX Si\* CPE supports non-line-of-sight (NLOS) operation and the most stable indoor links for the highest subscriber satisfaction. Improving the operator business case by minimizing truck rolls and installation costs, BreezeMAX Si also offers longer ranges and superior capacities, giving operators a higher ROI. Typical customers include small operators using the upgradeable BTS configuration for deployments in small communities, and large scale IOCs (Independent Operating Companies) using BreezeMAX Si as a way to compete with basic, primary data and voice services in fixed applications.

\* Pending FCC approval

## System Components

### Base Station Equipment

High-density, modular chassis configuration scalable for deployments of various sizes.

#### Modular Base Station



Carrier class 8U high cPCI shelf that fits into a standard 19" or 22" (ETSI) rack and contains a network processor unit, hot-swappable multiple access unit modules (up to 6 in a single chassis), a power supply and power supply modules.

#### Micro Base Station



Pay as you grow with MMC feature: one micro base station supports up to four sectors and four outdoor radios. The micro base station supports all macro base station features.

#### Indoor/Outdoor Access Units



Utilizes wireless IEEE 802.16e/HiperMAN MAC and modem to establish wireless network connections and manage bandwidth. Each indoor access unit includes four 3.5 or 5 MHz PHY channels supporting of RF 2<sup>nd</sup> and 4<sup>th</sup> order diversity combining functionality and radio link redundancy. Alvarion's unique technology enables each such Access Unit to support up to four different frequencies.

**WiMAX architecture** based on the WiMAX Forum® standard implementation of the IEEE 802.16e and ETSI HiperMAN industry specifications for wireless access in Metropolitan Area Networks (MAN).

**Plug-and-play solution** using a self-installable CPE with automatic provisioning traffic management.

**Scalable** high-density macro and micro base station configurations.

**High power, multiple diversity radios** using Space Time Coding (STC), Cyclic Delay Diversity (CDD) and Maximum Ratio Combining (MRC).

**Range of CPEs for managing tiered services** in residential, business, MDU/MTU, hotspot, backhaul, and wireless home networking applications.

**Low cost of ownership** through simple self-installation and demand-based, pay-as-you-grow build-outs.

**High capacity and throughput** using efficient and robust 802.16e-based air protocol.

**End-to-end QoS** essential for high quality data, voice and video services.

**Adaptive modulation technology** maximizes system bandwidth throughput.

**AlvariSTAR management system** simplifies network deployment and enables fast customer-based expansion with effective fault management for quick resolution.

## Customer Premises Equipment (CPE)

BreezeMAX self-install CPEs are powered by an Intel 802.16e WiMAX chip. Providing operators the flexibility to cost-effectively serve different business and residential customers, the BreezeMAX CPE portfolio allows for both outdoor (professional) and indoor (self-install) deployments.

### BreezeMAX PRO-S



BreezeMAX PRO-S consists of an indoor unit (IDU) and an outdoor unit (ODU) that contains the modem, radio, data processing and management components, as well as an integral high-gain flat antenna with either vertical or horizontal polarization. An ODU with a connector to an external antenna is also available.

### BreezeMAX Si\*



\* pending FCC approval

BreezeMAX Si is a self-installable, WiMAX subscriber unit providing broadband data services in a compact design. Ideal for residential and SOHO users, it is a complete indoor solution (without the need for an outdoor unit) supplied with installation software and/or a smart card for simple self-installation and automatic service operation. The smart card option permits operators to ship this CPE to end users and then separately enable the type of service purchased by online smart card configuration, making installation easier than ever.

### BreezeMAX Voice Gateway



BreezeMAX Voice Gateway is a single box solution providing integrated voice and data services. Available with one or two RJ-11 POTS ports, it features advanced voice and data functions such as VLAN tagging, traffic prioritization by IP DiffServ, SIP protocols, Class 5 voice services (third party conference call waiting, call hold), and integrated management.

### Networking Gateway



Networking Gateway is the optimal networking solution for both home and small business customers. Featuring an advanced, integrated broadband router with comprehensive IP-sharing and security capabilities, it offers four 10/100 BaseT ports and an 802.11g wireless access point.

## Headquarters

International Corporate HQ  
corporate-sales@alvarion.com

North America HQ  
n.america-sales@alvarion.com

## Sales Contacts

Australia:  
anz-sales@alvarion.com

Asia Pacific:  
ap-sales@alvarion.com

Brazil:  
brazil-sales@alvarion.com

Canada:  
canada-sales@alvarion.com

Caribbean:  
caribbean-sales@alvarion.com

China:  
cn-sales@alvarion.com

Czech Republic:  
czech-sales@alvarion.com

France:  
france-sales@alvarion.com

Germany:  
germany-sales@alvarion.com

Italy:  
italy-sales@alvarion.com

Ireland:  
uk-sales@alvarion.com

Japan:  
jp-sales@alvarion.com

Latin America:  
lasales@alvarion.com

Mexico:  
mexico-sales@alvarion.com

Nigeria:  
nigeria-sales@alvarion.com

Philippines:  
ph-sales@alvarion.com

Poland:  
poland-sales@alvarion.com

Portugal:  
sales-portugal@alvarion.com

Romania:  
romania-sales@alvarion.com

Russia:  
info@alvarion.ru

Singapore:  
asean-sales@alvarion.com

South Africa:  
africa-sales@alvarion.com

Spain:  
spain-sales@alvarion.com

U.K.:  
uk-sales@alvarion.com

Uruguay:  
uruguay-sales@alvarion.com

For the latest contact information  
in your area, please visit:  
[www.alvarion.com/company/locations](http://www.alvarion.com/company/locations)



[www.alvarion.com](http://www.alvarion.com)

© Copyright 2009 Alvarion Ltd. All rights reserved.  
Alvarion® and all names, product and service names referenced herein are either registered trademarks, trademarks, tradenames or service marks of Alvarion Ltd.  
All other names are or may be the trademarks of their respective owners. The content herein is subject to change without further notice.

"WiMAX Forum" is a registered trademark of the WiMAX Forum. "WiMAX," the WiMAX Forum logo, "WiMAX Forum Certified" and the WiMAX Forum Certified logo are trademarks of the WiMAX Forum.

214948 rev.b

## Specifications

### Radio and Modem

**Frequency**  
3.650-3.675 GHz  
(hardware ready for 3.650-3.700)

**Radio access method**  
TDMA TDD

**Modulation**  
OFDM 256 FFT with adaptive sub-carrier modulation:  
BPSK, QPSK, 16QAM, 64QAM and upstream OFDMA

**Channel bandwidth**  
3.5 MHz, 5 MHz, 7 MHz\*, 10 MHz\*  
(SW selectable)

**Central frequency resolution**  
125 KHz

**Antenna for CPE**  
Integrated vertical and horizontal antenna

**Outdoor CPE**  
17 dBi at 3.65-3.7 GHz

**Indoor Si CPE**  
Six integrated antennas with 9 dBi, plus external port for window patch and support of OFDMA to allow full EIRP

**Sensitivity typical values**  
-80 dBm for highest modulation (QAM64) @ 5 MHz  
-98 dBm for lowest modulation (BPSK) @ 5 MHz

### Data Communications

**Data**  
IEEE 802.3 CSMA/CD

**Air Interface**  
IEEE 802.16-2004 / IEEE 802.16-2005

**VLAN support**  
IEEE 802.1Q

**Traffic classification**  
Layer 2/3 IEEE 802.1p, IP DiffServ  
Code Points DSCP

### Voice Gateways

**Primary voice**  
1.5 hours, battery backup

**Managed voice**  
For QoS management and admission control

**Data and voice services**  
Integrated in single box

**Interfaces**  
One of two RJ11 connectors for analog phones

**Services**  
Class 5

**VoIP protocol**  
SIP

**Speech codecs**  
6.711, 6.729ab, AMR

### Environmental

Parameter	Indoor Unit	Outdoor Unit
Operating Temperature	0°C to 40°C (32°F to 104°F)	-40°C to 55°C (-40°F to 131°F)
Operating Humidity	5-95% non-condensing	5-95% non condensing, weather protected

### Standard Compliance

**EMC**  
ETSI EN 301 489-1

**Safety**  
EN 60950 (CE), CB, IEC 60 950 US/C (TUV)

**Environmental**  
ETS 300 019  
(part 2-1 T 1.2 & part 2-2 T 2.3 for indoor & outdoor)  
(part 2-3 T 3.2 for indoor, part 2-4 T 4.1E for outdoor)

**Radio**  
FCC part 27, ETSI EN 301 021 V1.4.1, ETSI EN 301 753 V1.1.1

\* Future channel bandwidth options

### About Alvarion

Alvarion (NASDAQ: ALVR) is the largest WiMAX pure-player with the most extensive WiMAX customer base and over 250 commercial deployments around the globe. Committed to growing the WiMAX market, the company offers solutions for a wide range of frequency bands supporting a variety of business cases. Through its OPEN™ WiMAX strategy, superior IP and OFDMA know-how, and proven ability to deploy end-to-end turnkey WiMAX projects, Alvarion is shaping the new wireless broadband experience