

MicroMAX Base Station

MicroMAX is a family of single mode (802.16d or 802.16e) highly integrated micro-cell base stations with all-in-one outdoor packaging of RF and base-band components. For Mobile WiMAX applications, MicroMAXe includes integrated dual RF transceivers to support two-channel MIMO. Performance optimized variants for high density roof-top deployments and cost optimized variants for low density / rural deployments are available.

MicroMAX family comprises of two products:

- **MicroMAXe** - an all outdoor solution for Mobile WiMAX applications to minimise physical footprint and operator OPEX
- **MicroMAXd** - an outdoor solution for Fixed WiMAX applications with an indoor traffic aggregator.

MicroMAXe

MicroMAXe is a sophisticated micro-cell Mobile WiMAX base station which employs the software defined radio (SDR) technology first developed for HiperMAX, together with dual radio transceivers, antennas and GPS receiver all in a highly integrated, physically small and light, all outdoor package.

MicroMAXe has been designed to provide a sophisticated yet cost-effective base station solution in less dense deployment situations. The product supports a wide range of licensed and unlicensed frequency bands. The product has been designed to address the markets needs thru to 2011 and beyond by supporting the current and future air interfaces thanks to its SDR technology.

MicroMAXe base station product bringing together state-of-the-art technologies in a compact and all

outdoor package. Thanks to its small footprint MicroMAXe is easy to deploy and minimises site OPEX expenditure.

MicroMAXe comes in two variants, a Hi-Power class and a Lo-Power class. MacroMAXe implements dual radios for 2x2MIMO delivering up to 56dBm EIRP with the integrated antennas.

MicroMAXe initially supports 5MHz and 10MHz channel sizes. However, the product is capable of supporting 20MHz channels (Mobile WiMAX profile Rel. 1.5) as well. MicroMAXe has been designed to support either 2x10MHz (using dual PHY/MAC) or 1x20MHz channel.

MicroMAXe has been conceived for deployment in 3-sector configuration, which is the optimum configuration for Mobile WiMAX deployments. MicroMAXe design also incorporates an Ethernet switch which enables the traffic from 3 sectors to be aggregated for backhaul and network interfacing. MicroMAXe fully supports the interoperable R6 reference point for interworking with ASN Gateways either in a distributed or centralised network configuration.

Spectrum is a scarce and valuable resource which must be used efficiently. In order to achieve frequency reuse factor of one (N=1) the best balance between spectral efficiency and interference mitigation must be achieved. This is realised through Fractional Frequency Reuse for which MicroMAXe has been optimized. Fractional Frequency Reuse controls co-channel interference to support frequency reuse of one with minimal degradation in spectral efficiency. MicroMAXe can also be deployed using traditional frequency reuse plans.

MicroMAXe

Main Features

- Supports 802.16e-2005 SOFDMA Supports wide range of frequency bands
 - 2.3GHz, 2.5GHz, 3.3GHz, 3.5GHz, 3.7GHz, 4.9GHz, 5.4GHz, 5.8GHz
- All-in-one single outdoor unit minimises deployment costs and site OPEX
- Dual 36dBm radios
- STC and MIMO support
 - Matrix A
 - Matrix B
- Supports 5/10/20MHz channel size
 - 2x5MHz
 - 2x10MHz
 - 1x20MHz
- Supports 512, 1024, 2048 FFT SOFDMA
- Supports interoperable reference points defined by NRM
 - Supports interoperable R6 reference point
- Compact and light form factor

MicroMAXd



MicroMAXd is a complete standalone base station, sharing the same system architecture as our tried and tested ASWipLL product line.

The MicroMAXd base station is highly modular in design and consists of two main components: the all-outdoor Base Station Radios (BSR) and the indoor aggregator Base Station Distribution Unit (BSDU), or the single channel Data Adaptor.

Each base station site can contain up to 16 BSRs, depending on the amount of available spectrum. Each BSR is connected to the BSDU via a 100BaseT interface operating over a

CAT5 cable, which carries both data and power. Each BSDU can support up to 8 BSRs.

MicroMAXd is designed to support lower density, rural broadband access, enterprise applications and DSL in-fill scenarios in both licensed (1.5GHz, 3.3GHz, 3.5, 3.7GHz, 4.9GHz) and unlicensed (5.1, 5.4GHz, 5.8GHz, 5.9GHz) bands.

One of the key features of the MicroMAX BSR is that it requires less than 28W power, making it ideally suited for those rural deployments where power generation and supply may be a problem.

MicroMAXd operating in unlicensed bands can be used by Wireless ISPs to deploy WiMAX easily and cost effectively wherever the need is identified.

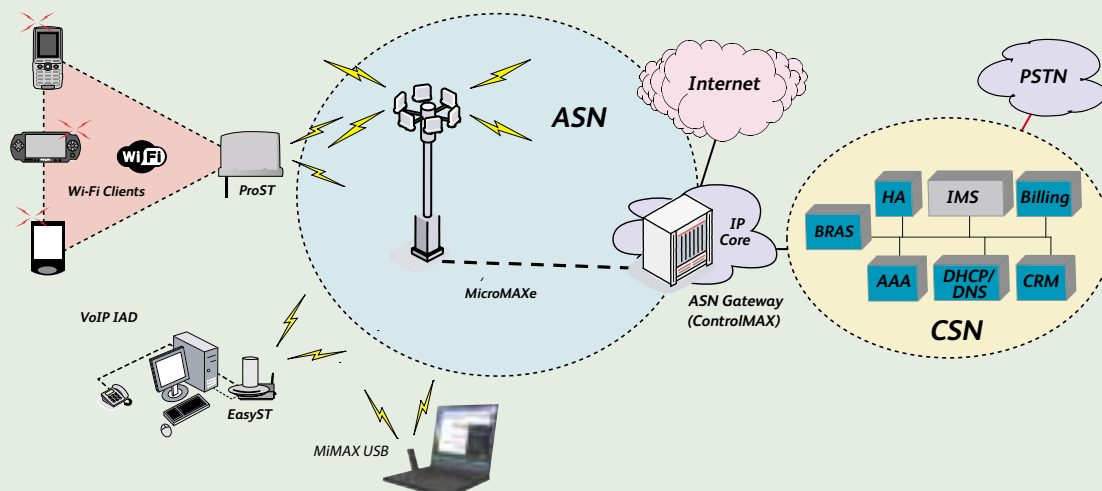
Both MicroMAXe and MicroMAXd base stations are managed by Netspan, Airspan's SNMP based element management platform.

MicroMAXd

Main Features

- Cost optimized for lower density applications
 - Modular and scalable architecture
 - All outdoor integrated baseband digital processing, radio and antenna
 - Up to 16 radios per mast
 - Radios connected to indoor aggregator using Cat5
 - Cat5e (100m), up to 300m with Cat5 repeater
- Sophisticated radio implementation
- Supports WiMAX Forum™ profiles in 1.5GHz, 3.3GHz, 3.5GHz, 3.7GHz, 4.9GHz, 5.1GHz, 5.4GHz, 5.8GHz and in 5.9GHz bands
- BPSK/QPSK/16QAM/64QAM adaptive modulation
- Full duplex FDD and TDD operation
- Advanced software features
 - Full IEEE 802.16 QoS service classes
 - Full 802.1d transparent bridging
 - IEEE 802.1Q/p VLAN tagging/untagging
 - Bridging and routing functionality

Network Architecture



MicroMAX Base Station Technical Summary

	MicroMAXe	MicroMAXd
Mobile WiMAX	Yes	No
Fixed WiMAX	No	Yes
Standards Compliance	IEEE802.16e-2005	IEEE802.16-2004
Form Factor	All Outdoor	Split Indoor / Outdoor
Frequency Bands	2.3GHz, 2.5GHz, 3.3GHz, 3.5GHz, 3.7GHz, 4.9GHz, 5.4GHz, 5.8GHz, (700MHz - Future)	1.5GHz, 3.3GHz, 3.5GHz, 3.7GHz, 4.9GHz, 5.1GHz, 5.4GHz, 5.8GHz, 5.9GHz
Channel Size	20MHz, 2x10MHz, 10MHz, 5MHz	10MHz, 5MHz, 3.5MHz, 1.75MHz
FFT	2048, 1024, 512	256
Duplex Method	TDD (FDD - Future)	TDD, FDD
Tx Power (Frequency band dependant)	Up to 2 x +36dBm	+27dBm
Maximum EIRP per sector	56dBm	44dBm
GPS Synchronisation	8hr holdover, Integrated	Distributed
STC	Yes	No
MRC	Yes	No
MIMO	2x2	No
MIMO Matrix Type	Matrix A, Matrix B	No
CSM	Yes	No
Beamforming	No	No
Uplink Sub-Channelization	Yes	Yes
PUSC	Yes	No
Fractional Frequency Reuse	Yes	No
Dynamic Frequency Selection (DFS)	Yes	Yes
Ethernet CS	Yes (Future)	Yes
IP CS	Yes	No
IP version support	IPv6, IPv4	IPv4
Network Interface	1000bT Ethernet / R6	100bT Ethernet
End to End VLAN (802.1Q)	No	Yes
Network VLAN Traffic Segregation	Yes	Yes
ASN Profile	Profile C	No
Supported Usage Scenarios	Mobile, Portable, Nomadic, Fixed	Nomadic, Fixed
Handover Supported	Yes	No
Encryption	AES	DES, AES
Authentication	PKM, PKMv2, EAP-TLS, EAP-AKA, EAP-SIM	PKM
Environmental (outdoor elements)	ETS 300 019-1-4 Class 4.1E	ETS 300 019-1-4 Class 4.1E
Environmental (indoor elements)	-	ETS 300 019-1-3 Class 3.2

Note: Specifications are subject to change without notice and are for information purposes only.



Worldwide Headquarters;
Airspan Networks Inc.
777 Yamato Road, Suite 105,
Boca Raton, FL 33431-4408, USA
Tel: +1 561 893 8670 Fax: +1 561 893 8671

Main Operations;
Airspan Communications Limited
Cambridge House, Oxford Road,
Uxbridge, Middlesex, UB8 1UN, UK
Tel: +44 (0) 1895 467 100 Fax: +44 (0) 1895 467 101