MacroMAX

MacroMAX Base Station

MacroMAX is a family of single mode (IEEE 802.16-2004 or 802.16e-2005) highly integrated macro-cell base stations with all-in-one packaging of RF and base-band components. MacroMAX includes integrated dual RF transceivers to support two channel diversity and MIMO.

MacroMAX family comprises of two products:

- **MacroMAXe** - an all outdoor solution for Mobile WiMAX applications to minimise physical footprint and operator OPEX
- **MacroMAXd**- an all indoor solution for Fixed WiMAX applications.

MacroMAXe

MacroMAXe is a class-leading 2nd generation 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.

MacroMAXe has been designed and optimized for the 2.3GHz and 2.5GHz Mobile WiMAX bands and will be Wave 2 certified in these 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.

MacroMAXe is a remarkable base station product bringing together state-of-the-art technologies in a compact all outdoor package. Thanks to its small footprint MacroMAXe minimises site OPEX expenditure. MacroMAXe is small in size but big in performance. Thanks to the efficient power amplifier technology employed in its RF implementation, MacroMAXe implements dual 40dBm (10W) radios for 2x2MIMO delivering up to 60dBm EiRP with the integrated antennas.

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

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

In licensed band deployments available spectrum is a scarce and valuable resource. Therefore it 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 MacroMAXe has been optimized. Fractional Frequency Reuse controls co-channel interference to support frequency reuse of one with minimal degradation in spectral efficiency. MacroMAXe can also be deployed using traditional frequency reuse plans.

MacroMAXe

Main Features

- Supports 802.16e-2005 SOFDMA
- Optimized for 2.3GHz and 2.5GHz bands
- All-in-one single outdoor unit minimises site OPEX
- Dual 40dBm radios
  - 60dBm EiRP with integrated antennas
- STC and MIMO support
  - Matrix A
  - Matrix B
- Supports 5/10/20MHz channel size
  - 2x5MHz
  - 2x10MHz
  - 1x20MHz
- Supports interoperable reference points defined by NRM
  - Supports interoperable R6 reference point
- Supports 512, 1024, 2048 FFT SOFDMA
- Compact and light form factor

MacroMAXd

MacroMAXd is a WiMAX Forum™ certified base station product; one of the first to achieve certification. MacroMAXd has been shipped to customers since 2H 2005.

MacroMAXd has been designed to deliver the best link budget with the highest capacity and net throughput; all essential qualities for macro-cell deployments used in typical wireless rollouts. It is available in the 3.4-3.6GHz band in the 3.5F1 profile.

Each MacroMAXd sector comprises of a 4U high rack mountable shelf, which contains the baseband processor and the RF unit. The baseband is a single card that is directly connected to the RF, PA and LNA, which in turn is connected to appropriate mast installed antennas via external feeders.

Two separate antennas enable the link budget to be further increased through the use of multi-channel transmit diversity and receive diversity. A compact rack supports up to three sectors with diversity a full rack supports up to 4 sectors.

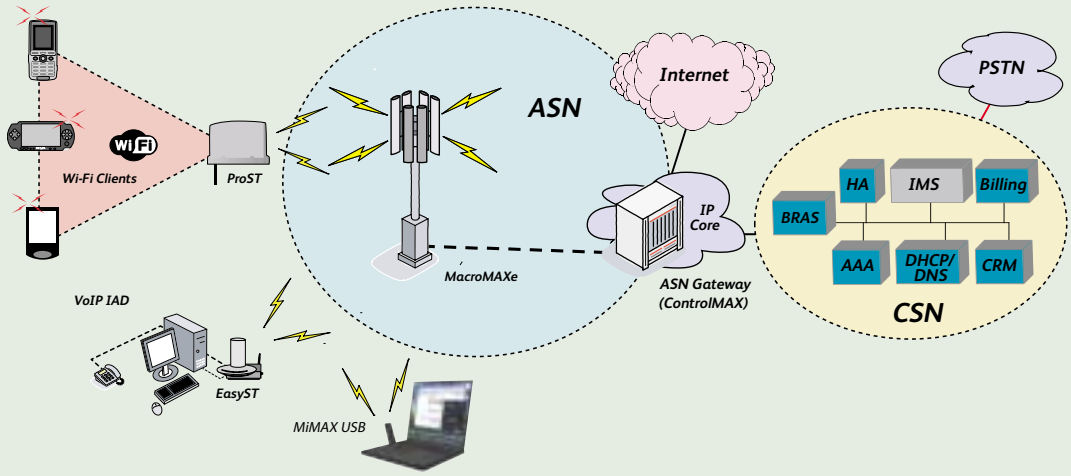
Both MacroMAXe and MacroMAXd base stations are managed by Netspan, Airspan's SNMP based element management platform.

MacroMAXd

Main Features

- The first base station to achieve WiMAX Forum™ certification in the FDD profile in March 2006
- Designed for Fixed WiMAX deployments where high capacity is required
- Available in 3.5GHz full FDD profile
- MacroMAXd supports
  - 256 FFT OFDM
  - Up to 35dBm transmit power
  - 3 or 4 diversity channels per rack
  - Baseband to RF connection made digitally
  - Final RF feed using conventional antenna feeders
  - Downlink diversity (Space Time Coding - STC)
  - Uplink diversity (Maximal Ratio Combining - MRC)
  - Up to 10Mbps net capacity using 3.5MHz channel

Network Architecture



MacroMAX Base Station Technical Summary

	MacroMAXe	MacroMAXd
Mobile WiMAX	Yes	No
Fixed WiMAX	No	Yes
Standards Compliance	IEEE802.16e-2005	IEEE802.16-2004
Form Factor	All Outdoor	Indoor
Frequency Bands	2.3GHz, 2.5GHz (700MHz - Future)	3.5GHz
Channel Size	20MHz, 2x10MHz, 10MHz, 5MHz	3.5MHz
FFT	2048, 1024, 512	256
Duplex Method	TDD (FDD - Future)	FDD
Tx Power (Frequency band dependant)	2x +40dBm	2x +35dBm
Maximum EiRP per sector	+60dBm	+53dBm
GPS Synchronisation	8hr holdover, Integrated	No
STC	Yes	Yes
MRC	Yes	Yes
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)	No	No
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.

Airspan
Makes Mobile WiMAX Simple

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