



MicroMAX Base Station

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

The MicroMAX 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.

MicroMAX is designed to support lower density, rural broadband access, enterprise applications and DSL in-fill scenarios in both licensed (3.5GHz) and unlicensed (5.8GHz) 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.

MicroMAX operating in the 5.8GHz unlicensed band can be used by Wireless ISPs to deploy WiMAX easily and cost effectively wherever the need is identified.

In the future we plan to have an IEEE 802.16e-2005 version of the MicroMAX product.

For Cost Sensitive WiMAX Deployments

Main Features

- Cost optimised 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 3.5GHz and in 5.8GHz
 - BPSK/QPSK/16QAM/64QAM adaptive modulation
 - Multi-channel Tx and Rx diversity across multiple radios
 - 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



MicroMAX Operation

The MicroMAX base station is highly modular in design and is constructed from a number of Base Station Radios (BSR). Each BSR incorporates antenna, radio and baseband functions all within the single BSR enclosure. Each BSR can be deployed with a built-in 60° sectorial antenna or indeed with a wide variety of external antennas including 360° omni, 90°, 120° etc. When multiple BSRs are deployed at the same physical location a BSDU can be used to aggregate the traffic from up to 8 BSRs. A seventh BSR may be supported for redundancy. The BSR will support both full duplex FDD and TDD operation.

The fact that each BSR is self contained gives MicroMAX great deployment flexibility. For example, it is possible to start with one BSR and an omni antenna and progressively increase the number of deployed BSRs as more customers are signed up.

MicroMAX provides extensive software features such as support for WiMAX specified service classes, full IEEE 802.16-2004 transparent bridging features, IEEE 802.1Q/p VLAN features, and support for VoIP operation. The BSR will provide VoIP call supervision (or dynamic bandwidth allocation) enabling the radio interface to gracefully handle VoIP overload conditions by implementing an admission control procedure. The BSDU provides three main functions: aggregation of traffic from BSRs, powering the BSRs, and synchronising the BSRs by using an external GPS source.

Due to its low power consumption, the MicroMAX BSRs is ideally suited for line powering. In this application up to 4 twisted copper pairs can be used to both power and backhaul a BSR over a distance of up to 5km. This in turn

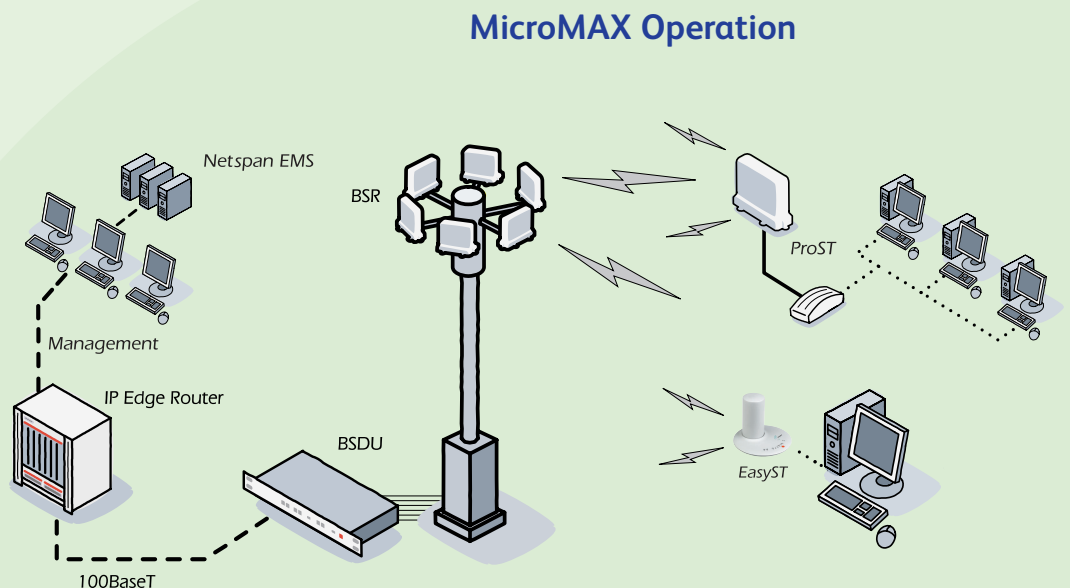
enables tens of customers to be provided with wireless broadband services beyond the reach of DSL technology with an inbuilt cheap backhaul capability.

Point-to-Point applications are also supported by the use of a single MicroMAX BSR coupled with a single ProST.

This arrangement provides a very low cost solution for medium speed IP backhaul.

MicroMAX fully supports the extensive QoS characteristics of the 802.16 radio interface, including full support for UGS, rtPS, nrtPS and BE services classes.

MicroMAX is managed by Netspan, the SNMP based central element management platform.



Technical Data Sheet - MicroMAX Base Station

RF Interface

Physical Layer	OFDM (future release supports SOFDMA)	
Frequency Bands	3.3-3.8GHz, 5.8GHz + subsequent additional WiMAX bands	
Channel Size	1.75MHz, 3.5MHz, 5 MHz, 10MHz	
FFT	256 (future release supports 512 and 1024)	
Duplex Method	FDD + TDD	
Sector Angle	60 + others with external antenna	
Modulations Supported	64QAM , 16QAM, QPSK, BPSK	
WiMAX Profiles Supported	Fixed WiMAX (future release supports Mobile WiMAX)	
Nomadic Support	Yes	
Mobility Support	Future Release supports Mobile WiMAX with mobility	Note 1: Tx powers apply for QPSK operation. 64QAM support requires appropriate power back-off.
Standards Compliance	IEEE 802.16-2004 (future release to support 802.16e)	requires appropriate power back-off.
Tx Power (see note 1)	+28dBm	Note 2: Rx sensitivities apply to the minimum channel bandwidth supported and include maximum sub-channelisation.
Rx Sensitivity (see note 2)	-115dBm (1/16), -103dBm (1/1)	
AAS & Diversity Gains (Downlink / Uplink)	Up to 5dB / 5dB with dual BSRs	

RF Interface Options

Adaptive Antenna System (AAS) Support	No
Multi Channel Tx Diversity	Yes (with multiple BSRs)
Nth Order Rx Diversity	Yes (with multiple BSRs)
Space Division Multiple Access (SDMA) Support	No
Spatial Freq. Interference Rejection (SFIR) Support	No
MIMO	No
Uplink Sub-Channelisation Support	1/2, 1/4, 1/8, 1/16
Dynamic Frequency Selection (DFS) Support	Yes (at 5.8GHz)
Turbo Coding Supported	No (Supported with future Mobile WiMAX version)
Configurable Cyclic Prefix	1/4, 1/8, 1/16, 1/32
Configurable Frame Duration	2.5, 4, 5, 8, 10, 12.5, 20ms
GPS Clock Synch Supported	Yes

IP Options/Features

Bridging Mode	802.1D self-learning bridge
IPv	IPv4 + IPv6
802.1Q VLAN	Yes
MIR / CIR	Yes
DiffServ	Yes
Packet IPv6 over 802.3/Ethernet	Yes
Packet IPv4 over 802.1Q	Yes
Packet IPv6 over 802.1Q	Yes
Payload Header Suppression	Yes
Multicast Polling	Yes
ARQ	Yes
Packing	Yes

Scheduling

Unsolicited Grant Service	Yes
Real Time Polling	Yes
nonReal Time Polling	Yes
Best Effort	Yes

Encryption & Management

DES (3DES Keys)	Yes
AES	Yes
Managed Subscriber Station	N/A

User/Network Interface Options

User / Network Interface	100bT/1000bT Ethernet
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Powering & Interconnect

Supply Voltage	-48V DC nominal, 90-265V AC
Indoor / Outdoor Interconnect	CAT5 Ethernet Cable

Environment

Outdoor Equipment	ETS 300 019-1-4 Class 4.1
Indoor Equipment	ETS 300 019-1-3 Class 3.2



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