

# e!MAX



**e!MAX CHANGES EVERYTHING**

*Broadband Wireless for Everyone, Everywhere*

WiMAX Systems from Polonix and ENTE

**ente** 

**e!MAX™**

# Changes Everything

Every now and then, a new product or technology emerges to forever change the way we do things. Like the automobile, the personal computer and the digital camera, **WiMAX** is a disruptive technology and e!MAX makes it easy for you to make the transition.

e!MAX systems, from ENTE and Polonix, serve as the platform for carrier-class wireless voice and data transmission, and the new standard for business, home and mobile broadband network and Internet access.

## **Polonix and ENTE**

Incorporated in 2000 and based in Poland, ENTE's mission is to enable customers to improve their operational and financial performance with advanced electronics products and services. The heart of the company is its people...experts in engineering, software development, system design, manufacturing and customer service. Based in Ottawa, Canada, Polonix is ENTE's global distribution partner for the e!MAX line of industry leading WiMAX products.

## **Market-share, Top-line Growth and Bottom-line Profitability**

The challenge for today's operator is to protect and expand the customer base, increase revenue opportunities and lower the cost of doing business. e!MAX systems make it all possible by delivering wireless broadband voice and data for the masses—rapidly deployable and affordable solutions for business and consumer clients, with higher margins for service providers.

## **Incremental ROI**

e!MAX is a modular system that enables you to expand and leverage the value of each base station investment, as your business grows.

## **Future-proof**

e!MAX is ready for 802.16e. With the swap of a card you will enable the next generation of mobile communication devices, including WiMAX VoIP telephones.

## **Multiple Revenue Streams**

e!MAX can deliver video, voice communication (using the SIP protocol), broadband Internet, network connectivity and other services to business and residential clients.

## Optimizing Airspace, Minimizing Infrastructure

A high power e!MAX base station can provide wireless broadband access for thousands of subscribers located within 38 Km of the installation. Customer premises equipment can be internal or external or even limited to a plug-and-play PCI card for individual PCs running Windows XP.

## Reliability and Redundancy

Designed for extreme weather performance, e!MAX systems feature the acclaimed “System-on-a-Module (SoM)” from Wavesat, a founding member of the WiMAX Forum. With hardened, modular subassemblies for longevity and optional 1+1 base station redundancy, e!MAX systems are engineered to exceed performance standards.

## Power and Sensitivity

e!MAX base stations generate a whopping +29 dBm of transmission power in all modulation schemes to provide crystal clear reception over great distances. And that’s only half the story. Coming back, extremely high receiver sensitivity has been achieved with an innovative, proprietary design for the base station’s RF module. And since the base station provides expanded coverage, transmission power requirements are low, which drives incremental cost savings. That’s particularly important in rural areas with smaller population densities. Additional savings are realized by the 64QAM modulation, which delivers higher throughput to lower infrastructure costs.

### e!MAX BASE STATIONS



Modular and scalable, e!MAX carrier class base stations are engineered with the flexibility to meet your specific requirements. Multiple sector cards operating on different frequency bands can be mounted in the same unit. Cards and power supplies are “hot swappable”, and the base stations come in either 1U or 4U.

### e!MAX BSS



The e!MAX BSS is our single-sector WiMAX base station, designed for low-density networks that are likely to expand in the near future. Its low cost and high performance delivers a rapid return on investment, which can be leveraged for higher returns as your requirements expand.

### e!MAX BSM



The e!MAX BSM is our scalable, multi-sector WiMAX base station. It utilizes network, radio, and power supply modules that are “hot swappable” for fast and easy deployment and maintenance. Module redundancy ensures that the e!MAX BSM maintains high reliability and delivers cost efficiencies.

All e!MAX base stations support leading antenna technologies including active antennas and adaptive systems.

## SECTOR CARDS

Each e!MAX base station sector card is an autonomous element, equipped with its own operating system and ODU management module. The ODU module contains a radio modem and it's mounted adjacent to the antenna.

## NETWORK PROCESSOR CARDS

Optional network processor cards enable you to connect multiple sector cards to one commonly managed system, which simplifies the establishment of redundancy services. Network processor cards can also serve as a configurable router.

Optional Ethernet switch cards fill the same role as an external switch connected to the base station, but, unlike external switches, they can be monitored by the network processor card.

## CUSTOMER PREMISES EQUIPMENT

The e!MAX system has 3 CPE models including the industry's first PCI card for the Windows XP operating system. All e!MAX CPE are based on the Wavesat DM256 chipset, which ensures the sensitivity of the receiver and the power of the transmitter deliver the highest possible signal quality.

### e!MAX CPEO



The **e!MAX CPEO** (outdoor) and **e!MAX CPEI** (indoor) subscriber stations can be equipped with an optional Wi-Fi module to serve as an access point, as well as a VoIP module working on the SIP protocol, to connect analog telephone systems and PBX switches.

The CPEO's sturdy construction and resistance to extreme weather conditions, makes it well suited for outdoor video monitoring systems. The PoE power supply, located inside the premises, includes a fast Ethernet port and can also be delivered with an RJ-11 jack which serves as a VoIP gateway. The CPEI subscriber station is designed for small businesses and individual

### e!MAX CPEI



subscribers. It delivers the same capabilities as the CPEO station in an indoor environment. The CPEI system consists of a fast Ethernet port, an internal antenna mounted directly into the device, or an external antenna connected by a coax cable.

The **e!MAX CPEpci** client station is the industry's first WiMAX PCI card for the Windows XP operating system. It comes equipped with an internal antenna or an external antenna connected with a coax cable. This solution enables the network operator to provide individual subscribers with fast and easy WiMAX access with carrier class quality.

### e!MAX CPEpci



## Management

All elements of the e!MAX system, from base station to customer premises equipment, can be remotely monitored and controlled using a secure SNMP management protocol. Direct management of the base station is achieved using an intuitive management console.

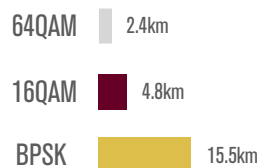
The security of the management system was achieved without negatively impacting functionality. At every access point, you can define as many as 256 administrative accounts and specify levels of access and system privileges. That means the system administrator can control a CPE installer's access privileges during equipment deployment.

## Scalable Coverage

One e!MAX base station can be optimized to provide powerful WiMAX service to the areas you need to cover, without increasing power requirements. It's all in the antenna configuration. The standard omni directional antenna provides 360° coverage for up to 15.5 km, while a six-sector configuration provides coverage for up to 38 km. The antennas partition and focus the WiMAX signal to increase the coverage area.

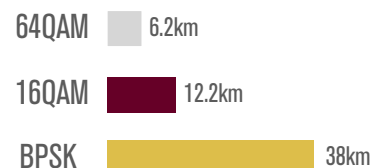
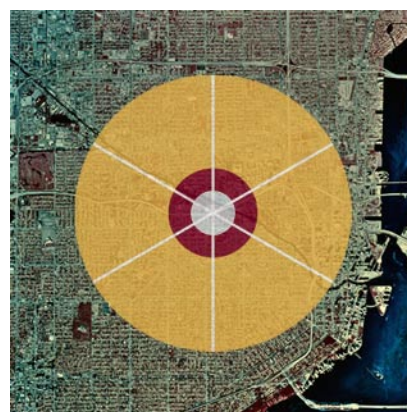
### ONE SECTOR

Omnidirectional Antenna, 10dBi



### SIX SECTORS

60° Antennas, 17dBi



## BASE STATION SPECIFICATIONS:

### BSS Chassis

Height	1U
Number of cards	max 2
Number of power module	max 1
Power supply	110/220VAC or -48VDC

### BSM Chassis

Height	4U
Number of cards	max 8
Number of power module	max 4
Power supply	110/220VAC or -48VDC

### BSXL Chassis

Height	8U
Number of cards	max 16
Number of power module	max 4
Power supply	110/220VAC or -48VDC

### e!MAX 5000 sector card

Frequency range	5.15 - 5.85GHz (licensed)
Channel bandwidth	10MHz,
Throughput	50Mbps/36Mbps

### e!MAX 3000 sector card

Frequency Range:	3.410 - 3.600GHz (3.5GHz)
Channel bandwidth	1.75MHz, 3.5MHz, 7MHz
Throughput (Raw/Effective)	35Mbps/18Mbps (for 7MHz channel)

### Radio specifications

Radio Technology	OFDM 256FFT
Coverage	LOS, NLOS, NrLOS
Modulation Types	BPSK, QPSK, 16QAM, 64QAM
Transmitting power	29dBm
Receiver sensitivity	BPSK: -98dBm, 64QAM: -82dBm

### Network specifications

Topologies	Point-to-Point, Point-to-Multipoint
Functionality	Bridge, Router
Network Filtering	IP, MAC

### Communication interface

Interface	Ethernet 10/100Base-T
Connector	RJ-45
VLAN service	802.1q, 802.1p
QoS	DSCP, BE, UGS, rtPS, nrtPS

### Management

Access	through communication port, dedicated Ethernet management port, RS-232
Remote Management	SSH, SNMP

### Security

Encryption algorithms	AES
Administrator authorization system	256 logins

## CPE SPECIFICATIONS:

### e!MAX CPEO subscriber station

ODU housing	300x300x65mm
Antenna	Integrated 18dBi
Communication interface	Ethernet 10/100/1000 Base-T
Connector	RJ-45
VLAN service	802.1p,
QoS	802.1p, DSCP
Management	SSH, SNMP

### e!MAX CPEI subscriber station

ODU housing	250x150x65mm
Antenna	Integrated 9dBi or External
Communication interface	Ethernet 10/100/1000 Base-T
Connector	RJ-45
VLAN service	802.1p,
QoS	802.1p, DSCP

### e!MAX CPEpci subscriber station

Form factor	Standard PCI Card
Antenna	Integrated 9dBi or External
Management	Windows XP drivers

### Optional WiFi module for CPEO and CPEI

Standard	802.11a/b/g
Frequency Band	2.4GHz (b/g), 5.4 - 5.7GHz (a)
Chipset	Atheros AR5004X
Security and authorization	WEP 64-bit, 128-bit, 152-bit AES-CCM&TKIP 802.1x

### Radio Specifications

Frequency Band	3.5GHz
Channel bandwidth	1.75MHz, 3.5MHz, 7MHz
Radio technology	OFDM 256FFT
Coverage	LOS, NLOS, NrLOS
Duplexing format	TDD, HFDD
Modulation	BPSK, QPSK, 16QAM, 64QAM
Throughput (Raw/Effective)	35Mbps/18Mbps (for 7MHz channel)
Receiver sensitivity	64QAM: -82dBm BPSK: -98dBm
Transmitting power	23dBm

### Optional VoIP for CPEO and CPEI

Data protocol	SIP 2.0
Codecs	G.711, G723.1, G726, G.729.A, iLBC
Audio features	Automatic silence suppression VAD (Voice Activity Detection) CNG (Comfort Noise Generation) Echo cancellation (G.168) ACG (Automatic Gain Control)
Call features	Caller ID, Call Waiting Call Transfer, Hold Caller Forward, DTMF
Security and authorization	DIGEST through MD5 and MD5-sess