



Motorola wi4 WiMAX CPEo 450 Series

Outdoor Modem for Cost Effective and Convenient Wireless Broadband Access with Integrated Voice

The outdoor CPEo 450 Series Customer Premises Equipment (CPE) lets operators extend the coverage of critical broadband and Voice over IP (VoIP) services on WiMAX 802.16e networks, enhancing service to end-users in both urban areas and remote regions and reducing service provider network investment and support costs.

Innovation and Low Total Cost of Ownership

The outdoor WiMAX CPEo 450 integrates VoIP functionality directly into the unit – a unique feature that provides simpler installation and improved reliability with fewer points of potential failure in an outdoor WiMAX with VoIP solution. Additional benefits include decreased external ATA interoperability test needs, and decreased cost of having multiple boxes.

Integrated VoIP along with a design that utilizes cross-polarized antennas with wide beam widths show Motorola's continued innovation with the CPEo 450. These features and a number of others allow Motorola to continue to lead the 802.16e CPE market in convenience, reliability, and performance with an ultimate focus on low total cost of ownership for WiMAX operators.

Reliable and Efficient

The CPEo 450 has substance and simplicity, and is designed from the start for reliability and efficiency. As an outdoor unit with data and multiple voice access ports, it provides an effective solution to home networking needs even in cell edge areas. Factors such as integrated multiple antennas, no

moving parts and advanced ventilation improve the operational life span of this device. With VoIP integrated into the WiMAX modem outdoor unit there is only a single "intelligent box" in the solution, avoiding the need for a separate ATA box and the potential for multiple points of failure. Failures can cause increased support calls, truck rolls, and product re-shipments, significantly increasing operational costs (OPEX). The reliability and streamlined design of the CPEo 450 effectively reduce failures and therefore significantly decrease OPEX.

The CPEo 450 makes installation and maintenance quicker and simpler. A comprehensive, intuitive, user-friendly Graphical User Interface (GUI) and intelligent LEDs make it easy for an operator's installer or a user to easily check the status of the device and get it working quickly.

State of the Art Antenna Technology

The CPEo 450 Series features multiple cross-polarized antennas that help with angular dispersion, essentially allowing the CPE to be more sensitive to the different angular polarizations of a signal. In a multi-path environment, such as with OFDM, cross polarized antennas offer better protection from fades.

The integrated antennas also have a wide beam width, increasing the vertical and horizontal widths of the beam by approximately 50% over typical directional, high-gain outdoor CPE. This increased beam width enables hassle-free, easy orientation. The CPE will get the best possible radio signals with a simple alignment, and plug and play setup.

DATA SHEET

MOTOROLA wi4 WiMAX CPEo 450 SERIES



Easy to use mounting bracket on the back of the CPEo 450.

The Motorola CPEo 450 Series features multiple cross polarized antennas to support diversity techniques such as Maximum Ratio Combining (MRC), and MIMO Matrix A and B. Combined with multi-antenna operations at the access points and open and closed-loop adaptive antenna techniques, the Motorola's access points and CPE solution provides best-in-class range to the operators, reducing the overall CAPEX requirements as well as offering multiple revenue streams.

Convenience

All access ports in the plug and play CPEo 450 are integrated on to one junction box that resides inside the customer premises. The device comes with all the necessary device drivers pre-loaded. Pre-loaded device drivers mean no CDs are required for end user installation. The CPE can work with Windows, MAC and LINUX operating systems with out any user intervention. Subscribers just connect the device via the indoor POE junction box to their computer and voice handsets and the device is ready to offer WAN/ VoIP services.

The network will automatically detect the device and perform the necessary authentication processes. Finally, over the air (OTA) software upgrades eliminate the need for operator intervention.

Performance

The outdoor mounted CPEo 450 provides significant improvement in the coverage and capacity capabilities of the network, reducing the number of base sites required to address a given geography and boosting the bandwidth available to end-users.

Outdoor CPE device performance is a factor of antenna gain, antenna beam width, receiver sensitivity, orientation, diversity techniques used and effective transmitter power. The radiated performance of WiMAX CPE devices can differ dramatically. In a typical environment, 3 to 6dB low-end performance by CPEs on your network can translate to the need for over two times as many access points in order to provide the same level of service. This factor needs special attention particularly during the initial deployment periods of the network.

With high receive sensitivity and innovative antenna technology, the CPEo 450 stretches the service level regions in a network, reducing base station infrastructure requirements for operators, and offering subscribers better quality data and voice services (with QoS).

In addition, as the number of subscribers increase on the network, interference introduced by the devices themselves can dramatically reduce the service level areas from the original network plans. Motorola's CPEo 450 design offers best in class shielding and supports power control to mitigate these risks. In cases where the unit is installed on high rise buildings, operators may face an issue of CPE being able to reach most of the adjacent cells. This causes interference on the overall network and might prevent the CPE from locking into a single cell. CPEo 450 features select cell locking to assist operators in such situations.

Control

The Motorola CPEo 450 Series supports remote management capability allowing management and health monitoring of the device from a centralized network or element management system. Motorola CPEs support a wide range of statistics for the operator to look at the network performance from the device perspective. In addition, advanced security and authentication protocols protect the end-user and the operator from external threats.

Motorola and wi4 WiMAX

The Motorola wi4 WiMAX CPEo 450 Series is part of the Motorola wi4 WiMAX comprehensive portfolio of solutions and services needed to plan, launch and manage a WiMAX network. Motorola wi4 WiMAX solutions address a broad range of applications across operator segments. Our wi4 WiMAX CPEs and devices demonstrate exceptional ability to overcome the harsh conditions of the radio propagation environment. Hundreds of thousands have been shipped around the world and operate in a wide variety of conditions. They will not only deliver excellent performance for your subscribers, but also lower costs and higher returns to you.

MOTOROLA CPEo 450 SERIES SPECIFICATIONS	
Connectivity	1 Ethernet port
	2 Integrated ATA ports (VoIP)
Outdoor Coverage	Up to 5 kilometers range**
Radio Performance	WiMAX Certification Ready
	Band support: 2.5GHz and 3.5GHz (Separate products)
	26dBm WiMAX output power
	Antenna gain: CPEo 35450 = 14dBi; CPEo 25450 = 13dBi
	Antenna beam widths: > 40deg horizontal and > 20deg vertical
	Highly sensitive receiver that beats the RCT specifications by an average of 5dB across all modulation schemes
	Two branch Maximum Ratio Combining Diversity (MRC)
	Convolution Turbo Coding (CTC)
	Hybrid Automatic Repeat request (HARQ)
	Power control: Transmit dynamic range > 46 dB
Channel Support	3.5GHz product supports 5 / 7 / 10MHz & 2.5GHz product supports 5MHz & 10MHz.
Physical & Electrical Characteristics	External power: 100-240 volts AC input
	Power over Ethernet
	Dimensions : 318 (h) X 176 (w) X 100 (d) mm
	Weight : 1.3Kgs
	Operating temperature: -40 deg C to +55 deg C
	Operating humidity: 5% to 95%, non-condensing
	US and international plug support
Modulation Schemes	QPSK, 16QAM, 64QAM
Quality of Service Classes	BE (Best Effort)
	UGS (Unsolicited Grant Service)
	RTPS (Real Time Polling Service)
	NRTPS (Non Real Time Polling Service)
	ERTPS (Extended Real Time Polling Service)
Security	Device authentication based on X.509 digital certification
	Authentication methods according to IEEE 802.16e, EAP-TLS and also EAP-TTLS
	AES (128-bit CCM) data encryption and authentication
	Residential firewall
Remote Configuration and Software Upgrade	OTA (Over The Air) field upgradeable
	SNMP v3 Agent
	TR-069 Agent
	OMA Agent

MOTOROLA CPEo 450 SERIES SPECIFICATIONS (Continued)	
OS & Browser Compatibility	Windows
	Mac
	LINUX
	Internet Explorer or Firefox 1.0 or higher
Environmental and Regulatory	Asia
	Europe
	Canada
	Latin America

** Cell site range and data throughputs are dependent on network planning and RF conditions.



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