

### Audience

- Government
- Regions
- Municipalities

### SmartCity® Framework

- WiFi wireless controllers
- Unlicensed Wimax **NEW**
- Fiber Optic Devices
- Wireless nodes
- Data centre
- Certified Applications
- Operational Services

### SmartCity® Wireless

- High Quality
- Performance
- All-In-One Device
- Management Software

### Data centre

- Management Server
- Utility Server
- Firewall Software
- Routing Software
- Network Mgmt Software
- User Mgmt Software
- Remote Mgmt Tool

### SmartCity® Applications

- Telemetry & SCADA **NEW**
- Internet Access
- SIP Telephony
- Hotspot Services
- Advertising Services **NEW**
- Alert & Messaging
- Wildfire Protection
- Video Security
- Web Filtering **NEW**
- Internet Usage Reports
- Card Pmnt Method
- PIA-PayKiosk
- PIA-InfoView
- PIA-NetSpooler
- PIA-HotSpotVPN
- Remote Control
- Pocket ERP
- OpenHire
- MissionMode
- Security Monitoring
- Document Management
- OpinionWare
- Business Webcam

### SmartCity® . Unlicensed WiMAX **NEW**

The unlicensed WiMAX is now available to all SmartCity® customers under the same architecture and complete application compatibility and coexistence with the Wifi products. The advanced NLOS (Non Line of Sight) and QoS features of the WiMAX devices will fit existing installation without any changes to the network configuration.

Operating in the unlicensed 5 GHz band, the new devices will equip SmartCity® wireless nodes allowing municipalities to offer different classes of services to different end users.



### Technical Overview

SmartCity® WiMAX devices benefit from a unique combination of features delivering the best economics and most attractive services for fixed and mobile access broadband:

- FFT OFDM radios for true Non-Line-of-Sight nomadic applications
- Burst-by-burst adaptive modulation and error correction
- Class leading spectral efficiency
- Low latency radio interface for time critical applications
- Point to Multipoint Access and Point-to-Point backhaul
- Smart Antenna System. Intelligent, beam forming
- Transmit and Receive Diversity to improve link budget
- Software Defined Radio (SDR) - essential technology for simultaneous support of both Fixed and Mobile 802.16e
- Advanced TCA (ATCA) - Industry standard Indoor equipment practice



### WiMAX Technology To Municipalities

By deploying WiMAX technology in their SmartCity® networks, municipalities are able to offer not only fixed broadband wireless services to homes and businesses but also be able to offer anytime, anywhere mobile access IP services at much higher speeds than is possible with voice-centric 3G networks.



### SmartCity® Network Integration

The SmartCity® WiMAX base station devices consist of the indoor section, suitable to the SmartCity® Control Boxes and the outdoor RF section. The indoor wireless controllers, are housed in the SmartCity® Control Box chassis. The outdoor contains the RF subsystem and antennas. WiMAX controllers can coexist with conventional Wifi devices for a two-level service.

SmartCity® customers will be able to add WiMAX support to existing networks by simply adding wireless controllers to the SmartCity® Control Boxes.





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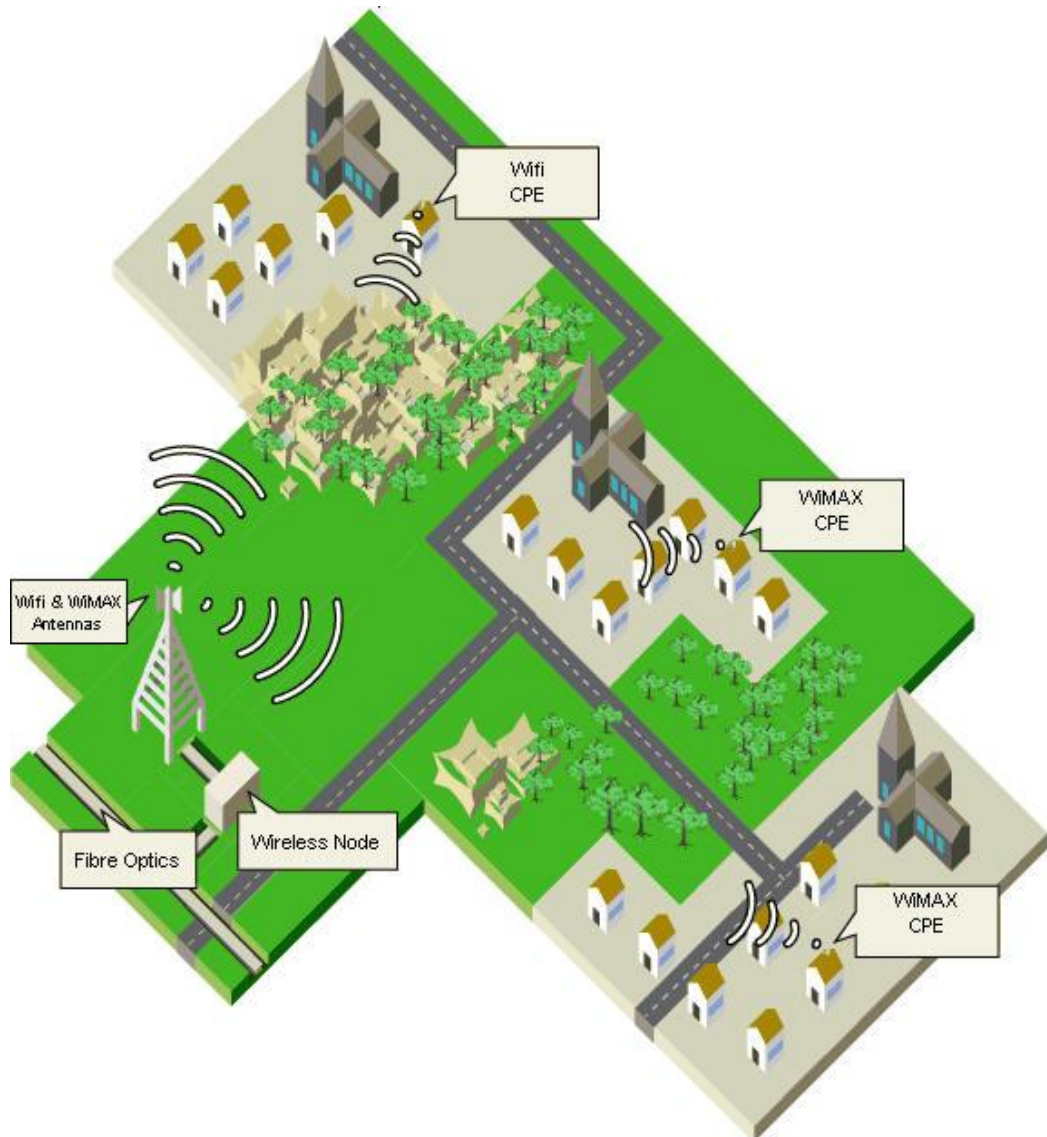
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## SmartCity®. Wifi & WiMAX Combined Installations For An Optimal Coverage

The SmartCity® architecture and RF design optimisation allows the combined installation of Wifi & WiMAX devices under the same wireless node.

WiMAX clients will have the advantage of the NLOS installations, mobility and superior QoS services, while Wifi clients will suit better to low-budget installations. Both clients will benefit without any restrictions from all network application and resources at the same quality and security level.



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## SmartCity®. Indoor WiMAX CPE Developed To Work With All Compliant Base Stations

SmartCity® Indoor WiMAX CPE device is designed for self-install by the end user providing a superior link budget at all deployment conditions. The WiMAX CPE is a physically compact device designed to be deployed alongside the end user's PC. With dimensions close to the size of 2 CD jewel cases, the device looks great when sitting on a desk or bookshelf.

The SmartCity® Indoor WiMAX CPE is designed to be installed by the end user through an easy-to-use but sophisticated interface. A visual indication informs the user when the optimum location for RF reception and transmission is achieved.



### Wifi Add-On

The Wifi expansion base provides full IEEE 802.22 b/g Access Point functionality and turns each SmartCity® Indoor WiMAX CPE into an instant hotspot, with the WiMAX radio interface providing the backhaul connection for the IEEE 802.22 b/g clients. Thanks to IEEE 802.16 QoS built into the device, wireless SIP phones can make high quality, managed VoIP calls.

### VoIP Add-On

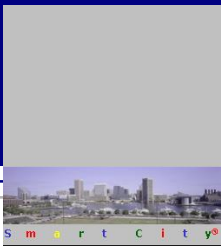
Voice and Data applications are supported by the VoIP expansion base, which supports 2 voice lines and an Ethernet port, thus providing services to standard, RJ-11 equipped telephone instruments. Battery backup can also be provided, where applicable, and uses simple AA rechargeable NiMH cells.

The VoIP expansion base is fully managed centrally to ensure a fully transparent, carrier-class voice service..



### SmartCity® Indoor WiMAX CPE Features

- Designed to function under the unlicensed 5 GHz band
- World's first "Self-Install" WiMAX CPE
- Full Indoor Non-LOS deployment
- User unpacks, plugs in and surfs
- Installation takes less than 1 minute!
- Stackable "CD" Style Design
- Utilises Intel WiMAX connection 2250 device
- Optional IEEE 802.11b/g Wi-Fi access point
- Optional VoIP base for 1 or 2 POTS lines
- A range of antenna options
- Up to 8.5dBi, 4 x 90° auto selecting antenna
- 13dBi external indoor window mount antenna
- Full support for Sub-Channelisation (OFDMA on uplink)
- Integral SIM card reader
- "Auto-Connect" and "Auto-Config" Features
- "Fully Nomadic Operation"



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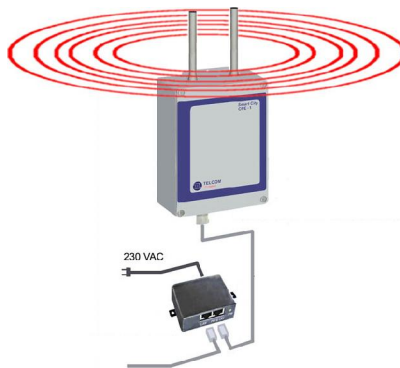
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## SmartCity® Outdoor WiMAX CPE (Optional Wifi Support)

SmartCity® Outdoor WiMAX CPE gives municipalities a fully integrated service platform for building high-capacity broadband wireless networks for personalized service delivery. SmartCity® system architecture supports multi-service applications, scales easily for increased capacity and coverage, and provides dynamic link optimisation on a per-subscriber basis. It also features fast deployment and easy-to-use management. With a SmartCity® Outdoor WiMAX CPE device installed at the subscriber's site, users can browse Web pages, support voice calls, view streaming video, and download files—all at multi-megabit data rates downstream and upstream.

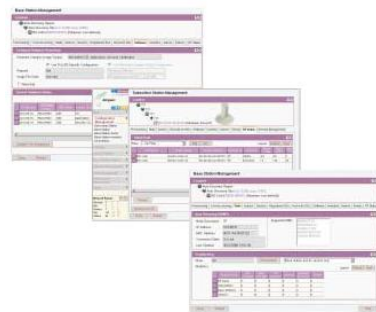


### Easy Installation

The SmartCity® Outdoor WiMAX CPE consists of a main unit that can be installed outdoors connecting with a single power over Ethernet cable, to a small interface unit that also provides an Ethernet port for a PC or a LAN. It can be configured as a bridge or as a router delivering data rates from 16Kbps up to 20 Mbps enabling the most efficient use of aggregate bandwidth, so a large number of users can enjoy simultaneous access.

### Wifi Add-On

The WiFi Add-On is a special version of the SmartCity® Outdoor WiMAX CPE and has an outdoor integrated 802.11b/g Access Point inside the device. The solution enables the device to provide outdoor Wi-Fi coverage and enables the rapid construction of Wi-Fi Hotzones. The WiFi Add-On operates over the full CPE temperature range and includes industrial strength 802.11b/g technology that supports 16 SSIDs per CPE and SSID to VLAN and VLAN to 802.16 Service Flow mapping.



### SmartCity® Outdoor WiMAX CPE Features

- Suitable for full outdoor Non-LOS deployment
- Based on field-proven mechanics
- Comprehensive range of indoor Subscriber Data Adaptors (SDA)
- 1-4 port Switch
- Up to 4 ports with VLAN switching
- Indoor and Outdoor IEEE802.11b/g Wi-Fi and VoIP support
- AC or DC powering options
- Outdoor and indoor units connected using CAT5e cable
- Built-in antenna gain of 17dBi
- Wide range of external antenna options



External Antennas

### Multiple Integrated Features

- 1 to 4 port Switch
- 4 port with VLAN port Switching
- Integral 802.11b/g WiFi Access Point
- Integral VoIP IAD

## SmartCity WiMAX Devices Technical Description

Category	Feature	Wireless Controller	Indoor CPE	Outdoor CPE
RF Interface	Physical Layer	OFDM/SOFDMA	OFDM	OFDM
	Frequency Bands	5.2-5.8GHz	5.2-5.8GHz	5.2-5.8GHz
	Channel Size	5MHz	5MHz	5MHz
	FFT	256	256	256
	Duplex Method	FDD+TDD	HFDD + TDD	HFDD + TDD
	Modulations Supported	64QAM, 16QAM, QPSK, BPSK	64QAM, 16QAM, QPSK, BPSK	64QAM, 16QAM, QPSK, BPSK
	Nomadic Support	Yes	Yes	No
	Mobility Support	No	No	No
	Standards Compliance	IEEE 802.16-2004	IEEE 802.16e-2005	IEEE 802.16e-2005
	Tx Power <sup>1</sup>	+28dBm	+24dBm	+24dBm
	Rx Sensitivity <sup>2</sup>	-115dBm (1/16), -103dBm (1/1)	-103dBm	-103dBm
	AAS & Diversity Gains (Downlink / Uplink)	Up to 5dB / 5dB with dual BSRs	Up to 2dB/2dB	Up to 2dB/2dB
RF Interface Options	Nth Order Rx Diversity	No	Yes	Yes
	Space Division Multiple Access (SDMA) Support	No	Yes	Yes
	Spatial Freq. Interference Rejection (SFIR) Support	No	Yes	Yes
	MIMO	No	No	No
	Uplink Sub-Channelisation Support	1/2, 1/4, 1/8, 1/16	1/2, 1/4, 1/8, 1/16	1/2, 1/4, 1/8, 1/16
	Dynamic Frequency Selection (DFS) Support	Yes	N/A	N/A
	Turbo Coding Supported	No	No	No
	Configurable Cyclic Prefix	1/4, 1/8, 1/16, 1/32	N/A	N/A
	Configurable Frame Duration	2.5, 4, 5, 8, 10, 12.5, 20ms	N/A	N/A
GPS Clock Synch Supported	Yes	N/A	N/A	
IP Features	Bridging Mode	802.1D self-learning bridge	802.1D self-learning bridge	802.1D self-learning bridge
	IPv	IPv4, IPv6	IPv4, IPv6	IPv4, IPv6
	802.1Q VLAN	Yes	Yes	Yes
	MIR / CIR	Yes	Yes	Yes
	DiffServ	Yes	Yes	Yes
	Packet IPv4/IPv6 over 802.3/Ethernet	Yes	Yes	Yes
	Payload Header Suppression	Yes	Yes	Yes
	Multicast Polling	Yes	Yes	Yes
	ARQ	Yes	Yes	Yes
	Packing	Yes	Yes	Yes
Scheduling	Unsolicited Grant Service	Yes	Yes	Yes
	Real/nonReal Time Polling	Yes	Yes	Yes
	Best Effort	Yes	Yes	Yes
Encryption Network	AES/DES (3DES Keys)	Yes	Yes	Yes
	User / Network Interface	100bT/1000bT Ethernet	10/100bT Ethernet, 802.11g WiFi, POTs with integrated RGW	10/100bT Ethernet, 802.11g WiFi, POTs with integrated RGW, E1, T1
Powering & Interconnect	Supply Voltage	-48V DC nominal, 90-265V AC	90-264V AC, 6VDC	-48V DC nominal, 90-264V AC
	Indoor / Outdoor Interconnect	CAT5 Ethernet Cable	Indoor	CAT5 Ethernet Cable
Environmental	Outdoor Equipment	ETS 300 019-1-4 Class 4.1	N/A	ETS 300 019-1-4 Class 4,1
	Indoor Equipment	ETS 300 019-1-3 Class 3.2	ETS 300 019-1-3 Class 3,1	ETS 300 019-1-3 Class 3,1

<sup>1</sup> Tx powers apply for QPSK operation. 64QAM support requires appropriate power back-off.

<sup>2</sup> Rx sensitivities apply to the minimum channel bandwidth supported and include maximum sub-channelisation.