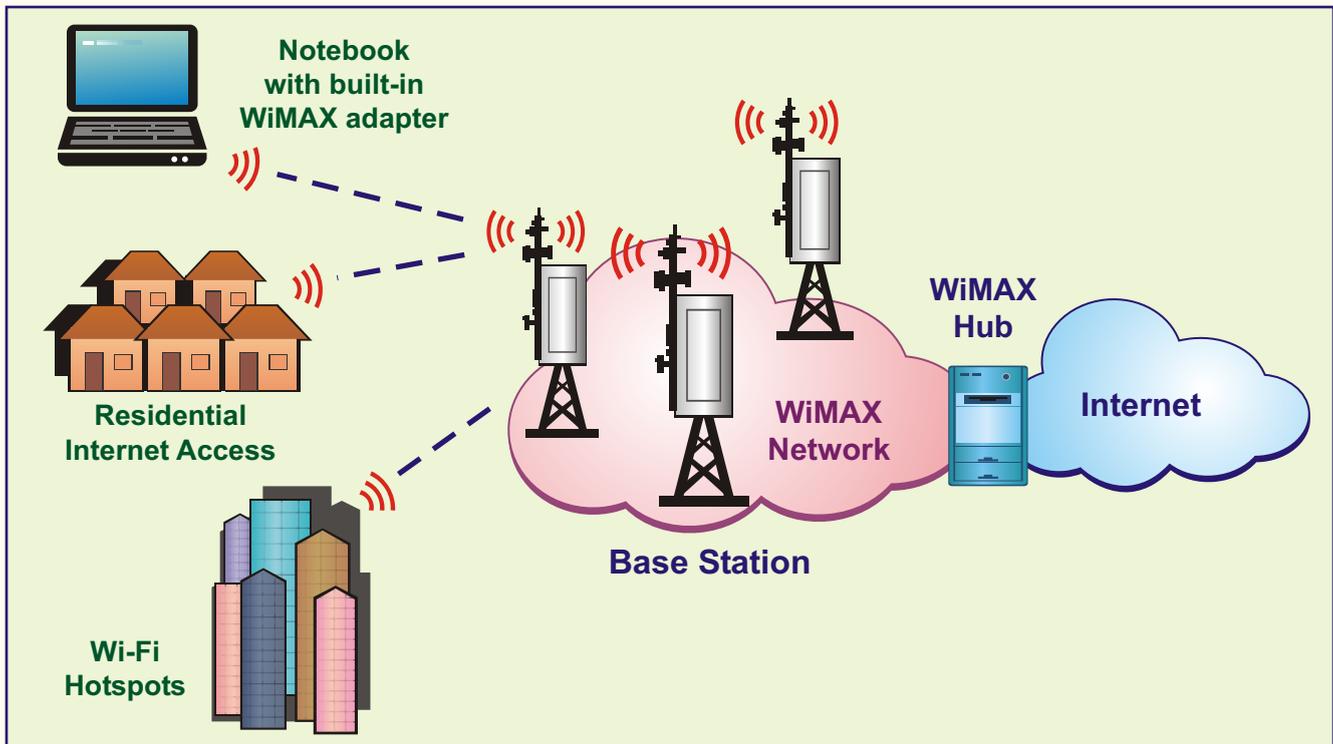




4G WIMAX TRANSMITTER RECEIVER SYSTEM TRAINER MODEL - 4GWIMAX100

This trainer has been designed with a view to provide practical and experimental knowledge of 4G LTE WIMAX Realtime Mobile Transmitter Receiver System.



What is 4G WIMAX (Worldwide Interoperability for Microwave Access)

- WiMAX is a scalable wireless access technology designed to provide high throughput over long distances.
- It is a wireless industry coalition dedicated to the advancement of IEEE 802.16 standards for Broadband Wireless Access (BWA) Networks
- It is a family of wireless communications standards initially designed to provide 30 to 40 megabit-per-second data rates with the 2011 update providing up to 1 Gbps for fixed stations.
- It supports Mobile, Nomadic and Fixed wireless applications.

A mobile user, in this context, is someone in transit, such as a commuter on a train.

A nomadic user is one that connects on a portable device but does so only while stationary -- for example, connecting to an office network from a hotel room and then again from a coffee shop.

Fixed wireless typically refers to wireless connectivity among non-mobile devices in homes or businesses.

- WiMAX has the capability to deliver triple play services, i.e. voice, video and data over microwave RF (Radio Frequency) spectrum to stationary or moving users making broadband available anywhere
- There are two flavors of WiMAX, i.e. Fixed WiMAX and Mobile WiMAX.

Fixed WiMAX is developed based on the IEEE 802.16-2004 standard and is optimized for fixed and nomadic applications in LOS and NLOS environments.

Mobile WiMAX is based on the IEEE 802.16e standard and targeted primarily for portable and mobile applications in NLOS environment. However, Mobile WiMAX systems also can provide fixed and nomadic access.

Mobile WiMAX incorporates additional features crucial to mobile applications: handoff, flexible power management (Sleep mode and Idle mode), Channel Bandwidth Scalability (SOFDMA), Fractional frequency reuse, and better NLOS performance and indoor penetration.

- Over 455 WiMAX networks have been deployed in over 135 countries.

FEATURES

- This 4G WIMAX Trainer is designed to explain, teach and experiment Real time 4G WIMAX system in the laboratory with Wimax Tower and End users.
- Wimax Transmitter and Receiver Modem can be reconfigurable as required.
- Different speed can be configured.
- The Trainer has Wimax Base Station and Wimax Receiver.
- A WiMAX receiver is a USB Wiamx dobgle whcih can be conencted to a laptop or a computer. This is also referred as customer premise equipment (CPE).
- Uplink data speed is 10Mbps and Download data speed is 40 Mbps.

SPECIFICATIONS

(A) WIMAX Transmitter

1. Compliance : IEE 802.16-2004
2. Duplex Mod PHY : TDD, OFDM 256 FFT
3. Frequency : 3.3 3.4, 3.4 3.6 GHz, 3.650 3.675 GHz, 5.725-5.875 GHz
4. Frequency Resolution : 250 KHz (3 GHz), 5 MHz steps (5 GHz)
5. Channel Bandwidth : 3.5 & 7 MHz (3 GHz), 3 MHz (3.3 GHz), 10 MHz (5 GHz)
6. Radio Output Power : 20 dBm
7. Radio Output Dynamic Range : 30 dB
8. Error Coding : Concatenated Reed-Solomon Convolutional Coding
9. Modulation : BPSK, QPSK, 16QAM, 64QAM
10. Radio Sensitivity -64 QAM : -72 dBm
11. External Antenna : Type-N connector
12. IP Networking Bridging : IEEE 802.1d
13. Multi-Service/Multi-User Support : ToS, Protocol, Address, Source Port, MAC address, User Priority, VLAN ID

(B) WIMAX Receiver

1. Connection : USB Port
2. Standard Compliant : IEEE 802.16e
3. Air Interface : S-OFDMA
4. Frequency Band : 3.3-3.8GHz
5. Channel Bandwidth : 3 MHz, 3.5 MHz, 5 MHz, 6 MHz, 7 MHz, 8.75 MHz and 10 MHz
6. Modulation : Adaptive QPSK, 16QAM, 64QAM
7. MIMO : MRC, Matrix A + MRC, Matrix B
8. Beamforming : All I/O Beamforming Items
9. RF Output Power : 2x17dBm @ 3.3-3.8GHz
10. RX Sensitivity : QPSK1/2: -99 @ 3.5 Ghz and 10 MHz BW
11. Antenna Gain : >1.2 dBi @ 3.55 GHz
12. Antenna Type : Internal Omni-Directional
13. Throughput : 40 Mbps Total DL + UL
14. OS Support : Windows XP/Vista/7, Linux, MAC OS X

(C) Hardware Supplied

1. Wimax Transmitter : 1 No.
2. Wimax Receiver : 1 No.
3. Wimax Antennas : 2 Nos.
4. Laptop : 1 No

(E) Software Supplied

1. TX Operating Software : 1 No.
2. RX Software : 1 No.

(F) Accessories Supplied

1. Training Manual
2. **Books for Wimax Communication : 10 Nos in pdf Format**
3. **Mp4 Video Class for Wimax Communication : 40 Classes in Mp4 on Pen Drive**

EXPERIMENTS

1. To understand theory and Block Diagram of Wimax
2. To Understand Operation of Wimax Transmitter Base Station
3. To understand Operation of Wimax Receiver Dongle
4. To configure Wimax Base Station
5. To configure Wimax Receiver Dongle
6. To configure Wimax TX as Access Point mode (AP Mode)
7. To configure Wimax TX as Wireless Bridge mode
8. To configure Wimax TX as Wireless Repeater mode
9. To configure Wimax TX as Client Bridge mode
10. To connect two or more computers using Wimax Networking – Access Point – Client Configuration
11. To connect Wifi enabled Computer in Wimax Network.
12. To understand Glossary and Acronyms used in 4G Wimax Mobile Technology