1. Introduction

1.1. General

The information contained in this manual provides GigAccess^{TM} 900 system overview and instructions for Planning, Installation, Configuration, and Operation of both the Access Units, the Subscriber Units including antennas and accessories.

1.2. GigAccess^{TM} System Overview

GigAccess^{TM} is WaveIP's wireless point-to-point and point-to-multipoint broadband communication system. The basic subsystem is composed of a single sector, which consists of an AU (Access Unit) and up to 128 SUs (Subscriber Units). Each sector is a stand-alone communication network operating on a star topology with a gateway to the WAN, which allows two-way communication between the SUs and the WAN via the AU. A Sector may be divided into sub sectors, which are consecutive to the SUs within the sector.

GigAccess^{TM} 900 system allows operators that provide IP services using GigAccess^{TM} at 2.4 GHz band to extend the reach of their system and provide services to clusters of customers that cannot otherwise be reached due to being obstructed by heavy foliage or other obstacles existing in rural areas. Operators can benefit from the advantage of operating locally in the 900 MHz band, being able to provide services to customers within a radius of few miles in none line of sight environments with heavy foliage.

A sector may include a BC (Base Controller) as an option. The BC (PC based) is connecting to the AUs via the Ethernet. The interface to the BC is a 10/100 BASE-T, Ethernet port, which provide an NMS (Network Management System) that can be integrated through an SNMP interface to high level NMS of the service provider. Its main purpose is to configure the AUs and SUs with SLA (Service Level Agreement). AU can run autonomic without the need of a BC (stand alone configuration) After first successful configuration.

Figure 1-1 depicts a general description of a typical sector in the GigAccess™ system.
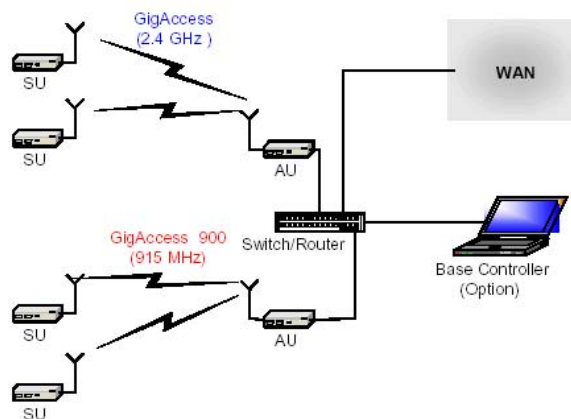

Figure 1-1: General Description of typical sector in GigAccess™ System

The sector uses a single channel out of seven overlapping possible radio channels in frequency band of 902-928 MHz. Each channel carries up to 11 MBPS of data throughput. The data bandwidth is divided between the traffic from the AU to SUs (downstream) and the traffic from the SUs to AU (upstream). GigAccess™ utilizes Time Domain Duplex (TDD) technique in order to divide the bandwidth periodically, based on FRAME SIZE. The portion of the frame, which is allocated to the upstream traffic between the SUs, is TDMA (Time Division Multiplex Access) time domain technique.

It is controlled dynamically and allows a very efficient way of channel capacity utilization. A small portion of the capacity is allocated for new SU registration. The registration slot is allocated to the SU based on slotted aloha algorithm.

Figure 1-2: GigAccess™ 900 Outdoor Unit

The GigAccess™ 900 MAC layer is based on IEEE 802.16 MAC standard with additional proprietary attributes, which allow some special features such as Consecutive AP™.

GigAccess™ 900 networking enables routing and QoS (Quality of Service) queuing of traffic, based on classification of packets information in layer 2, 3 & 4. In certain instances QoS queuing can be done using packet information (priority defined by the management).

GigAccess™ 900 leverages Direct Sequence Spread Spectrum (DSSS) technology to deliver high data rates, high spectral efficiency in addition to immunity to interference and line of site boundaries via patent pending consecutive-AP™ technology. GigAccess™ 900 ensures always-on connectivity to full range of IP-based services, including fast Internet streaming video and VOIP. GigAccess™ 900 provides an independent infrastructure, which is easy to deploy with very low operating costs.

In case of NLOS (Non Line of Sight) between the AU and the SU due to obstacles such as tall buildings or mountains, a consecutive sector can be used. In this case the SU Ethernet output feed a consecutive AU, which acts as a repeater to bypass the obstacle as shown in Figure 1-3.
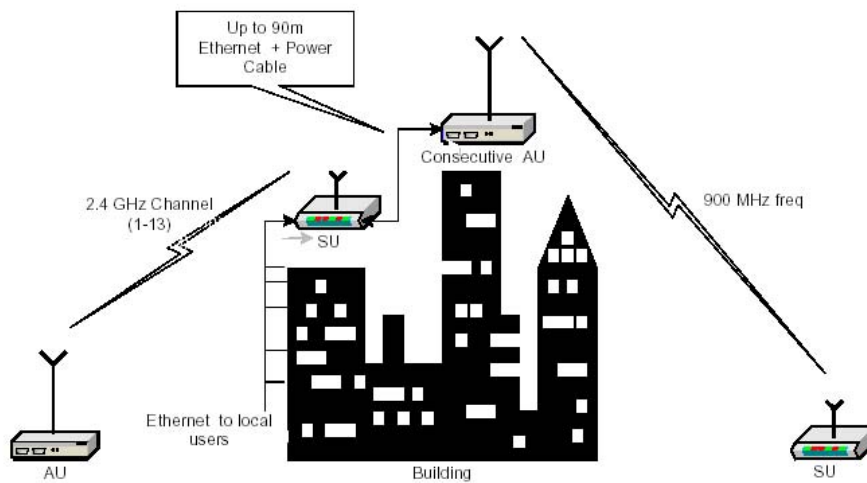

Figure 1-3: Consecutive Sector principle