Exhibit 12 – Operational Description

SpectraPoint Wireless LLC
SP2000 Series Node Transmitter

FCC ID: NNSTX2000-HG-99

Model Number: TX2000-28-HG-510

Information Provided in this Exhibit:

Operational description of the Node Transmitter

Operational Description of High Gain Transmitter Unit

The node transmitter provides the RF link from the central office for the LMDS system. The SpectraPoint® LMDS system is designed to transport a variety of broadband wireless services to customers. This LMDS system is capable of delivering up to 240 MHz of contiguous bandwidth of data services to customers in an area of up to 5 Km radius from a central base station. The same frequency spectrum may be reused in similar sectors throughout a given metropolitan area.

The two basic parts that make up the SpectraPoint® LMDS system are the Base Station and Subscriber Terminal equipment. The block diagram in Figure 1 shows the relationship of the High Gain node RF Transmitter Unit to the total system. In the diagram, the downstream direction is defined from the RF Transmitter to the Roof Top Unit. The reverse signal direction is defined as upstream. In operation, the DS3 data interface to the Channel Group is Quadrature Phase Shift Key (QPSK) modulated onto an L-Band intermediate frequency carrier. The I/F is input to the RF Transmitter where it is

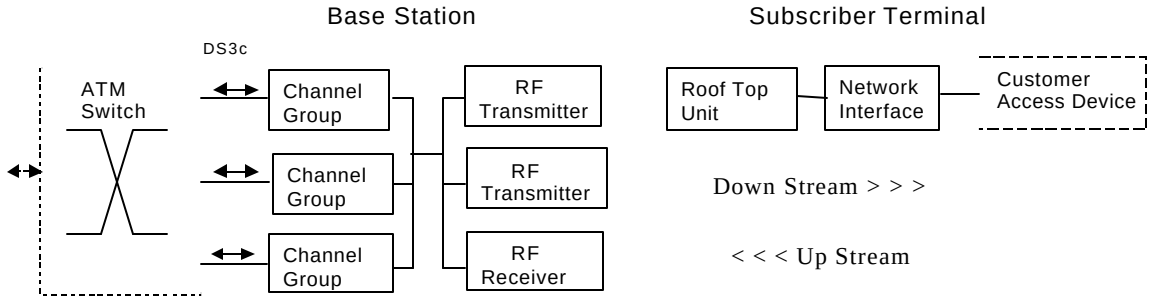

Figure 1: LMDS Block Diagram

upconverted to the 27.5-28.35 GHz authorized LMDS frequency band. The RF is transmitted downstream through one of 4 orthogonal sectors. Each sector reuses the same frequency spectrum analogous to a cellular phone system that has no moving components. The RF Transmitter is authorized to transmit from one to three 40 MHz data channels as well as a CW pilot tone of 28510 MHz.

In the upstream direction, the customer interface to the Network Interface Unit (NIU) may be a combination of multiple T1 data lines, 10BaseT local area network data, or digital video data. The NIU combines the data into a single data stream and modulates an L-Band IF carrier. This IF carrier is then input to the transmit side of the CPE Roof Unit Transceiver. The CPE Roof Unit upconverts the L-Band signal to the 27.5-28.35 GHz authorized LMDS frequency band for transmission to the Sector RF Receiver. The RF Receiver then down converts the RF to the L-band frequency in a reverse of the Base

Station downstream process. Finally data is reassembled into a DS3 format for interfacing with the Central Office equipment.

The node transmitter consists of a Local Oscillator Module, High Power Amplifier Module (HPA)/Up converter Module, a waveguide filter, antenna, polarizer, and radome mounted configured in and around an aluminum chassis. The chassis also contains a Digital Assembly which supplies control functions, Power conversion/distribution and a communications interface to the Base Station.

The input power to the node transmitter is –48 VDC. Power supply modules on the Digital Assembly convert the input DC voltage into +/- 15, +5, and +8 VDC. These supply voltages are distributed to the various electronic modules through cables internal to the chassis.

Control functions to the node transmitter is supplied through an RS-485 serial control port. The functions include local oscillator frequency, IF attenuation, and transmitter power level. The node transmitter supplies status on IF Built In Test (BIT) detection, RF signal level detection, LO frequency lock, and level detection through the same serial interface.
The node transmitter IF ranges from 950 MHz to 1950 MHz. The IF is upconverted by the node transmitter to the transmission frequency range of 27.35 to 27.86 GHz. Within this IF range, combinations of modulated and CW signals may be contained. The transmitter may operate with one to three QPSK carriers, with each carrier of up to 40 MHz BW. Also, the transmitter is capable of transmitting a 27.510 GHz pilot tone either singularly or in combination with the modulated carriers. The pilot tone is upconverted from the 960 MHz reference.

Power output of the node transmitter is controlled using automatic level control (ALC) through a power range of +13 dBm to +30 dBm. Power from the HPA is coupled to the antenna through a waveguide band pass filter. The antenna is polarized either horizontally or vertically depending on the application environment. Antenna gain ranges between 17 and 22 dBi at the 0 degree elevation plane and through the +/- 45 degree azimuth. The range of the antenna elevation pattern is – 2.5 to + 30 degrees.

Built in test (BIT) sensors monitor IF power, RF power, LO level, and LO lock status. These monitored values are periodically transmitted to the base station as status. If the base station processor finds any component out of tolerance, it can command the power amplifier to the off state. The transmitter will then be disabled.