

AvaLAN Wireless Systems Incorporated

AW5800m

Theory of Operation

June 27, 2006

The AvaLAN AW5800m is a point to point Ethernet module that operates in the 5.725-5.850GHz ISM band. The product has no user interface and automatically selects one of fifty eight available non-overlapping frequency channels by monitoring the data error rate of the receiver.

When transmitting, data enters the system through a 10BaseT Ethernet RJ45 connector and is held in a buffer until the system is able to process the data. Once the system is ready, it encrypts the data using a 128Bit key. The data is then scrambled using a 5/6 coding DSSS technique to ensure spectral whiteness of better than 8dBm/3KHz. The data is then sent to the RF Section at 1.536Msymbol per second and is FSK modulated and then transmitted through the antenna port. The occupied bandwidth is 2MHz and the FSK frequency deviation is 512KHz.

When receiving, data enters through the antenna port. The radio energy is then FSK demodulated, clock recovered, reframed and sent to the DSSS demodulator to extract the data stream. This section also monitors the error rate of the passing data and reports to the baseband controller the performance of the current radio channel. The data departs the demodulator and is decrypted and sent to the buffer to be sent out the RJ45 Ethernet connector.

Channel changing is handled by the baseband controller receiving error information from the receive demodulator. If excessive errors are detected the baseband will initiate a channel change sequence by transmitting a channel change bit in the next transmission. The units then change channel on the next transmitted packet.

