AvaLAN Wireless Systems Incorporated

AW900MR
Theory of Operation
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The AvaLAN AW900 is a point to multi-point Ethernet Bridge that operates in the 902-928Mhz ISM band. The product has an HTTP interface and automatically selects one of twelve available non-overlapping frequency channels by monitoring the data error rate of the receiver.

When transmitting, data enters the system through a 10/100 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 1.5Mb/s 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 send 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.