Cover Letter

SP5300 Grant Submission

EION Inc
320 March Road, Suite 500
Ottawa, Ontario, K2K 2E3
Canada
Tel +1-613-271-4400-ext 247
Fax +1 -613-271-7040
www.eionwireless.com

General

This is a request to have EION Wireless SP5300 wireless network device NII operating in the 5.725 to 5.850 GHz band to be granted a change in FCC ID of the radio module and thus be listed uniquely with the FCC. The radio package is made up of 1) a radio module from Compex Inc that already has been modularly approved by the FCC. Permission has been granted by the OEM manufacturer Compex Ltd. to obtain our own FCC ID for the module they are providing us. This module will then be multi-listed with the FCC. The modular approval FCC-ID is TK4WLM200N5-26ESD ...The grant for this ID was issued on 05/12/2011. The module and the product will be labeled with new ID when issued for this request.

Radio Module

The radio module is not a standalone device and requires the computer board to operate. The Radio Module is called WIFI Adaptor and is used as a daughter board to the single board computer in the product. Electrically, it is a PCI bus device and connects to the SBC via a MiniPCI connector. The adaptor will be supporting additional features that are mot ordinarily used in other applications of the module. These features do not affect the RF characteristics of the card as tested... They do affect TDD timing, framing, scheduling and other protocol related aspects.

The radio module will be used without any circuitry changes or firmware change on the card itself. The testing and conditions that the module was issued its Grant under apply for this application. The same frequency range, power levels, bandwidths, modulation types, frequency stability and other pertinent aspects apply.

Conformity

The Compex single board computer used to operate the module also has bee tested and conforms to FCC regulations. This hardware plus EION's enclosure is being used as is with EION's proprietary Software load with features that do not violate FCC restrictions for the Class of Service being applied for, (which is NII).

The entire product package has been taken through conformance testing meeting both Class A and Class B emissions criteria. The package consists of the Enclosure, single board computer, radio module, POE (power over Ethernet) power supply / POE DC injector). All these subsystems have been tested and conform to FCC regulations. The test report for the SP5300 product has been submitted with the application for reference, (Report **E35R12-179**). Photographs of the internal and external views of the product have been provided as well of the individual circuit cards used

Software License Key for Band Setting, Channel Frequency, Bandwidth and Power levels

The SP5300 utilizes a license key that is provided along with the equipment to end users. The key system only allows the radio to be used according to the conditions stated in the Grant in terms of power levels, channel frequencies allowed and type of transmission. With out the key the radio defaults to channel (153) and sets the power to a low value well below the value for the band. The onboard SW is protected by security and thus cannot be overwritten or modified in attempt to defeat the Key system. In our design the radio cannot be forced to operate out side of the limitations enforced by the license Key. The key system works seamlessly with radio module of the system. The key system will allow the radio to operate on standard channel frequencies between 5.745 and 5.825 GHz only. Power has a maximum output of 400 mw (26 dBm) per channel with a combine output power of 800 mw (29 dBm). The output power is adjustable in 1 dB increments form 7 dBm to +26 dBm.

The radio system has the capability to operate in either 802.11a mode or 802.11n mode in the frequency ranges of 5.745 -5.825 GHz.. Channels are selectable in this range following the 5.0 MHz channel plan for the 5 GHz band.. The radio system can be instructed to operate with broadband channels of 5, 10, 20, and 40 MHz. It can operate in SISO mode or MIMO mode determined by Software used in the system. The maximum signaling rates in SISO mode under 802.11a is 108 Mb/s using a 40 MHz channel. In MIMO mode (802.11n), the maximum signaling rate per channel is 150Mb/s. The system utilizes a 100 Mb/s Ethernet interface to the user. The radio will provide lower bit rates according to channel conditions by dynamically changing modulation levels and CRC ratios The radio utilizes OFDM paired up with 64 QAM, 16 QAM, QPSK and BPSK depending on receive level (RSSI) and SNIR, (Signal to Noise plus Interference). The net throughput of the radio is dependent on the Channel size, modulation rate used and FEC (forward Error Control Cyclic Redundancy Check ratio in effect. Power control is also exercised to ensure that only the power necessary to maintain the channel at the desired bit rate and BER is used to in order to minimize interference.

Application

This product will be used as base station or Access point (AP) in a point to multipoint system or as a point to point system to deliver digital network services such as the public Internet. The units are designed to be used outdoor either wall or roof mounted on a small radio mast. An Ethernet cable connects the AP to the operator's local area network via a switch or similar devices.

EION WIRELESS

INTELLIGENCE IN THE AIR

The SP5300 when employed as base-station transceiver will connect wirelessly to multiple Customer premise equipment (CPE) in its coverage area. The system is designed to carry packet traffic (IP) linking the end user to private or public Internet networks. The system can support VoIP, IPTV, Internet Traffic, and other packet based services.

Date: July 5th, 2012

City: Ottawa

Name: Douglas J. Reid P'Eng

Function: Senior Systems Architect

E-male doug@eion.com

Signature: 

Corporate Headquarters

320 March Road, Suite 500, Ottawa, ON, K2K 2E3, Canada. Phone: +1 (613) 271-4400, Fax: +1 (613) 271-7040, www.eionwireless.com