

Cover Letter

SP1110 Grant Submission

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General

This is a request to have EION Wireless SP1110 wireless network device (DTS) operating in the 5.725 to 5.850 GHz band to be granted and FCC ID and thus listed 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 TK4-09-WLM200NX...The grant for this ID was issued on 02/27/2009. The module and the product will be labeled with new ID when issued for this request.

NII Band Only Operation

The SP1110 will operate only in the NII band since it does not support DFS operations in its SW. As explained further down in the letter the product incorporates a license key system that prevents operation on unauthorized – prohibited frequencies by users. The key is encrypted and is very resistant to attempts to defeat it. by operators or users.

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 not 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.

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Conformity

The single board computer used to operate the module also has been tested and conforms to FCC regulations. An integrated antenna is also employed and forms the front cover of the enclosure. It is a dual plane 17 dBi H& V plane polarization antenna system which has been tested with the radio module by the OEM. The OEM manufacturer offers a complete radio system product consisting of the enclosure, integrated antennas, single board computer, Firmware and approved radio module. This product has been conformance. This hardware product 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, integrated antenna, 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 SP110 product has been submitted with the application for reference, (Report E35R12-139). 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 SP1110 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. Without 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 outside 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 only operate on standard channel frequencies between 5.725 and 5.845 GHz only. Power has a maximum output of 63 mw (18 dBm) per channel with a combine output power of 126 mw (21 dBm). The output power is adjustable in 1 dB increments from 1 dBm to +18 dBm.

The radio system has the capability to operate in either 802.11a mode or 802.11n mode in the frequency ranges of 5.180-5.240, 5.260- 5.320, 5.500-5700, 5.745 -5.850 GHz. Channels are selectable in this range following the 5.0 MHz channel plan for the 5 GHz band.. Again, the SP1110 will only use the 5.725 to the 5.850 GHz and will not operate on DFS frequencies below 5.725 GHz.

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

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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 the subscriber station or Customer premise Equipment (CPE) 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 CPE to the user's local area network via a switch, wireless router or similar devices.

The SP11110 is to be employed as a customer located transceiver which connects wirelessly to a centralized Base Station. 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.

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