



Envisionnovation, Inc.
Etobicoke, Ontario, Canada

April 10, 2010

To:

United States Federal Communications Commission (FCC)

Industry Canada
Spectrum Management and Telecommunications

Re: Modular Approval Request for FCC ID X5C-BARBER2 &
Industry Canada 8815A-BARBER2

This letter requests modular approval of EIN's *Barber2 ZigBee Module*.

This low-power radio device operates as a digital modulation spread-spectrum transceiver in the 2.4 GHz ISM band under the provisions of FCC 47 CFR Part 15.247(a)(2) and Industry Canada RSS-210 and RSS-GEN Issue 5.

The *Barber2 ZigBee Module* is designed for OEMs who are designing short-range wireless industrial control and monitoring equipment, who wish to use the ZigBee protocol, and do not have the RF expertise to design their own radio module.

We address the specific items of FCC Public Notice DA 00-1407 and Industry Canada RSS-GEN, Issue 5, Section 7.1.1 below:

- a) Shields. The *Barber2 ZigBee Module* incorporates shielding over the the radio transceiver and the microprocessor. The shields are soldered to the printed circuit board. The bottom of the shield is enclosed by a copper plane that is part of the circuit board.
- b) I/O connections. The module has digital and digitized analog discrete I/O and serial digital connections, but in all cases these inputs are processed by data buffering.

- c) Effect of inputs on modulation. The *Barber2 ZigBee Module* incorporates digital data buffers on the I/O inputs, which are an integral part of the transceiver (microcontroller) IC. The peak modulation is set by a computer program (firmware) stored in the transceiver IC. That portion of the firmware cannot be modified by the OEM user. The digitized analog and/or digital inputs on the I/O inputs cannot change the transmission rate, produce over-modulation or change RF output power.
- d) Completeness and availability. The *Barber2 ZigBee Module* is a complete transmitter with its own 16-MHz quartz-crystal-controlled reference oscillator and voltage regulators. It is designed to be incorporated into OEM equipment, and is only offered for sale to original equipment manufacturers (OEMs) and their agents.
- e) Power regulation. The *Barber2 ZigBee Module* has its own internal voltage regulation, and is designed for a voltage input of 2.8 to 3.6 volts. RF power is guaranteed to stay under the maximum measured in certification testing over entire input voltage range. The transceiver IC has its own internal 1.8V regulator to power the frequency-determining circuitry. Frequency is guaranteed to stay within ± 40 ppm over the entire input voltage range
- f) Antennas. The *Barber2 ZigBee Module* has two antenna configurations, each with two antenna options. The module has had emissions levels tested with all antennas. The two internal antennas are soldered to the printed circuit board, and cannot be removed by the user. The two external antennas are connected by a non-standard connector, the U.FL connector from Hirsose Industries of Japan.
- g) Host Devices. The *Barber2 ZigBee Module* is designed for use in wireless industrial control and monitoring equipment by original equipment manufacturers (OEMs), using instructions in the users' manual provided by EIN.
- h) RF Exposure. The *Barber2 ZigBee Module* is a low-power (100 mW) device and operates with a low transmit duty cycle. Analysis shows the device complies with SAR and MPE RF exposure requirements for mobile devices. Installation and operation instructions specify the required minimum distance from humans.
- i) Labeling. The *Barber2 ZigBee Module* is identified with the FCC and Industry Canada ID on a label that is permanently affixed to the *Barber2 ZigBee Module* with adhesive that has been shown in our tests to last the life of the unit. Additionally, the Module's FCC and Industry Canada IDs and the Part 15 warnings appears in the users' manual.

j) The *Barber2 ZigBee Module* complies with all applicable provisions of FCC Part 15.247 Industry Canada RSS-210 and RSS-GEN Issue 5 for digital modulation spread-spectrum devices in the 2.4 GHz ISM band.

Thank you for your consideration.

Sincerely,



A handwritten signature in black ink, appearing to read "B.A.C. Douglas".

(Signature/Title)

Bruce A.C. Douglas, CEO, EIN