

danjuliodesigns LLC
engineering for life

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Apr 18, 2010

Nemko Canada Inc
303 River Road
Ottawa, Ontario, Canada
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Attn: Director of Certification

FCC ID: XO6-DJ2MOD1
IC: 8558A-DJ2MOD1

Request Limited Modular Authority

We hereby request **Limited** Modular Approval based on the numbered requirements identified below as we address them to be included in our application for equipment authorization.

1. The modular transmitter must have its own RF shielding. This is intended to ensure that the module does not have to rely upon the shielding provided by the device into which it is installed in order for all modular transmitter emissions to comply with Part 15 limits. It is also intended to prevent coupling between the RF circuitry of the module and any wires or circuits in the device into which the module is installed. Such coupling may result in non-compliant operation.

This product does not include RF shielding on the module but products incorporating the module meet spurious limits of 15.209 without shielding. Verification testing of new products using the module will be performed to verify they continue to meet the limits.

2. The modular transmitter must have buffered modulation/data inputs (if such inputs are provided) to ensure that the module will comply with Part 15 requirements under conditions of excessive data rates or over-modulation.

This product does not include logical isolation buffers on the data and clock signals that connect the transceiver Integrated Circuit to the external microcontroller. However, data transmission rates on the external data and clock signals are logically decoupled from data transmission rates from the RF section. Data for transmission is loaded by the external microcontroller using the data and clock signals into buffer memory inside the transceiver Integrated Circuit. State machines internal to the transceiver and clocked by the transceiver clock are

responsible for encoding and clocking out data during an RF transmission preventing excessive data rates or over-modulation.

3. The modular transmitter must have its own power supply regulation. This is intended to ensure that the module will comply with Part 15 requirements regardless of the design of the power supplying circuitry in the device into which the module is installed.

This product includes a built-in voltage regulator. The regulator is part of the Nordic nRF24L01+ transceiver integrated circuit.

4. The modular transmitter must comply with the antenna requirements of Section 15.203 and 15.204(c). The antenna must either be permanently attached or employ a “unique” antenna coupler (at all connections between the module and the antenna, including the cable). Any antenna used with the module must be approved with the module, either at the time of initial authorization or through a Class II permissive change. The “professional installation” provision of Section 15.203 may not be applied to modules.

The module contains a PCB-based trace antenna meeting the permanently attached and “unique” antenna coupler requirements.

5. The modular transmitter must be tested in a stand-alone configuration, i.e., the module must not be inside another device during testing. This is intended to demonstrate that the module is capable of complying with Part 15 emission limits regardless of the device into which it is eventually installed. Unless the transmitter module will be battery powered, it must comply with the AC line conducted requirements found in Section 15.207. AC or DC power lines and data input/output lines connected to the module must not contain ferrites, unless they will be marketed with the module (see Section 15.27(a)). The length of these lines shall be length typical of actual use or, if that length is unknown, at least 10 centimeters to insure that there is no coupling between the case of the module and supporting equipment. Any accessories, peripherals, or support equipment connected to the module during testing shall be unmodified or commercially available (see Section 15.31(i)).

The module is verified in a stand-alone configuration, 10 cm from a simple test controller built from an existing product PCB. The test controller contains firmware implementing the RF protocol modified to enable the appropriate test conditions. The module is commanded to transmit representative packets at the maximum protocol specified packet rate.

6. The modular transmitter must be labeled with its own FCC ID number, and, if the FCC ID is not visible when the module is installed inside another device, then the outside of the device into which the module is installed must also display a label referring to the enclosed module. This exterior label can use wording such as the following: “Contains Transmitter Module FCC ID: XYZMODEL1” or “Contains FCC ID: XYZMODEL1.” Any similar wording that expresses the same meaning may be used. The Grantee may

either provide such a label, an example of which must be included in the application for equipment authorization, or, must provide adequate instructions along with the module which explain this requirement. In the latter case, a copy of these instructions must be included in the application for equipment authorization.

The module includes a 1 inch by 0.375 inch label with the module model number, FCC ID and IC number on it per danjuliodesigns, LLC drawing 20-00050-00.pdf. Devices utilizing the module contain an exterior label with the words “Contains FCC ID: XO6-DJ2MOD1 and IC: 8558A-DJ2MOD1” as the module is not visible when installed in another device. An example label, 24-00002-01.pdf, is included for review.

7. The modular transmitter must comply with any specific rule or operating requirements applicable to the transmitter and the manufacturer must provide adequate instructions along with the module to explain any such requirements. A copy of these instructions must be included in the application for equipment authorization. For example, there are very strict operational and timing requirements that must be met before a transmitter is authorized for operation under Section 15.231. For instance, data transmission is prohibited, except for operation under Section 15.231(e), in which case there are separate field strength level and timing requirements. Compliance with these requirements must be assured.

Equipment containing the module meets these requirements by design and through verification. Operation of the module under the FCC ID granted by the Limited Modular Approval will be controlled by the means that all products using the module will be designed and manufactured by danjuliodesigns, LLC. All devices that utilize the module, designed by danjuliodesigns LLC, are designed and verified to meet an engineering and manufacturing specification that details operation of the RF protocol to meet the Limited Modular Approval. These specifications, documented in the file “DJ2MOD1_Install_00.pdf” included in the submittal package, detail operation of the protocol, radio operation parameters including legal RF frequency ranges and power output, device labelling and user documentation requirements.

8. The modular transmitter must comply with any applicable RF exposure requirements. For example, FCC Rules in Sections 2.1091, 2.1093 and specific Sections of Part 15, including 15.319(i), 15.407(f), 15.253(f) and 15.255(g), require that Unlicensed PCS, UNII and millimeter wave devices perform routine environmental evaluation for RF Exposure to demonstrate compliance. In addition, spread spectrum transmitters operating under Section 15.247 are required to address RF Exposure compliance in accordance with Section 15.247(b)(4). Modular transmitters approved under other Sections of Part 15, when necessary, may also need to address certain RF Exposure concerns, typically by providing specific installation and operating instructions for users, installers and other interested parties to ensure compliance.

The module operates under Section 15.249 with a maximum transceiver Integrated Circuit output power of 0 dBm. It is exempt from these restrictions.

9. According IC RSS Gen, clause 7.1.2, If compliance with one or more of the requirements stated in (1) to (4) in Section 7.1.1 cannot be demonstrated, applicants may be granted a “Limited Modular Approval” (LMA). This will be issued in those instances where applicants can demonstrate that they will retain control over the final installation of the device, such that compliance of the end product is assured. In such a case, an operating condition on the LMA for the module would state that the module is only approved for use when installed in devices produced by a specific manufacturer, typically the applicant. If LMA is sought, the application for equipment approval must make this fact clear. It must also specifically state how control of the end product into which the module will be installed, will be maintained, such that full compliance of the end product is always ensured.

Equipment containing the module meets these requirements by design and through verification. Operation of the module under the IC approval granted by the Limited Modular Approval will be controlled by the means that all products using the module will be designed and manufactured by danjuliodesigns, LLC. All devices that utilize the module, designed by danjuliodesigns LLC, are designed and verified to meet an engineering and manufacturing specification that details operation of the RF protocol to meet the Limited Modular Approval. These specifications, documented in the file “DJ2MOD1_Install_00.pdf” included in the submittal package, detail operation of the protocol, radio operation parameters including legal RF frequency ranges and power output, device labelling and user documentation requirements.

Sincerely,

A handwritten signature in black ink that reads "Dan Julio". The signature is written in a cursive, flowing style with a long, sweeping underline.

Dan Julio
owner