



Feb 23, 2010

Timco Engineering  
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PO Box 370  
Newberry, FL 32669

Attn: Director of Certification

FCC ID: VIK-OH001

### **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.

Our equipment meets this by having a ground plane and a power plane within its PCB layers underneath the RF components and not requiring further shielding due to meeting radiated emission levels of 15.249 and 15.209. Discus Dental maintains full control of the end product into which the module will be installed. The Module will always be contained in variations of same or similar mechanical structures that will not have any other circuitry, ever.

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.

Our equipment meets this by having a complete, self-contained design where there are no electrical inputs (other than power) to accommodate external devices. The only input is a magnetic one and gets sensed via the module's Hall sensor chip. Data rates and modulations are all built in and fixed, and not dependent on the magnetic field strength.

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.

Our equipment meets this by having on-board 3V regulator, which further gets regulated internally by the Nordic nRF24LE1 radio chip. Therefore, power supply voltage variations do not affect transmission power levels or modulation levels.



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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.

Our equipment meets this by having a fixed PCB trace antenna. Antenna is not detachable and is part of the module. The module is a single-board design.

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)).

Our equipment meets this when testing the module by itself. The module is a battery operated device and has battery terminals build into it. No housings are used during testing.

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.

Our equipment meets this by showing the FCC ID number on the module label. The User’s Manual and Installation Guide directs the User to also have this FCC ID on the outside of the final product, especially since the module will not normally be visible when installed.

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



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**Brian Zargari**  
Device Development Department

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.

Our equipment meets this by:

- 1) Not allowing any transmitter characteristics to be affected by outside influences, such as power supply voltage or magnetic force strengths. No other inputs are provided and no detachable antennas exist.
- 2) The User's Manual and Installation Guide clearly gives instructions and warns against tampering.

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.

Our equipment meets this by meeting the requirements of 15.249.\

Although we meet all requirements for Modular Authority, it is the intentions of Discus Dental LLC not to market the RF Module and will retain full control in manufacturing it and the products it will be placed into.

Sincerely,

**Brian Zargari**  
**Sr. Electrical Engineer**  
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