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**USER'S MANUAL AND  
INTALLATION GUIDE FOR  
DISCUS TRANSMITTER MODULE  
04-1293P03**



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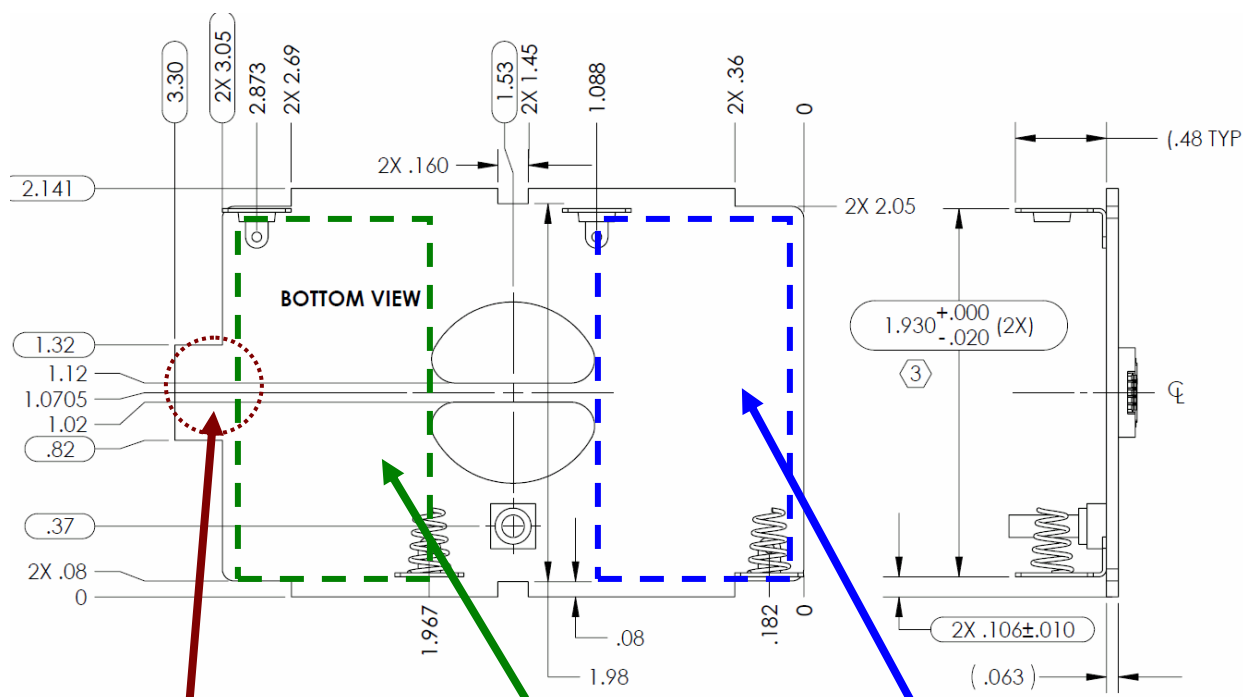
## I. DESCRIPTION

Discus Dental 04-1293P03 Transmitter Module is a radio frequency transmitting device intended for integration into professional products requiring a wireless link. This module does not contain the receiver necessary to complete the wireless link.

The module also includes a Hall sensor which measures magnetic fields. This feature allows the use of low cost permanent magnets for measuring small change in distance, such as the ones used in foot pedal or foot switch applications. Magnetic field strength data is sent through the wireless link to the receiver.

## II. MODULE SPECIFICATIONS AND REQUIREMENTS

### a. Mechanical Specifications



All 3 indicators are located on the opposite side of the board in this area

Product ID label is located on this surface in the area shown.

The RF circuit including the PCB trace antenna is located in this area on both sides of the board. Keep clear for best transmission performance.



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The ID label indicates the following information:

<b>Discus Dental, LLC</b> <b>Model: 04-1293P03 REV ____</b> <b>FCC ID: VIK-OH001</b> <b>IC: 7260A-OH001</b> <b>VID ____ Lot: ____</b>
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**b. Electrical Specifications**

Operating voltage range:	3.4VDC to 4.5VDC
Operating current consumption:	100mA
Recommended power source:	Disposable AAA Alkaline batteries (x6) Can also operate on 3 cells (one cell bank)

**c. Magnetic Interface Requirements:**

A number of combinations of magnetic strengths and applied distances could successfully work with this module. The magnetic field required is polarized, so magnet orientation is critical.

Hall sensor useable voltage range:	0 to 1.2V
Hall sensor voltage relationship to magnetic field:	Decreasing voltage with magnetic force increase
Typical magnet characteristics:	Pull Force: 1.05 lbs Surface Field: 1217 Gauss Brmax: 14,800 Gauss
Magnet distance range:	Selected based on magnet size and force

**d. Environmental Specifications**

Operating temperature:	0°C to +40°C
Storage temperature:	-20°C to +50°C
Relative Humidity:	10% - 95% RH non-condensing



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**e. RF Communications Specifications**

The module transmits within the 2.4GZ ISM band. The selected frequencies of operation are:

Channel #	Frequency [MHZ]
1	2405
2	2410
3	2415
4	2420
5	2425
6	2430
7	2435
8	2440
9	2445
10	2450
11	2455
12	2460
13	2465
14	2470
15	2475
Sync	2478

There are 15 channels of normal operation and one specially assigned channel, sync, only used for transmitter-receiver pairing purposes.

During the pairing (synchronization) process, both a new channel number and a new 5-byte address are selected by the module and get communicated to the receiver.

Each time it is paired with a receiver, the module increases the frequency by 2 channels, meaning 10MHZ increments. The change is always in the ascending order and wraps around once the maximum normal operating channel number (channel 15) has been exceeded. For example, if starting at channel 1, then the following are the order of channel numbers every time pairing is performed:

1, 3, 5, 7, 9, 11, 13, 15, 2, 4, 6, 8, 10, 12, 14, 1, 3, .....



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**f. Indicators:**

There are 3 indicators on the module:

1. Amber:

This light blinks when power supply voltage level drops below approximately 3.4V. Though the module is still functional at this point, it acts as a warning for the User to replace the batteries soon (if batteries are used as the source of power).

2. Green:

This light indicates the unit is in fully powered and awake, but in idle mode. It is ready to transmit if the magnetic field is strong enough to qualify.

3. Blue:

The blue light, when solid on, indicates normal RF packets are being transmitted. When blinking, it indicates that it is in pairing (Sync) mode.

### III. OPERATING INSTRUCTIONS

**a. Pairing With a Receiver:**

- i. The receiver (not supplied with this module) must be put into learning mode in order to start the pairing process
- ii. Then, the button on this module must be pressed continuously until the blue light starts flashing. This usually takes about 3 seconds.
- iii. Once blue light starts flashing, release the button and the module will start a pairing mode transmission lasting about 10 seconds. The pairing mode packets contain the new wireless address and channel for the receiver to learn.

**b. Sleep and Wakeups:**

The module enters a low power sleep mode as soon as power is applied to it. The green and blue lights are off in this state. The amber light may blink if the supply voltage is low. A magnetic force applied to the Hall sensor at the center of the board wakes up the module, and RF transmission begins. A solid blue light indicates this event.

**c. Transmitting and Idle Modes:**

While transmitting, the blue LED will remain on. Once the magnetic force is no longer applied, the module enters idle mode and remains in that state for up to 2 minutes. The green light will be on during this time. If no magnetic force is sensed in this period, the module will enter low power/sleep mode and the green and blue lights will remain off.



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**d. Calibration:**

Due to variations in magnetic forces and the mechanical distance of it to the Hall sensor, calibration may be necessary in order to provide the largest possible dynamic range. The magnetic force has to be in the acceptable range in order for calibration to be possible. Calibration is intended for final product factory use, though calibrating in field is not prevented. Here are the instructions for calibration. The entire calibration process is time critical, so calibration mode may exit at any time with errors if operator action does not happen quickly.

- Remove power from the module
- Re-apply power to the module and immediately press and release the button 5 times without much delay. The green and blue lights will flash slowly and in sync with each other. If they blink quickly and out of sync, then there is an error. On any errors, the module will enter sleep mode and the entire sequence has to be repeated.
- Once slow green and blue blinks are observed, making sure the magnet is at the furthest distance press and release the button once. If accepted, the in-sync blinking becomes a rapid one. Otherwise the out-of sync rapid blinking will be observed and it follows same error routine described above.
- When the in-sync rapid blinking starts. Making sure the magnet is now at the closest distance range, press and release the button once. . If accepted, the in-sync blinking becomes a rapid one. Otherwise the out-of sync rapid blinking will be observed and it follows same error routine described above.
- On successful completion, both the green and the blue lights will light up together for a few seconds before module going to sleep mode.

## **IV. REGULATORY REQUIREMENTS**

**a. Labeling**

When fully integrated in to the final product, it is required by United States and Canada regulatory agencies to have a label on the exterior of the final product with wording as shown below:

**“This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.”**

In addition, the FCC and Industry Canada (IC) certificate numbers must appear as follows:



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“Contains FCC ID: VIK-OH001, IC: 7260A-OH001 ”

An example of such label is shown below:

YOUR COMPANY NAME                      Model: XXXXXXXX  
CONTAINS FCC ID: VIK-OH001, IC: 7260A-OH001  
This device complies with Part 15 of the FCC rules subject to the  
following two conditions:  
1) This device may not cause harmful interference.  
2) This device must accept all interference received,  
including interference that may cause undesired operation.

For use in other countries, contact Discus Dental LLC.

**b. Information for the User:**

FCC requires certain information to be provided in the final product User's Manual. The following text must appear in the manual:

**This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) This device must accept any interference received, including interference that may cause undesired operation.**

**This equipment has been tested and found to comply with the limits for Class B Digital Device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures.**

- **Reorient or relocate the receiving antenna**
- **Increase the separation between the equipment and receiver**
- **Connect the equipment into an outlet on a circuit different from that to which the receiver is connected**
- **Consult the dealer or an experienced radio/TV technician for help**

**Any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.**

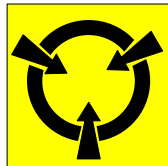


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## V. INSTALLATION NOTES

Follow these general installation guidelines when integrating the module into the final product:

1. For best transmission distance, do not shield the antenna side of the module with electrically conductive materials. No other circuitry should be located near the RF transmitter section.
2. This module is not intended for products operating near strong magnetic fields. Keep magnetic materials, other than the intended distance sensing magnet, away from the Hall sensor location (at the center of the board assembly).
3. The device can be powered up with only 3 AAA sized 1.5V batteries. Operating time can be extended by having 3 additional cells. Use of Alkaline type is recommended to achieve longer operating times.
4. Certification will be void if any circuitry on this module is modified or tampered with. Contact Discus Dental LLC for all such information. Contact Discus Dental for any other questions regarding safe and legal installation of this device
5. The product housing should be designed in such a way not to allow liquid spillage on this module.
6. Components on this assembly are static sensitive. Handle using proper Electrostatic Discharge (ESD) protective equipment.



## VI. MAINTENANCE AND CARE

No periodic maintenance is required for this module.