Table 1. Placing the Sensor in the Sensor Cradle

Step	Instruction	Illustration
1.	A. Check "U-shaped" Positioner. The number pointing towards the Sensor (1 or 2) must correspond with the Sensor's size. B. If it isn't, lift up Positioner and turn it so that the correct number size on the Positioner is pointing towards the Sensor.	
2.	Slide Sensor Back on Spring-Tension Guide	
3.	Release Sensor Gently and Secure it in Position	

3.4.2. Turning on the Sensor

1. Reconnect the battery pack, following the alignment guides along the Sensor (see **Table 2**). The battery pack and Sensor are keyed to each other so that when they are

positioned correctly, the battery pack will slide along the guides and snap easily into place.

2. Press the pushbutton switch located on the battery package to toggle the Sensor on and off. Sensor battery status and RF channel selection are displayed on the dual LEDs when the Sensor is turned on. Refer to **Table 3** for battery status and RF channel codes.

3.4.3. Positioning the Sensor

1. Place the Wireless Sensor on or close to the patient chair and adjust the Antenna so it is within line of sight of the Wireless Sensor.

2. Turn on the sensor (if it's not on already) and start the CDR Wireless Monitor to determine the strength of the RF signal received by the Antenna / Receiver. The Wireless Monitor can be started from the Windows System Tray of your computer.

3. Check the Battery Level and the Signal Strength values. If signal strength is good, continue with **Section 3.5**. If signal strength is poor, repeat the steps, repositioning the Antenna / Receiver and checking RF signal strength again. It may be beneficial to undock the Antenna / Receiver and mount it remotely from the USB Interface. Refer to **Section 3.6** for details.
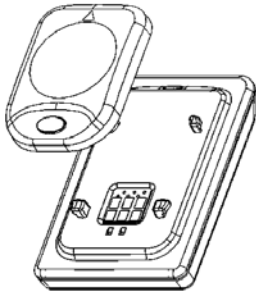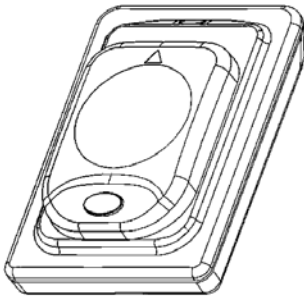
3.5. Wireless Sensor Calibration
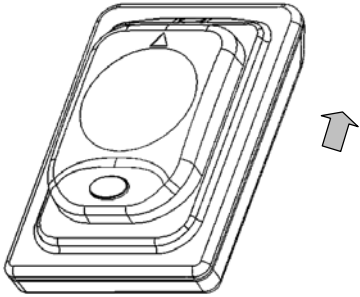
For this procedure you will need the CDR Wireless Calibration File disk provided with your system. This disk contains a unique calibration file for your Wireless Sensor.

1. Insert the CDR Wireless Sensor Calibration File disk into the floppy drive of your computer.

2. Click Start, Run, and then enter a :\ install2.

The file is copied automatically to the appropriate folder on your computer.

Table 2. Securing the Battery Pack to the Sensor

Step	Instruction	Illustration
1.	Line up Battery Pack with Sensor	
2.	Position Battery along Sensor Guides	
3.	Slide Battery along Guides and Snap into Place	

3.6. Remote Mounting Option

PLEASE NOTE: If you have already positioned the USB Interface and Antenna / Receiver in their docked position (using the steps in **Section** Error! Reference source not found.), you can skip this section.

The Antenna / Receiver and USB Interface can be wall- or ceiling-mounted as one unit (docked) or separately (undocked) to achieve the best performance. When the two modules are positioned separately, you will need to add the protective covers provided with your system for the Antenna / Receiver and USB Interface. These covers will attach to the connector panels of each module.

1. During shipment, the Antenna / Receiver and USB Interface are docked together. Using a Phillips screwdriver, remove the two screws linking the units.

2. Using a Phillips screwdriver, secure the protective cover to the USB Interface with one (#6 x 3/4) screw (provided).

3. Using a Phillips screwdriver, secure the protective cover to the Antenna / Receiver with two (#6 x 3/4) screws (provided).

4. Locate the USB Interface on either a stable, fixed surface, or a wall, or a ceiling. Use the keyhole slots and the screws provided for wall- or -ceiling mounting. Keep in mind that you may need to periodically access the Sensor cradle for channel configuration.

5. Using the USB cable provided with your system, connect the cable from the USB Interface to the PC workstation. If you need a different USB cable from the one supplied with your system, refer to Error! Reference source not found. for compatible cable lengths and markings.

IMPORTANT! Signal strength between the Wireless Sensor and the Antenna / Receiver is affected by several factors, including the distance between them. Locate the Antenna / Receiver as close as possible to where the Wireless Sensor will be used (within 6 feet or 1.8 meters), facing the patient.

6. Locate the Antenna / Receiver on either a stable, fixed surface, or a wall, or a ceiling. Select an area that will most likely face the front of the patient and be within 6 feet (1.8 meters) of the area where the Wireless Sensor will be used.

7. Using standard computer network Category 5 cable, connect the USB Interface to the Antenna / Receiver.

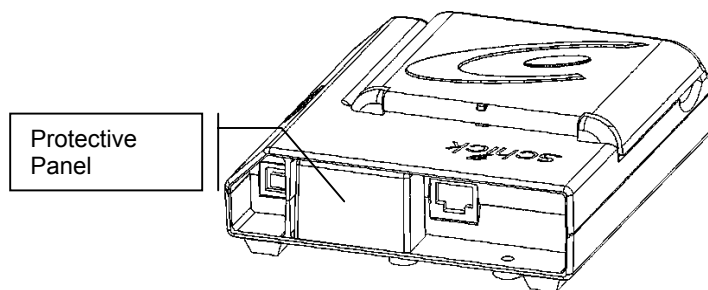Figure 1. USB Interface with Protective Panel Attached
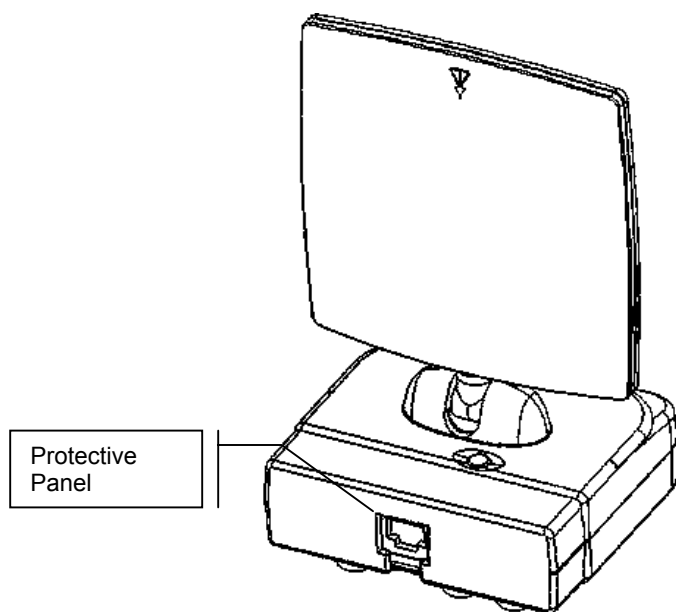
Figure 2. Antenna / Receiver with Protective Panel Attached

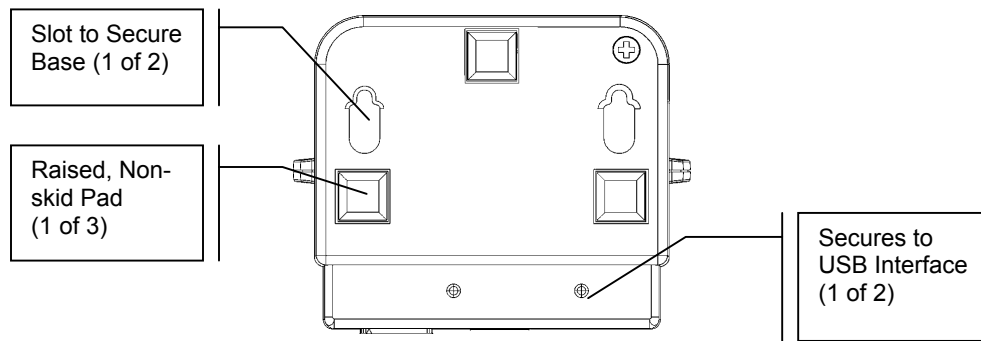Slot to Secure Base (1 of 2)

Raised, Non-skid Pad (1 of 3)

Secures to USB Interface (1 of 2)

Figure 3. Antenna / Receiver Base

Secures to Antenna (1 of 2)

Slot to Secure Base (1 of 2)
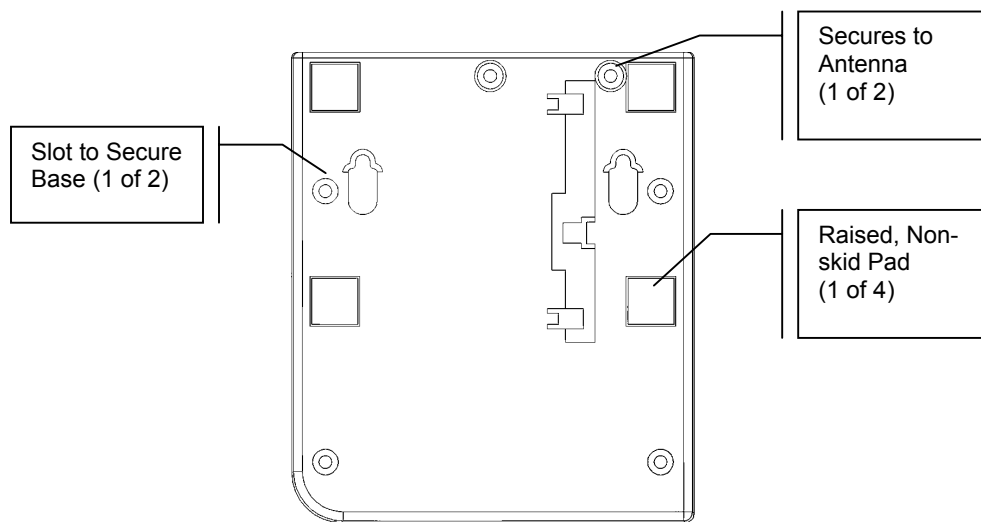
Raised, Non-skid Pad (1 of 4)

Figure 4. USB Interface Base

4. Controls and LED Indicators

4.4. Wireless Sensor

4.4.2. Controls and Indicators

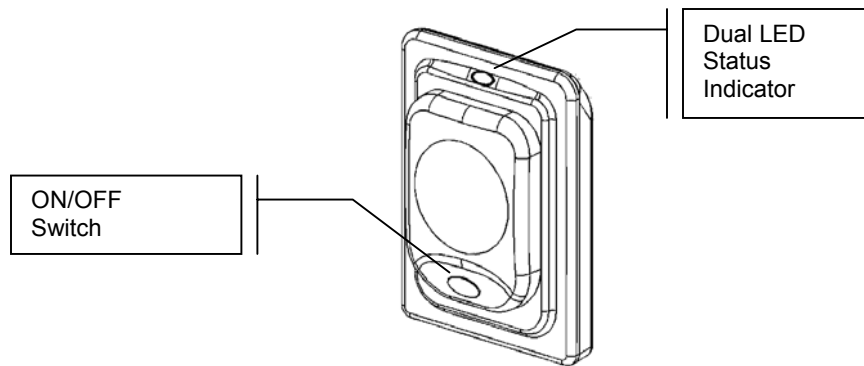The following illustration and table provide information about the controls and indicators of the Wireless Sensor.

Figure 5. Wireless Sensor Controls and Indicators

Table 3. Wireless Sensor Dual LED Indications

Action	Green LED	Amber LED	RF Channel		Battery Status
Turn on Sensor	ON	OFF	Ch. 1	1 long, 1 short	OK
			Ch. 2	1 long, 2 short	
			Ch. 3	1 long, 3 short	
			None	1 long only (Channel not set or RF problem)	
Sensor on	Blinking every 6 seconds	Blinking every 6 seconds	OK		OK
	ON	OFF	OK		New battery
	OFF	ON	OK		Battery power low; replace battery
Turn off Sensor	ON momentarily and then OFF	ON momentarily and then OFF	OK		OK
Sensor off or not available	OFF	OFF	OFF		Battery power depleted or battery OK (Sensor is off)

NOTE: In this state, sufficient battery power is available for one full mouth series (18-21 images).

4.5. Antenna / Receiver

Once a good RF link has been established with the Wireless Sensor (**Section 3**), no additional configuration is needed. There are no On / Off controls on the device. When image date is being exchanged between the Antenna / Receiver and the Sensor, an LED illuminates on the Antenna / Receiver.

4.5.2. Controls and Indicators

The following illustration provides information about the connections and indicators of the Antenna / Receiver.

LED Status Indicator

RJ-45 Connector (to remotely connect to the USB Interface)

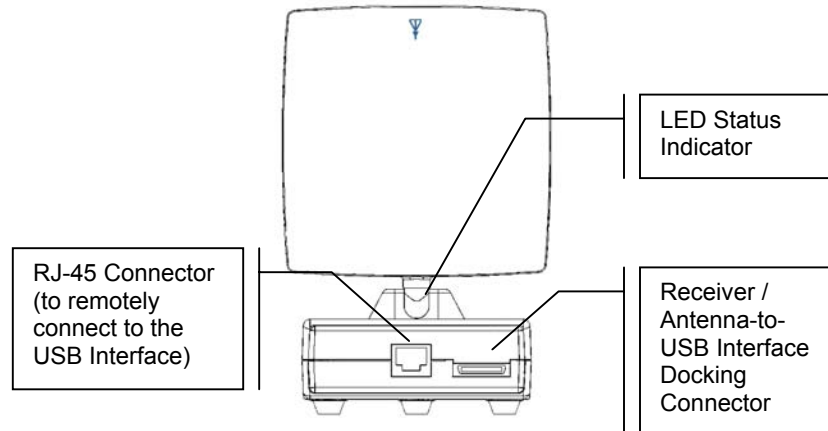Receiver / Antenna-to-USB Interface Docking Connector

Figure 6. Antenna / Receiver Connections and Indicators

4.6. USB Interface

When the cable connection is made between the USB Interface and the Antenna / Receiver (not required if the two units are docked together) and between the USB Interface and the PC Workstation (required), no additional configuration is needed. There are no On / Off controls on the device. LEDs located on the unit provide status information about the system and the Wireless Sensor currently in use. Refer to the **Table 4** for details.

4.6.2. Controls and Indicators

The following illustration provides information about the connections and indicators of the USB Interface.

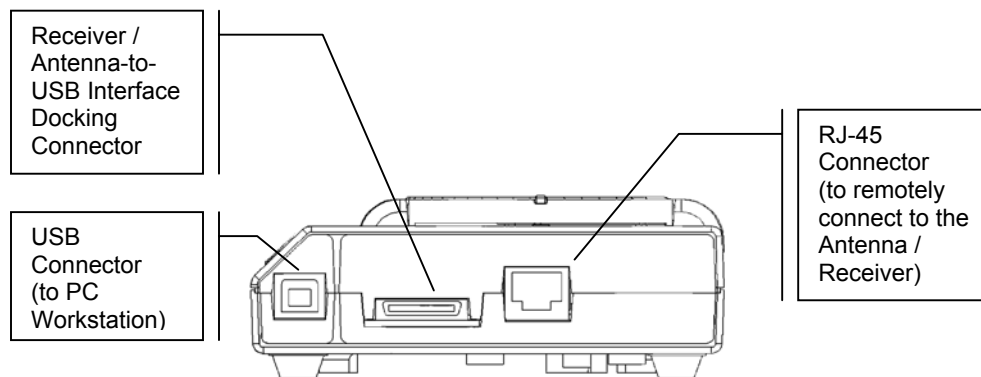Receiver / Antenna-to-USB Interface Docking Connector
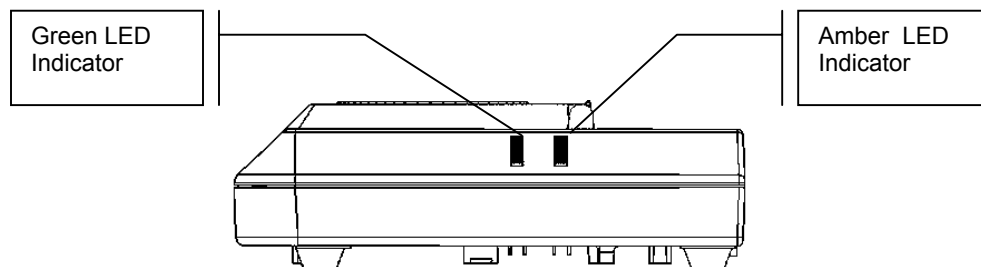
USB Connector (to PC Workstation)

RJ-45 Connector (to remotely connect to the Antenna / Receiver)

Figure 7. USB Interface Connections

Green LED Indicator

Amber LED Indicator

Figure 8. USB Interface Indicators

Table 4. USB Interface LED Indications

Green LED	Amber LED	CDR Status	Sensor Status
ON	OFF	Read ID performed	Sensor connected, normal status
OFF	ON	–	Sensor not connected
OFF	Blinking slowly	–	Error condition
ON	Steady	Software running	CDR view box activated, Sensor in acquisition mode
ON	Blinking rapidly	Software ready to acquire image	Image being transmitted to computer across USB
OFF	OFF	Software not running	Sensor connected, normal status, or USB cable not connected

5. Using Your Wireless Sensor

5.4. Sensor Sheaths

Sheaths and the appropriate holders are required for CDR Wireless Sensors. New sheaths and sensor holders (disposable type) are required for each new patient and should be disposed of properly after patient use. Sheaths for CDR Wireless Sensors must be sealed before use to ensure proper patient protection.

5.5. Sensor Holders

To achieve stable Sensor positioning during X-ray exams, use the appropriate tabs and sensor holders available with the CDR system. When positioning the Sensor, the LED on the Sensor enclosure can be used to determine the orientation of the image exposure.

5.6. Taking X-rays

Perform the following steps to take an X-ray using CDR version 2.6 or CDR DICOM software. If you are using a different image acquisition program, refer to documentation supplied with that product.

1. Start CDR from the Windows Start button or by clicking the desktop shortcut .

2. In the CDR exam window, click File > New, or click the New Exam button. In the Patient Information dialog box, enter the appropriate information and select the series. Click OK.

3. Turn on the Wireless Sensor by depressing the switch on the battery package, illuminating the LEDs on the Sensor. Place and seal the sheath over the Sensor, and then place the Sensor into an appropriate holder. Place the Sensor in the patient's mouth with the flat side facing the X-ray tube. Check the X-ray source exposure setting.

4. In CDR software, the first empty view box is pre-selected and flashes green (default color). The CDR system is now in image acquisition mode. A "Please Wait" message may appear momentarily.

5. Activate the X-ray source. "Reading Image from Sensor" appears on the screen momentarily.

6. When acquisition is complete, the image appears in the zoom window.

7. CDR advances to the next empty frame in the series automatically. To take another X-ray, reposition the Sensor and Holder as needed and repeat this procedure starting at Step 5.

6. Using the Wireless Tools Utility

6.4. Introduction

The Wireless Tools utility is installed during the CDR Wireless Sensor Software setup program. Primarily, the tools serve these practical purposes:

- To choose an alternate RF channel

- To minimize interference between sensors in a multi-operatory setting

- To perform firmware upgrades when directed by Schick Technologies Product Support

The utility does not require CDR program software (version 2.6 or DICOM), so it can be used by CDR and non-CDR users alike. During normal operation, there is little need to use the utility. It is intended principally for troubleshooting RF interference or Sensor-to-Receiver communication problems that result in either no images or images with poor quality.

6.5. Sensor Upgrade and Configuration

1. Please close all CDR program applications (if any are running).

2. Disconnect the USB cable from the USB Interface (if connected). Remove the battery package from the Sensor if it is attached and place the Wireless Sensor in its cradle in the USB Interface. Reconnect the USB cable.

3. Make sure that the USB Interface and Antenna / Receiver are either docked together or connected by Category 5 cable.

4. Start the Wireless Tools utility (wstools.exe).

5. At the Welcome Screen, click on the Start button.

6. If you wish to upgrade Sensor firmware (**Figure 9**):

   A. Click Upgrade Sensor Firmware button.

   B. Click OK when prompted.

   C. Click OK when the firmware has been installed.

7. If you wish to select a new RF channel:

   A. In the Set RF Channels section, select a new Sensor RF channel number.

   B. Mark the check box to match Sensor and Receiver RF channels.

   C. Click Apply.

   D. Click OK when prompted.

   E. Click OK when the RF channel has been changed.

6.6.   Receiver Upgrade and Configuration

1. Please close all CDR program applications (if any are running).

2. Place the Wireless Sensor in its cradle in the USB Interface. Remove the battery package from the Sensor if it is attached.

3. Start the Wireless Tools utility (wstools.exe).

4. At the Welcome Screen, click on the Start button.

5. If you wish to upgrade Receiver firmware (**Figure 9**):

   A. Click Upgrade Receiver Firmware button.

   B. Click OK when prompted.

   C. Click OK when the firmware has been installed.

6. If you wish to select a new RF channel for the Receiver:

   A. In the Set RF Channels section, select a new Receiver RF channel number.

   B. Mark the check box to match Sensor and Receiver RF channels.

   C. Click Apply.

   D. Click OK when prompted.
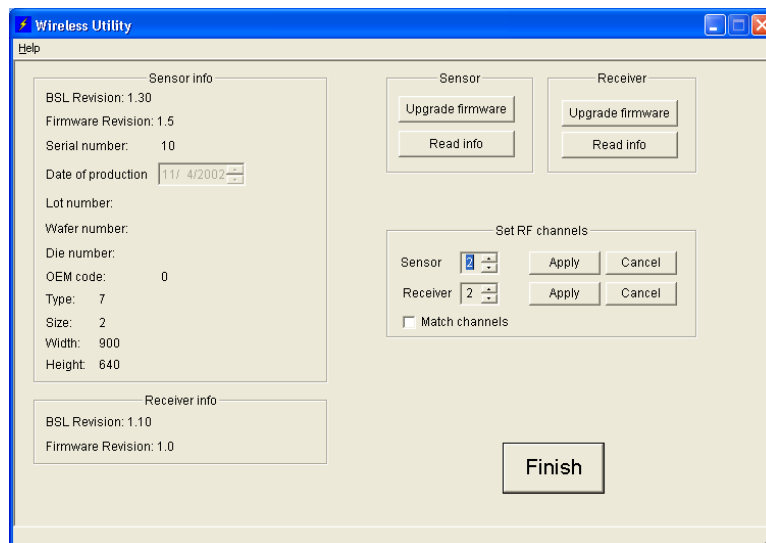
   E. Click OK when the RF channel has been changed.

Figure 9. Wireless Tools Selection Screen

7. Maintenance

7.4. Preventive Actions

The following paragraphs address issues in preventive maintenance.

7.4.2. Sensor Cleaning

To clean and disinfect the Wireless Sensor, remove the battery pack, and use a non-abrasive, lint-free cloth and a small amount of disinfectant to wipe down the Sensor and Battery Pack. Do not use any other medium or approach to clean Wireless Sensors (autoclave, cold soak, gas- or heat-sterilize).

7.4.3. Sensor and Battery Storage

When not in use, one Wireless Sensor and battery pack can be stored in the USB Interface. If additional Wireless Sensors are used, they must be stored appropriately, in suitable environments for heat, moisture, and humidity.

7.5. Corrective Actions

The following paragraphs address issues in corrective maintenance.

7.5.2. Battery Replacement

Indications that a battery has failed or is low on power will appear in several ways:

1. LED indications on the Wireless Sensor (**Table 3**)
2. Battery Level percentage in the CDR Wireless Monitor dialog box (Error! Reference source not found.**)**
3. CDR software message displays when attempting to take an X-ray

If the battery is low on power, it may be possible to complete the current dental exam before replacing the battery, but the battery should be replaced before the Wireless Sensor is used again. If the battery is depleted, it must be replaced, as the Sensor will not be able to send images to or communicate with the Antenna / Receiver.

7.5.3. Field Upgrades

If needed, new firmware may be installed to the Wireless Sensor and Base Station. The Wireless Tools Utility software is used to upgrade these devices.

7.5.4. Sensor Diagnostics

If needed, diagnostic information may be obtained using the Wireless Tools Utility and the Diagnostic Utility to identify and resolve problems in the Wireless system.

8. Reference

8.4. System Summary

Included here is a summary of the CDR Wireless System and its principal hardware units.

Table 5. Wireless Sensor System Summary

Hardware	Description
Wireless Sensor	2.4 GHz FM digital data transmission, 3 channels (selectable). Battery pack with On/Off switch. Single-window, dual LED display.
Antenna / Receiver	Remote-mountable or dockable with USB Interface. Equipped with pivotable Antenna. Single LED display for transmission status.
USB Interface	Dockable with Antenna / Receiver and secured via locking screws. Recessed configuration cradle for one Wireless Sensor and one spare battery pack. USB 1.1 compliant. Dual LED display for power and battery level status.

Table 6. Wireless Sensor System Specifications

Specification	Description
EN60601-1	Medical Electrical Equipment Part 1: General Requirements for Safety
EN60601-1-1	Medical Electrical Equipment Part 1: General Requirements for Safety 1.Collateral Standard: Safety Requirements for Medical Electrical Systems
EN55011	Limits and Methods of Measurement of Radio Disturbance Characteristics of Industrial, Scientific, and Medical (ISM) Radio-Frequency Equipment
EN60601-1-2	Medical Electrical Equipment Part 1: General Requirements for Safety 2.Collateral Standard: Electromagnetic Compatibility Requirements Tests
EN61000-4-2	Electrostatic Discharge Susceptibility
EN61000-4-3	Radiated Susceptibility - Electric Field
EN61000-4-6	Conducted Transients Susceptibility
EN61000-4-5	Power Line Conducted Surge Susceptibility

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