



CDR Wireless User Guide

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Compliance Statement and Safety Issues

FCC Compliance Statement

Changes or modifications not expressly approved by Schick Technologies could void your authority to operate this equipment.

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.

Check CDR Wireless Sensor before Using It

Before each usage, check the CDR Wireless Sensor for any signs of physical damage or defect. Make sure the battery pack is attached securely to the sensor. Before taking X-rays, observe the proper guidelines for using sheaths, holders, and tabs.

Observe Handling, Storage, and Disposal Guidelines for Batteries

Your CDR Wireless Sensor system is equipped with disposable batteries that have been packaged and protected at the factory. Be sure to read the special instructions relating to battery usage and follow all of the guidelines for storage and disposal.

Radio Frequency (RF) Interference Considerations

Your CDR Wireless Sensor system has been tested and found to comply with the limits for a Class A digital device under the Federal Communication Commission's Rules and Regulations. These limits are designed to provide reasonable protection against harmful interference when the system is operated in a commercial (in this case, clinical) environment. To operate this system safely, follow all the procedures in accordance with this User Guide and all other documentation distributed with this system.

Explanation of Symbols

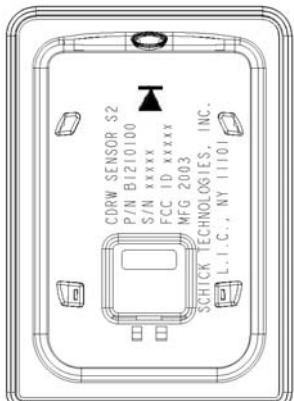
Some symbols on the USB Interface label identify the Wireless CDR System as having met the requirements for sale within the United States and for export internationally. The “CE” symbol is an example of this type of mark. The remaining symbols provide either technical or directive information, as described below

Symbol	Description
	Indicates that CDR Wireless is Class II equipment.
	Indicates that CDR Wireless is Type BF equipment.
	Indicates an attention to users to consult accompanying documents (the CDR Wireless System User Guide) for more information on CDR hardware.

Label Locations

Sensor Label

Refer to the following figure for labels and / markings found on the CDR Wireless Sensor.

Label	Description
	Regulatory Markings and Manufacturer Label (located on back of Sensor)

Battery Package Label

Refer to the following figure for labels and / markings found on CDR Wireless Sensor Battery Packages.

Label	Description
	Regulatory Markings and Manufacturer Label

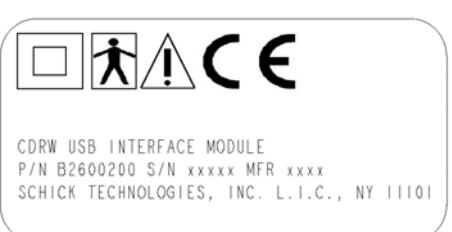
Antenna / Receiver Module Label

Refer to the following figure for labels and / markings found on the Antenna / Receiver Module.

Label	Description
 The label is rectangular with rounded corners. It features a top section with three icons: a square, a person walking, and an exclamation mark inside a triangle, followed by the letters 'CE'. Below this is a bottom section containing the text: 'CDRW RECEIVER MODULE', 'P/N B2600210 S/N xxxxx MFR xxxx', and 'SCHICK TECHNOLOGIES, INC. L.I.C., NY 11101'.	Regulatory Markings and Manufacturer Label (located on bottom)

USB Interface Module Label Antenna / Receiver:Picture of Label

Refer to the following figure for labels and / markings found on the USB Interface Module.

Label	Description
 The label is rectangular with rounded corners. It features a top section with three icons: a square, a person walking, and an exclamation mark inside a triangle, followed by the letters 'CE'. Below this is a bottom section containing the text: 'CDRW USB INTERFACE MODULE', 'P/N B2600200 S/N xxxxx MFR xxxx', and 'SCHICK TECHNOLOGIES, INC. L.I.C., NY 11101'.	Regulatory Markings and Manufacturer Label (located on bottom)

1. Overview

1.1. Purpose

The CDR Wireless Sensor, Base Station, and application software are elements of an electronic imaging system that transmits X-ray dental exams over a wireless RF link. The Wireless Sensor is powered by a single battery, enclosed in protective packaging. The Base Station is powered from the computer's USB port.

1.2. Indications for Use

The CDR Wireless Sensor system is intended for any dental practice that uses X-ray equipment for intraoral diagnostic purposes. It is indicated for patients receiving intraoral dental X-ray examinations and produces digital images that can be displayed, enhanced, printed, and saved. Because of the Sensor's higher sensitivity to X-rays in comparison to film, the radiation dose to the patient is reduced. For diagnostic purposes, digital images compare favorably with images acquired with X-ray film media.

1.3. Important Setup Reminders

1. Images acquired with your Wireless Sensor are transmitted to the Antenna / Receiver over RF link. If active during image transmission, other devices that use radio frequency or microwave technology (wireless Local Area Networks, wireless telecommunication devices, microwave ovens) may interfere with the optimal performance of your CDR Wireless System. For best results, turn off other wireless or microwave devices when using your Wireless Sensor.
2. Correct placement of the Antenna / Receiver with respect to the Wireless Sensor is essential. Be sure to follow the positioning information found in this document when establishing the optimal location for the Antenna / Receiver. As a general rule, place the Antenna / Receiver as close as practically possible to the patient chair where the Sensor will be used. The distance between the Sensor and the Antenna / Receiver should not exceed 6 feet (1.8 meters).
3. As with any X-ray procedure, stabilizing the Sensor in the correct intraoral position is critical for diagnostic quality images. Equally important is for the patient to remain completely still as X-ray images are acquired. Wireless Sensors are more sensitive to motion during the imaging process, so be sure to remind your patients as you take X-ray images.

1.4. General Description

Hardware in the CDR Wireless Sensor system performs the following actions.

- Wireless Sensor -- Captures the image created when the Sensor is exposed to radiation from an X-ray source.
- Base Station Antenna / Receiver -- Receives, via wireless RF link, the image acquired from the Wireless Sensor and sends it to the USB Interface Unit. The unit is powered from the computer's USB port.
- Base Station USB Interface -- Communicates, via wired USB link, with attached computer hardware, enabling acquired images to be displayed on a computer monitor or other display system. The unit is powered from the computer's USB port.

Software used with the CDR Wireless system performs the following actions.

- Wireless Sensor Driver, supplied with your system, acquires images captured by the Wireless Sensor. It also optimizes image quality for display on a computer monitor.
- Wireless Tools, Wireless Monitor, and Diagnostic utilities, supplied with your system, monitor, configure, and diagnose the system.
- CDR Application Software (version 2.6 or DICOM for Windows), optional and available separately, provides the user with advanced features for image review, manipulation, printing, and storage.

1.5. Explanation of Terms

Terms used in this document are defined below.

CDR-W (Wireless CDR)	Wireless implementation of the Computed Dental Radiology imaging system manufactured by Schick Technologies, Inc.
RF (Radio Frequency)	Alternating current suitable for wireless transmission
RJ (Registered Jack)	RJ-45 is the connector type at each end of the Category 5 cable used in the CDR Wireless system to convey data between the Antenna / Receiver and USB units when they are not connected directly ("docked") with each other.
USB (Universal Serial Bus)	Plug and play interface between host computer and connected USB-compatible devices

2. System Description

2.1. Hardware

The hardware elements of the Wireless CDR system consist of the Wireless Sensor (with battery pack); Antenna / Receiver and USB Interface units (known collectively as the Base Station), a compatible PC workstation, and interconnecting cables.

The following block diagram shows the functional relationships between modules and devices within the CDR Wireless system. The Antenna / Receiver unit can be located remotely from the USB Interface unit via Category 5 cable (RJ-45 connectors); however, in the following illustration, they are shown in their default ("docked") configuration.

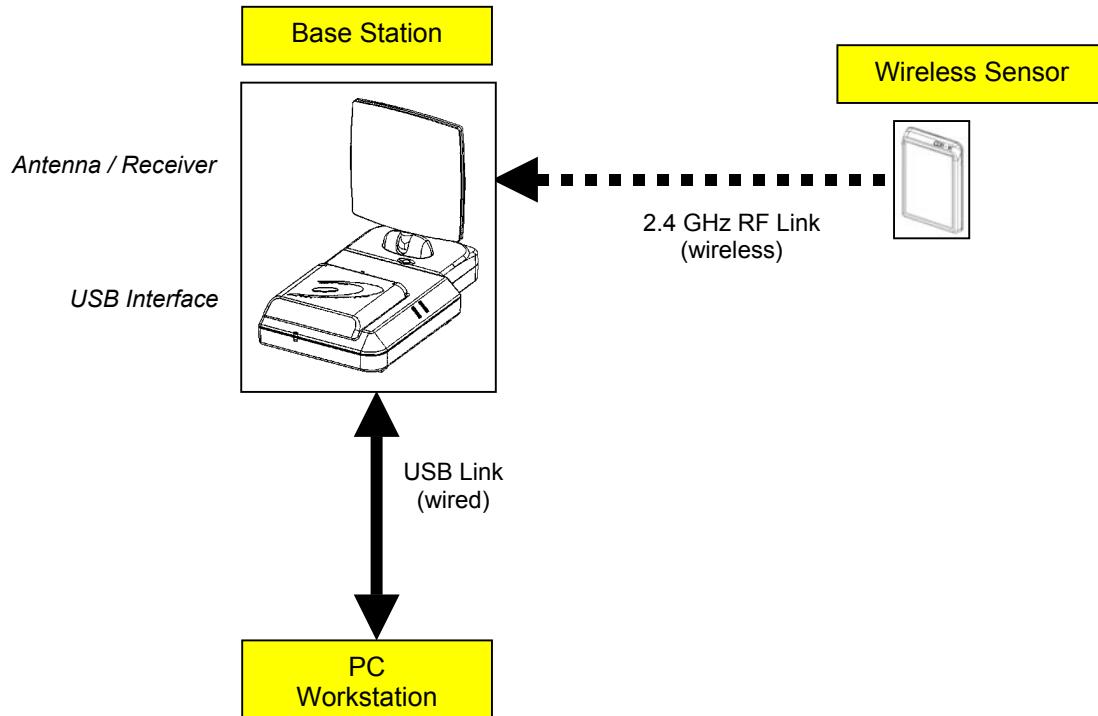


Figure 1. CDR Wireless System

2.1.1. Wireless Sensor

The Wireless Sensor provides FM digital data to the Antenna / Receiver over the 2.4 GHz frequency band. Three, user-selectable channels are available to minimize interference in practices where multiple Wireless Sensors are in use.

Power for the Wireless Sensor is provided by a water resistant, non-rechargeable battery package located on the back (non-active pixel area) of the Sensor. Battery status is displayed on the Sensor using a single window, dual LED display. (For more information about the Wireless Sensor LEDs and their indications, refer to Error! Reference source not found..) Battery level information is also available in the Wireless Monitor dialog box (**Figure 6**), where RF channel, signal strength, and Sensor information can be found.

PLEASE NOTE: When detached from the Sensor, place the battery pack on its back with the terminals facing upwards. Ensure that no conductive object contacts the battery terminals to eliminate accidental discharge.

The Sensor ON / OFF switch is part of the battery package. Turn the Sensor on and off by pressing lightly on the button shown below. The Wireless Sensor must be turned ON to capture X-ray images. The Sensor will turn itself OFF automatically if no X-ray exposures are detected for approximately 15 minutes.

For steps on attaching the battery pack to the Sensor, refer to Error! Reference source not found..

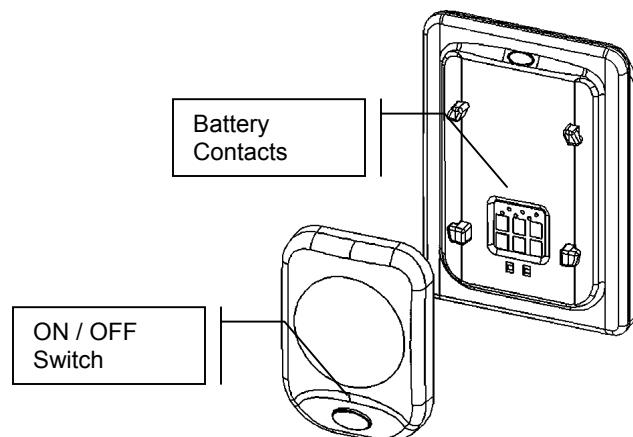


Figure 2. Wireless Sensor with Battery Pack Removed

2.1.2. Base Station Antenna / Receiver

The Base Station is composed of the Antenna / Receiver and USB Interface. The Antenna / Receiver receives the radio frequency status and image data signals from the Wireless Sensor, demodulates the signals and transfers the information to the USB Interface. When the Antenna / Receiver is receiving data, the LED located near the base of the Antenna illuminates.

The Antenna / Receiver can be positioned separately from the USB Interface to enhance signal reception. Nominally, the Antenna / Receiver should be within 6 feet (1.8 meters) of the Wireless Sensor and facing the patient for best results. The Antenna can be pivoted forward-and-back and rotated from left-to-right to achieve optimum reception.

The Antenna / Receiver and USB Interface are shipped connected directly to each other ("docked"). Two screws are used to secure the units. Remote mounting of the Antenna / Receiver from the USB Interface is optional, and may be prompted by a number of factors (including physical layout of the office and / or RF reception). The base of the Antenna contains molded areas to allow for wall- and ceiling-mounted options.

When the Antenna / Receiver is mounted remotely, the two screws securing the Antenna / Receiver to the USB Interface are removed allowing the two units to be unplugged from each other. A standard computer network modular Category 5 cable with RJ-45 connectors is then used to connect the Antenna / Receiver to the USB Interface.

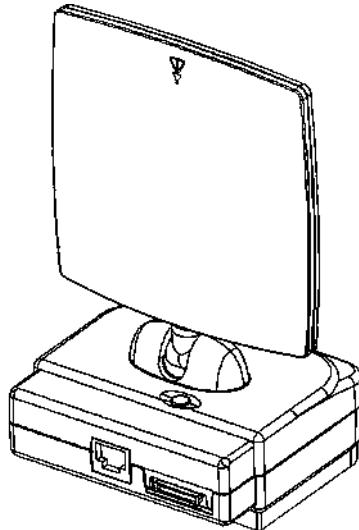


Figure 3. Antenna / Receiver

2.1.3. Base Station USB Interface

The USB Interface connects the CDR hardware to the computer via a standard USB 1.1 port. It also provides channel selection for Wireless Sensors, performs Sensor diagnostics, and supports field upgrades of the firmware for the unit itself, the Antenna / Receiver, and Wireless Sensors. When opened, the translucent compartment lid permits access to the Sensor cradle (used for RF channel configuration and diagnostics) and a storage slot for a battery pack. When closed, the compartment lid serves to protect the Sensor and battery pack when not in use.

Dual LEDs are located on the exterior of the USB Interface and supply power and status information about the unit and the Wireless Sensor currently in use. LED indications have several states (On / Off / Blinking) to reflect various states of operation. For more information about the USB Interface LEDs and their indications, refer to Error! Reference source not found..

The USB Interface can be wall-mounted, either "docked" with the Antenna / Receiver itself, or located some distance from the Antenna, via Category 5 cable with RJ-45 connectors.

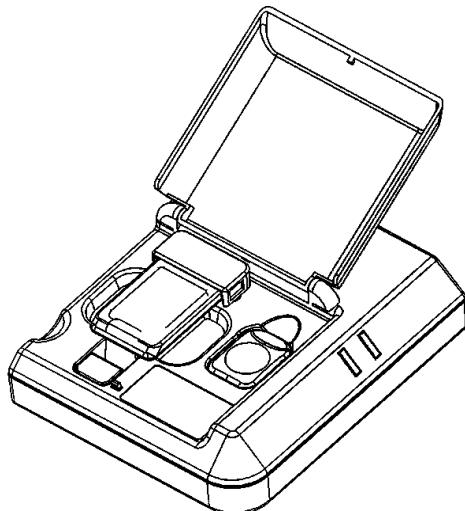


Figure 4. USB Interface

2.1.4. PC Workstation

The PC workstation connects to the USB Interface via compatible USB cable and serves as host for CDR software and CDR utilities. In addition, the workstation provides the capabilities to display, manipulate, store, and print images acquired with CDR Wireless hardware. The recommended system requirements for PC workstations are listed below:

- Compatible operating system (Windows 98, 2000, or XP)
- Minimum of 64 MB RAM
- Minimum of 20 MB free disk space (to install CDR software)
- Minimum of 20 GB free disk space (to store X-ray images you acquire or convert to DICOM format)
- Available USB port

When connecting the USB Interface to the PC workstation, verify that the USB cable has a “/2c” designation marked along the cable, typically at either end and close to the connector. The “/2c” designation is the USB spec designation for power connectors inside the cable, and is a requirement for this system.

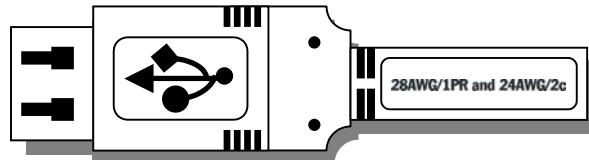


Figure 5. USB Connector and Cable Marking

Different lengths of USB cables will be marked differently. Refer to **Table 1** for a list of compatible USB cables and their designations.

Table 1. USB Cable Markings

Length of Cable	Proper Gauge for CDR USB Cables
0.81 meters (32 inches)	28AWG/1PR and 28AWG/2c
1.31 meters (4.3 feet)	28AWG/1PR and 26AWG/2c
2.08 meters (6.8 feet)	28AWG/1PR and 24AWG/2c
3.33 meters (10.9 feet)	28AWG/1PR and 22AWG/2c
5.00 meters (16.4 feet)	28AWG/1PR and 20AWG/2c

2.2. Software

In normal use the CDR software provides the interface and control between the Wireless System hardware and the computer. It provides the user with advanced features for display, manipulation, storage, and printing of acquired X-ray images. Please refer to the CDR software User Guide for more details.

Functions specific to the Wireless System have been added to CDR software to provide configuration, monitoring, and diagnosis of system components.

The Wireless Monitor, located in the Windows ® System Tray, provides real-time reporting of the Wireless Sensor and shows the current status of several elements required for proper operation (**Figure 6**). The Wireless Monitor is especially useful when positioning the Base Station with respect to the Sensor (**Section 3**).

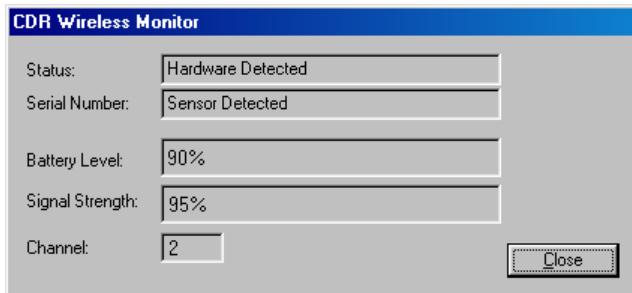


Figure 6. Wireless Monitor

The Wireless Tools utility (wstools.exe), accessible by either desktop shortcut or by name under the program group for CDR Wireless Sensor software, is intended to identify, diagnose, and resolve configuration and communication issues in or between the Sensor and Receiver. The selection screen for the Wireless Utility is shown in **Figure 7**.



Figure 7. Wireless Tools

In the event of partial image corruption due to RF interference, CDR software will identify those areas on the displayed image so that the dental professional can evaluate whether another exposure is required.

3. Installation and Operation

3.1. Wireless Sensor Software Installation

For this procedure you will need the CDR Wireless Sensor disk provided with your system. This disk contains the driver for the Wireless Sensor, the Wireless Monitor, and Wireless Tools utility.

1. Insert the CDR Wireless Sensor Software disk into the floppy drive of your computer.
2. Click Start, Run, and then enter a :\ setup.exe.
3. Click Next when the Welcome Screen for the setup program is displayed.
4. Click Yes after reading and agreeing to the license agreement.
5. If you are CDR program user (version 2.6 or DICOM), select the software version you intend to use with the Wireless Sensor. This screen does not appear for non-CDR users.
6. Click Next after selecting the location where the software will be installed.
7. Click Finish after the software is installed.

3.2. USB Interface Positioning

The Antenna / Receiver and USB Interface can be surface-, wall-, or ceiling-mounted as one unit (docked) or separately (undocked) to achieve the best performance. To locate the units in their shipped (docked) position, follow the steps below. To locate them separately, refer to **Section** Error! Reference source not found..

1. Choose a convenient location for the USB Interface, keeping in mind that you may need to periodically access the Sensor cradle for channel configuration.
2. 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 **Table 1** for compatible cable lengths and markings.

3.3. Antenna / Receiver Positioning

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.

1. Choose a convenient location for the Antenna / Receiver, selecting an area that will most likely face the front of the patient and be within 5 (1.52 meters) of the area where the Wireless Sensor will be used.
2. At your PC workstation, click Start > Programs > CDR > CDR Diagnostic Utility.
3. At the Welcome Screen, click the Check Wireless CDR USB System button.
4. Review the information on the Computer Resources screen. If all settings are correct, (all checkmarks are green), click Next.
5. On the CDR Hardware screen:
 - Click the Test USB Interface button to test the Sensor's ability to send an image for display. When the gray test pattern appears, review it for clarity and contrast. A good test pattern will have different shades of gray that are easy to distinguish.
 - Click the Test RF Environment button to test the amount of RF noise in the area where the Sensor will be used. Be sure that the Wireless Sensor is turned off since this will affect test results. Acceptable test results will appear as green dots under the threshold (marked by a heavy line). Red dots appearing above the threshold indicate RF noise occurring in the same range as the channel the Antenna / Receiver is currently set. Relocating the Antenna / Receiver or changing the Receiver RF channel are recommended in this case.
6. Click Next to advance to the Report screen. Click Finish to close the utility.

3.4. Wireless Sensor Setup, Turn On, and Positioning

Before using the Wireless Sensor, it must be configured to transmit on one of three RF channels.

3.4.1. RF Channel Setup

To configure the Wireless Sensor, perform the following steps. You need to perform this procedure before the Sensor is used the very first time and when you want to change the Sensor's channel to avoid interference.

1. Remove the battery pack from the Sensor by sliding and lifting it away from Sensor.
2. Place the Sensor with contacts side down into Sensor cradle located under the lid of the USB Interface (Error! Reference source not found.).
3. Run the CDR Wireless Tools utility to select the channel for the Sensor (default channel is 1.)
4. Once the Sensor is configured, it is ready for use.