

Notice to Non-CDR Users

If you do not have CDR software installed on your system, your software installation instructions are revised as follows.

Before performing any of the steps in **Section 3 (Software Setup)**, do the following:

1. Start Windows Explorer and create a new folder on your hard drive called TempDrivers or some other name that will help you identify this folder as a storage place for USBCam drivers.
2. Insert the "CDR Video Manager for DirectX" disk, but do not run the Setup program. When the USBCam Setup Screen is displayed, click Exit.
3. Using Explorer, browse the CD, and open the folder named USBCam Driver and copy its contents to your TempDrivers folder.
4. Continue with the "USBCam Device Drivers" installation section for your particular operating system. When you are prompted for the location of the drivers, point the installation wizard to the TempDrivers folder.
 - For Windows 98 Second Edition, continue with **Section 3.4.3**
 - For Windows 2000, continue with **Section 3.5.3**
 - For Windows XP, continue with **Section 3.6.3**.
5. If you have questions about these instructions or experience any problems during installation, please refer to the following resources for assistance. In North America, customers can contact the Patterson Technology Center at 1-877-498-6505. Other customers please contact the authorized dealer for Schick Technologies products in your country or region.



USBCam User Guide

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Contents

1. Introduction to USBCam	1
1.1. Welcome	1
1.2. USBCam System.....	1
1.3. Getting the Best Images with Your USBCam.....	1
1.4. Controls on the USBCam.....	2
2. Hardware Setup.....	3
2.1. Connecting the USBCam and Cable	3
2.2. Installing the USBCam Handpiece Holder	3
3. Software Setup	5
3.1. What You Will Need to Complete this Section	5
3.2. Before You Start Installing Software	5
3.3. Installing CDR Software	6
3.4. Setup with Windows 98 Second Edition.....	7
3.5. Setup with Windows 2000	13
3.6. Setup with Windows XP	19
4. Operation	24
4.1. Operating the Camera.....	24
4.2. Using Camera Sheaths	25
4.3. Using the Camera with CDR.....	26
4.4. Acquiring Video Images with the Footpedal	28
4.5. Acquiring Video Images with Keyboard Shortcuts	28
5. Protective Measures.....	29
5.1. Sheaths	29
5.2. Handpiece and Lens	29
5.3. Computer.....	29
Appendix A. Reference Information.....	30
A-1. Removal and Replacement Procedures	30
A-2. Summary of Specifications	30
A-3. Leakage Current Statement	31
A-4. Handpiece Product Label Information	31
A-5. EMC Tables	32
Appendix B. Additional Information.....	35
B-1. Checking DirectX Version and Video Information	35
B-2. Checking Your Video Settings.....	36

List of Figures

Figure 1. USBCam Controls.....	2
Figure 2. USB Cable Connectors.....	3
Figure 3. Handpiece Holder Installation.....	3
Figure 4. Video Window Setup and Capture Buttons.....	25

List of Tables

Table 1. Description of Camera Controls	2
Table 2. Footpedal Actions.....	28
Table 3. Keyboard Shortcuts	28
Table 4. Specifications.....	30
Table 5. Guidance and Manufacturer's Declaration - Electromagnetic Emissions.....	32
Table 6. Guidance and Manufacturer's Declaration - Electromagnetic Immunity	32
Table 7. Recommended Separation Distance Between Portable and Mobile RF Communications Equipment and the USBCam System	34
Table 8. Setup Dialog Box Description	36
Table 9. Camera Properties Dialog Box Description.....	37
Table 10. Video Format and Display Dialog Box Descriptions	38

Safety Issues

Check USBCam before Using It

Before each usage, check the outer surface of the USBCam for any signs of physical damage or defect. The surface of the USBCam should have a smooth finish, with no evidence of chipping or damage to either the handpiece housing or the lens section. To help ensure proper hygiene and to protect against infectious disease, refer to the "Protective Measures" section of this document and observe all device cleaning and patient protection recommendations specified there.

Avoid Excessive Temperatures when Using USBCam

When in use, the LEDs in the USBCam may generate surface temperatures in excess of 106° F. (41° C). To avoid the potential risk of burn, do not use the USBCam in a single hand-held position for a prolonged period. As an additional safety measure, the USBCam is equipped with an Auto-Off feature. This feature turns off the camera automatically after 4 to 5 minutes of continuous use. The camera can be turned back on by simply pressing the ON/OFF button on the handpiece.

Operate the USBCam as Directed

Always use the USBCam in accordance with the directions and recommendations contained in this User Guide. Do not attempt to modify the USBCam or use it in system configurations not specified in this document.

RF Interference Considerations

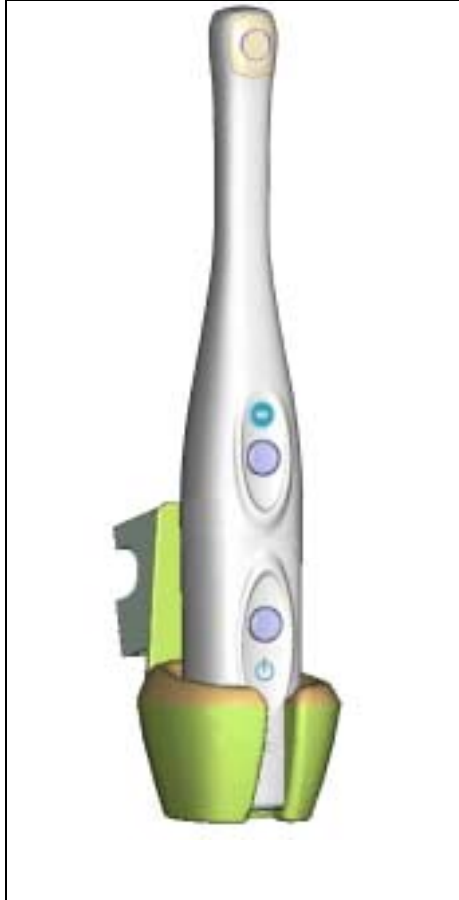
Although the USBCam equipment is designed to provide a reasonable degree of protection from electromagnetic interference, according to IEC International regulations, it must be installed at an adequate distance from electricity transformer rooms, static continuity units, two-way amateur radios and cellular phones. To ensure proper operation, the latter can be used only at a minimum distance of 5 feet (1.5m) from any part of the equipment.

Any instrumentation or equipment for professional use located near USBCam must conform to Electromagnetic Compatibility regulations. Non-conforming equipment, with known poor immunity to electromagnetic fields, may not operate properly unless they are installed at a distance of at least 10 feet (3m) and supplied by a dedicated electric line.

Explanation of Symbols on the USBCam

Some of the symbols on the USBCam identify it as having met the requirements for sale within the United States and for export internationally. The "CE" and "ETL" symbols are examples of these types of marks. The remaining symbols provide either technical or directive information.

Symbol	Description
	Indicates that the USBCam is Type BF equipment.
	Indicates an attention to users to consult accompanying documents (this User Guide) for more information on the USBCam.
	Indicates that under certain ambient environmental conditions (especially low humidity), the USBCam may be susceptible to electrostatic discharge (ESD). Appropriate care and handling must be observed to avoid damage.



USBCam with Handpiece Holder

1. Introduction to USBCam

1.1. Welcome

USBCam is the newest hand-held intraoral camera from Schick Technologies. Its lightweight design and smooth contours make it both comfortable to hold and easy to use. Taking images with USBCam's integrated capture button makes video capture a simple one-step operation. And its built-in LED light source provides reliable, long-life illumination.

Adding USBCam to your office provides the following advantages:

- Fast and easy hardware setup
- Plugs directly into your computer -- no separate power supply required
- Ports quickly from operator to operator -- just disconnect and reconnect
- Uses Microsoft Windows ® DirectX ® drivers -- no special "frame-grabbing" video card or additional device driver required

1.2. USBCam System

The USBCam system hardware consists of the following components.

- USBCam Handpiece and Holder
- USBCam Cable
- Camera Sheaths

1.3. Getting the Best Images with Your USBCam

Getting the best results from your USBCam begins with having a computer system suitable for displaying and capturing video images. For optimum performance we recommend: (a) PCs equipped with Pentium III processors or higher, (b) minimum 8MB video memory, and (c) display values for your monitor set at least to 800 x 600 x 24-bit color. We also recommend using the factory defaults for the USBCam.¹

IMPORTANT! USB bandwidth is shared among all USB devices. Achieving optimum performance with the USBCam (25 frames-per-second video streams) may not be possible if other USB devices are in use at the same time.

¹ The amount of video memory on your system can be checked by running **dxdiag.exe** and checking the **Display** tab. Color resolution can be checked by clicking Windows **Start** > **Settings** > **Control Panel**, double-clicking on **Display**, and then clicking on the **Settings** tab. Factory settings for the USBCam are: 25 frames per second frame rate, auto white balance, and auto exposure. More information about video settings can be found in **Sections B-1 and B-2**.

1.4. Controls on the USBCam

An illustration of the USBCam is shown below in **Figure 1**. For a description of user controls on the camera, refer to **Table 1**.

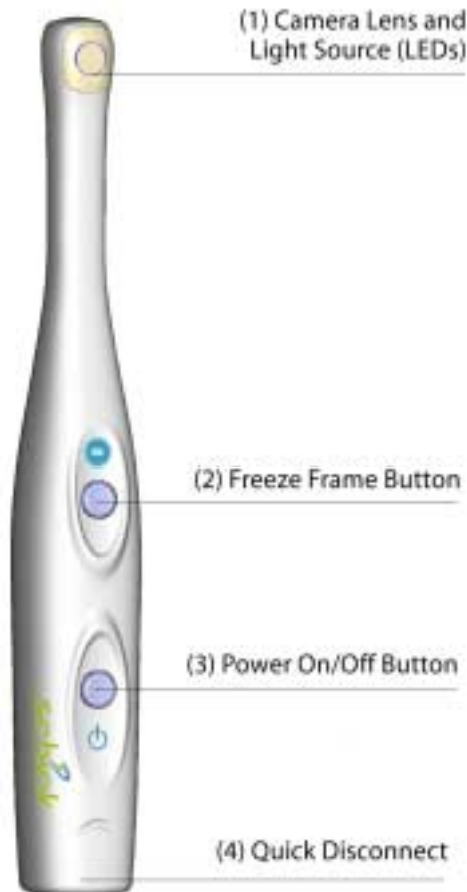


Figure 1. USBCam Controls

Table 1. Description of Camera Controls

Number	Description
①	Camera lens and LED (light-emitting diode) source
②	Freeze frame button (set to Freeze/Unfreeze or Freeze/Take option)
③	Power on/off button (See Note 1)
④	Quick disconnect for portability (See Note 2)
NOTE 1: Light source will automatically time out after 4-5 minutes of continuous operation NOTE 2: "B" connector end of USB cable connects here	

2. Hardware Setup

2.1. Connecting the USBCam and Cable

IMPORTANT! Do not connect the USBCam and cable to your computer until after you have installed CDR Video Manager and updated the DirectX files on your system. Procedures for installing these files are supplied in Section 3, "Software Setup."

The USB cable used with the camera is a 5 meter (5.5 yards) cable, with a Series "A" USB plug on one side and a Series "B" USB plug on the other. The "A-type" plug connects to any available USB port on the computer. The "B-type" plug connects to the handpiece.



Figure 2. USB Cable Connectors

2.2. Installing the USBCam Handpiece Holder

The USBCam Handpiece Holder turns off the camera when the handpiece is inserted and turns on the camera when the handpiece is removed. The holder is equipped with several mounting options: (1) Can be mounted to a dental chair with bar attachment, (2) Can be wall-mounted with fastening hardware, or (3) Can be attached to a wall or other acceptable bonding surface with double-sided adhesive tape.

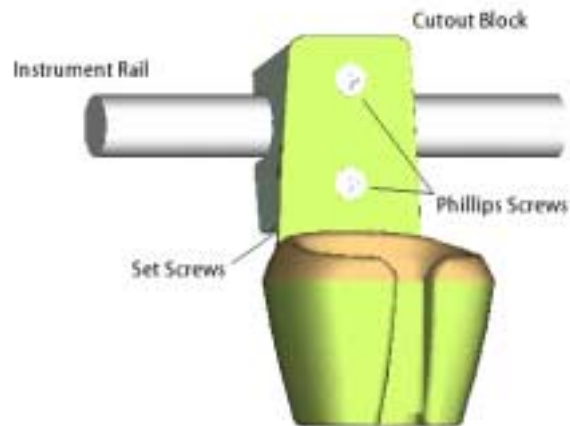


Figure 3. Handpiece Holder Installation

PLEASE NOTE: When selecting the mounting option for your USBCam, choose a location that offers easy access during patient exams and safe storage afterwards. In most practices, mounting the USBCam to the dental chair will provide the best all-around solution.

2.2.1. Dental Chair-Mounting Option

To install the handpiece holder to a dental chair, do the following:

1. Remove the handpiece from its holder before performing this procedure.
2. Position the holder on the instrument rail of your dental chair, using the cutout space on the back of the holder as a guide.
3. When the holder is in position, use an Allen key to tighten 2 set screws located at the bottom of the cutout block.

2.2.2. Wall-Mounting Option (with Fasteners)

To install the handpiece by fastening it to a wall or other vertical surface, do the following:

1. Remove the handpiece from its holder before performing this procedure.
2. Remove the cutout block from the handpiece holder by loosening 2 flat-head Phillips screws.
3. Position the holder on a smooth stable vertical surface. Using the holes on the back of the holder as guides, fasten the holder securely to the wall using 2 (#6 x 3/4) dry wall screws (not supplied) or other hardware appropriate to the mounting surface.

2.2.3. Wall-Mounting Option (with Adhesive)

To install the handpiece by attaching it with adhesive tape to a wall or other vertical surface, do the following:

1. Remove the handpiece from its holder before performing this procedure.
2. Remove the cutout block from the handpiece holder by loosening 2 flat-head Phillips screws.
3. Cut and trim a piece of double-sided adhesive tape (not supplied) to the size of the back of the holder. Remove one side of the tape and attach it to the holder.
4. When the holder is correctly located, remove the other side of the adhesive tape and fasten the holder securely to the wall or other surface.

3. Software Setup

3.1. What You Will Need to Complete this Section

To expedite software installation, please have the following items available:

- A. CDR Software CD (*only applies to users installing the CDR program for the first time*)
- B. CDR Video Manager for DirectX CD
- C. Windows 98 System CD (*only applies to Windows 98 SE users*)
- D. USBCam and Cable

3.2. Before You Start Installing Software

IMPORTANT! CDR users please do not connect the USBCam and cable to your computer until after you have installed CDR Video Manager and updated the DirectX files on your system. Procedures for installing these files can be found in this section. Non-CDR users please refer to the Notice Page at the beginning of this User Guide.

The software for your USBCam consists of the following components:

- A. CDR Video Manager for DirectX Installation
- B. DirectX Update
- C. USBCam Device Driver Installation
 - USB device driver
 - Composite video driver
 - Audio driver ²

You must install each of these components successfully to ensure proper operation of your USBCam. Actual installation differs slightly between operating systems (Windows 98 Second Edition, Windows 2000, and Windows XP), so you should follow the procedures that refer to your particular system. (Procedures can be found in this section.) If you're not sure which operating system is installed on your computer, right click on the **My Computer** icon on your desktop and select **Properties**.

² Although an audio driver is installed during the setup process, there are no audio components associated with the USBCam.

3.3. Installing CDR Software

PLEASE NOTE: If you have already installed CDR software on your system, skip ahead to the CDR Video Manager, DirectX update, and device driver installation procedures that apply to your operating system.

CDR software is an essential component of every CDR system. When you receive your CDR software, follow the short directions below to load the CDR program.

Turn on your computer (if it's not on already), wait for the Windows desktop, and insert the CD. The CD should install the CDR setup program automatically. If it doesn't, click the **Start** button and then on **Run**. When the Run dialog box opens, type **d:\cdrsetup\setup** (if "d" is the drive letter for your CD-ROM drive. If your CD-ROM drive uses a different letter, type in that one instead). Then read and follow the instructions on each screen. When you're all done, remove the CD and restart your computer.

Continue with the steps provided in the following paragraphs to install the CDR Video Manager for DirectX, update your DirectX files, and install the USB Cam device drivers for your particular operating system.

3.4. Setup with Windows 98 Second Edition

3.4.1. Installing CDR Video Manager for DirectX

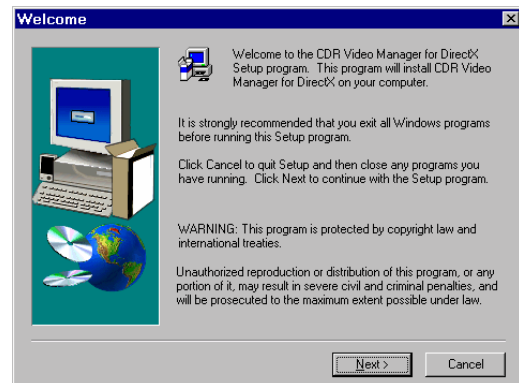
STEP 1

- A. Insert the “CDR Video Manager for DirectX” disk. Setup should start automatically. If it doesn't, click **Start**, **Run**, and then enter **d:\setup\setup** at the command line (if your CD drive is a letter other than "d", use that letter instead).
- B. Click **Install CDR Video Manager** to begin the setup process.



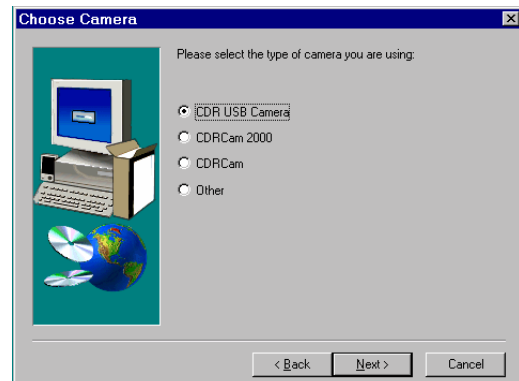
STEP 2

Click **Next**.



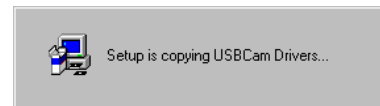
STEP 3

- A. Select the CDR camera you will be using. By default, USBCam is selected.
- B. Click **Next**.



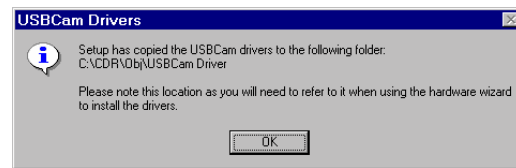
STEP 4

Setup will copy the drivers to your workstation.



STEP 5

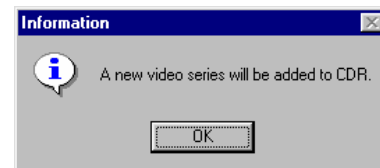
- A. Setup will tell you where on your system it has copied the drivers.
- B. Please note the location of these files as you will need this information during the "Add New Hardware" wizard (in **Section 3.4.3**).



- C. Click **OK**.

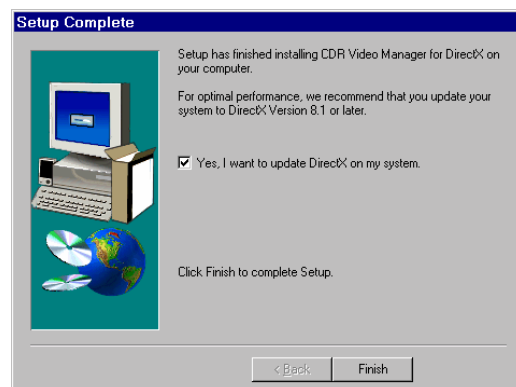
STEP 6

When the new video series is installed, click **OK**.



STEP 7

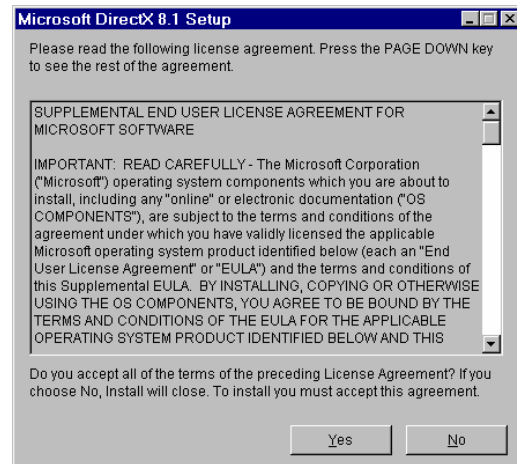
- A. Make sure the checkbox, "Yes, I want to update DirectX on my system" is marked.
- B. Click **Finish**, which will automatically start the setup program to update DirectX files on your system.
- C. Continue with **Section 3.4.2**, "Installing DirectX Drivers."



3.4.2. Installing DirectX Drivers

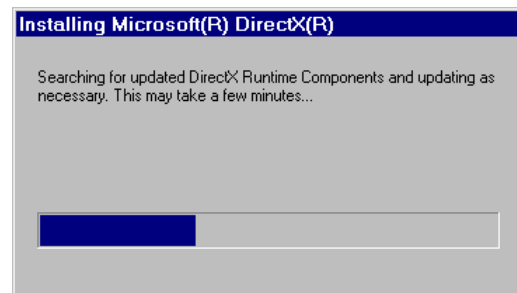
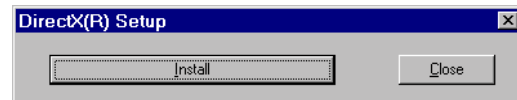
STEP 1

- A. Microsoft's licensing agreement for DirectX is displayed.
- B. Click **Yes** after reading and agreeing with the terms of the license.



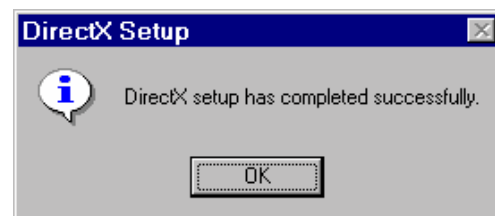
STEP 2

- A. Click **Install** when prompted by the setup program.
- B. The DirectX setup program will analyze your current version of DirectX and update files as needed.



STEP 3

- A. Click **OK** when setup is complete.
- B. When prompted, click OK to restart your computer.
- C. Continue with **Section 3.4.3**, "Installing USBcam Device Drivers."



3.4.3. Installing USBCam Device Drivers

PLEASE NOTE: When you connect the USBCam to your computer, Windows will automatically detect this new device. You will be prompted through separate driver installations – USB Device, Composite Video, and Audio – one after another.

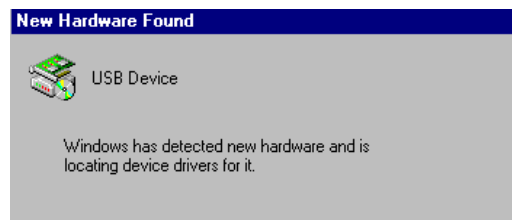
STEP 1

You will need the Windows 98 CD to complete the following procedure. When prompted, insert the Windows 98 CD-ROM and follow the directions provided.

STEP 2

Connect the USBCam to your computer. When you do, you will receive a momentary message saying that Windows has detected new hardware.

Please Note: This is the first driver that will be installed.



STEP 3

Click **Next**.



STEP 4

- A. Select "Search for the best driver for your device (Recommended)"
- B. Click **Next**.



STEP 5

- A. Select the checkbox, "Specify a location" and browse your system for the USBCam drivers that were installed on your system during **Section 3.4.1**, "Installing CDR Video Manager for DirectX."

(Non-CDR users please browse to your USBCam driver folder, as described in the Notice Page at the beginning of this document.)

- B. Click **Next**.



STEP 6

- A. When Windows finds the appropriate driver, it prompts you to confirm it.
- B. Click **Next**.



STEP 7

- A. Windows is ready to install the driver you selected and will prompt you to install it.
- B. Click **Next**.



STEP 8

Click **Finish**.



STEP 9

Please Note: Windows will automatically begin locating the next driver.

- A. You will be prompted through screens similar to the ones in Steps 3 through 7.
- B. When you reach the last screen, remove the Windows 98 CD and click **Finish**.
- C. If the Windows 98 CD setup program begins, just cancel setup and remove the Windows 98 CD.
- D. Click the **Exit** button on the USBCam Setup page and remove the CD.



3.5. Setup with Windows 2000

3.5.1. Installing CDR Video Manager for DirectX

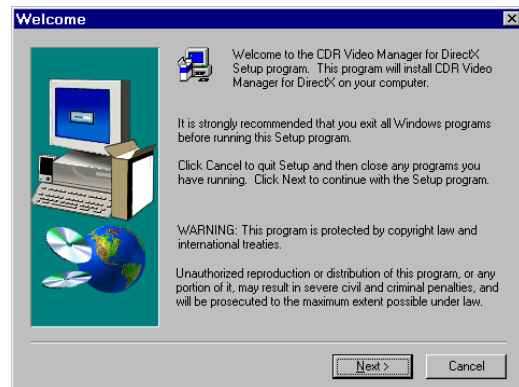
STEP 1

- A. Insert the “CDR Video Manager for DirectX” disk. Setup should start automatically. . If it doesn't, click **Start**, **Run**, and then enter **d:\setup\setup** at the command line (if your CD drive is a letter other than "d", use that letter instead).
- B. Click **Install CDR Video Manager** to begin the setup process.



STEP 2

Click **Next**.



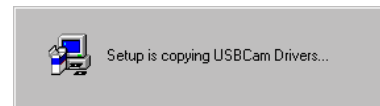
STEP 3

- A. Select the CDR camera you will be using. By default, USBCam is selected.
- B. Click **Next**.



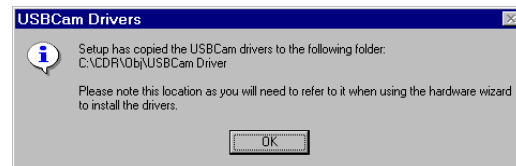
STEP 4

Setup will copy the drivers to your workstation.



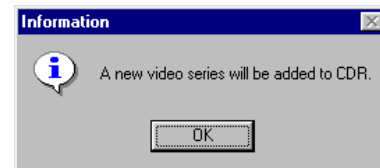
STEP 5

- A. Setup will tell you where on your system it has copied the drivers.
- B. Please note the location of these files as you will need this information during the "Add New Hardware" wizard (in **Section 3.5.3**, "Installing USBCam Device Drivers").
- C. Click **OK**.



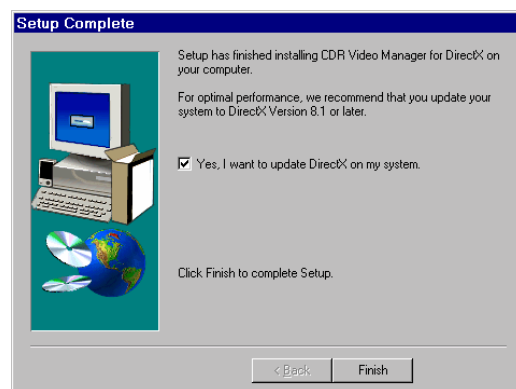
STEP 6

When the new video series is installed, click **OK**.



STEP 7

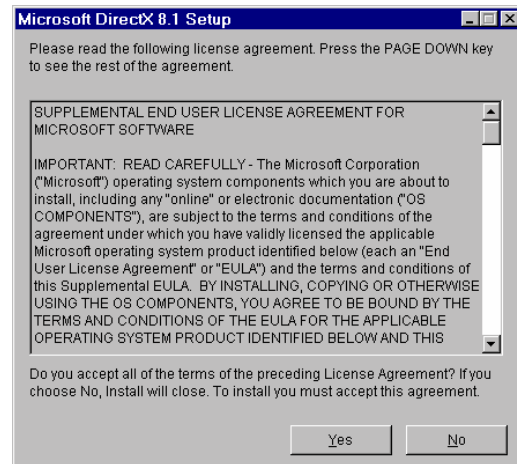
- A. Make sure the checkbox, "Yes, I want to update DirectX on my system" is marked.
- B. Click **Finish**, which will automatically start the setup program to update DirectX files on your system.
- C. Continue with **Section 3.5.2**, "Installing DirectX Drivers."



3.5.2. Installing DirectX Drivers

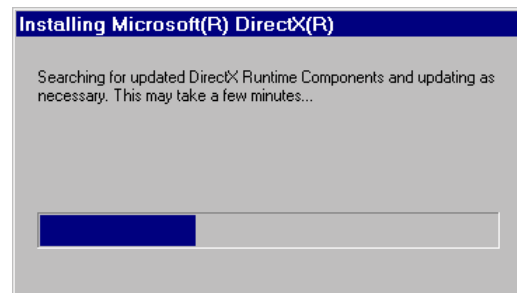
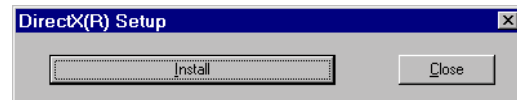
STEP 1

- A. Microsoft's licensing agreement for DirectX is displayed.
- B. Click **Yes** after reading and agreeing with the terms of the license.



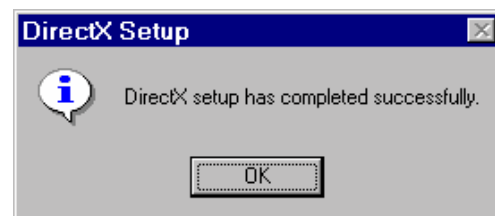
STEP 2

- A. Click **Install** when prompted by the setup program.
- B. The DirectX setup program will analyze your current version of DirectX and update files as needed.



STEP 3

- A. Click **OK** when setup is complete.
- B. When prompted, click OK to restart your computer.
- C. Continue with **Section 3.5.3**, "Installing USB-Cam Device Drivers."



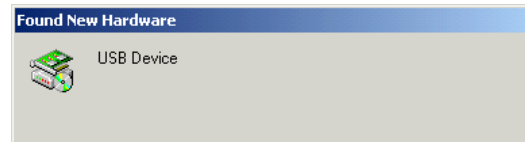
3.5.3. Installing USBCam Device Drivers

PLEASE NOTE: When you connect the USBCam to your computer, Windows will automatically detect this new device. You will be prompted through separate driver installations – USB Device, Composite Video, and Audio – one after another.

STEP 1

Connect the USBCam to your computer. When you do, you will receive a momentary message saying that Windows has detected new hardware.

Please Note: This is the first driver that will be installed.



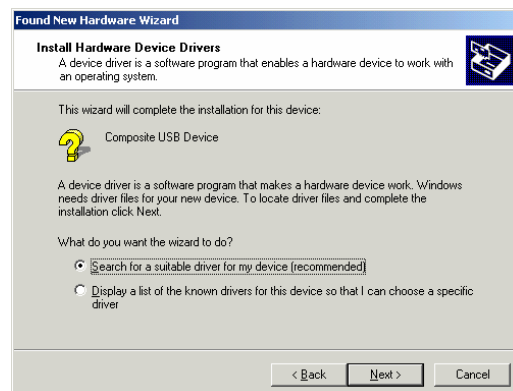
STEP 2

Click **Next**.



STEP 3

- A. Select "Search for a suitable driver for my device (recommended)"
- B. Click **Next**.

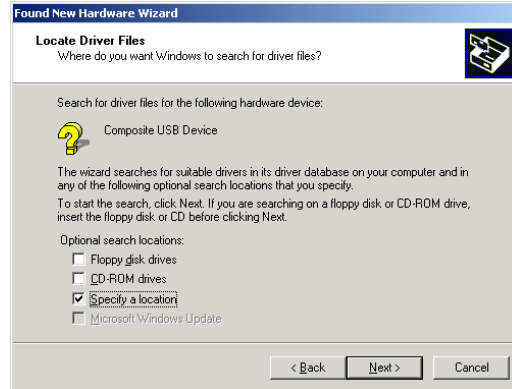


STEP 4

- A. Select the checkbox, "Specify a location" and browse your system for the USBCam drivers that were installed on your system during **Section 3.5.1**, "Installing CDR Video Manager for DirectX."

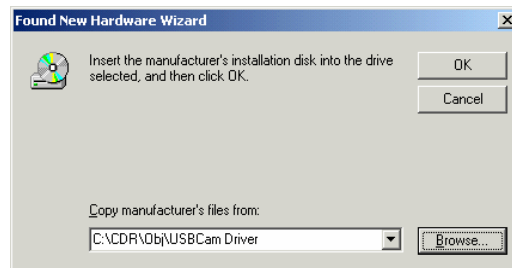
(Non-CDR users please browse to your USBCam driver folder, as described in the Notice Page at the beginning of this document.)

- B. Click **Next**.



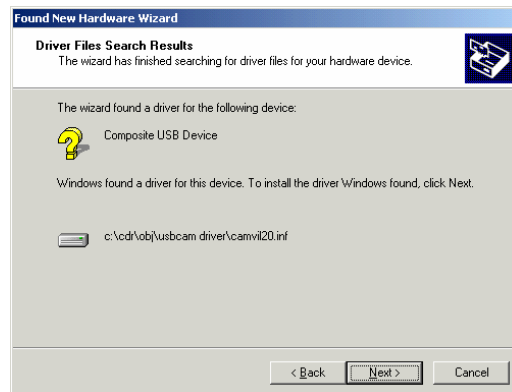
STEP 5

- A. When Windows finds the appropriate driver, it prompts you to confirm it.
- B. Click **OK**.



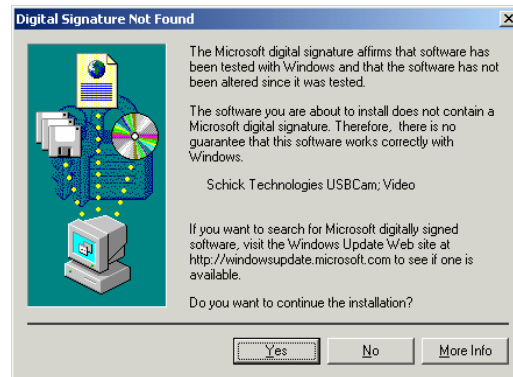
STEP 6

- A. Windows is ready to install the driver you selected and will prompt you to install it.
- B. Click **Next**.



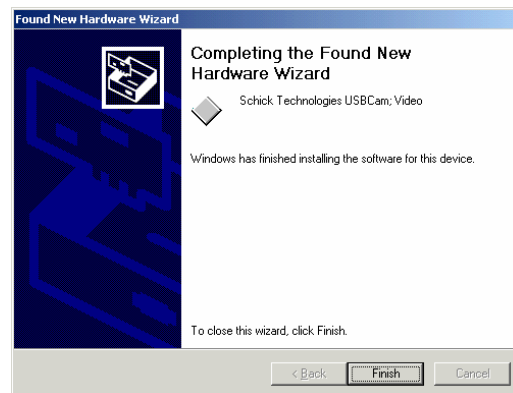
STEP 7

Click **Yes**.



STEP 8

Click **Finish**.



STEP 9

Please Note: Windows will automatically begin locating the next driver.

- A. You will be prompted through screens similar to the ones in Steps 2 through 8.
- B. Click the **Exit** button on the USBCam Setup page and remove the CD.



3.6. Setup with Windows XP

3.6.1. Installing CDR Video Manager for DirectX

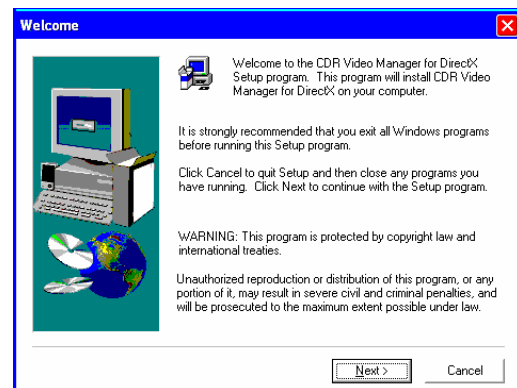
STEP 1

- A. Insert the “CDR Video Manager for DirectX” disk. Setup should start automatically. . If it doesn't, click **Start**, **Run**, and then enter **d:\setup\setup** at the command line (if your CD drive is a letter other than "d", use that letter instead)..
- B. Click **Install CDR Video Manager** to begin the setup process.



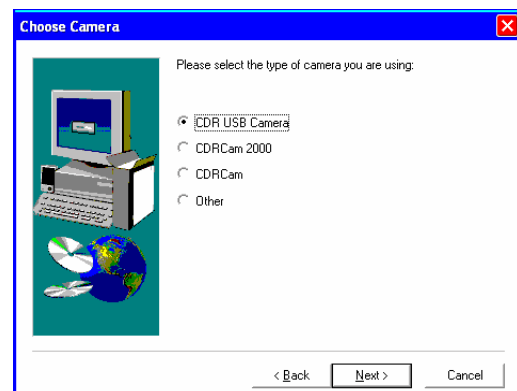
STEP 2

Click **Next**.



STEP 3

- A. Select the CDR camera you will be using. By default, USBCam is selected.
- B. Click **Next**.



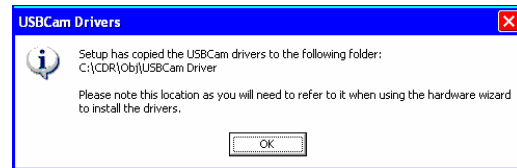
STEP 4

Setup will copy the appropriate files to your workstation.



STEP 5

- A. Setup will tell you where on your system it has copied the drivers.
- B. Click **OK**.



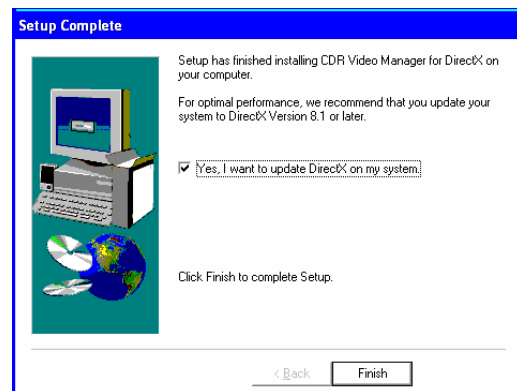
STEP 6

When the new video series is installed, click **OK**.



STEP 7

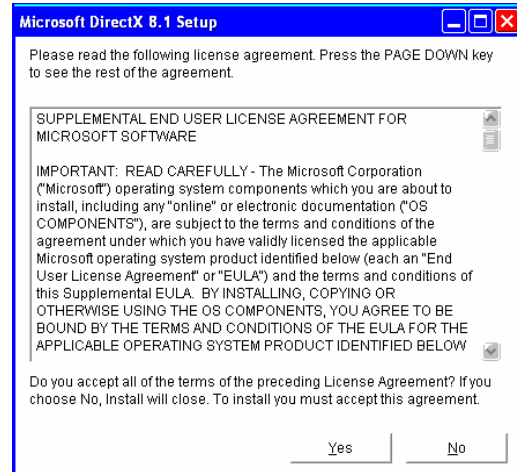
- A. Make sure the checkbox, "Yes, I want to update DirectX on my system" is marked.
- B. Click **Finish**, which will automatically start the setup program to update DirectX files on your system.
- C. Continue with **Section 3.6.2**, "Installing DirectX Drivers."



3.6.2. Installing DirectX Drivers

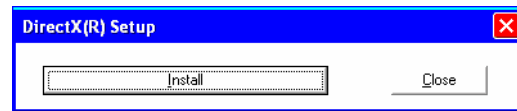
STEP 1

- A. Microsoft's licensing agreement for DirectX is displayed.
- B. Click **Yes** after reading and agreeing with the terms of the license.



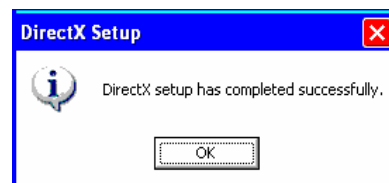
STEP 2

- A. Click **Install** when prompted by the setup program.
- B. The DirectX setup program will analyze your current version of DirectX and update files as needed.



STEP 3

- A. Click **OK** when setup is complete.
- B. When prompted, click OK to restart your computer.
- C. Continue with **Section 3.6.3**, "Installing USBCam Device Drivers."



3.6.3. Installing USBCam Device Drivers

PLEASE NOTE: When you connect the USBCam to your computer, Windows will automatically detect this new device. You will be prompted through separate driver installations – USB Device, Composite Video, and Audio – one after another.

STEP 1

Connect the USBCam to your computer. When you do, you will receive a momentary message saying that Windows has detected new hardware.

Please Note: This is the first driver that will be installed.



STEP 2

- A. Select "Install the software automatically (Recommended)."

(Non-CDR users please browse to your USBCam driver folder, as described in the Notice Page at the beginning of this document.)

- B. Click **Next**.



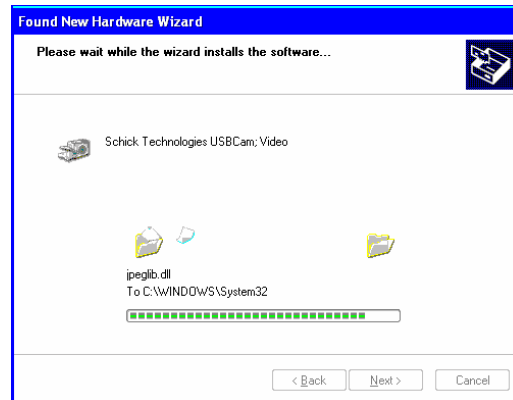
STEP 3

Click **Continue Anyway**.



STEP 4

Setup will copy the appropriate files to your workstation.



STEP 5

Click **Finish**.



STEP 6

Please Note: Windows will automatically begin locating the next driver.

- A. You will be prompted through screens similar to the ones in Steps 2 through 5.
- B. When all of the drivers have been installed, Windows displays a message confirming a completed installation.
- C. Click the **Exit** button on the USBCam Setup page and remove the CD.



4. Operation

4.1. Operating the Camera

Refer to the following sections for instructions on turning the USBCam on and off, focusing, and taking still images from streaming live video ("freeze-frame" capture).

4.1.1. Turning the Camera On

Before turning on the camera make sure the cable connections are secured. Turn on the camera by clicking the Power On/Off button (**Figure 1, item 3**). Removing the handpiece from its holder also turns the camera on.

4.1.2. Turning the Camera Off

When the camera's light is on, clicking the camera's Power On/Off button (**Figure 1, item 3**) shuts power off to the camera. Clicking the Power On/Off button restores power to camera and turns the LEDs back on.

When not in use, store the camera in its holder to protect the device and for easy access. Placing the camera in its holder turns off the camera LEDs automatically if they are illuminated.

4.1.3. Focusing the Camera

The USBCam is a fixed-focus type camera with an 8 mm (0.31 in) to 40 mm (1.6 in) depth of field. To accurately focus the camera, start CDR and turn the camera on. As live video begins to stream, adjust the distance of the handpiece to the area of interest until the images are as clear and sharp as possible.

4.1.4. Pausing and Capturing Still Frame Images

To set up your handpiece Freeze Frame button for Freeze/Take mode, do the following:

- Click the Setup button on the Video Capture window
- Select the option for Freeze/Take
- Click OK to save settings

To use your handpiece in this mode, depress the Freeze Frame button once (**Figure 1, item 2**) to capture the frame. To resume live video after taking an image, select any empty target frame and click on it.

4.1.5. Pausing and Resuming Live Video

To set up your handpiece Freeze Frame button for Freeze/Unfreeze mode, do the following:

- Click the Setup button on the Video Capture window
- Select option for Freeze/Unfreeze
- Click OK to save settings

To use your handpiece in this mode, depress the Freeze Frame button once (**Figure 1, item 2**) to pause live video. Depressing the button again will resume streaming video.

To capture an image when live video is paused, click the Take button on the Video Capture window.



Figure 4. Video Window Setup and Capture Buttons

4.2. Using Camera Sheaths

Disposable sheaths are provided with each USBCam System as an effective measure for ensuring proper hygiene and to protect against infectious disease. Use a new sheath for each intra-oral use, and then dispose it of properly.

When the sheath is inserted over the handpiece, notice that the upper part of the sheath (covering the lens) has both a clear and frosted side. Make sure the CLEAR side of the sheath is facing the camera lens.

4.3. Using the Camera with CDR

NOTE: Refer to the CDR User Guide, Schick P/N 1051001, for more detailed information on using CDR.

STEP 1

Start CDR from the Windows **Start** button or by clicking the shortcut to CDR on your desktop.

STEP 2

When the CDR exam window appears, click on **New** in the CDR **File** menu or just click the New Exam button on the toolbar.

STEP 3

- A. Enter the appropriate patient information and then click on **Video Exam**. You may use a pre-defined video series or create a new one.
- B. If you choose to create a new video series, click **Edit Series**, which opens the New Custom Video Series dialog box. The numbers in the text boxes correspond to how many target frames are included in this series. You can edit the numbers in the text boxes, creating a series customized with the views you wish to include.
- C. Enter a name for this video series, so you will be able to reuse it again. Click **Ok** to finish.

STEP 4

- A. Place a new sheath over the camera.
- B. Click the Power button on the handpiece to turn the camera LEDs on if they are not on already.

STEP 5

- A. In the CDR exam window, click on an empty frame that matches the video image area.
- B. Once the target frame is highlighted, click on the frame again to begin viewing live video.

STEP 6

- A. The Video Capture window displays live video.
- B. Move the camera to focus it and to find the depth of field that will provide the best results for capturing a still frame.
 - 1) If you set up your USB Cam for **Freeze/Take**, pressing the Freeze Frame button captures the image. Continue with Step 7.
 - 2) If you set up your USB Cam for **Freeze/Unfreeze**, pressing the Freeze Frame button pauses live video. To resume streaming video, press the Freeze Frame button again. To capture an image, click the Take button on the Video Capture window. Continue with the next step.

STEP 7

- A. The captured video image appears in either the exam or zoom window, depending on settings in the CDR.INI file. For more information on options in the CDR.INI file, refer to your CDR User Guide or download a current version of this document from our website at www.schicktech.com.
- B. To take another image, repeat this procedure, starting at Step 5.

4.4. Acquiring Video Images with the Footpedal

The CDR footpedals can be used to control the capture of video images. Refer to the following table for information on using these footpedals to capture video images.

Table 2. Footpedal Actions

Video	Desired Action		Use Pedal
Streaming	Freeze Image		Green
	Close Video Window		Amber
Still	(Image is frozen in video window)	Take Image	Green
	(Image is frozen in video window)	Unfreeze Image	Amber

4.5. Acquiring Video Images with Keyboard Shortcuts

Video image acquisition can be also accomplished through the use of shortcut keys. To use the following shortcuts, press and hold down the first key (always the Alt key) and then press the second key (shown after the plus sign) for the appropriate action.

Table 3. Keyboard Shortcuts

Video	Desired Action		Use Keys
Streaming	Freeze Image		Alt + F
	Close Video Window		Alt + C
Still	(Image is frozen in video window)	Take Image	Alt + T
	(Image is frozen in video window)	Unfreeze Image	Alt + U

5. Protective Measures

5.1. Sheaths

The USBCam system uses disposable sheaths to ensure proper hygiene and to protect against infectious disease. Sheaths are intended for single-use only. Do not use the camera for intraoral use until a new sheath has been properly fitted to the handpiece. After each intra-oral use, remove the sheath and dispose of it properly. Then, clean the outer surfaces of the camera using mild cleaning solution and sterile wipes. A new sheath must be used for each patient.

Disposable sheaths are provided with every USBCam system. In the U.S, additional sheaths can be ordered from Patterson Dental Supply, Inc by calling 1-800-328-5536. International customers should contact the Schick Technologies Sales and Marketing department at 718-937-5765.

5.2. Handpiece and Lens

IMPORTANT! Be sure to disconnect the camera from its USB cable and port before performing any cleaning procedures.

To clean and disinfect the handpiece, use a clean lint-free cloth and a small amount of alcohol. Do not soak the handpiece and be sure to dry it completely. Before cleaning the lens, be certain that it is free of any abrasive contaminants. This will help to avoid the formation of scratches while cleaning.

To clean the lens surface, moisten a soft cotton swab dipped in rubbing alcohol. Gently wipe the lens surface end to end in straight lines without applying pressure; do not scrub. Allow the alcohol to evaporate from the lens surface. Repeat these steps, as needed, until the lens surface is clean.

5.3. Computer

To avoid cross contamination, follow the cleaning instructions provided by your computer manufacturer and implement them as part of your normal routine for ensuring proper sterilization and disinfectant of tools in your dental practice.

Appendix A. Reference Information

A-1. Removal and Replacement Procedures

There are no user-serviceable parts in the USBCam system. Should you experience problems with the USBCam system, please contact your local distributor of Schick Technologies products.

In the United States, Schick Technologies products are available exclusively through Patterson Dental Supply, Inc. Call your local Patterson representative, local Patterson branch, or 1-800-873-7683 for more information.

A-2. Summary of Specifications

Table 4. Specifications

Item/Specification	Value	
EMC/Safety	CAN/CSA C22.2 No.601.1-M90	Medical Electrical Equipment Part 1: General Requirements for Safety
	IEC60601-1	Medical Electrical Equipment Part 1: General Requirements for Safety
	IEC60601-1-2	Medical Electrical Equipment Part 1: General Requirements for Safety 2.Collateral Standard: Electromagnetic Compatibility – Requirements and Tests
	UL60601-1	Medical Electrical Equipment: General Requirements for Safety
Input electrical ratings	5VDC @ 400mA	
Equipment type	Type BF equipment  (on handpiece)	
Fuses	63VDC/VAC, 1A fast blow fuse	
Restricted service statement	Unless otherwise specified, this unit should be serviced only by the manufacturer. It contains no user-serviceable parts.	
Imager	1/4-inch progressive scan CCD	
Effective pixel layout	659 (H) x 494 (V)	
Video output	USB 1.1 compliant full motion digital	
Focus range	8 - 40 mm (0.31 - 1.6 in)	

Item/Specification	Value
Focus type	Fixed
External power supply	None
Maximum cable length	5 m (5.5 yds)
Handpiece weight	60 g (2.1 oz)
Special features	Integrated frame capture button

A-3. Leakage Current Statement

USBCam complies with the leakage current requirements of IEC 60601-1-1 safety standard. Variations, however, may exist in the construction of computers to which the USBCam is connected. Users are advised to have a qualified electrician perform a leakage test on their equipment before using the USBCam.

A-4. Handpiece Product Label Information

The following product label information can be found on the USBCam handpiece. An **ESD** symbol also appears on the handpiece and is described in the **Safety Issues** section of this document.



A-5. EMC Tables

Table 5. Guidance and Manufacturer's Declaration - Electromagnetic Emissions

PLEASE NOTE: The USBCam is intended for use in the electromagnetic environment specified below. The USBCam user must ensure that it is used in such an environment.

Emissions Test	Compliance	Guidance
RF emissions CISPR 11	Group 1	The USBCam system uses RF energy only for its internal function. Therefore, its RF emissions are very low and are not likely to cause any interference in nearby electronic equipment.
RF emissions CISPR 11	Class B	The USBCam system is suitable for use in all establishments including domestic establishments and those directly connected to the public low-voltage supply network that supplies buildings used for domestic purposes.
Harmonic emissions IEC 61000-3-2	Class A	
Voltage fluctuations/ flicker emissions IEC 61000-3-3	Complies	

Table 6. Guidance and Manufacturer's Declaration - Electromagnetic Immunity

PLEASE NOTE: The USBCam is intended for use in the electromagnetic environment specified below. The USBCam user must ensure that it is used in such an environment.

Immunity Test	IEC 60601 Test Level	Compliance Level	Guidance
Electrostatic discharge (ESD) IEC 61000-4-2	±6 kV contact ±8 kV air	±6 kV contact ±8 kV air	Floors should be wood, concrete or ceramic tile. If floors are covered with synthetic material, the relative humidity should be at least 30%. To avoid damage to electronic components inside, users should not touch the exposed USBCam connector before discharging to an earthed object.
Electrical fast transient/burst IEC 61000-4	±2 kV for power supply lines ±1 kV for input/output lines	±2 kV for power supply lines ±1 kV for input/output lines	Mains power quality should be that of a typical commercial or hospital environment.
Surge IEC 61000-4-5	± 1 kV differential mode ± 2kV common mode	± 1 kV differential mode ± 2kV common mode	Mains power quality should be that of a typical commercial or hospital environment.
Voltage dips, short interruptions and voltage variations on power supply input lines IEC 61000-4-11	< 5% U_T (>95% dip in U_T) for 0.5 cycle < 40% U_T (>60% dip in U_T) for 5 cycles	< 5% U_T (>95% dip in U_T) for 0.5 cycle < 40% U_T (>60% dip in U_T) for 5 cycles	Mains power quality should be that of a typical commercial or hospital environment. If the user of the USBCam system requires continued operation during mains interruptions, it is recommended that the USBCam system be powered from an uninterruptible power supply or battery.

Immunity Test	IEC 60601 Test Level	Compliance Level	Guidance
	$< 70\% U_T$ (>30% dip in U_T) for 25 cycles $< 5\% U_T$ (>95% dip in U_T) for 5 sec	$< 70\% U_T$ (>30% dip in U_T) for 25 cycles $< 5\% U_T$ (>95% dip in U_T) for 5 sec	NOTE: U_T is the AC mains voltage prior to application of the test level.
Power frequency (50/60 Hz) magnetic field IEC 61000-4-8	3 A/m	3 A/m	
Conducted RF IEC 61000-4-6 Radiated RF IEC 61000-4-3	3 Vrms 150 kHz to 80 MHz 3 V/m 80 MHz to 2.5 GHz	3 Vrms 3 V/m	Portable and mobile RF communication equipment should be used no closer to any part of the USBCam system, including its cables, than the recommended separation distance calculated from the equation applicable to the frequency of the transmitter. Recommended separation distance: $d = 1.2 \sqrt{P}$ $d = 1.2 \sqrt{P}$ for 80 MHz to 800 MHz $d = 2.3 \sqrt{P}$ for 800 MHz to 2.5 GHz Where P is the maximum output rating of the transmitter in watts (W) according to the transmitter manufacturer and d is the recommended separation in meters (m). Field strengths from fixed RF transmitters, as determined by an electromagnetic site survey,^a should be less than the compliance level in each frequency range.^b Interference may occur in the vicinity of equipment marked with the following symbol. 
NOTE 1: At 80 MHz and 800 MHz, the higher frequency range applies. NOTE 2: These guidelines may not apply in all situations. Electromagnetic propagation is affected by absorption and reflection from structures, objects and people			

Immunity Test	IEC 60601 Test Level	Compliance Level	Guidance
^a Field strengths from fixed transmitters, such as base stations for radio (cellular/cordless) telephones and land mobile radios, amateur radio, AM and FM radio broadcast and TV broadcast cannot be predicted theoretically with accuracy. To assess the electromagnetic environment due to fixed RF transmitters, an electromagnetic site survey should be considered. If the measured field strength in the location in which the USBCam is used exceeds the applicable RF compliance above, the USBCam should be observed to verify normal operation. If abnormal performance is observed, additional measures may be necessary, such as reorienting or relocating the USBCam. ^b Over the frequency range 150 kHz to 80 MHz, field strengths should be less than 3 V/m			

Table 7. Recommended Separation Distance Between Portable and Mobile RF Communications Equipment and the USBCam System

PLEASE NOTE: The USBCam is intended for use in an electromagnetic environment in which radiated RF disturbances are controlled. The USBCam user can help prevent electromagnetic interference by maintaining a minimum distance between portable and mobile RF communications equipment (transmitters) and the system as recommended below, according to the maximum output power of the communications equipment.

Rated maximum output power of the transmitter (W)	Separation distance according to the frequency of the transmitter (m)	
	150 kHz to 800 MHz $d=1.17 \times \sqrt{P}$	800 MHz to 2.5 GHz $d=2.3 \times \sqrt{P}$
0.01	0.12	0.23
0.1	0.37	0.73
1	1.17	2.30
10	3.69	7.27
100	11.7	23.00
For transmitters rated at a maximum output power not listed above, the recommended separation distance d in meters (m) can be estimated using the equation applicable to the frequency of the transmitter, where P is the maximum output power rating of the transmitter in watts (W) according to the transmitter manufacturer. NOTE 1: At 800 MHz, the separation distance for the higher frequency range applies. NOTE 2: These guidelines may not apply in all situations. Electromagnetic propagation is affected by absorption and reflection from structures, objects, and people.		

Appendix B. Additional Information

B-1. Checking DirectX Version and Video Information

When installing CDR Video Manager for your USBCam, you will be prompted to install the latest version of Microsoft's DirectX files on your system. We strongly recommend that you install these files as earlier versions of DirectX (prior to DirectX 8.1) are not compatible with USBCam. In the event you experience video problems with USBCam, please verify that your system has properly installed DirectX version 8.1 or later by performing the steps below.

Video quality and performance is also affected by the amount of video memory available. By running **diag.exe**, as documented below, and checking the **Display** tab, you can verify the amount of video memory available on your graphics card.

STEP 1

- A. At the Windows desktop, click **Start, Run**, and then type **dxdiag.exe**.
- B. The "DirectX Diagnostic Tool" dialog box is displayed.
- C. Under the System tab, verify that your current DirectX version is 8.1 or higher.

STEP 2

- A. If your DirectX version is 8.1 or higher, you have the correct version for USBCam operation. Click **Exit** to close this dialog box.
- B. If your DirectX version is less than 8.1, repeat the steps to install CDR Video Manager and verify that the box, "Yes, I want to update DirectX on my system" is checked and continue with the update.

B-2. Checking Your Video Settings

Video settings can affect the display and capture of video images using USBCam. To help ensure your video images are consistently high quality, some USBCam settings are factory set by default. Frame rate settings (25 frames per second), White Balance (auto), and Exposure (auto) are examples of factory settings. These settings are optimized for your USBCam, but if you need to change them, they can be adjusted using options found on the video setting dialog boxes. Refer to the following tables for more information.

Table 8. Setup Dialog Box Description

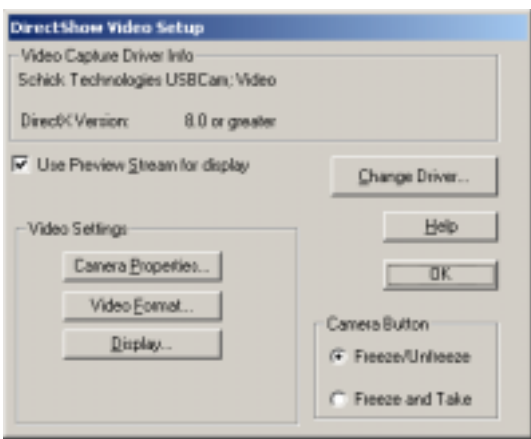
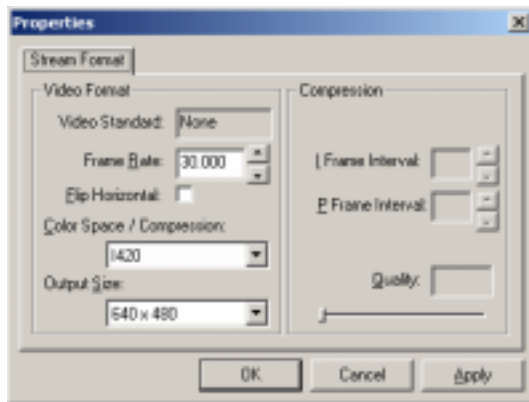
Dialog Box Options	
	
<i>Use Preview Stream for Display</i> — May improve video performance for slower Pentium processors (PII). This checkbox has no effect on faster (PIII and above) processors. <i>Video Settings</i> — More camera operation and video display options are available here. <i>Change Driver</i> — If you have installed other video drivers (with a video capture card, for example), they can be selected from this drop-down box. <i>Camera Button</i> — Selects USBCam Freeze-frame button actions.	

Table 9. Camera Properties Dialog Box Description

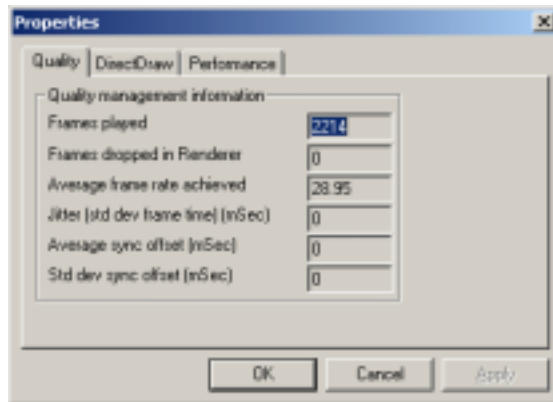
Dialog Box Options
 <i>Image Controls</i> — Adjusts color settings of streaming video images. <i>Exposure</i> — Adjusts the exposure settings of the camera and may be useful for capturing poorly illuminated areas. Auto exposure is the optimized setting for the USBCam. <i>Frame Rate</i> — The number of video frames displayed per second. If changes in frame rate are required, do not change them here, but in the Video Format dialog box (Table 10). <i>Image Modes</i> — Adjusts the orientation (Mirror) or the appearance of darker areas on the displayed image (Backlight Compensation). <i>White Balance</i> — Adjusts color levels of video images to compensate for environmental lighting conditions. <i>Flickerless</i> — Compensates for display flickering, which may occur in florescent lighting environments. <i>Defaults</i> — Factory settings may be changed, saved, or restored to their original settings.

Table 10. Video Format and Display Dialog Box Descriptions

Dialog Box Options



(Video Format)



(Display)

A. Video Format Dialog Box

Video Format — The number of video frames displayed per second can be changed here. Twenty-five (25) frames per second is the optimized setting for the USB Cam

Color Space/Compression — Selects a different model for rendering color.

Output Size — Changes the size of the video window.

Compression — Applies only to certain kinds of video protocols (like MPEG-2) that support interframe or temporal compression.

B. Display Dialog Box

Quality — Reports frame rate and other information about the current video sequence.

DirectDraw — Applies to buffers used in DirectDraw to increase smooth frame-to-frame video display.

Performance — Applies to DirectDraw status and performance options.