USBCam2 User Guide

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Safety Issues

Check USBCam2 before Using It

There are no customer-serviceable components in the USBCam2. However, before each usage, check the outer surface of the USBCam2 for any signs of physical damage or defect. The surface of the USBCam2 should have a smooth finish, with no evidence of chipping or damage to either the handpiece housing or the lens section. If detected, contact your local distributor of Schick Technologies products for further instructions.

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 USBCam2

When in use, the LEDs in the USBCam2 may generate surface temperatures in excess of 106° F (41° C). To avoid the potential risk of burn, do not use the USBCam2 in a single hand-held position for a prolonged period. As an additional safety measure, the USBCam2 is equipped with an Auto-Off feature. This feature turns off the camera automatically after 5 minutes of continuous use. The camera can be turned back on by simply pressing the ON/OFF button on the handpiece.

Operate the USBCam2 as Directed

Always use the USBCam2 in accordance with the directions and recommendations contained in this User Guide. Do not attempt to modify the USBCam2 or use it in system configurations not specified in this document.

RF Interference Considerations

Although the USBCam2 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 (meaning, electricity transformer rooms, static continuity units, two-way amateur radios and cellular phones) can be used only at a minimum distance of 5 feet (1.5m) from any part of the USBCam2 system.

Any instrumentation or equipment for professional use located near USBCam2 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.

Apply Recommended Procedures for Cleaning the Equipment

Safe and proper operation of the equipment requires that a regular schedule of preventive maintenance be followed. Refer to the Protective Measures section of this manual for details.

Do Not Connect Items that are Not Part of the System

Only items specified for use with the equipment are to be connected to the system. The equipment should not be used adjacent to other equipment that is not part of the system. If, however, use with adjacent equipment is necessary, normal operation should be observed and verified in that configuration.

Installers to Ensure that USBCam2 Operates Optimally

Installers must ensure that the USBCam2 provides the user with the optimal use of the equipment. This includes, but is not limited to, ensuring the system operates as described in this document. Installers must also ensure that the system presents no physical obstacles or hazards during operation and when not in use. To verify this requirement, installers shall confirm that the USBCam2 is installed as described in this User Guide and shall perform the appropriate procedures therein.

Ensure Proper System and PC Workstation Installation and Operation

The USBCam2 has been determined to be in accordance with international safety standards and is deemed suitable for use within the patient area, which extends from the patient for a distance of 5 feet (1.5m). To comply with these standards, do not operate non-medical equipment (such as a PC workstation) inside the patient area. Outside the patient area, the presence of approved non-medical grade equipment and Listed / Approved / certified Information technology Equipment (ITE) computer equipment is acceptable.

The PC workstation that connects to the USBCam2 via compatible USB cable is an integral part of a Medical Electrical System. The PC must be a CE-approved computer system conforming with the Low Voltage [73/23/EC] and EMC Directive [89/336/ERC]. Also, to help ensure optimal performance, ensure that all software programs residing on the workstation are virus-free and have been adequately tested so they will not impact imaging applications after installation.

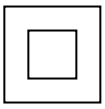
Please refer to documentation provided by the PC manufacturer for important information about its safe operation and usage.

Observe Proper PC Workstation Cleaning Methods

To avoid cross contamination, be sure to 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

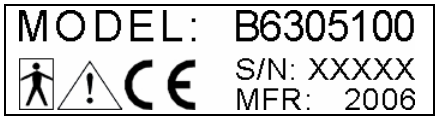
Explanation of Symbols

Some of the symbols on the USBCam2 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 USBCam2 is Class II equipment.
	Indicates that the USBCam2 is Type BF equipment.
	Indicates an attention to users to consult accompanying documents (this User Guide) for more information on the USBCam2.
	Conforms to EC 93/42/EEC (European Communities) concerning medical devices.
	Conforms to UL 60601-1 Certified to CAN/CSA STD C22.2 NO 601.1.
	Indicates the location of the Power On / Off button the USBCam2 camera.
	Indicates the location of the Freeze Frame Capture button on the USBCam2 camera.

Label Location

The Schick logo and the following label can be found on the USBCam2 camera.



Waste Electrical and Electronic Equipment

Background

The European Union's Waste Electrical and Electronic Equipment (WEEE) Directive (2002/96/EC) has been implemented in member states as of August 13, 2005. This directive, which seeks to reduce the waste of electrical and electronic equipment through re-use, recycling, and recovery, imposes several requirements on producers. Schick Technologies and its Dealers are committed to complying with the Directive.

WEEE Marking

All Schick products subject to the WEEE Directive and shipped after August 13, 2005 will be compliant with the WEEE marking requirements. These products will be identified with the "crossed-out wheeled bin" WEEE symbol shown below, as defined in European Standard EN 50419, and in accordance with WEEE Directive 2002/96/EC.

This "crossed-out wheeled bin" symbol on the product or on its packaging indicates that this product must not be disposed of with other unsorted municipal waste. Instead, it is user's responsibility to dispose of EE waste equipment by handing it over to a designated collection point for the reuse or recycling of waste electrical and electronic equipment. The separate collection and reuse or recycling of Electrical & Electronic waste equipment will help to conserve natural resources and ensure that it is recycled in a manner that protects the environment and human health. For more information about where you can drop off your waste equipment for recycling, please contact your local officials.

Reporting

According to the WEEE Directive, Schick Technologies or its Dealers will ensure that information needed to calculate the financial obligations with respect to EEE products will be provided as required.

WEEE from Users other than Private Households

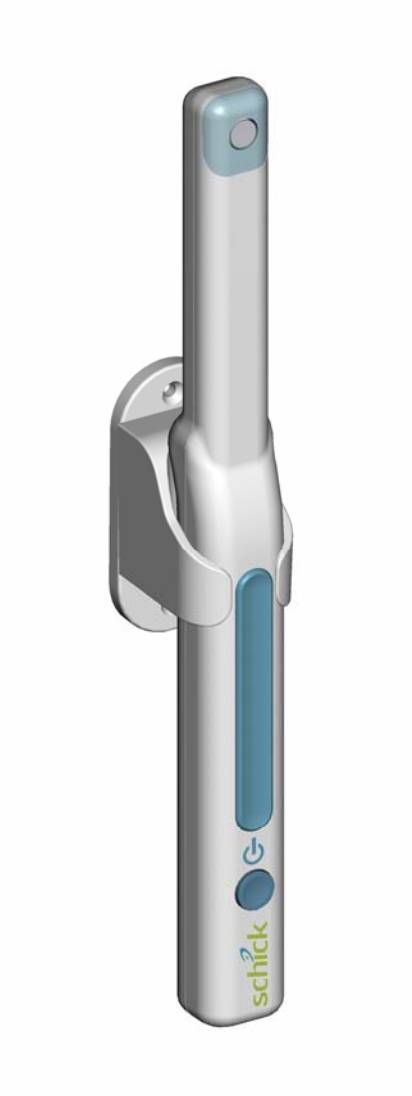
According to the WEEE Directive, Schick Technologies or its Dealers will fulfill its obligations for the management of WEEE from users other than private households.

Furthermore, as required by the WEEE Directive, in order to enable the date upon which the equipment was put on the market to be determined unequivocally, a mark on the equipment will be placed to specify that the equipment was put on the market after August 13, 2005.

Information for Reuse Centers, Treatment and Recycling Facilities

After August 13, 2005, and as required by the WEEE Directive, Schick Technologies or its Dealers will provide reuse, treatment, and recycling information for each type of new EEE put on the market within one year of the date in which the equipment is put on the market.

Information will include the different EEE components and materials as well as the location of substances in these items. The information will be provided as a printed document or in electronic media (on CD-ROM or by web download, for example)



USBCam2 with Handpiece Holder

1. Introduction to USBCam2

1.1. Purpose

USBCam2 (Schick P/N B6305100) is the newest hand-held intraoral camera from Schick Technologies. An effective communication tool, USBCam2 supports streaming video and still frame capture to help dental professionals demonstrate the current condition and post-treatment outcomes of their patients' dental health. Video frames can be archived with dental exams as permanent records and retrieved for comparison or subsequent review.

Ergonomic, the USBCam2 provides slim, smooth contours and a small head profile for comfortable use and operation. Taking images with the USBCam2 integrated capture button makes video frame capture a simple one-pushbutton step. Bright, built-in LEDs supply superior illumination and advanced optics provide excellent depth of field for optimal performance.

Adding USBCam2 to your office provides the following advantages:

- Digital output over high-speed USB 2.0
- Full motion video, full color depth, and VGA resolution quality with no compression artifacts
- Plugs directly into your computer, no separate power supply required, and ports quickly from operatory to operatory — just disconnect and reconnect
- Uses Microsoft Windows ® DirectX ® drivers — no special "frame-grabbing" video card

1.2. Indications for Use

USBCam2 is to be used as an intraoral video source and is indicated for individuals who may benefit from the addition of video images in intraoral dental examinations.

1.3. System Description

The USBCam2 system hardware consists of the following components: USBCam2 Handpiece and Holder, USB 2.0 Cable, and Camera Sheaths. The USBCam2 is connected by USB 2.0 type A-B cable to a compatible PC workstation (running Windows XP or Windows 2000), which also provides the power source for the device. To turn on the USBCam2, press the Power button located near the base of the handpiece, close to the USB connector; pressing the button a second time turns the USBCam2 off (**Figure 1**).

The holder for the USBCam2 serves as storage for the device when not in use and can be installed in a variety of chair-side or adjacent surface options, providing quick access as well as protection from accidental damage. The holder also turns off the camera automatically when the handpiece is stored. When the handpiece is removed, the camera is turned on automatically and is ready for use.

A programmable button to Freeze / Take / Unfreeze video is located at the side opposite from the camera LEDs, near the middle of the handpiece (**Figure 1**). Built-in support for these video functions is provided by compatible software programs such as CDR DICOM for Windows 3.5 and higher, EagleSoft 12.0 and higher, and Patterson Imaging 12.0 and higher. For other custom applications, a programmer's guide is available.

Optically clear sheaths are required for each new patient and provide an effective measure for ensuring proper hygiene and protection against infectious disease. Cleaning and disinfection information for the USBCam2 handpiece and the holder can be found in **Section 5,** Protective Measures, which includes a list of recommended products and procedures.

1.4. Getting the Best Images with USBCam2

Getting the best results from your USBCam2 begins with having a computer system suitable for displaying and capturing video images. For optimum performance we recommend: (a) PCs equipped with Pentium IV processors, (b) available USB 2.0 port, (c) minimum 8MB video memory, and (d) 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 USBCam2.[1]

IMPORTANT! USB bandwidth is shared among all USB devices. Achieving optimum performance with the USBCam2 (30 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 USBCam2 are: 30 frames-per-second frame rate, fixed white balance, and auto exposure. More information about video settings can be found in **Sections B-1 and B-2**.

1.5. Controls on the USBCam2

An illustration of the USBCam2 is shown below in **Figure 1**. For a description of user controls on the camera, refer to **Table 1**.

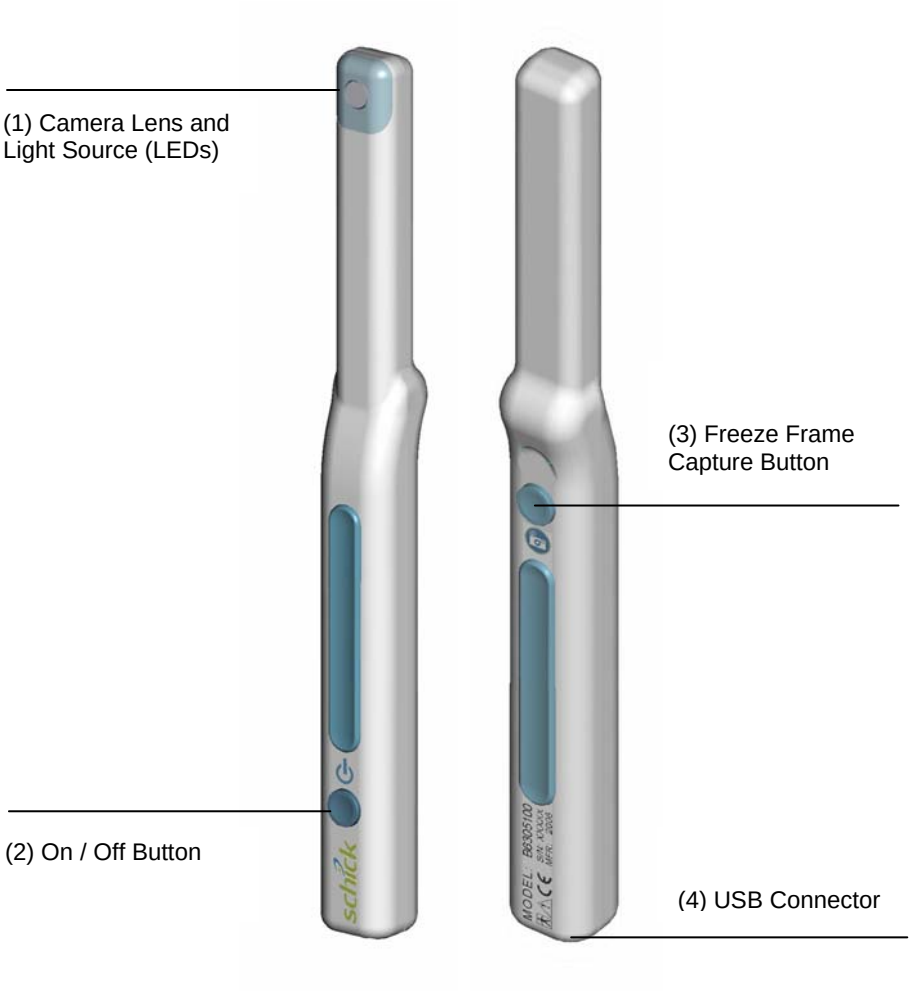


Figure 1. USBCam2 Controls

Table 1. Description of Camera Controls

Number	Description
1	Camera lens and LED (light-emitting diode) source
2	Power on/off button (See Note A)
3	Freeze frame capture button (See Note B)
4	USB cable connection (See Note C)
NOTE A: Light source will automatically time out after 5 minutes of continuous operation. NOTE B: Can be set to either Freeze / Unfreeze images or Freeze / Take images. Refer to Section 4, Operation, for details. NOTE C: "B" connector end of USB cable connects here.	

2. Hardware Setup

2.1. Connecting the USBCam2 and Cable

IMPORTANT! Do not connect the USBCam2 and cable to your computer until after you have successfully run the setup program. Procedures for installing these files are supplied in Section 3, "Software Setup."

The USB 2.0 cable used with the camera has 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. For EMC and EMI compliance, the USB cable should not exceed a maximum length of 5 meters (5.5 yards).

Figure 2. USB Cable Connectors

2.2. Installing the USBCam2 Handpiece Holder

The USBCam2 Handpiece Holder turns off the camera when the handpiece is inserted and turns on the camera when the handpiece is removed. The holder is designed for several mounting options: (1) Mounted to a standard ½-inch dental instrument bar, or (2) Wall-mounted with fastening hardware.

PLEASE NOTE: When selecting the mounting option for your USBCam2, choose a location that offers easy access during patient exams and safe storage afterwards. In most practices, mounting the USBCam2 to the dental unit will provide the best all-around solution.

2.2.1. Dental Unit Option

To install the handpiece holder to a standard ½-inch instrument bar, do the following:

1. Remove the handpiece from its holder before performing this procedure.
2. Remove the cutout block from the holder by untightening and retaining 2 Phillips screws.

3. Attach the holder to the instrument rail mounting block by tightening 2 Phillips screws removed previously.
4. Position the holder on the instrument bar of your dental unit, using the cutout space on the back of the mounting block as a guide.
5. When the holder is in position, use an Allen key to tighten 2 set screws located at the bottom of the mounting block.

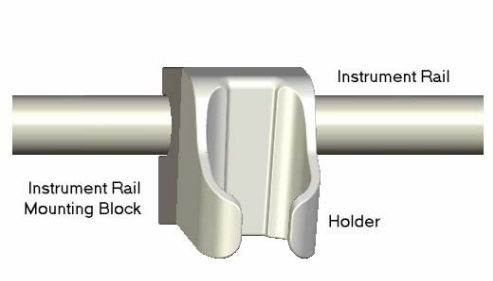


Figure 3. Handpiece Holder Instrument Rail Installation

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. Position the holder on a smooth stable vertical surface.
3. 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.

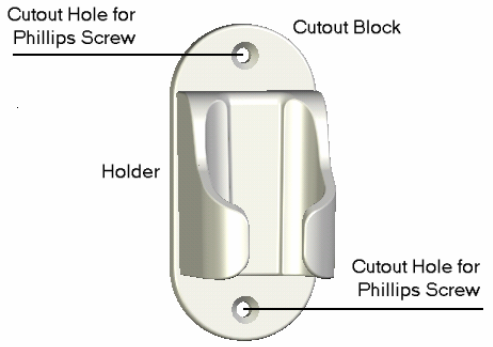


Figure 4. Handpiece Holder Wall Mounting Installation

3. Software Setup

3.1. What You Will Need to Complete this Section

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

- USBCam2 Driver CD
- USBCam2
- USB 2.0 type A-B Cable (not supplied, but should not exceed a maximum length of 5 meters (5.5 yards) to comply with EMC and EMI standards)

3.2. Before You Start Installing Software

IMPORTANT! CDR users please do not connect the USBCam2 and cable to your computer until after you have installed the device driver and updated the DirectX files on your system. Procedures for installing these files can be found in this section.

The software for your USBCam2 consists of the following components:

- USBCam2 Device Driver Installation
- DirectX Update

You must install each of these components successfully to ensure proper operation of your USBCam2. Actual installation differs slightly between operating systems (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**.

To review USBCam2 system requirements, refer to Section 1.4, Getting the Best Images with USBCam2.

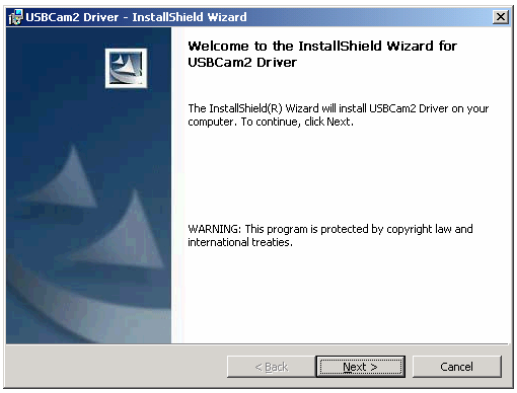
3.3. Setup with Windows XP

PLEASE NOTE: Do not connect USBCam2 until you have completed the following steps. If prompted, install DirectX 9 and restart your computer at the end of installation.

STEP 1

A. Insert the "USBCam2 Driver" CD. Setup should start automatically. If it doesn't, click **Start**, **Run**, and then enter **d:\setup** at the command line (if your CD drive is a letter other than "d", use that letter instead).

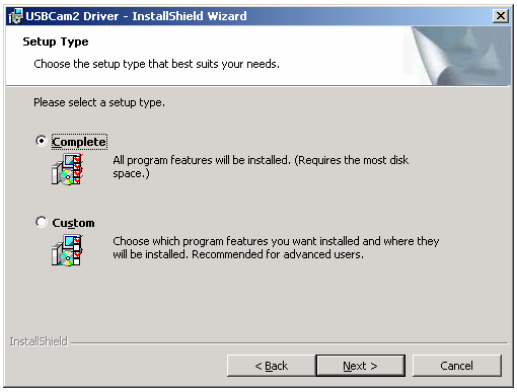
B. Click **Next** to begin the setup process.



STEP 2

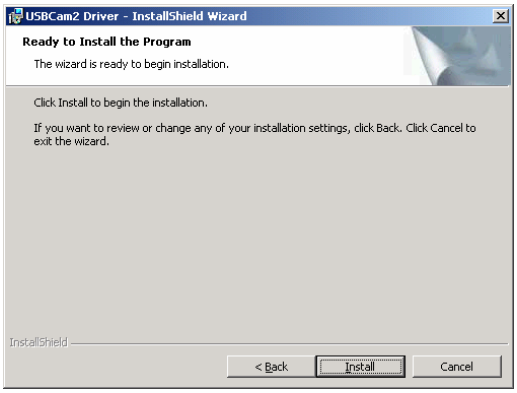
A. Choose **Complete**. This is the recommended installation and is appropriate for most customers.

B. Click **Next**.



STEP 3

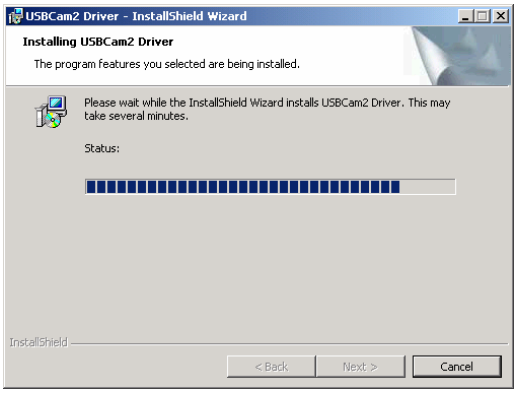
Click **Install**.

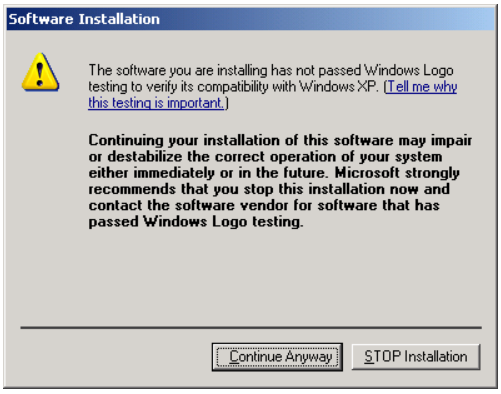


STEP 4

A. Setup will pre-install files to your workstation.

B. Click **Continue Anyway** if you receive a message about Windows logo testing.

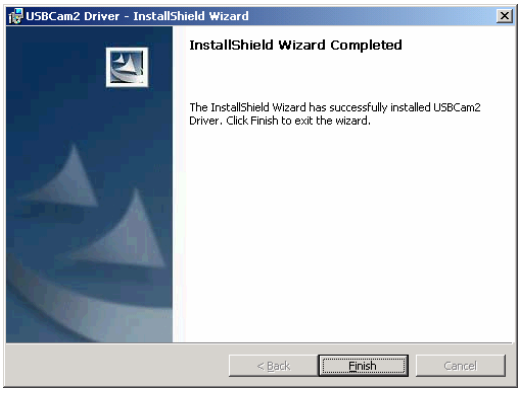




STEP 5

A. You may be reminded to connect the USBCam2 to your computer after a successful setup. Click **OK** to close the message.

B. Click **Finish**, which will automatically start the setup program to update DirectX files on your system.



STEP 6

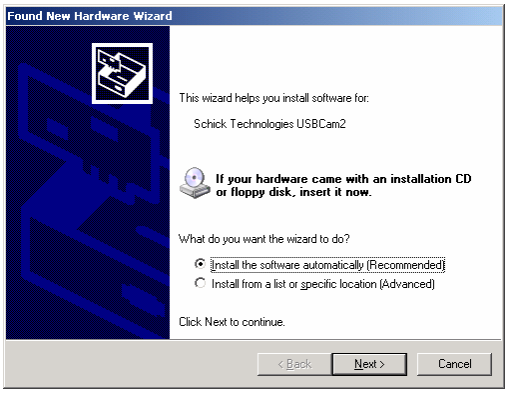
A. Connect the USBCam2 to your computer if you haven't done so already.

B. Click **No** at the option to connect to Windows Update service.

C. Click **Next**.

STEP 7

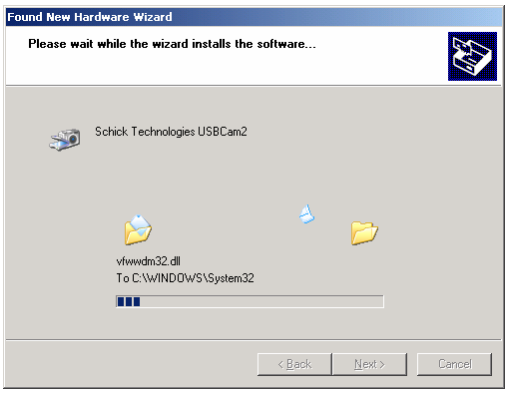
Click **Next** to install software automatically.

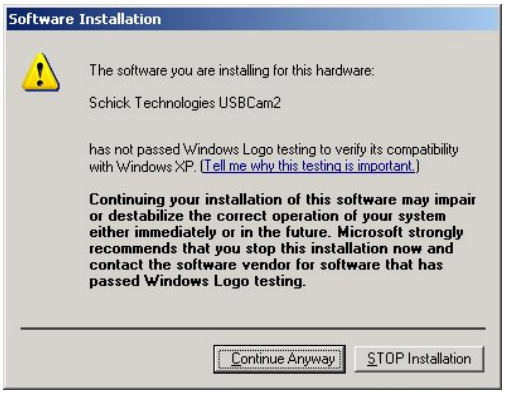


STEP 8

A. Setup will copy the drivers to your workstation.

B. Click **Continue Anyway** if you receive a message about Windows logo testing.





STEP 9

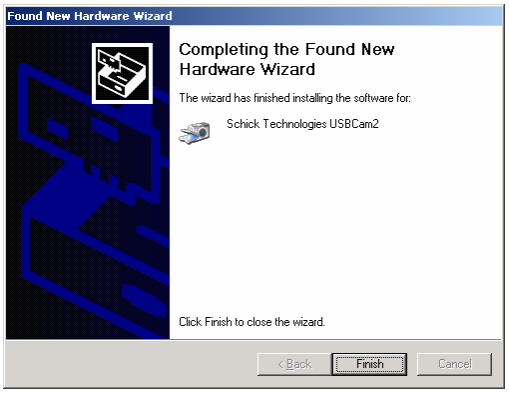
A. Click **Finish**.

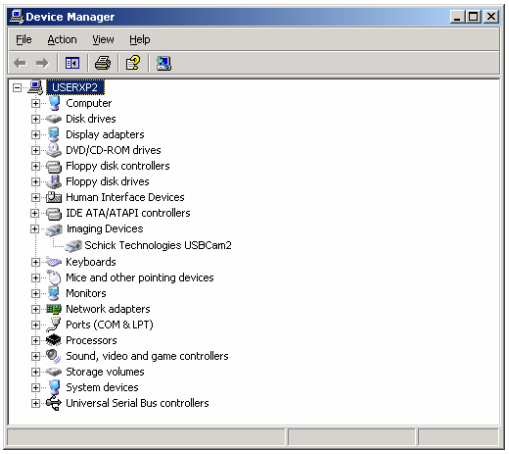
B. The message, "Your new hardware is installed and ready to use" will appear momentarily in the Windows System tray.

C. Remove USBCam2 Driver CD.

D. As a final check, open Device Manager (Windows **Start** > **Control Panel** > **System** > **Hardware** tab > **Device Manager**).

E. In Device Manager, open the list of Imaging devices. Schick Technologies USBCam2 will be displayed there.





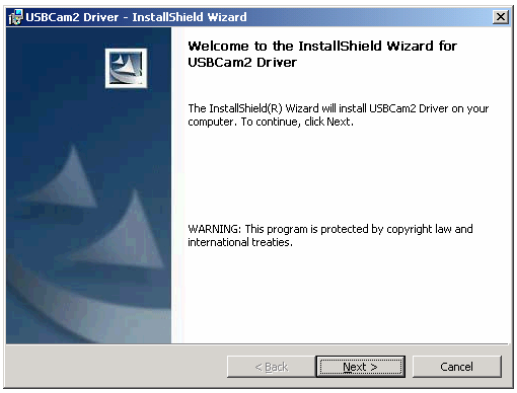
3.4. Setup with Windows 2000

PLEASE NOTE: Do not connect USBCam2 until you have completed the following steps. If prompted, install DirectX 9 and restart your computer at the end of installation.

STEP 1

A. Insert the "USBCam2 Driver" CD. Setup should start automatically. If it doesn't, click **Start**, **Run**, and then enter **d:\setup** at the command line (if your CD drive is a letter other than "d", use that letter instead).

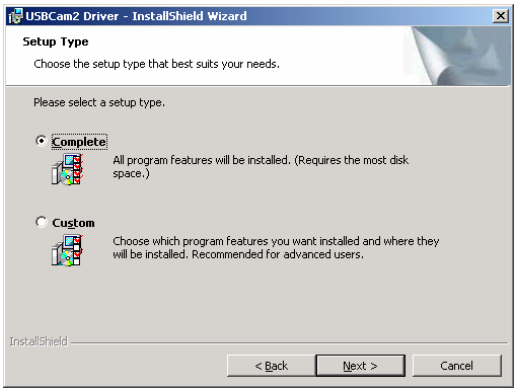
B. Click **Next** to begin the setup process.



STEP 2

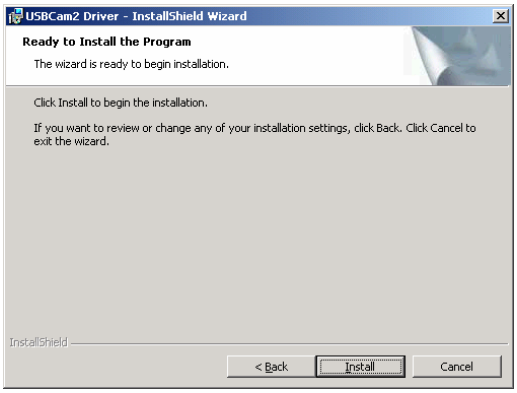
A. Choose **Complete**. This is the recommended installation and is appropriate for most customers.

B. Click **Next**.



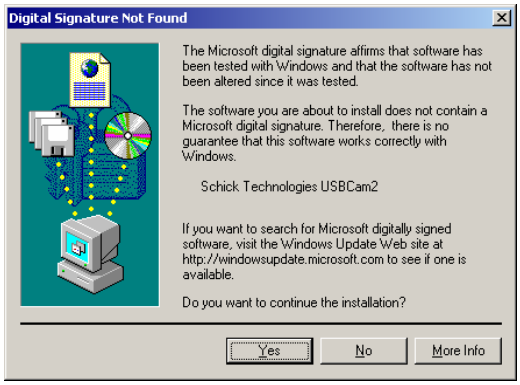
STEP 3

Click **Install**.



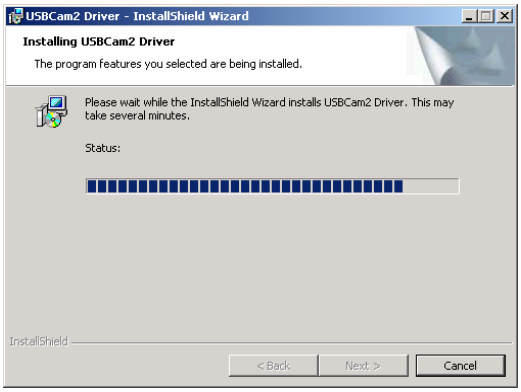
STEP 4

Click **Yes** at Microsoft's digital signature screen.



STEP 5

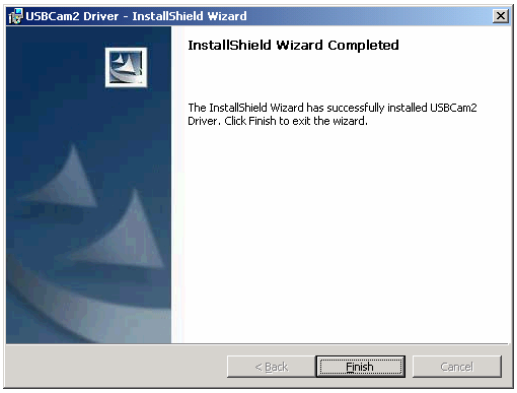
Setup will copy the drivers to your workstation.



STEP 6

A. You may be reminded to connect the USBCam2 to your computer after a successful setup. Click **OK** to close the message.

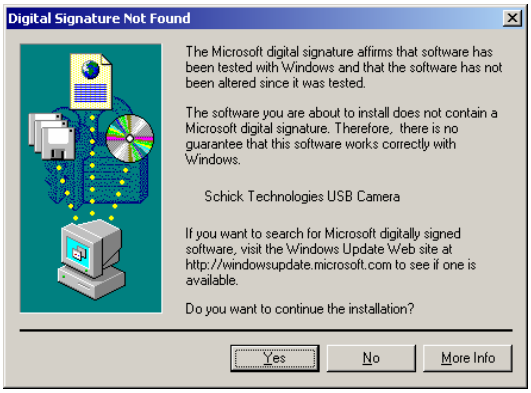
B. Click **Finish**, which will automatically start the setup program to update DirectX files on your system.



STEP 7

A. Click **Yes** at Microsoft's digital signature screen. Unlike Windows XP installations, there are no additional screens or notifications.

B. Remove USBCam2 Driver CD.

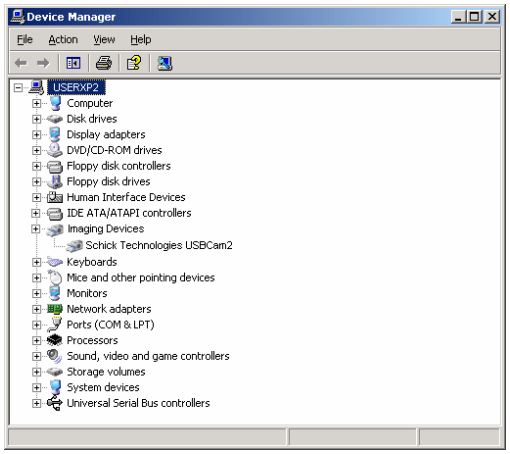


STEP 8

A. As a final check, open Device Manager (Windows **Start** > **Control Panel** > **System** > **Hardware** tab > **Device Manager**).

B. In Device Manager, open the list of Imaging devices. Schick Technologies USBCam2 will be displayed there.

C. .Remove USBCam2 Driver CD.



4. Operation

4.1. Operating the Camera

Refer to the following sections for instructions on turning the USBCam2 on and off 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 2**). 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 2)** 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 automatically.

NOTE: Camera will turn off automatically after 5 minutes of continuous use.

4.1.3. Pausing and Capturing Still Frame Images

NOTE: The following steps apply to the use of USBCam2 with CDR DICOM software.

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 3)** to capture the frame. To resume live video after taking an image, select any empty viewbox and click on it.

4.1.4. Pausing and Resuming Live Video

NOTE: The following steps apply to the use of USBCam2 with CDR DICOM software.

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.

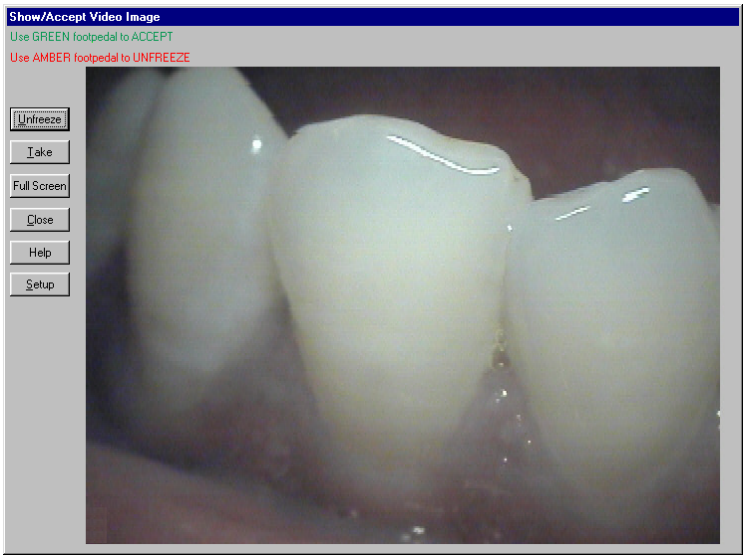


Figure 5. Video Window Setup and Capture Buttons

4.2. Using Camera Sheaths

Disposable sheaths are provided with each USBCam2 System as an effective measure for infection control. 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 DICOM

NOTE: Refer to the CDR DICOM User Guide, Schick P/N 1051047, for detailed information on the use and operation of CDR DICOM software.

STEP 1

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

STEP 2

When the CDR exam window appears, click on **New Exam** under the **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 Series**. 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. 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. Position camera to display the desired dental image on screen.

   1) If you set up your USBCam2 for **Freeze/Take**, pressing the Freeze Frame button captures the image. Continue with Step 7.

   2) If you set up your USBCam2 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 still frame video image appears in either the exam or zoom window, depending on capture settings.

B. To take another image, repeat this procedure, starting at Step 5.

4.4. Acquiring Video Images with the Footpedal

Serial footpedals (Schick P/N B2501100; PDCO P/N 07-0410100) can be used to control the capture of video images. Refer to the following table for information on using this footpedal 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 though 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 USBCam2 system uses disposable sheaths (Schick P/N 6310120) to ensure proper infection control. 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 (mild soap and water) and sterile wipes. A new sheath must be used for each patient.

Disposable sheaths are provided with every USBCam2 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 authorized international dealer for Schick Technologies products in their country or region.

5.2. Handpiece and Lens

IMPORTANT! Be sure to disconnect the camera from its USB cable and port before performing any cleaning procedures. 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 disinfect the handpiece, use a 70% Ethanol solution, administered by saturating spray or moist towelettes. Do not soak the handpiece and be sure to dry it completely.

To clean the handpiece, use a clean lint-free cloth and any of the following solutions. Do not soak the handpiece and be sure to dry it completely.

- Mild soap and water
- Isopropyl alcohol (70%)
- Isopropanol (>15%) / quaternary ammonium compounds combination (<1%)

To clean the lens surface, moisten a soft cotton swab dipped in rubbing (isopropyl) 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 USBCam2 system. Should you experience problems with the USBCam2, 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

USBCam2 is ETL-certified and compliant with the safety standards listed below.

Table 4. Specifications

Item	Value	
EMC/Safety	CAN/CSA C22.2 No.601.1-M90	Medical Electrical Equipment Part 1: General Requirements for Safety
	EC 93/42/EEC	Medical Device Directive
	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 rating	5VDC @ 440mA	
Transport and storage conditions	Ambient temperature range: 0° F (-18° C) to 150° F (66° C) Relative humidity range: less than 75% Atmospheric pressure range: 700 hPa to 1060 hPa	
Equipment type	Type BF equipment  (on handpiece)	
Fuse	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	CCD	
Video output	High Speed USB 2.0	
Focus range	5 - 45 mm (0.2 - 1.77 in)	
Focus type	Fixed	
External power supply	None (power supplied via USB)	
Maximum cable length	5 m (5.5 yds)	

Item	Value
Handpiece weight	42.5 g (1.5 oz)
Special features	Integrated frame capture button

A-3. Leakage Current Statement

USBCam2 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 USBCam2 is connected. Users are advised to have a qualified electrician perform a leakage test on their equipment before using the USBCam2.

A-4. EMC Tables

The following tables provide USBCam2 compliance information to electromagnetic compatibility (EMC) and electromagnetic immunity (EMI) standards. To ensure conformance, the customer or user must use the USBCam2 in environments that are consistent with these standards.

The USB cable required with the USBCam2 camera must also comply with the same standards. To meet those specifications, the USB A-B type cable should not exceed a maximum length of 5 meters (5.5 yards). Cables longer than that distance may result in increased emissions or decreased immunity.

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

PLEASE NOTE: The USBCam2 is intended for use in the electromagnetic environment specified below. The customer or user of the USBCam2 must ensure that it is used in such an environment.

Emissions Test	Compliance	Guidance
RF emissions CISPR 11	Group 1	The USBCam2 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 USBCam2 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 D	
Voltage fluctuations/ flicker emissions IEC 61000-3-3	Complies	

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

PLEASE NOTE: The USBCam2 is intended for use in the electromagnetic environment specified below. The customer or user of the USBCam2 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%.
Electrical fast transient/burst IEC 610004-4	±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	< 5% U_T (>95% dip in U_T)	< 5% U_T (>95% dip in U_T)	Mains power quality should be that of a typical commercial or hospital environment. If the user of the

Immunity Test	IEC 60601 Test Level	Compliance Level	Guidance
supply input lines IEC 61000-4-11	for 0.5 cycle < 40% U_T (>60% dip in U_T) for 5 cycles < 70% U_T (>30% dip in U_T) for 25 cycles < 5% U_T (>95% dip in U_T) for 5 sec	for 0.5 cycle < 40% U_T (>60% dip in U_T) for 5 cycles < 70% U_T (>30% dip in U_T) for 25 cycles < 5% U_T (>95% dip in U_T) for 5 sec	USBCam2 requires continued operation during mains interruptions, it is recommended that the PC workstation to which the USBCam2 is connected be powered from an uninterruptible power supply or battery. 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	3A/m	3A/m	
Conducted RF IEC 61000-4-6	3 Vrms 150 kHz to 80 MHz	3 Vrms	Portable and mobile RF communication equipment should be used no closer to any part of the USBCam2, including its cables, than the recommended separation distance calculated from the equation applicable to the frequency of the transmitter. Recommended separation distance: $d = 1.2 \sqrt{P}$
Radiated RF IEC 61000-4-3	3 V/m 80 MHz to 2.5 GHz	3 V/m	$d = 1.2 \sqrt{P}$ for 80 MHz to 800Mhz $d = 2.3 \sqrt{P}$ for 800 MHz to 2.5Ghz 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. 

Immunity Test	IEC 60601 Test Level	Compliance Level	Guidance
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			
[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 USBCam2 is used exceeds the applicable RF compliance above, the USBCam2 should be observed to verify normal operation. If abnormal performance is observed, additional measures may be necessary, such as reorienting or relocating the USBCam2. [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 USBCam2

PLEASE NOTE: The USBCam2 is intended for use in an electromagnetic environment in which radiated RF disturbances are controlled. The customer or user of the USBCam2 can help prevent electromagnetic interference by maintaining a minimum distance between portable and mobile RF communications equipment (transmitters) and the USBCam2 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 $d=1.2 \times \sqrt{P}$	800 MHz to 2.5 GHz $d= 2.3 \times \sqrt{P}$
0.01	0.12	0.23
0.1	0.38	0.73
1	1.2	2.30
10	3.8	7.3
100	12.0	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 your USBCam2, you will be prompted to install the latest version of Microsoft's DirectX files on your system (DirectX 9). We strongly recommend that you install these files as earlier versions of DirectX prior to DirectX 8.1 are not compatible with USBCam2. In the event you experience video problems with USBCam2, 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 **dxdiag.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 USBCam2 operation. Click **Exit** to close this dialog box.

B. If your DirectX version is less than 8.1, repeat the installation steps found in the “Software Setup” section of this manual.

B-2. Checking Your Video Settings

Video settings can affect the display and capture of video images using USBCam2. To help ensure your video images are consistently high quality, some USBCam2 settings are factory set by default. In the event, however, that some settings need to be adjusted, that can be done using options found on the video setting dialog boxes. Refer to the following tables for more information.

Table 8. Setup Dialog Box Description

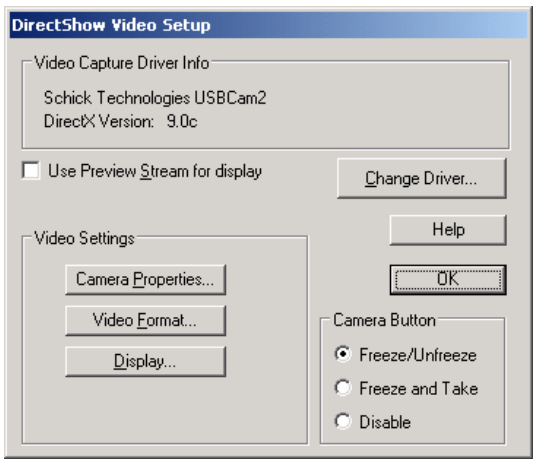
Dialog Box Options

Use Preview Stream for Display — May improve video performance for slower Pentium processors. Not checked (factory setting). *Change Driver* — If you have installed other video drivers (with a video capture card, for example), they can be selected from this drop-down box. *Video Settings* — More camera operation and video displays options are available here (Customizable settings for **Camera Properties** and **Video Format** are provided on the pages that follow. There are no user-selectable settings on the **Display** dialog, which has been omitted.) *Camera Button* — Selects USBCam2 Freeze-frame button actions. Refer to **Section 4** for details.

Table 9. Camera Properties Dialog Box Description

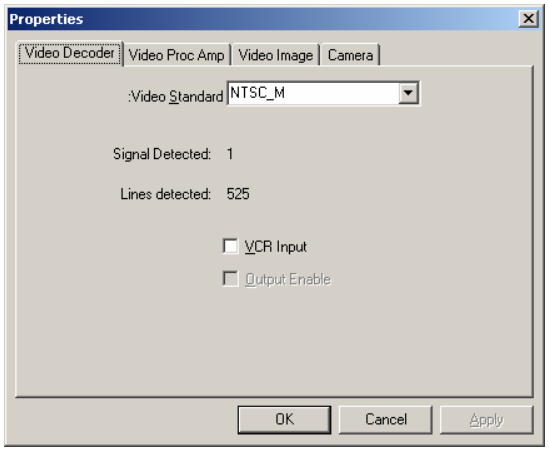
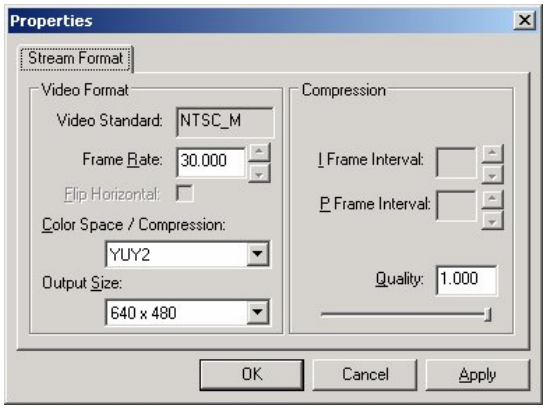
Dialog Box Options

Video Decoder — • Video Standard: NTSC_M (factory setting) • VCR Input: Not checked (factory setting) *Video Proc. Amp* — • Brightness: 112 (factory setting) • Contrast: 38 (factory setting) • Hue: 64 (factory setting) • Saturation: 25 (factory setting) • Sharpness: 2 (factory setting) *Video Image* — • Image mask: Black (factory setting) • Flip Vertical: Not checked (factory setting) • Flip Horizontal: Not checked (factory setting) • Use PC Cam: Not checked (factory setting) *Camera* — • White Balance: Fixed White Balance (factory setting) • Shutter Mode: Electric Iris (factory setting) • Enhanced Motion Stabilization: Not checked (factory setting)

Table 10. Video Format Dialog Box Descriptions

Dialog Box Options

Stream Format — • Video Format Frame Rate: 30.000 (factory setting) • Video Format Color Space / Compression: YUY2 (factory setting) • Video Format Output Size: 640 x 480 (factory setting) • Compression Quality: 1.000 (factory setting)

Appendix C. Troubleshooting Tips

C-1. Introduction

In the event you experience a problem with the USBCam2, refer to the table of troubleshooting tips found on this page. If the problem persists, 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.

C-2. Troubleshooting Table

Item	Description	Corrective Action
1	Camera LEDs illuminate and remain on immediately after connecting USB cable, whether software is running or not.	This is normal camera operation. To turn off LEDs, press the Power button on the camera, or place the camera in its handpiece.
2	Camera turns on and off intermittently.	Check USB cable connection at camera and at PC connectors.
3	Cannot select 640 x 480 output size in Video Format dialog box.	Camera is not connected to High-Speed USB 2.0 port. Reconnect camera to appropriate port.
4	Spots are visible on video image.	Check camera lens for spots and follow the instructions in the Handpiece and Lens cleaning section of this document (**Section 5.2**). Also check the "fit" of the camera sheath over the lens. Camera sheath should be on tight enough so there are no wrinkles across the lens section.
5	Extraoral images appear grainy or blurry.	Camera is strictly intended for intraoral use.
6	Camera options are missing from the DirectShow Video dialog box.	Camera driver was not installed correctly. Disconnect camera from USB cable, uninstall USBCam2 driver, and follow the instructions in the Software Setup section of this document (**Section 3**).
7	Corrupted video image is displayed when using the camera with an Ultra Port USB 2.0 PCI card, ALI chipset.	Replace the USB card with one that is compatible with the camera.
8	Momentary blip occurs recurrently during video exam.	Change to a different USB port.
9	Image appears nearly completely red during video exam.	Toggle between the Fixed Balance / Auto White Balance options in the Camera properties dialog box.

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