

VeinViewer® Vision2

# USER GUIDE



 **CHRISTIE**



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# Introduction

This document provides information and procedures for using VeinViewer<sup>®</sup> Vision2. It does not provide training in venous identification or clinical practices.



Please read and understand the information in this document in its entirety before using VeinViewer Vision2. To make sure that you continue to operate the device correctly, periodically review this document.

To request additional information, submit your inquiry by email to [info@christiemed.com](mailto:info@christiemed.com) or call Christie Technical Support at 1-877-733-8346. For international calls, dial +1-901-721-0330.

## Intended Use

VeinViewer Vision2 is a non-invasive, electro-optical visual aid device designed to detect superficial blood under the skin, and project an image of the blood pattern onto the surface of the skin of neonatal, pediatric, and adult patients.

## Indications for Use

VeinViewer Vision2 is intended to image subcutaneous blood patterns on the surface of the skin. The projected blood patterns may be interpreted by the clinician to determine intravascular or interstitial blood patterns, such as:

- blood within vessels, for example, veins,
- the blood flowing through the vessels, for example, venous refill, and/or,
- blood within the interstitial space, for example, hematoma.

The projected image pattern may also be used to demonstrate intravenous (IV) fluids displacing blood during IV flushes.

VeinViewer Vision2 is intended to be used by trained Health Care Professionals such as, but not limited to, Licensed Doctors, Nurse Practitioners, Emergency Medical Technicians, Registered Nurses, Anesthesiologists, Vascular Access Technicians, Phlebotomists and Infusion Nurses, to perform vascular access.

## Contraindications

- Do not use VeinViewer Vision2 for vein imaging in the eyes or for tissue differentiation.
- Do not use VeinViewer Vision2 to diagnose or verify the presence of a medical condition.
- Do not use VeinViewer Vision2 as a form of treatment.
- Do not use VeinViewer Vision2 near equipment that may emit strong magnetic fields such as Magnetic Resonance Imaging (MRI) scanner.
- Do not operate VeinViewer Vision2 outdoors or in direct sunlight.

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# Warnings And Safety Notifications

To prevent personal injury and to protect VeinViewer Vision2 from damage, observe the safety precautions defined in this section

## Symbol Definitions

These symbols appear in this guide to identify hazards or unsafe practices which could result in physical injury or property damage.



**WARNING:** Indicates a potentially hazardous situation which, if not avoided, could result in serious injury or loss of life.

















**CAUTION:** Indicates a hazardous situation which, if not avoided, may result in minor or moderate injury or damage.










Provides important information and recommendations for efficient, trouble-free use of VeinViewer Vision2.

	Class IIa device complies with European Directive 93/42/EEC
	UL Classification mark
	European representative
	Consult accompanying documentation
	Consult instructions for use
<b>SN</b>	Serial number
	On/Standby
	Battery
	Manufacturer

	<p>Date of manufacture (YYYY-MM)</p>
	<p>Storage temperature limits</p>
	<p>Storage humidity limits</p>
	<p>Storage pressure limits</p>
	<p>Waste Electrical and Electronic Equipment (WEEE) - Do not dispose of this product in household waste. This product <b>MUST</b> be disposed of in accordance with local directives as established in the European Union (EU) for the disposal of electronic equipment.</p>
	<p>Keep dry</p>
	<p>Fragile - Handle with care</p>
	<p>This end up</p>

	<p>Do not lift</p>
	<p>Do not pull on optical head assembly to transport</p>
	<p>Do not transport the device when the optical head assembly is extended</p>
	<p>Do not step or stand on device</p>
	<p>Use handle to transport</p>
	<p>Tip hazard</p>

	<p>Weight</p>
	<p>RoHS – Restriction of Hazardous Substances Directive</p>
	<p>Serial number</p>
<p>Segurança</p> 	<p>InMetro certification</p>
	<p>Australian regulatory compliance mark</p>
	<p>Federal (USA) law restricts this device to sale by or on the order of a physician</p>
	<p>Swiss representative</p>

## Warnings and Safety Notices

This section contains important information for the safe operation of VeinViewer Vision2.



**WARNING:** VeinViewer must be set up and put into service according to the EMC information provided in the Technical Specifications in this manual. VeinViewer must not be used adjacent to, or stacked with other equipment not specified in this manual. If adjacent use is necessary, VeinViewer must be observed to verify normal operation in the configuration in which it will be used, prior to starting any type of medical procedure. Portable and mobile RF communications equipment can affect VeinViewer. Refer to the Technical Specification included in this manual. Failure to do so could result in injury or damage.



**WARNING:** Do not use VeinViewer Vision2 or any available optional equipment without first completely reading and understanding the instructions outlined in this document and any additional instructional material such as service documents or instruction sheets supplied with this product or optional equipment.



**WARNING:** Do not modify this product beyond the instructions provided in this document or instruction sheets supplied with this product or optional equipment. Failure to comply could result in physical injury or property damage.



**WARNING:** VeinViewer Vision2 components are specifically designed and manufactured for use in conjunction with VeinViewer Vision2. Components, parts and accessories designed by other manufacturers have not been tested by Christie and are not recommended for use with this product. Failure to heed this warning could result in increased electromagnetic emissions or a decrease in electromagnetic immunity, and affect the safety and effectiveness of VeinViewer Vision2. Use **ONLY** the components listed in the "[Parts List](#)" on [page 14](#).



**WARNING:** Do not connect any other medical devices directly to VeinViewer Vision2. This could cause unexpected failure of the device and VeinViewer Vision2.



**WARNING:** Connect ONLY IEC 60950 certified equipment to VeinViewer Vision2.



**CAUTION:** An impact with another object can alter the effectiveness of VeinViewer Vision2. Do not operate VeinViewer Vision2 after any impact. See "[Troubleshooting](#)" on page 73.



**CAUTION:** Do not look directly into the imaging light source. When imaging patients who might have inhibited or reduced blink reflexes, provide the patient with medical facility issued eye protection. Refer to your institution's guidelines concerning eye safety procedures when VeinViewer Vision2 power is on as the light output is very bright.



**CAUTION:** Do not touch, strike, or otherwise damage the VeinViewer Vision2 glass lens. Follow the recommended cleaning methods in "[Maintenance](#)" on page 68.



**CAUTION:** In rare instances, shallow arteries may be detected and projected by near infrared devices. VeinViewer Vision2 does not distinguish between venous or arterial vessels. Use standard vascular access practices, palpation, visualization with the device of venous refill and valve detection of any blood patterns prior to vascular access, to better ensure vein identification. Failure to do so could result in misidentification of an artery as a venous target.



**CAUTION:** Interpretation and final application of VeinViewer Vision2 is the sole responsibility of the health care professional. Christie recommends that the health care professional rely on standard health care practices prior to starting any medical procedure.



**CAUTION:** The maximum allowable basket weight is 0.23 kg (0.5 lbs). Exceeding this weight may result in device instability. Failure to comply may result in physical injury or property damage.

# Parts Description

VeinViewer Vision2 uses visible and near infrared light to illuminate and project the subcutaneous venous structure directly onto the skin of a patient with a real-time digital image.

The adjustable head can be positioned over any part of the anatomy, leaving the clinician's hands free to perform the procedure, using our trademarked EOP™ (Eyes On Patient) technique.

## Parts List



**CAUTION:** Do not use substitute parts as this may result in physical injury or property damage.

Part Number	Description
134-003104-xx	VeinViewer Vision2
016-106000-xx	Detachable AC power cord (North America) - Manufacturer: GlobTek Inc, Manufacturer P/N: 401P1214M071(R)
016-104423-xx	Battery (QTY: 1) - Manufacturer: Inspired Energy, Manufacturer P/N: NB2037CD
016-104403-xx	USB cable
020-101077-xx	VeinViewer Vision2 user guide
000-104270-xx	Product training video [DVD] VeinViewer Connect (VVC) software [CD]

# Optional Accessories

Part Number	Description
003-003986-xx	Battery charger - Manufacturer: Energy Access Inc, Manufacturer P/N: CCC-3162
003-003987-xx	AC power adapter - Manufacturer: XP Power, Manufacturer P/N: VEP24US09 (For use with Battery Charger - Christie P/N 003-003986-xx)
003-003988-xx	Battery (QTY: 1) - Manufacturer: Inspired Energy, Manufacturer P/N: NB2037CD

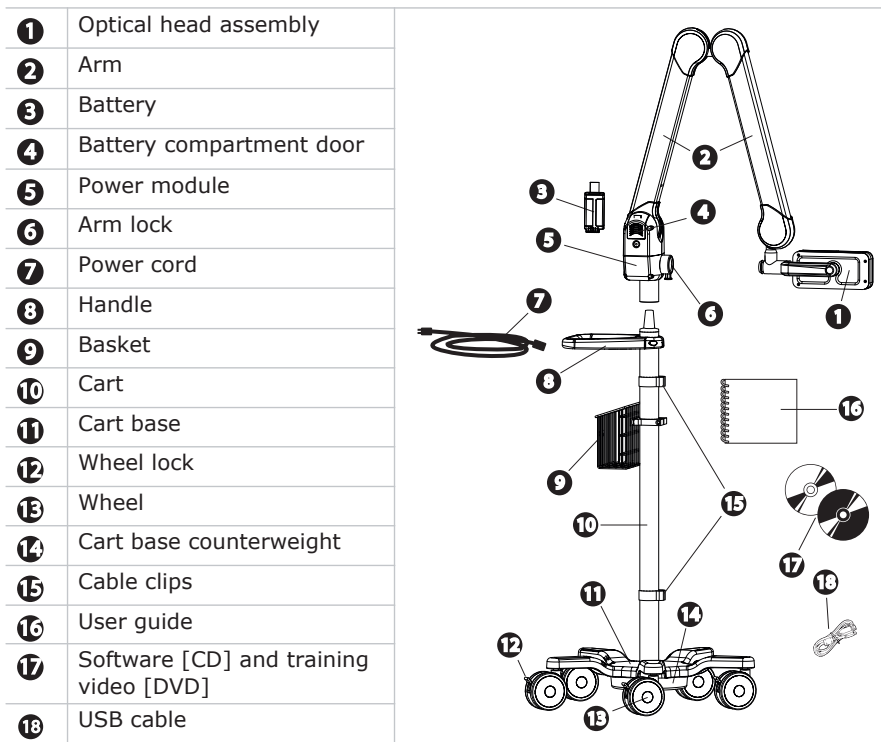


**WARNING:** The lithium-ion battery may explode if it is not replaced, used, handled, or properly disposed. When disposing batteries, follow local ordinances or regulations. Do not use batteries other than those supplied by Christie.

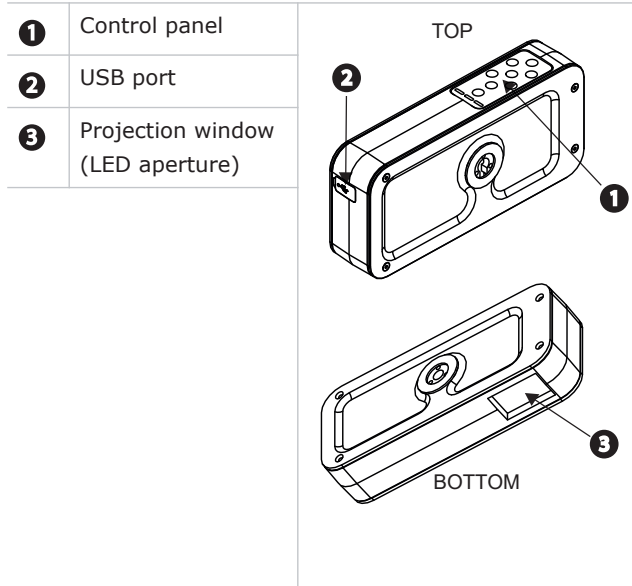


**WARNING:** Use only the battery charger provided by Christie. Substitute battery chargers may have different voltage and terminal polarities. Using a substitute battery charger could result in increased heat, smoke, fire, or battery rupture.

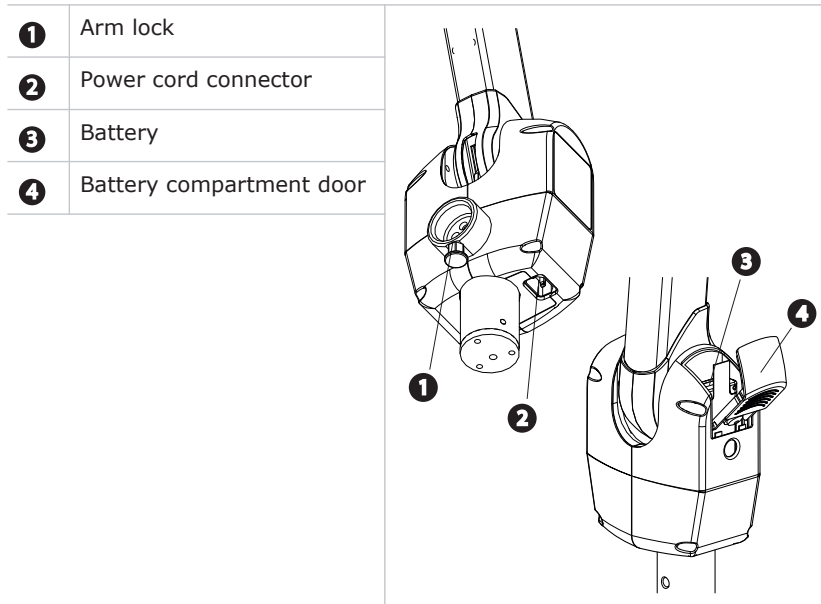
# VeinViewer Vision2 Components



# Head Components



# Power Module Components



# Control Panel Components

<b>1</b>	Status indicators	<p>The diagram shows a vertical control panel with the following components labeled with numbers 1 through 9:</p> <ul style="list-style-type: none"> <li><b>1</b>: Three status indicator lights (blue, green, orange) at the top.</li> <li><b>2</b>: Power button (power symbol).</li> <li><b>3</b>: Function button (letter 'f').</li> <li><b>4</b>: Resize button (rectangle with arrows).</li> <li><b>5</b>: Inverse button (rectangle with arrows pointing in opposite directions).</li> <li><b>6</b>: MaxBright button (sun icon).</li> <li><b>7</b>: Fine Detail button (circular icon with 'FINE' text).</li> <li><b>8</b>: Image capture button (camera icon).</li> <li><b>9</b>: TriColor button (tricolor icon).</li> </ul>
<b>2</b>	Power	
<b>3</b>	Function (CathCompass™)	
<b>4</b>	Resize	
<b>5</b>	Inverse	
<b>6</b>	MaxBright	
<b>7</b>	Fine Detail	
<b>8</b>	Image capture	
<b>9</b>	TriColor	

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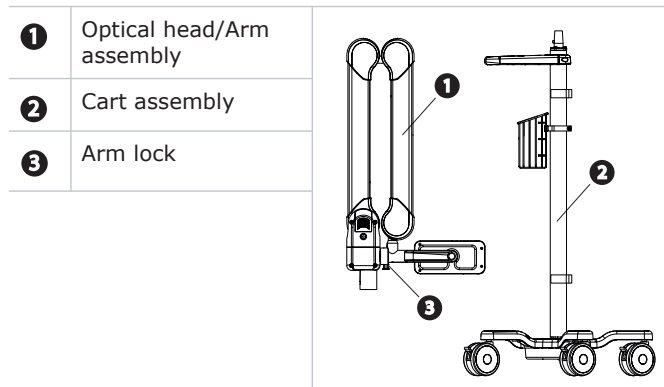
# VeinViewer Vision2 Setup

Upon opening the carton, verify that the items listed in the *"Parts List" on page 14* are included with the product. If any item is missing, contact your representative or Christie Technical Support.

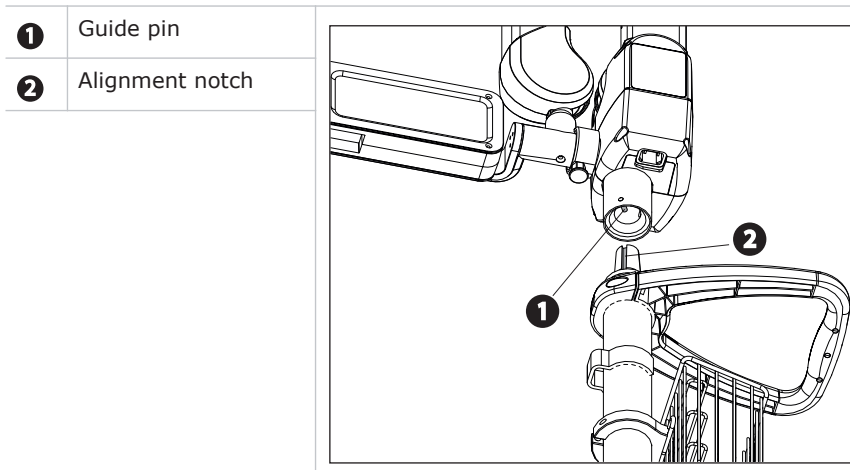
## Assembly



**CAUTION:** To avoid movement of the cart during assembly, engage all wheel locks. See *"Transport VeinViewer Vision2" on page 30*.

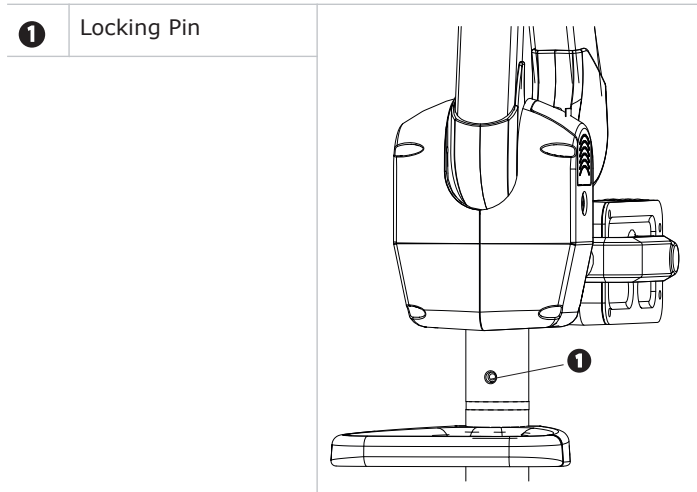


1. Remove the cart assembly from the packaging carton and place it on the floor.
2. Remove the optical head/arm assembly from the packaging carton.
3. Align the guide pin in the base of the optical head assembly with the alignment notch on the cart assembly post.



**CAUTION:** A pinch hazard exists during the assembly of the optical head assembly and the cart assembly. Keep fingers clear of the engagement post.

- Slide the optical head/arm assembly down onto the cart assembly post until the locking pin is engaged and you hear an audible click.



- Verify that the pin has engaged by attempting to lift the optical head assembly from the cart assembly.

## Install AC Power Cord

VeinViewer Vision2 is shipped with an AC power cord which acts as the MAINS disconnect, and is compliant for North American use.



For locations outside of North America, contact your distributor or representative to request a region specific power cord.

The power cord must be compliant with both the power requirements of the destination country, and the electrical requirements specified in this document. See "*Technical Specifications*" on [page 87](#).

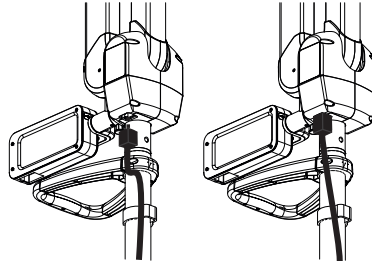


**WARNING:** Inspect the power cord on a regular basis to avoid the risk of electrical shock or fire hazard. If the power cord or plug are or appear to be damaged, do not use VeinViewer Vision2 and immediately contact Christie Technical Support.



The use of the power cord is recommended when you connect VeinViewer Vision2 to a computer.

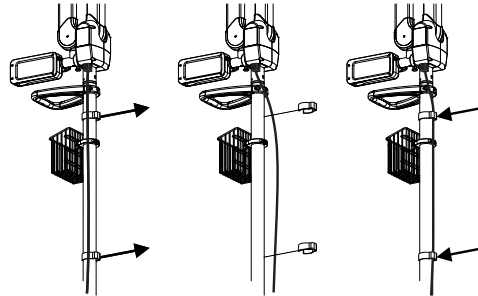
1. Connect the AC power cord to the power module.



2. Close the retention clip over the AC power cord to hold it in place.



3. Remove cable clips and re-install with the AC power cord captured within the indent of the clips.



4. Wrap the remaining length of the AC power cord around the basket.

# Install or Change the Battery

1	Battery compartment door	
2	Battery compartment door center lock button	
3	Battery	
4	Battery tab	

1. Press the center lock button to open the battery compartment door.
2. If you are changing the battery, pull the battery tab upward to remove it.

3. Align the grooves on the new or charged battery with the grooves in the battery compartment and then slide the battery into the battery compartment.  
Make sure the battery is fully seated in the battery compartment.
4. Close the battery compartment door and make sure the center lock button is locked into place.



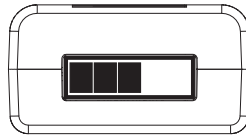
The green status indicator will blink three times when the battery is installed to notify that power has been applied to the device. This will only occur if there is no AC power already connected to VeinViewer Vision2.

Although VeinViewer Vision2 is ready for use once a fully charged battery is installed or when it is connected to an AC outlet, Christie recommends connecting VeinViewer Vision2 to a computer prior to operating to ensure the date and time are set correctly. See "[VeinViewer Connect](#)" on page 52.

## Charge the Battery

The battery is shipped partially charged. If you do not intend to connect VeinViewer Vision2 to AC power, it is recommended that you fully charge the battery before operation. This takes approximately 4 hours.

The battery charges when it is installed in the battery compartment and VeinViewer Vision2 is connected to AC power. To charge the battery, VeinViewer Vision2 does not need to be on. To verify that the battery is being charged, look at the battery charge indicator on the top of the battery. The right most indicator square will blink.



You can also use the optional battery charger (P/N 003-003986-xx) and AC power supply (P/N 003-003987-xx) to charge the battery.

A fully charged battery will provide up to 120 minutes of continuous use.

When using only battery power and the power is on, VeinViewer Vision2 will shut down automatically when the battery charge is below 10%.

When using only battery power and the power is off, VeinViewer Vision2 enters stand-by mode. In stand-by mode, a fully charged battery discharges in approximately 7 days.

A battery that is fully charged and left out of the VeinViewer Vision2, will discharge completely in approximately 6 months.

The battery provides approximately 300 full charge and discharge cycles. To maintain optimal performance of the VeinViewer Vision2, replace the battery at the end of this cycle.

Exposure to high temperatures may also affect battery performance. See "[Technical Specifications](#)" on page 87.

## Transport VeinViewer Vision2



**CAUTION:** Always turn VeinViewer Vision2 off and disconnect the AC power cord before transporting. Failure to do so may result in physical injury or property damage.



**CAUTION:** Do not place, hang, or apply weight to the VeinViewer Vision2 or any of its components. This can make VeinViewer Vision2 unstable. Failure to comply may result in physical injury or property damage.



**CAUTION:** Do not transport the device when the optical head assembly is extended. Always put the optical head assembly in the travel position over the handle when moving VeinViewer Vision2. Failure to comply may result in physical injury or property damage.



**CAUTION:** Do not pull on the optical head assembly to transport. Use the handle. Failure to comply could cause the device to tip which may result in physical injury or property damage.



**CAUTION:** Do not step or stand on device. Failure to comply may cause the device to tip which may result in physical injury or property damage.

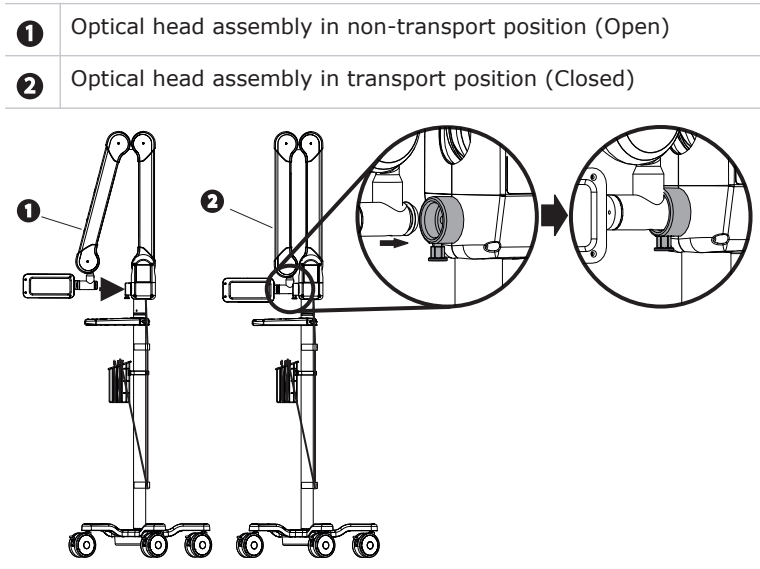


**CAUTION:** Do not attempt to lift the device off the ground. Failure to comply may result in physical injury or property damage.



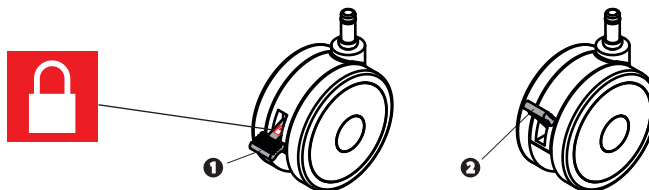
When you transport VeinViewer Vision2 from one location to another, temperature and humidity changes can cause condensation to form on the inside of the projection window. Allow VeinViewer Vision2 to acclimate or wait for the condensation to dissipate before operating.

1. Place the optical head assembly in the transport position and engage the arm lock.



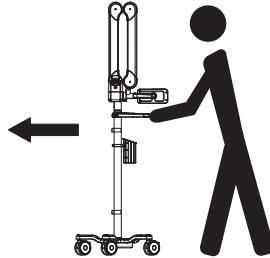
2. Move the wheel lock levers up. All wheels should turn freely and smoothly.

1	Wheel lock lever in <b>Locked</b> position (Down)- <i>Wheel lock label is exposed</i>
2	Wheel lock lever in <b>Unlocked</b> position (Up)- <i>Wheel lock label is hidden</i>



**CAUTION:** Make sure all wheel locks are disengaged prior to moving VeinViewer Vision2. Any attempt to transport the device while the wheel locks are engaged could cause the device to tip or fall over.

3. Transport VeinViewer Vision2 using the handle.



**CAUTION:** When transporting the VeinViewer Vision2 over any bumps or thresholds, use two hands on the handle to pull, rather than push, the device.

# Operation

This chapter provides details on the operation of VeinViewer Vision2. Read and understand all the information before operating VeinViewer Vision2.



Make sure wheel locks are engaged prior to using VeinViewer Vision2.

## Turn VeinViewer Vision2 On



**CAUTION:** Make sure the power cord connection to the VeinViewer Vision2 power module is easily accessible in the event a quick disconnect of the AC Mains is required.



**CAUTION:** Do not place the power cord where it can be tripped over or stepped on.



The use of the power cord is recommended when you connect VeinViewer Vision2 to a computer.

1. If you intend to operate VeinViewer Vision2 using only battery power (no AC connection), proceed to step 3.

OR

If you intend to operate the VeinViewer Vision2 using AC power make sure the AC power cord is installed (see "[Install AC Power Cord](#)" on page 24).

2. Plug the other end of the power cord into an AC outlet.

The green LED will blink 3 times to indicate power has been applied to the device. This will only occur if there is no battery already installed to VeinViewer Vision2. See "[Control Panel Status Indicators](#)" on page 37 for information on the LED's.
























When a battery is present, and when the AC is plugged in, the battery is automatically being charged. Time to a full charge may be more if the device is in use at the same time because if the device draws enough current it will detract from charging the battery.

3. Hold the optical head assembly and firmly press (minimum one second) and release the power button on the control panel.

The power is engaged upon the release of the power button. The status indicator LED on the control panel should illuminate solid green when power is on. See "[Control Panel Status Indicators](#)" on page 37 for information on the LED definitions.

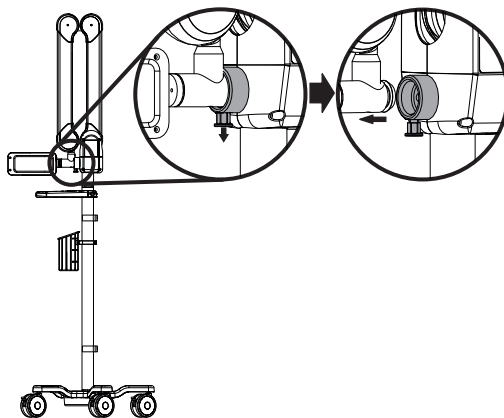
# Control Panel Status Indicators

LED Status			Device Status
Blue	Green	Amber	
			Device is functionally off
			Device is powering on
			Device is powered and projecting
			Battery <25% charge
			Battery power is too low to function by battery only
			System notification <sup>1</sup>
			Selected feature not activated

<sup>1</sup>See "Troubleshooting" on page 73.

## Release Optical Head

1. Pull down on the arm lock knob.
2. Pull optical head away from the arm lock.

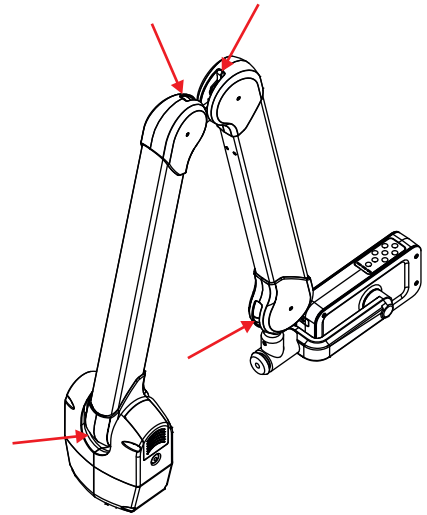


# Range of Motion

VeinViewer Vision2 is designed to provide a comprehensive range of motion.

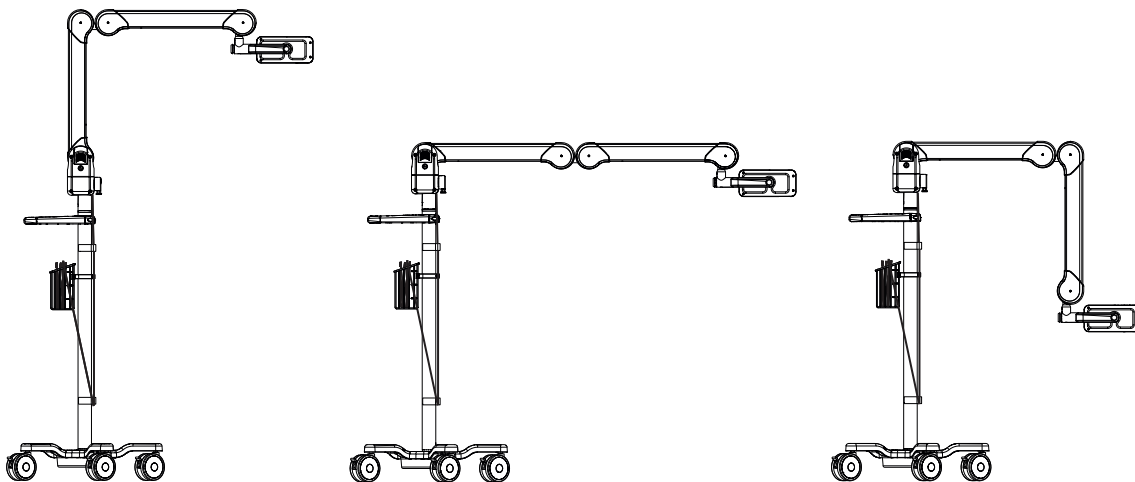


**CAUTION:** A pinch hazard exists at certain location on the articulation arm assembly as illustrated. Be cautious when handling the VeinViewer Vision2 at those locations.



The arm assembly is capable of neonatal (position 1), standard (position 2) and lowered (position 3) positions as well as any position within those ranges.

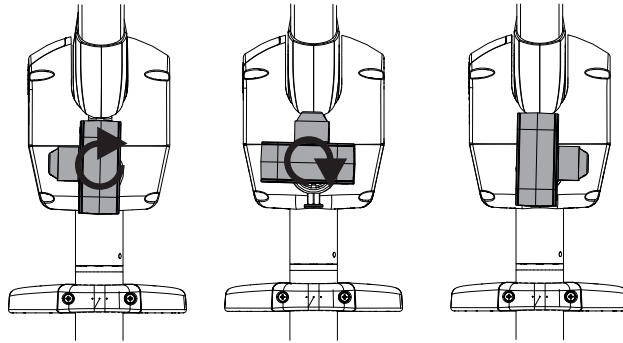
## Range of Motion-Arm Assembly



The optical head assembly is designed to provide independent 360° rotation of the wrist and 360° rotation of the optical head.

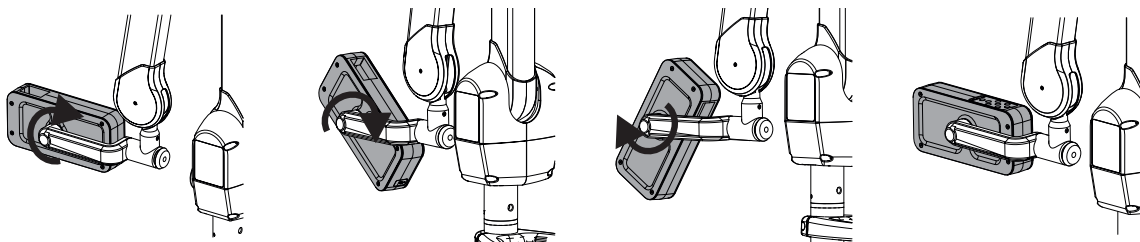
## Range of Motion-Wrist

The wrist rotates 360° in either direction.



## Range of Motion-Optical Head

The optical head rotates 360° in either direction. This permits more accurate positioning as well as easy access to the USB port.



## Adjust Focus

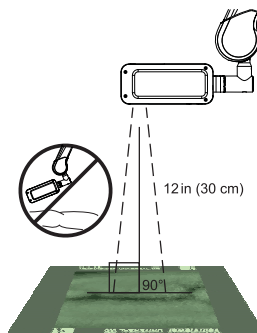
Before using VeinViewer Vision2 on a patient, make sure it is in focus, and familiarize yourself with "Imaging Modes" on page 45 in this chapter.



**WARNING:** Do not misuse the device by pulling on the optical head with the arm fully extended when imaging over a patient. The misuse of this device may create a tipping hazard. The misuse of the device creating a potential tip hazard may result in serious personal injury or loss of life resulting from such unsafe operation.

**i**

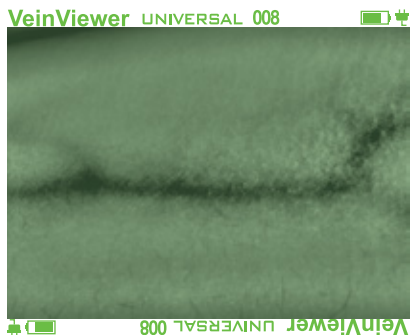
VeinViewer Vision2 must be positioned as closely as possible to a 90-degree angle, perpendicular to the surface of the patient's anatomy to be imaged, otherwise, the projected image may appear bent or distorted. Your line of sight should follow the projected imaging light as closely as possible.



1. Release the optical head assembly from the locked position.
2. Position the optical head by placing it over the area to be viewed, close to the skin, and slowly raise the optical head until you reach the optimal position.

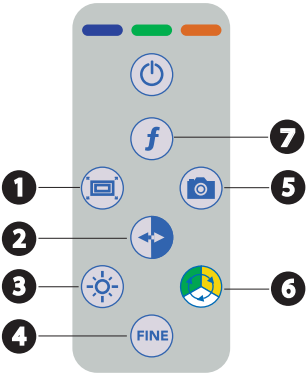
VeinViewer Vision2 is in optimal position when the optical head is approximately 12 inches (30 cm) from the targeted location on the patient and the border text of the projected image is clear and legible.

The image may show a slightly different vessel width than the size of the actual vessel. This effect may vary from subject to subject, from one location of the body to another, and between imaging modes. Christie recommends that the health care professional rely on standard health care practices prior to starting, or during any type of, medical procedure.



# Imaging Modes

<p><b>1</b></p>	<p><b>Resize</b> Firmly press and release the <b>Resize</b> button to adjust the image to one of three sizes. This is useful for pediatrics or when you wish to focus on one particular vessel.</p>	
<p><b>2</b></p>	<p><b>Inverse</b> Firmly press and release the <b>Inverse</b> button to project light-colored veins on a dark background. Press again to revert back to dark veins on a light-colored background.</p>	
<p><b>3</b></p>	<p><b>MaxBright</b> Firmly press and release the <b>MaxBright</b> button to adjust the image brightness. This is helpful where higher ambient light levels are present.</p>	
<p><b>4</b></p>	<p><b>Fine</b> Firmly press and release the <b>FINE</b> button to change the image from Universal to Fine mode.  Universal: Baseline mode with standard brightness and contrast. Fine Detail: Enhances contrast to bring out finer structures. Helpful for pediatrics, neonates, or sclerotherapy patients.</p>	

<p><b>5</b></p>	<p><b>Image Capture</b><sup>1-4</sup></p> <p>Firmly press and release the <b>Image Capture</b> button to capture a time stamped static image of the projected vein image and to save the image as a PNG file on VeinViewer Vision2.</p> <p>The captured image can then be transferred to a computer via a USB connection. See "<i>VeinViewer Connect</i>" on page 52.</p>	
<p><b>6</b></p>	<p><b>TriColor</b></p> <p>Firmly press and release the <b>TriColor</b> button to cycle through Green, Yellow and White displays.</p>	
<p><b>7</b></p>	<p><b>CathCompass™ Peripheral IV Catheter Size Reference Graphic</b><sup>5</sup></p> <p>Firmly press and release the <b>FUNCTION</b> button to enable or disable the catheter sizing reference graphic from the display.</p>	

<sup>1</sup>VeinViewer Vision2 does not capture patient information. The captured images are date and time stamped ONLY.

<sup>2</sup>A maximum of 200 images can be captured. The oldest image is automatically deleted from VeinViewer Vision2 when the memory reaches capacity and a new image is captured.

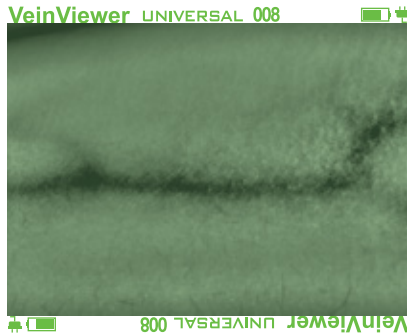
<sup>3</sup>When Image Capture is activated, it may take a few seconds for the image to be saved to VeinViewer Vision2. During this period, the Image Capture icon will be displayed on the image border rendering the keypad and its related functions inoperable. VeinViewer Vision2 will still be able to image subcutaneous blood patterns on the surface of the skin during this time period. Keypad functionality will resume when the image captured icon disappears.

<sup>4</sup>Images are captured only in grey scale format.






<sup>5</sup>The CathCompass™ PIV Catheter Reference Graphic is turned on by default on each power up and is only available in full size image mode (Universal or Fine). To turn the graphic off, press the FUNCTION button located on the Keypad.

# Projected Image Display

The image mode is displayed in the border of the projected image.



Icon	Icon Description
VeinViewer	Product name
UNIVERSAL	Current mode shown
FINE	

Icon	Icon Description
	Inverse indicator
	Image being captured
008	The remaining number of images that can be captured.
	Thermal indicator (internal device temperature)
	Battery charge level
	AC power indicator

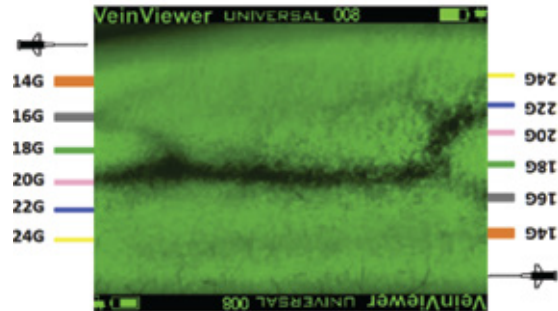
## CathCompass™: Catheter Size Reference Graphic

Chart displays six (6) peripheral IV catheter gauge sizes in color and accurate gauge width at device working distance (see *"ADJUST FOCUS" procedure on page 42*) and in alignment (see *page 74*). After identifying the access site, the projection may be moved within its working distance (maintaining a 90-degree angle) to align against the selected site. This evaluation reference tool allows the user to further assess vascular anatomy in relation to catheter width. Any clinical decision made for IV access is up to the sole discretion of the user, and is the ultimate responsibility of the clinician.

The CathCompass Catheter Sizing Reference Graphic is for reference only. Chart units are displayed as Gauge (G). *For example:* **14G** is displayed to the side of the orange bar.

PIV Catheter sizes (with corresponding colors and gauge size) are:

- 14G** (orange) = 2.2 mm
- 16G** (grey) = 1.7 mm
- 18G** (green) = 1.3 mm
- 20G** (pink) = 1.1 mm
- 22G** (blue) = 0.9 mm
- 24G** (yellow) = 0.7 mm



VeinViewer Vision2 must be positioned as closely as possible to 90-degree angle, perpendicular to the surface of the patient's anatomy to be imaged, otherwise, the projected image may appear bent or distorted. Your line of sight should follow the projected imaging light as closely as possible.

## Turn VeinViewer Vision2 Off

1. Firmly press (minimum 1 second) and release the power button.

The power is disengaged upon the release of the power button. The status indicator LED will turn off. See *"Control Panel Status Indicators" on page 37* for information on the LED's.



To make sure that you have effectively turned the device on or off, or changed imaging modes, hold the optical head firmly when pressing buttons.

2. If using AC power, unplug the power cord from the AC outlet.
3. Wind the power cord and place it around the basket.

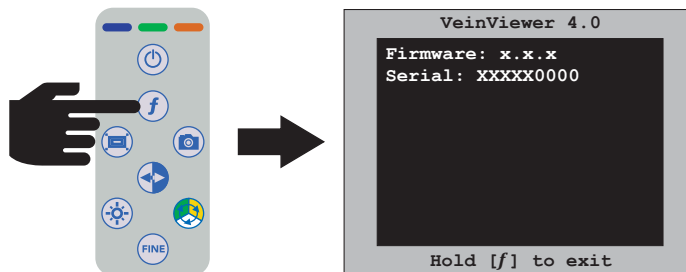
## Storage



**CAUTION:** Keep the VeinViewer out of reach from unauthorized persons.

1. Lock all wheels (see step 2 under *"Transport VeinViewer Vision2" on page 30*).
2. Store the AC power cord around the basket.
3. Position the optical head over the handle (transport position). See step 3 under *"Transport VeinViewer Vision2" on page 30*.

# Display VeinViewer Vision2 Device System Information



1. Firmly Press and hold the **FUNCTION** button (minimum 4 seconds) then release the button to display the Status screen in the projected image.
2. Note the device information.
3. Firmly Press and hold the **FUNCTION** button (minimum 4 seconds) then release the button to exit.

You can also use VeinViewer Connect to identify the device information. Open VeinViewer Connect and select the **Upgrades** tab.

# VeinViewer Connect

VeinViewer Connect is used to complete software and firmware upgrades, synchronize the date and time, manage images, and display status information.

To request a software or firmware upgrade, contact your Christie authorized distributor or representative. For technical assistance, contact Christie Technical Support (see "[Service](#)" on [page 71](#)).

## VeinViewer Connect Software



Operating Systems: Windows 10 and Windows 11 (64-bit only) are supported. If you do not have administrative rights to your computer, you may need to contact your network administrator to grant you access to install VeinViewer Connect software.



Hardware: Windows desktop and laptop computers. Tablets and Macintosh computers are not supported.

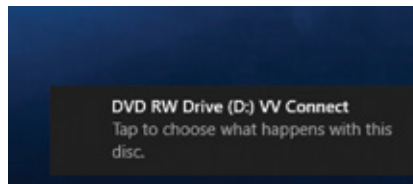


It is recommended that you quit all applications and have a clear screen desktop before beginning the VeinViewer installation.

## VeinViewer Connect - Windows 10 and 11

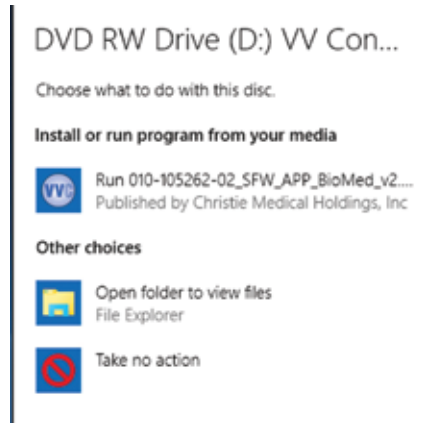
1. Insert the VeinViewer Connect software CD into your computer.

The following dialog screen is displayed.



2. Click on the dialog.

The **AutoPlay** dialog screen is displayed.



The AutoPlay image displayed in this document is for representational purposes only. The AutoPlay screen on your computer may differ from the image shown in this document.

## Connect VeinViewer Vision2 to your Windows 10 or 11 computer

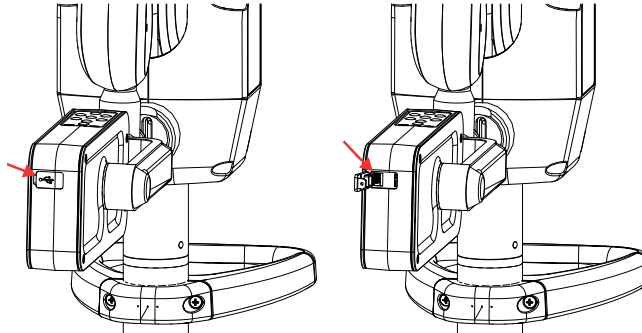


Do not interrupt power to VeinViewer Vision2 at any time while connected to a computer.

1. Make sure the VeinViewer Connect software is installed on your computer.  
See the "*VeinViewer Connect Software*" on page 52.
2. Connect VeinViewer Vision2 to an AC outlet or insert a fully charged battery. **Do not turn VeinViewer Vision2 on.**
3. Open the USB port cover on the optical head and connect the USB cable to VeinViewer Vision2.



The USB port is located on the back edge of the optical head.



4. Connect the other end of the USB cable to the USB port on your computer.

**i**

The interface may not operate correctly when connected through a USB hub.  
The USB connection does not provide power to VeinViewer Vision2.

This will initiate the installation of the drivers. A popup is displayed to notify that the drivers are being installed. A second notification is displayed to advise that **Device driver software installed successfully**.

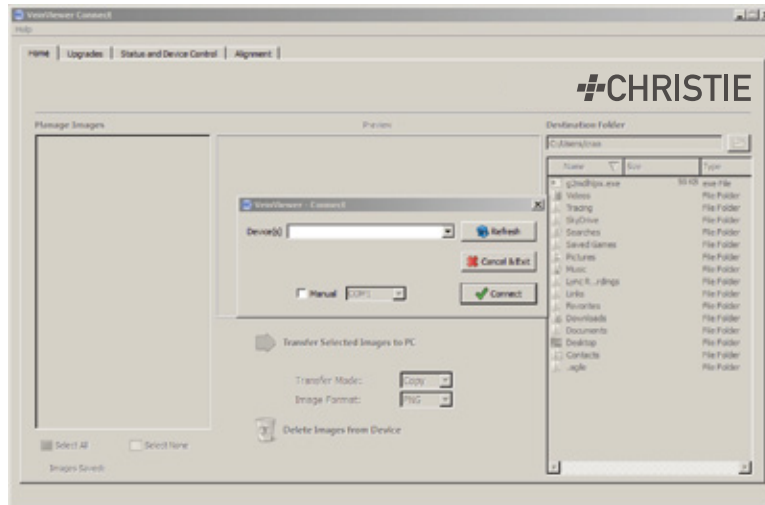
## Start VeinViewer Connect

Launch VeinViewer Connect from the CD



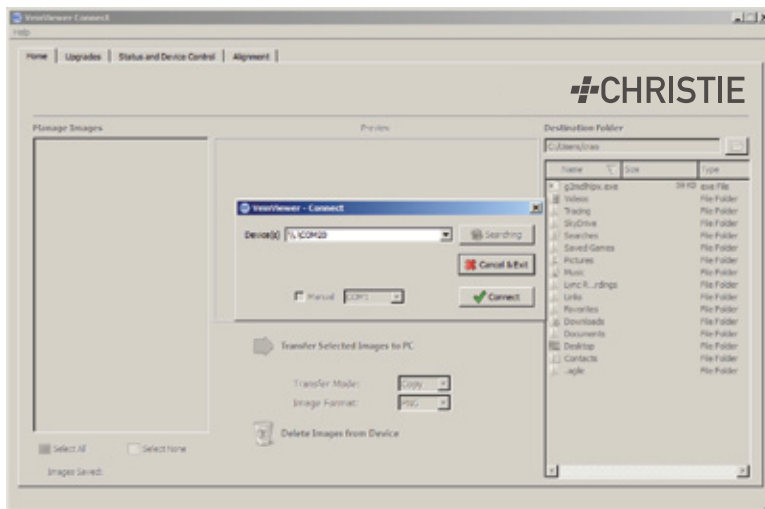
Click **VeinViewer Connect** (or the **VeinViewer Connect** icon on your desktop or from the CD) to start VeinViewer Connect. The first stage will show the main screen grayed out and the popup shows that VeinViewer Connect has not discovered a VeinViewer Vision2 through the COM ports.

If this condition does not change, click **Refresh**.

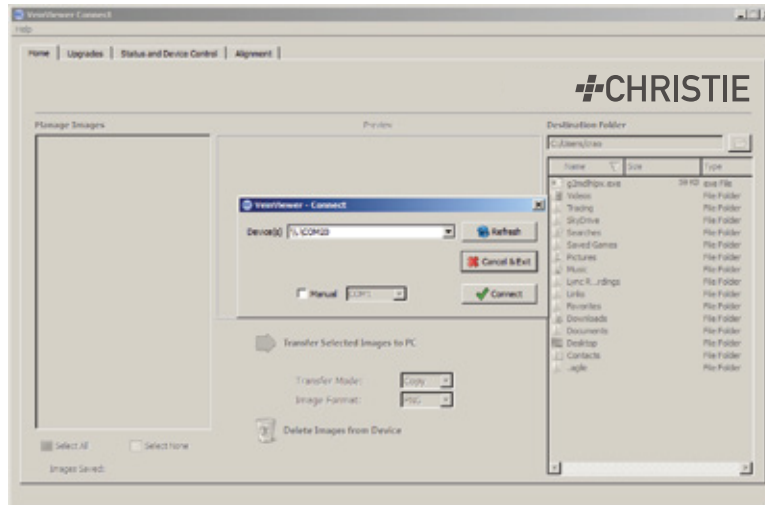


The VeinViewer Connect software can also be added to your computer desktop. Contact Christie Technical Support for a copy of VeinViewer Connect.

The second stage shows that a VeinViewer Vision2 is being recognized however, the VeinViewer Connect application is still in discovery mode. There is a device shown in the Device(s) bar and the Search and Manual options are inactive (grayed out) on the popup.



In the final stage, the VeinViewer Vision2 has been discovered and recognized. There is a device shown in the Device(s) bar and all functions of the popup are active.



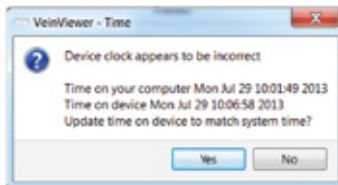
If your device is listed in the **Device(s)** menu, make sure it is selected and click **Connect**.

The VeinViewer Vision2 is now connected to your computer and the VeinViewer Connect application.



If your device does not appear, see ["Troubleshooting" on page 73](#) .

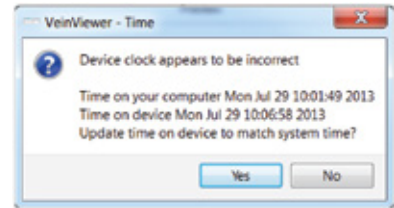
Click **Yes** if an **Update Time** popup appears. See ["Synchronize Date and Time" on page 61](#) for further instructions if required.



## Synchronize Date and Time

When VeinViewer Vision2 is connected to a computer, the message shown below will appear if the time on the device is not synchronized with the time on the computer.

Click **Yes** to update the time on VeinViewer Vision2.



## Manage Captured Images

VeinViewer Connect allows you to copy, move or delete the images captured by VeinViewer Vision2.

## Save Image

1. Click the **Home** tab.
2. Select the image check box of the image to save in the **Manage Images** pane.

A preview of the image displays in the center of the screen.



The filename format for a saved image on the VeinViewer Vision2 00000001.PNG 2013-12-31T10:30:12 and the corresponding file on the computer will be displayed as 00000001\_2013-12-31T103012.PNG.

3. Select the **Transfer Mode**.
  - **Copy** - saves the image to the desired folder without removing it from the **Manage Images** pane.
  - **Move** - saves the image to the desired folder and deletes the image from the **Manage Images** pane.
4. Select the **Image Format**.
5. In the **Destination Folder** pane, navigate to the folder to which the image is going to be saved.
6. Click **Transfer Selected Images to PC**.



To save more than one image, simply select the check box next to each desired image and follow steps 3 to 6 above. Click **Select All** to select all available images.

## Delete Image

1. Click the **Home** tab.
2. Select the image check box next to image to delete in the **Manage Images** pane.

3. Click **Delete Images from Device**.

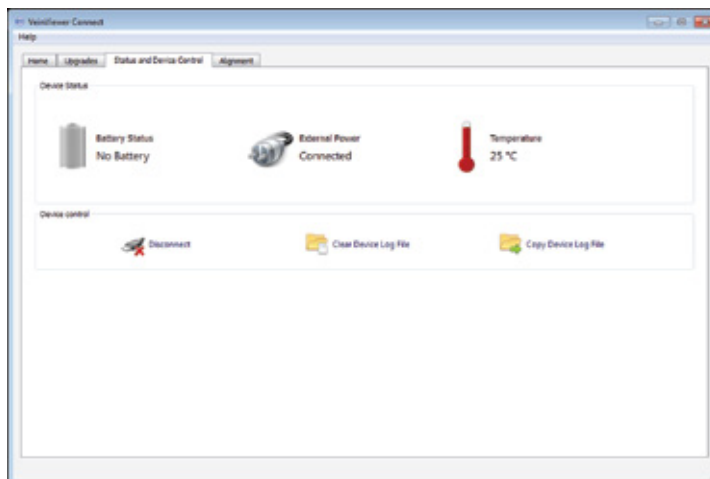


To delete more than one image, simply select the check box next to each desired image and follow step 3 above. Click **Select All** to select all available images.

## Device Status

VeinViewer Connect provides **Device Status** information for:

- The presence of a battery and its charge level,
- Presence of an external power supply, and
- The internal device temperature.

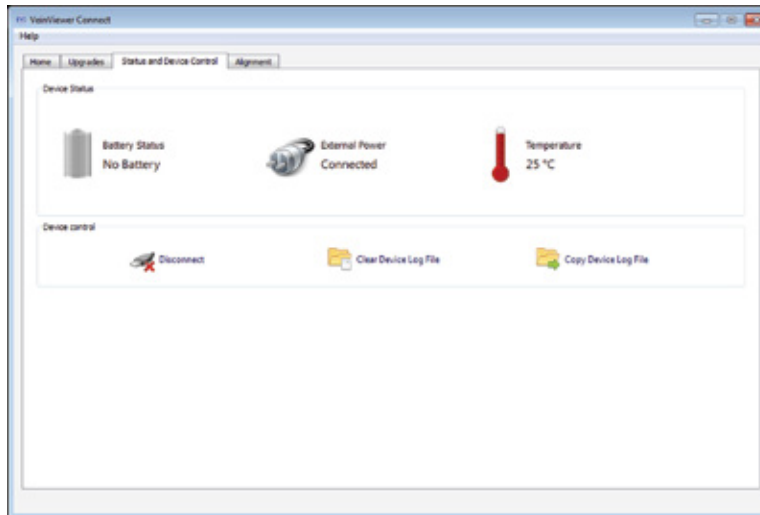


# Disconnect computer from VeinViewer Vision2



Do not interrupt power to VeinViewer Vision2 at any time while connected to a computer.

From the VeinViewer Connect screen:



1. Select the **Status and Device Control** tab.
2. Click **Disconnect** in the **Device Control** section of the screen.
3. Disconnect the USB cable from the computer and from the optical head.
4. Store the USB cable in an appropriate location.
5. Place the optical head back to its proper storage and transport position (see "*Range of Motion-Wrist*" on page 41).

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# Maintenance

This section provides procedures for cleaning VeinViewer Vision2.



**CAUTION:** Follow your institution's guidelines for the use of personal protective equipment when cleaning medical devices.



**CAUTION:** Do not spray cleaners or pour liquids directly onto the surface of VeinViewer Vision2 as fluids could enter and damage VeinViewer Vision2.



**CAUTION:** Always turn off and disconnect VeinViewer Vision2 from AC power before cleaning. Failure to comply, may affect user and patient safety and may affect the effectiveness of VeinViewer Vision2.



**CAUTION:** Do not use solvents or abrasive cleaners on any part of VeinViewer Vision2. Products or solutions other than those recommended may damage VeinViewer Vision2 and will void the warranty.

## Cleaning the Lens

1. Wipe the VeinViewer Vision2 lens with a lint-free cloth moistened with 70% isopropyl alcohol.
2. Dry the lens with a clean, dry lint-free cloth.



The cleaning frequency should be determined by your institution's infection control guidelines.

For more information about the compatibility of cleaning solutions for VeinViewer Vision2, contact your local representative or Christie Technical Support.

## Cleaning VeinViewer Vision2

1. Wipe down the exposed surfaces of VeinViewer Vision2 with a lint-free cloth moistened with 70% isopropyl alcohol. Alternatively, you may use Super Sani-Cloth, Sani-Cloth Plus, Sani-Cloth Prime, Sani-Cloth AF3, CaviWipes, Chlor-Clean Wipes, Haz-Tabs, Clinell Sporicidal Wipes, Clinell Universal Sanitizing Wipes, Accel TB Wipes, or 1:10 Bleach Wipes.
2. Air-dry or towel-dry with a clean, lint-free cloth.

## Disposal

Do not use incineration as a disposal method for VeinViewer Vision2.

To prevent a potential hazard to the environment or human health, follow local regulations when disposing of VeinViewer Vision2, the battery, the power cord, and accessories.



For information related to the recycling of VeinViewer Vision2, see your institutional guidelines. You may also contact your waste disposal service or Christie Technical Support.

# Service

Service instructions are available from Christie Technical Support and must be followed as indicated.

Unauthorized or improper use of VeinViewer Vision2 voids the limited warranty.



Before you send your VeinViewer Vision2 for service, store all captured images on your computer, and then delete all images from VeinViewer Vision2. See "[Manage Captured Images](#)" on page 61 .

For assistance with common issues, see "[Troubleshooting](#)" on page 73 .

If you cannot resolve your issue, contact Christie Technical Support.

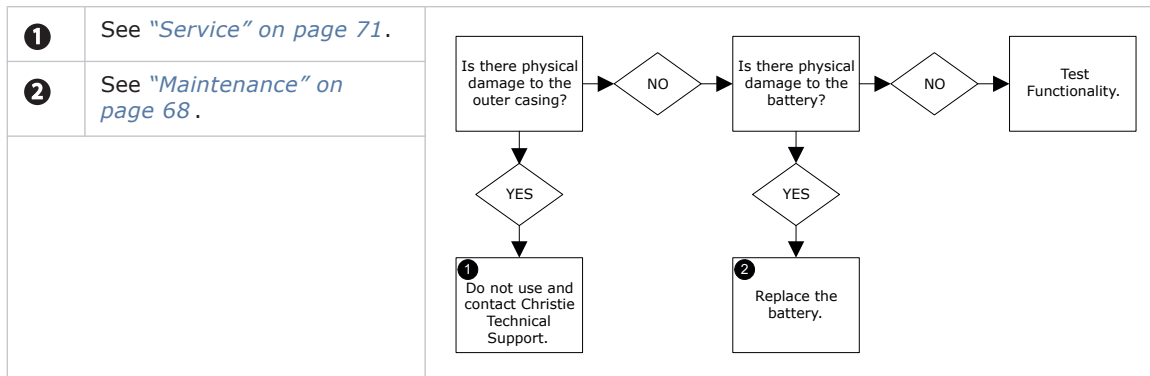
Christie Technical Support Hours: Monday – Friday 8:00 a.m. – 5:00 p.m. EST	Telephone: 1-901-721-0330 1-877-733-8346 toll-free +1-901-721-0330 (International)
E-mail: service@christiemed.com	Fax: 1-901-721-0350 +1-901-721-0350 (International)
Web site: www.christiemed.com	

The expected service life of VeinViewer Vision2 is 5 years.

VeinViewer Vision2 does not have a required preventive maintenance schedule.

# Troubleshooting

If you cannot resolve your issue with the information provided in this section, contact Christie Technical Support. See *"Service" on page 71*.



## Functionality Test

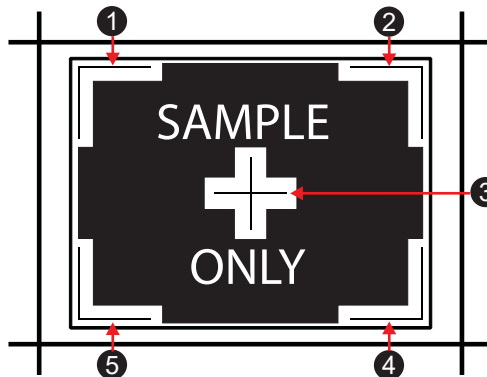
1. Turn VeinViewer Vision2 on and select the large image size.
2. Place the test pattern on a flat horizontal surface.

- Place VeinViewer Vision2 approximately 12 in. (30 cm) away from the test pattern image (located on the inside back cover of this document-sample shown below) and bring the image into focus. See *"Operation" on page 35*.

Make sure VeinViewer Vision2 is perpendicular to and in-line with the alignment test pattern. Adjust the distance of VeinViewer Vision2 until the border of the projected image is aligned with the largest rectangle of the test pattern.









Image below is only a sample (not to scale) and not to be used for alignment. See the actual scaled image on the inside back cover of this document.



- Evaluate alignment by looking for separation (white space) between the projected line and the printed line.



If there is any separation between the projected line and the printed line in any of the 5 horizontal and/or vertical positions, VeinViewer Vision2 is not within alignment specifications. Contact Christie Technical Support for further instructions.

CORRECT ALIGNMENT Projected Line Exactly Matches Printed Line	GOOD ALIGNMENT Projected Line Overlaps Printed Line	INCORRECT ALIGNMENT White Space Between Projected and Printed Lines
		
		

Problem	Status Indicator	Cause	Solution
VeinViewer Vision2 does not turn on	Off	VeinViewer Vision2 is turned off	Press the power button for a full second. See " <a href="#">Control Panel Components</a> " on page 19
		Battery does not have sufficient charge	Connect VeinViewer Vision2 to AC power to power the device and recharge the battery.
		Battery is not making good electrical contact	Make sure the battery is properly secured inside the battery compartment. Wipe the battery grooves with a clean, dry cloth. Make sure the battery door is closed.
		AC power cord is damaged	Do not use or attempt to repair a damaged AC power cord.  Immediately contact Christie Technical Support.

<b>Problem</b>	<b>Status Indicator</b>	<b>Cause</b>	<b>Solution</b>
VeinViewer Vision2 does not power on	Off	AC power cord is not making good electrical contact	<p>Make sure the AC power cord is fully inserted into the VeinViewer Vision2 power inlet.</p> <p>Make sure the plug is properly connected to a power receptacle. The AC outlet should provide between 100 – 240 VAC at 50/60 Hz.</p>
	Off	VeinViewer Vision2 thermal overload; ambient operating temperature, or storage specifications have been exceeded.	<p>Remove the battery from VeinViewer Vision2, and inspect it for damage.</p> <p>Disconnect the AC power cord from VeinViewer Vision2 and wall receptacle.</p> <p>Relocate VeinViewer Vision2 away from the extreme operating environment, and allow it to return to normal ambient conditions for a minimum of 15 minutes before attempting to turn it on. When VeinViewer Vision2 returns to normal operation, the status indicator LED flashes green 3 times.</p>
VeinViewer Vision2 turns off unexpectedly	Flashing blue	Battery does not have sufficient charge	Connect VeinViewer Vision2 to AC power to power the device and recharge the battery.

Problem	Status Indicator	Cause	Solution
No visible change in the image field or functionality when a feature button is pressed	Imaging Mode icon in image border	Control panel button not properly pressed	Press and release each Control Panel button to verify functionality.  Note: Make sure, desired modes and features have been enabled using the VeinViewer Connect software. See "VeinViewer Connect" on page 52.
Projected image is out of focus	Image border text appears blurry	VeinViewer Vision2 is not set to optimal focusing distance	See <i>"Range of Motion-Optical Head"</i> on page 42.
Projected image does not properly display veins	None	VeinViewer Vision2 is being operated outside or in direct sunlight	Do not use VeinViewer Vision2 outside or in direct sunlight. See the recommended operating conditions in <i>"Technical Specifications"</i> on page 87.

<b>Problem</b>	<b>Status Indicator</b>	<b>Cause</b>	<b>Solution</b>
System notice	Status LED is solid amber and the Thermal icon is displayed on the projected image border	Unusual Operating Temperature	<p>Disconnect the AC power cord from VeinViewer Vision2 and wall receptacle.</p> <p>Remove the battery and inspect it for damage.</p> <p>Relocate VeinViewer Vision2 away from the extreme operating environment, and allow it to return to normal ambient conditions for a minimum of 15 minutes before attempting to turn it on. When VeinViewer Vision2 returns to normal operation, the status indicator LED flashes green 3 times.</p>
	Status LED is solid Amber and there is no icon displayed in the projected image border.	Internal device related warning (watchdog trip)	Power cycle the device

Problem	Status Indicator	Cause	Solution
VeinViewer Connect does not properly install	None	Incorrect operating system	Only Windows 10 and 11 are supported.
		Administrative rights	Make sure you have administrative rights or contact your IT department.
		Unknown software publisher	Click <b>Accept</b> .
		Required Windows files in use	Restart the computer and the software again. See <a href="#">"VeinViewer Connect Software" on page 52</a>
		Previous version of Veinviewer Connect is installed on your computer	Uninstall the previous version of the VeinViewer Connect software. Restart the computer and install the software again. See <a href="#">"VeinViewer Connect Software" on page 52</a> .

Problem	Status Indicator	Cause	Solution
Unable to establish USB connection to VeinViewer Vision2	None	USB connectivity issue	<ol style="list-style-type: none"> <li>1. Restart the computer. Make sure the USB cable is properly inserted into VeinViewer Vision2 and the USB port on the computer.</li> <li>2. Wait 30 seconds then click <b>Refresh</b>.</li> <li>3. On the Device(s) list, verify that "\\.\COM_" appears.</li> </ol>
	None	VeinViewer is not connected to a power source	<p>Make sure the VeinViewer Connect software is running and the VeinViewer Vision2 is connected to a power source, but not turned on.</p> <p>Disconnect and reconnect VeinViewer Vision2. Wait 30 seconds and then click <b>Refresh</b>. If VeinViewer Vision2 does not appear in the <b>Device</b> list, see solution below.</p>

Problem	Status Indicator	Cause	Solution
Unable to establish USB connection to VeinViewer Vision2	None	VeinViewer Vision2 device drivers were not properly installed	Make sure the VeinViewer Connect software is running and VeinViewer Vision2 is connected to power source, but not turned on.

Problem	Status Indicator	Cause	Solution
		<p>VeinViewer Vision2 device drivers were not properly installed (cont'd)</p>	<p><u>WINDOWS 10 and 11 (64-bit ONLY)</u></p> <ol style="list-style-type: none"> <li>1. Disconnect and then reconnect the USB cable between the computer and VeinViewer Vision2.</li> <li>2. Select the <b>Refresh</b> button. VeinViewer Vision2 should be listed on the "Device(s):" pull down menu as "\\.\COM#". Select <b>Connect</b>, the Device Control panel on the VeinViewer Connect software should now be active. If VeinViewer Vision2 was not listed in the pull down menu, proceed to step below.</li> <li>3. Disconnect the USB cable connecting VeinViewer Vision2 to the computer.</li> <li>4. Restart the computer.</li> <li>5. Reset VeinViewer Vision2 by removing the Battery and AC power cord.</li> <li>6. Wait 5 seconds then reinstall the Battery and the power cord to VeinViewer Vision2.</li> <li>7. Turn the VeinViewer Vision2 on.</li> <li>8. Make sure the USB cable is properly inserted into the VeinViewer Vision2 and the USB port on the computer.</li> <li>9. Restart the VeinViewer Connect software and repeat step 2.</li> </ol>

Problem	Status Indicator	Cause	Solution
Unable to convert image files	None	VeinViewer Connect did not install correctly	Restart VeinViewer Connect. Ensure you are using latest version of VeinViewer Connect software.
Unable to download images from VeinViewer Vision2	None	USB connectivity issues	See previous USB connectivity issues.
		No images captured	See <i>"Imaging Modes" on page 45.</i>
Error pop-up while using VeinViewer Connect	None	Windows error	<ol style="list-style-type: none"> <li>1. Disconnect the USB cable connecting VeinViewer Vision2 to the computer.</li> <li>2. Restart the computer.</li> <li>3. Reset VeinViewer Vision2 by removing the Battery and AC power cord.</li> <li>4. Wait 5 seconds then reinstall the Battery and the power cord to VeinViewer Vision2.</li> <li>5. Turn the VeinViewer Vision2 on.</li> <li>6. Make sure the USB cable is properly inserted into the VeinViewer Vision2 and the USB port on the computer.</li> <li>7. Restart the VeinViewer Connect software.</li> </ol> <p>If the problem persists, document the error description and contact Christie Technical Support. See <i>"Service" on page 71</i> .</p>

# Limited Warranty

Contact Christie Medical Holdings, Inc. for Standard Limited Warranty and Terms and Conditions.

The limited warranty will not apply to any product which is or has been subjected to:

- Alteration or repair, without prior written authorization from Christie Medical Holdings, Inc
- Misuse, improper maintenance, negligence, or accident
- Damage from excessive current, temperature, or other deviation from the applicable environmental specifications (see "*Technical Specifications*" on page 87)
- Alteration, defacement, or removal of the serial number (or any part thereof)

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# Technical Specifications

<b>Model Number</b>	134-003104-xx
<b>Model Name</b>	VeinViewer 4.0
<b>Product Name</b>	Vision2
<b>Weight (assembled device)</b>	24.5 kg (54 lbs)
<b>Height (assembled device)</b>	177 cm (69.8 in)
<b>Basket Weight Limit</b>	0.23 kg (0.5 lbs) maximum
<b>Power Rating</b>	Input (AC Mains): 100-240 VAC, 50/60 Hz, 25W, 0.45A at 115VAC typical and 0.3A at 230VAC typical Input (Battery): 9V DC, 1.42A Maximum Equipment Protection Class: Class II (AC Power Cord)
<b>Battery</b>	2 cell Lithium Ion Rechargeable Battery Pack (each battery pack stores <100Wh of energy)
<b>IR Wavelength, peak</b>	Approximately 850 nm
<b>Visible Wavelength, peak</b>	Amber LED: 617 nm Green LED: Approximately 525 nm Blue LED: 465 nm

<b>Battery Duty Cycle</b>	Continuous
<b>Operating Temperature</b>	+60°F to +86°F (+16°C to +30°C)
<b>Storage Temperature</b>	-10°F to +140°F (-23°C to +60°C)
<b>Storage Humidity</b>	0% to 90% non-condensing
<b>Atmospheric Pressure (storage and operating)</b>	700 hPa to 1,060 hPa
<b>Humidity (storage and operating)</b>	10% to 90% non-condensing
<b>Support</b>	Christie Technical Support
<b>Safety</b>	<p>VeinViewer Vision2 has been tested to and complies with General Requirements for Safety per IEC 60601-1. For locations outside of North America, contact your distributor or representative to request a region specific power cord.</p> <p>VeinViewer Vision2 is compliant with IEC 60601-1 National differences for: Austria, Belgium, Canada, Switzerland, Czech Republic, Germany, Denmark, Finland, France, United Kingdom, Hungary, Israel, Italy, Japan, Netherlands, Norway, Poland, Sweden, Singapore, Slovakia, Slovenia, Turkey, Ukraine, United States.</p>
<b>EMC</b>	<p>VeinViewer Vision2 has been tested to and complies with IEC60601-1-2 standard for Electromagnetic Compatibility (EMC) and for radiated and conducted emissions.</p> <p>For additional EMC data and tables, please contact your distributor or representative to request the EMC Tables Technical Bulletin (P/N: 020-200418-XX)</p>

<b>EMC Classified</b>	CISPR11 Class B Group 1
<b>Regulatory Classified</b>	FDA Class 1 Exempt
<b>LED Radiation</b>	<p>Class 1 LED Product as per IEC 60825-1 ED. 1.2 (2001)</p> <p>LED maximum output:</p> <ul style="list-style-type: none"> <li>• 523nm (<math>\lambda_1</math>) = 1.60 mW</li> <li>• 875nm (<math>\lambda_2</math>) = 1.778mW</li> </ul>



**WARNING:** Portable RF communications equipment (including peripherals such as antenna cables and external antennas) should be used no closer than 30 cm (12 inches) to any part of the VeinViewer Vision2 including cables specified by the manufacturer. Otherwise degradation of the performance of the equipment could result. VeinViewer Vision2 should be observed to verify normal operation. If abnormal performance is observed, additional measures may be necessary, such as reorienting or relocating VeinViewer Vision2.

## Equipment Classification

The information contained in this section outlines the classification of the VeinViewer Vision2 as a medical device.

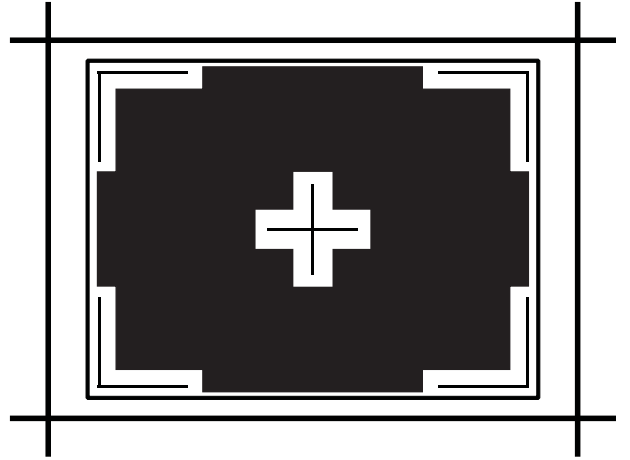
- Class II or Internally Powered Equipment.
- Protection Against Ingress of Liquids - Ordinary.

- Equipment is not suitable for use in the presence of flammable anesthetic mixture with air or with oxygen or nitrous oxide.
- Mode of operation of equipment - Continuous Operation.

VeinViewer Vision2 is manufactured and sold under U.S. patents 5,969,754 and 7,239,909 and 10.873.710.



FEDERAL (USA) law restricts this device to sale by, or on the order of, a physician/health-care professional.



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