Biovision User Guide

Model 4000 LD System

Model LED HD 1000 System

Software
Important

The Biovision Veterinary Endoscopy, LLC NeedleView 4000 LD and SurgView™ LED HD 1000 Systems provide illumination and visualization of anatomy in an interior cavity of the body through a natural or surgical opening. These devices are designed for minimally invasive surgical and diagnostic procedures in any medical veterinary setting. They are to be used by trained Veterinarians for the indicated uses only.

This manual describes the recommended procedures for preparing and operating the NeedleView 4000 LD and SurgView LED HD 1000 Systems. It does not describe how any medical procedure is to be performed on a patient with these instruments.

Read all instructions in this manual carefully before using the NeedleView 4000 LD and SurgView LED HD 1000 Systems. Carefully follow all safety instructions to prevent injury to the user or patient, fire hazards, electrical shock, and damage to the device.

To maintain this device in optimal conditions, follow all recommendations in this manual for handling, cleaning, and storage.

Contact information

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biovisionvet.com
System Package Contents

The following base components are included in each SurgView LED HD 1000 and NeedleView 4000 LD system. We perform quality and process checks to ensure the inclusion of all components prior to shipping. Nevertheless, we recommend that you check to see that you have all of the components for the system you purchased by reviewing your packing list before proceeding.

**NeedleView 4000 LD System**

- Custom 10” NeedleView medical terminal (or custom 21” medical terminal)
- Medical grade AC power cord and power supply
- NeedleView camera handpiece
- NeedleView scope kits compatible w/ NeedleView camera
- NeedleView accessories (packaged separately)
- Biovision User Guide
- Terminal kickstand or terminal arm (optional)

**SurgView LED HD 1000 System**

- SurgView system unit
- Medical grade AC power cord
- MediaCapture USB terminal: Custom 21” HD touchscreen medical terminal with medical grade AC power cord and power supply
- Medical terminal arm
- HDMI cable
- SurgView camera handpiece
- Fiberoptic cable (packaged separately)
- Supplemental instruments (packaged separately)
- Biovision User Guide

Check components against the packing list and if components are missing, contact Biovision Veterinary Endoscopy, LLC immediately using the company contact information.
Introduction

Welcome to the Biovision Veterinary Endoscopy LLC User Guide. This document will guide you through the equipment setup and operation of the Biovision Media Capture Software within the NeedleView 4000 LD System and the SurgView LED HD 1000 System for minimally invasive surgical and diagnostic procedures for any veterinary setting.

Biovision’s Media Capture Software provides accurate viewing and capture capabilities combined with advanced patient reporting. It operates on the NeedleView 4000 LD terminal or the SurgView HD terminal. As a diagnostic tool, it uses the patented NeedleView camera and scope. As a minimally invasive surgical and diagnostic system, it uses an HD camera with an integrated C-mount coupler.

The NeedleView 4000 LD System

The NeedleView 4000 LD System consists of the patented NeedleView scope and camera assembly that connects to a custom 10” medical terminal that runs the Biovision Media Capture Software. It is designed for minimally invasive surgical and diagnostic procedures for any veterinary setting.

The NeedleView camera uses a 1.2mm (18-gauge) disposable scope which is ideal for diagnosing joint anatomy when a micro minimally-invasive view is required for conclusive diagnoses. Biovision’s single-use, semi-rigid and flexible NeedleView fiberoptic endoscopes are available in a variety of diameters, lengths, and viewing angles.

The NeedleView 4000 LD System has a small footprint and can be used in office, treatment stalls, or laboratory settings. It is completely mobile and can even be used as a battery operated device, if needed for a limited time.

SurgView LED HD 1000 System

The SurgView LED HD 1000 System is a compact integrated fiberoptic lightsource, camera and image capturing system that is designed for use in both the operating and exam rooms. It is designed for minimally invasive surgical and diagnostic procedures for any veterinary setting.

The SurgView LED HD 1000 System consists of an HD universal C-mount camera and a LEDnon fiberoptic light source combined into a single system unit. This single system unit connects to a custom 21”HD touchscreen medical terminal that runs the Biovision Media Capture Software.

The SurgView HD camera connects to any rigid and some flexible endoscopes to perform all minimally invasive surgical and diagnostic procedures for any veterinary setting.
Conventions and Symbols

Special and important information is called out in this user guide and on the system components using notes and warnings. Notes usually pertain to a recommended protocol that will help extend the life of your equipment. Warnings pertain to protocols that delineate appropriate actions which maintain a safe and healthy work environment. Note and warnings are called out in the following manner:

- **NOTE:** This is a note
- **WARNING** This is a warning

Hazard Warning

Attention: Read Operating Manual for Warnings, Precautions, and Instructions for Use

Caution – High Voltage

Caution – Hot

Alternating Current

Fuse

Date of Manufacture

- **Type BF Applied Part**
- **Not Protected Against the Ingress of Water**
- **Storage Humidity**
- **Transport Temperature**
- **European CE Mark**
- **TUV, Nationally Recognized Testing Laboratory (NRTL) Mark**
- **Federal Communications Commission (FCC) Mark**
Product Specifications and Safety

**SurgView Technical Specifications**

**Electrical**
- **Input voltage:** 115/230VAC, 50/60Hz
- **Input current:** 3.0/1.5A maximum
- **Power connector:** IEC 320
- **Classification:** IEC60601-1 Class I, Type BF equipment
- **Mode of operation:** Continuous
- **Fuse:** 3.15A 250V Type F

**Environmental**
- **Operating altitude:** -304.8 to 3657.6m (-1000 to 12000 ft) MSL
- **Operating temperature:** 0°C to 40°C (-32°F to 104°F)
- **Operating humidity:** 0% to 95% RH, non-condensing
- **Storage/transport altitude:** -304.8 to 10668m (-1000 to 35000 ft) MSL
- **Storage/transport temperature:** 0°C to 50°C (-32°F to 122°F)
- **Storage/transport humidity:** 0% to 95% RH, non-condensing

**Video / Display**
- **Input video format:** HDMI
- **Video output 1:** HDMI
- **Video output 2:** USB 3.0

**Light Source**
- **Type:** LED module

**MediaCapture USB LCD 21” HD touchscreen medical terminal**
- **Storage media:** Hard drive
- **Still image file format:** JPEG / bitmap / Dicom
- **Still image size:** 720x576 and 1920x1080 pixels
- **Video file format:** AVI (MJPEG codec) 1080 pixels
- **Video size/frame rate:** 720x576 and 1920x1080 pixels/30fps

**Compatible Camera Attachments**
- NeedleView camera
- SurgView HD camera

**Compatible Endoscopes**
All rigid and flexible endoscopes with ocular eyepiece and Storz light post. Disposabe NeedleView scope:

![Endoscope Diagram]
Safety Information

General requirements for the safe use of the SurgView system:

- It is important that you read, understand, and comply with all of the following safety precautions, markings, labeling, and all accompanying literature.

- Failure to follow these precautions could result in injury to the patient or user, or damage to the SurgView system.

- Before each use, check the outer surface of the endoscope and endoscopically-used accessories to ensure there are no unintended rough surfaces, sharp edges, or protrusions that may cause a safety hazard to the patient or user or that may cause damage to the equipment and other accessories.

- In the event of use with other surgical tools such as shavers, care shall be taken to avoid damage to the endoscope or any endoscopically used accessories. All damaged instruments shall be discarded immediately.

- In the event of a loss of system function during a procedure, no further visualization is possible and the procedure is ended. The practitioner shall remove the endoscope and proceed with closure or further patient care as needed. Further endoscopic examination shall only be performed with a fully functional system, for which a backup unit is recommended.

To avoid personal injury and damage to this device:

- Do not block ventilation slots or openings. Always ensure sufficient clearance for ventilation by not placing any other equipment or objects on or near the vents on either side of the SurgView unit.

- Sufficient clearance is maintained by allowing an area six inches by six inches behind the SurgView unit.

- Always place and keep the SurgView unit on a flat, level, and secure surface.

- In the event of suspected damage or failure, DO NOT OPERATE. Have the device inspected by qualified personnel.
To avoid fire hazard and electrical shock:

- DO NOT operate the device outside of the specified input voltage range.
- Only use medical-grade power cords with the SurgView system.
- Connect to a properly grounded hospital-grade outlet only.
- Use only the fuse type and rating specified for this device.
- DO NOT operate the SurgView system in an explosive atmosphere (e.g. in the presence of flammable anesthetics, etc.).
- The SurgView system does not have any field-replaceable parts. DO NOT disassemble or remove the cover or panel. Opening the cover will void the manufacturer’s warranty.
- DO NOT operate this product if there are signs of tampering or if any of the covers are removed.
- DO NOT allow foreign objects inside of the device.
- Before performing any kind of maintenance (e.g. cleaning the SurgView system, replacing fuses, etc.), always perform the following:
  - Unplug the power cord.
  - Allow unit to cool for at least ten (10) minutes after turning off.
  - Do not allow spilling of liquids on the SurgView system.
  - Do not immerse any of the components in liquids.
  - Do not operate in wet or damp conditions.
  - If any maintenance or repair is needed beyond superficial cleaning or replacing fuses, contact Biovision Veterinary Endoscopy or a Biovision authorized service representative.
- Always unplug the power cord if:
  - The device has been exposed to moisture, liquid has been spilled on the device, or if the device or any of its components have been soaked or immersed in liquids.
  - The device has been dropped.
  - The device does not operate properly, the device does not turn on, or the performance of the device is noticeably different.
  - The device displays signs of tampering or damage, such as damage to the power cord, broken enclosures, etc.
⚠️ **WARNING**  In the event of use with other energized endoscopic instruments and accessories, the **PATIENT LEAKAGE** currents may be additive.

⚠️ **WARNING**  Possible explosion if used in the presence of **FLAMMABLE ANESTHETICS** or other **EXPLOSIVE GAS MIXTURES**.

⚠️ **WARNING**  This device is not intended to be used in the presence of **HIGH FREQUENCY SURGICAL EQUIPMENT** other than **Biovision’s**.

⚠️ **WARNING**  This device is not intended to be used in the presence of **LASER EQUIPMENT**.

⚠️ **WARNING**  Be aware of the possibility of a gas embolism whenever compressed gases are used in a patient procedure. To minimize the risk, you must verify that adequate space exists for the egress of any patient-applied gases.

⚠️ **WARNING**  DO NOT look directly into the light emitting windows of the Surgview, endoscope or camera handpiece. Use caution when removing the fiberoptic cable from the endoscope. Looking directly into the fiberoptic light may result in eye damage. DO NOT touch any of the metal ends of the fiberoptic cable immediately after removal from the light source.

⚠️ **WARNING**  After removing the endoscope, do not touch the light emitting window of the handpiece or the light receiving window of the endoscope. They may become hot after long periods of use.

⚠️ **WARNING**  DO NOT touch the light port of the handpiece upon disconnection. The tip of the port may become hot after long periods of use.

⚠️ **WARNING**  DO NOT IMMERSE the camera handpiece in liquids of any kind, personal injury or damage to the device may result.

**To avoid electromagnetic interference:**

⚠️ Special precautions are required regarding the electromagnetic compatibility (EMC) of the SurgView system. The system needs to be installed and put into service according to the EMC information provided in this manual.

⚠️ Portable and mobile radio frequency (RF) communications equipment can affect any medical electrical equipment, including the SurgView system.

⚠️ Only cables and accessories provided by the manufacturer may be used with the SurgView system. The use of any other cables or accessories may have an adverse effect in the electromagnetic compatibility of the device such as increased emissions or decreased immunity.

⚠️ This device should not be used adjacent to or stacked with other manufacturer’s equipment. If used adjacent to other equipment, the system should be observed to verify normal operation in that configuration.
Additional equipment connected to medical electrical equipment must comply with the respective IEC or ISO standards (e.g. IEC 60950 for data processing equipment).

Furthermore, all configurations shall comply with the requirements for medical electrical systems (see IEC 60601-1-1 or clause 16 of the 3Ed. of IEC 60601-1, respectively). Anybody connecting additional equipment to medical electrical equipment configures a medical system and is therefore responsible that the system complies with the requirements for medical electrical systems. Attention is drawn to the fact that local laws take priority over the above mentioned requirements. If in doubt, consult your local representative or the technical service department."

System Setup

The Biovision Media Capture Software is designed to work with either the SurgView LED HD 1000 System or the NeedleView 4000 LD system.

**NeedleView 4000 LD System**

**Components**

The NeedleView 4000 LD system ships with three basic components:

**The NeedleView 4000 LD Terminal with AC power cord (110Vac or 220Vac)**
The NeedleView Camera and Scope with USB connection cable

The NeedleView System

The NeedleView 4000 LD Terminal can be supported by a kickstand or secured by mounting arm.
**NeedleView 4000 LD System Setup**

1. Plug the NeedleView 4000 LD Terminal into a wall outlet.

2. Plug the NeedleView camera into the terminal by inserting the USB cable into the USB 2.0 port on the left side of the terminal. Note: USB 3.0 is typically blue.

3. Turn on the terminal by pressing the power button. Biovision media capture application will automatically start.

   When you are finished using the NeedleView system, unplug the NeedleView camera handpiece, and press the green power button to power down the NeedleView Medical terminal. It will ask you if you want to close the application, tap Yes (or No if you do not want to exit), and then unplug it from the outlet.

4. Slide the (sterile) scope into the sliding mount of the NeedleView camera.

   a. Connect the scope to the camera by pulling the sliding sleeve back and inserting the scope. Ensure that the green dot on the top of the scope lines up with the coupler top indicator.

   b. Release the sliding sleeve to secure the scope in place.

   NOTE: The proper technique must be utilized in order to preserve the sterile field through the drape that is attached to each NeedleView scope.

   NOTE: If scope is re-sterilized for more than a single use, you must only use ETO for sterilization and if needed procure additional sterile camera scope sleeves.
## Technical Specifications

| **Power Supply** | AC In | 100 - 240V ~ 1.5A 50/60 Hz |
| | AC Out | 19V, 3.4 A Max, 65 W |
| | Battery Capacity | Main Battery: 31.7 Whrs (11.1V 2860mAh) |

| **Computing System** | CPU | Intel Celeron Processor N2930 |
| | Max. Speed | Quad Core 1.83GHz |
| | Memory | DDR3L 1600MHz SODIMM (Default 4GB / Up to 8GB) |
| | Operating System | MS, W7 Embedded |

| **Storage** | SSD | 1 x mSATA SSD (Default 64GB / Supports up to 128GB) |

| **Display** | Display Type | 10.1” TFT LCD Panel |
| | Max. Resolution | 1280 x 800 |
| | Touch Type | Projected Capacitive Multi-Touch |
| | Glass Type | Enhanced Glass |

| **I/O Connectivity** | Micro HDMI x 1 |
| | USB 3.0 x 1 |
| | USB 2.0 x 1 |

| **Power Buttons** | On/Off |

| **System Indicators** | Power / Battery Status / Wireless |

| **Ingress Protection** | Water / Dust Resistance | IP-65 compliant |

| **Environment** | Temperature | Operating: -10 °C ~ +50 °C, 14 °F to 122 °F |
| | Storage: -30 °C ~ +70 °C, -22 °F to 158 °F |
| | Humidity | Operating: 5% ~ 95 % @ 40 °C / 104 °F non-condensing |
| | Storage: 5% ~ 95% @ 40°C / 104 °F non-condensing |
| | Vibration | Operation: (5-500GHz) 1G |
| | Non-operation: (5-500GHz) 0.04PSD |
| | Shock Resistance | Operating: 20G, 11ms, Non-operating: 40G, 11ms |
| | Handling Drop | 4ft drop onto steel plate, 4ft drop onto 2 inch plywood over concrete (MIL-STD 810G compliant) |
| | 6ft drop with add-on bumper |

| **Physical Characteristics** | Dimensions (W x H x D) | 292 x 196 x 20mm / 11.5 x 7.7 x 0.79 in |
| | Weight | 1.1 kg / 2.4 lb (Base Configuration) |
| | Color | Grey & Green |

| **Certifications** | FCC Class B, CE, IEC / EN 60950-1 |
| | ANSI / ISA 12.12.01-2015 - Optional Class I Division 2, groups ABCD certified model |
SurgView LED HD 1000 System

The SurgView LED HD 1000 System is designed for minimally invasive surgical and diagnostic procedures in any veterinary setting.

For best performance, always operate and keep the SurgView System on a flat, level and secure surface.

Components

SurgView System Unit

- Light Port
- Brightness Up and Down
- Carrying Handle
- Power Switch
- Camera Port
- Rear Power Switch
- HDMI Output
- USB 3.0 Output
- AC Power Input

SurgView HD camera

- Camera Cable
- Focus Knob
- Camera Capture
- White Balance
- Plug for Camera Port
- C-Mount Coupler

ACMI fiberoptic light cable

For complete information about the fiberoptic light cable, refer to the instructions shipped with the cable.
Media Capture HD Monitor

The MediaCapture HD touchscreen monitor is pre-loaded with the Biovision Media Capture Software. It can function as a standalone diagnostic terminal or be used in conjunction with the SurgView System unit for viewing and media capture when performing minimally invasive laproscopic surgical procedures.

Additionally, the MediaCapture HD monitor can be used with the NeedleView camera for diagnostic procedures by using a USB cable to connect to the USB monitor port.

![Diagram A: HD monitor port diagram](image)

A  Antenna Port/na  
B  Line-out/na  
C  Mic-in/na  
D  COM2/na  
E  COM1/na  
F  HDMI in (Reserve for SurgView System)  
G  USB 2.0 x2 on left (Reserve one for NeedleView camera)  
     USB 3.0 x2 :on right  
H  HDMI out (for external monitor)  
I  VGA/na  
J  LAN Ports x2/na  
K  DC Input for power source  
L  Power switch

NOTE: For streaming video only without any capture capability, you can connect the SurgView HDMI output to any standard monitor or external recording device with HDMI video input.
SurgView LED HD 1000 System

Typical endoscopes used with system

Otoscope

Operating Laparoscope
**SurgView LED HD 1000 System Setup**

The Biovision Media Capture Software allows you to capture still and video images while performing minimally invasive diagnostic and surgical procedures. Set up the capture system by following these steps.

NOTE: Prior to powering up the SurgView LED HD 1000 System unit, check the rear panel and ensure that the correct line voltage setting is selected. See the Maintenance chapter for step-by-step instructions for changing the line voltage setting for your area.

1. Situate the SurgView System unit so that the fans at the rear are not blocked and the AC power source is within reach.
   a. Install the LED non arc lamp module per instructions in the Maintenance chapter.
   b. Connect the HD monitor to the system unit using the provided HDMI cable.
   c. Plug the HD monitor into AC power source.
   d. Plug the SurgView System unit into AC power source.

2. Power up SurgView System unit.
   a. Ensure that the rear Power switch is in the ON position.
   b. Depress the front panel Power switch.

⚠️ **WARNING** Do not look directly at the light source!

3. Plug the fiberoptic cable into the light port.

*ACMI Fiberoptic Light Connection to SurgView System*
4. Plug the camera into the camera port. Ensure the red dot on top of the plug is aligned with the top of the camera port.

![Line up red dot](image1)

![Camera plug fully seated](image2)

5. Turn on the HD monitor by pressing the power switch on the back. See Diagram A in the SurgView LED HD 1000 System setup section for exact location. The Biovision Media Capture Software will automatically start.

When you are finished using the SurgView system, unplug the camera handpiece and press the power switch to power down the HD medical terminal. It will ask you if you want to close the application, tap Yes (or No if you do not want to exit).

6. Tap the HD monitor touchscreen to navigate to the Settings pane and select Device Settings.

![Device Settings](image3)

Select the camera you will use for your procedure. Select SD for NeedleView and HD-057 or HD-066 for the high definition camera to be used with SurgView.

Verify that the Video Size is 720x576 for SD and 1920x1080 for HD. However, the dropdown list allows you to select alternate resolutions.
7. Navigate to the Settings pane and select Advanced Settings. Here you can set image format and report formats. Use the defaults for all other options.

8. Attach the ocular eyepiece of the endoscope to the camera C-mount coupler.

9. Plug the female end of the fiberoptic cable to the light post of the endoscope.

10. Set white balance. With scope attached to camera, focus on a white background and press and hold the white balance button on the camera until the color on the white background is the same as the color shown on the screen.
Getting Started

Once the system is fully set up as described in the previous chapter, you are ready to get started using the software.

Start Up the System

*NeedleView 4000 LD System*
Press the green power button at the top right of the NeedleView 4000 LD terminal.

*SurgView LED HD 1000 System*
Press the power switch on the HD monitor.

The Home screen displays with a blank Patients pane on the left side of the screen.

Configure Report Header Template

The header for the reports can be conveniently pre-configured so every time you create a report, the same information appears. You can print on your own letterhead by checking the option “Report Doesn’t Require Header. Printed in preprinted sheet.”

You can change the information for a single report within the report window by clicking the Configure Report option.

**Configuring the report template**

Open the Report Template

1. Tap/click the Reports pane button located under the Patients Pane.
2. Tap/click the Configure Reports button

The report configuration window
The header configuration information in the above window is used to set the report header information as shown in the sample report below.

<table>
<thead>
<tr>
<th>Control Name</th>
<th>Description</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hospital/Clinic Name</td>
<td>Defines the name of the hospital to be used in the report.</td>
<td>Enter text via touchscreen or keyboard.</td>
</tr>
<tr>
<td>Address</td>
<td>Defines the address of the hospital to be used in the report.</td>
<td>Enter text via touchscreen or keyboard.</td>
</tr>
<tr>
<td>Logo (BMP or JPEG)</td>
<td>Field to hold the path to hospital logo image to be used in the report.</td>
<td>Use Browse button to navigate to image on the USB device.</td>
</tr>
<tr>
<td>Browse Button</td>
<td>Allows selecting the path for the logo image.</td>
<td></td>
</tr>
<tr>
<td>Report template</td>
<td>Images and Comments should be selected here.</td>
<td>(Select)</td>
</tr>
<tr>
<td>Report Save As</td>
<td>PDF or DICOM (As set in Advanced Settings.) If DICOM you will be able to select resolution.</td>
<td>(Select)</td>
</tr>
<tr>
<td>Image Display Mode</td>
<td>Scale is the recommended option.</td>
<td>Scale</td>
</tr>
<tr>
<td>Image &amp; Comment Border</td>
<td>Defines border for the images and comments in the print area.</td>
<td>(Select)</td>
</tr>
</tbody>
</table>

- **Transparent** – No border is drawn for image and comments.
- **Solid Line** – A black border is drawn for images and comments.
Hospital/Clinic Name
Address
222-333-4444

Exploratory

<table>
<thead>
<tr>
<th>Patient ID</th>
<th>12345</th>
<th>Visit Date</th>
<th>12/21/2015</th>
</tr>
</thead>
<tbody>
<tr>
<td>Patient Name</td>
<td>Rover, Owner: Jane Jones</td>
<td>Species/Breed</td>
<td>dog - Irish Setter</td>
</tr>
<tr>
<td>Age/Gender</td>
<td>2Yrs, Male</td>
<td>Attended Vet</td>
<td>Dr. McCurry</td>
</tr>
</tbody>
</table>

Minimally Invasive Surgery & Diagnostics:

![Image 1 comment](image1.jpg)
![Image 2 comment](image2.jpg)

Patient Visit Summary:
Impression of procedure

__________________________________________
Dr. McCurry
The Three Panes

The three panes on the left side of the screen allow you to manage the system, maintain records of your patients’ visits, and create reports from the images you capture. These are covered in more detail on the following pages.

NOTE: This software is not designed to function as your practice management database. We advise you to periodically go through and delete inactive patients and to store all reports and images in your primary patient care system.
Patients Pane

The Patients pane fields are blank when the program opens. The blank fields indicate that a NEW patient can be entered. You can generate a new blank Patients pane by tapping or clicking the Exit button.

The ID field allows you to enter an ID for the animal. This is useful if the animal already has a patient record in your patient management system.

The Name field is pre-populated with a generic name and number. Overwrite this information with the name/identity of the animal.

The rest of the fields are self-explanatory. They are used to populate the fields in the patient reports that can be generated by the system and to create a patient record in the Patient List.

The Save & Perform New Procedure button is used to save patient information and start a procedure for that patient.

Click or tap the Patient List button to open the list of all patients previously entered into this software.
**Settings Pane**

You will use the Settings pane for changing the settings you need to use if you switch between camera types (NeedleView SD and HD). Otherwise the default settings should not be changed.

The **Camera Settings** button allows you to specify which camera type you are using. See the System Setup section for more information.

The **Advanced Settings** button allows you to specify format types for images and reports. See the System Setup section for more information.

The **Reset Settings** button will generally not be used except in the rare case that you need service. See the System Setup section for more information.
Reports Pane

The Reports pane contains the tools you will need to create and export reports and images.

The **Configure Report** button opens the Report Configuration window so that you can set up the header for patient reports. See *Configure Report Header Template* section in the Getting Started chapter for more information.

The **Generate Report** button opens the **Report Preview Window** so that you can identify which captures from any one visit should be included in a patient’s report. See the *Reports* chapter for more information.

The Export Data button opens the Copy to USB Drive window so that you can copy reports and images onto any USB external drive for printing or storage in your patient management system. See *Export Reports and Images for Printing* section in the *Reports* chapter for more information.
Patient Information

The Patient List window uses a ribbon-style toolbar along the top. Patients are listed in chronological order by date of last visit, with the newest at the top. When a patient is selected by clicking the patient name, the visit pane opens in the bottom window listing the visits from most recent to earliest.

Patient information is pulled from the Patients pane and/or from the Report Preview Window.

A new visit is automatically created when the camera is started. Additional visit information is pulled from the Report Preview Window when you enter it to create a report.

NOTE: For easy text entry and navigation, use an external keyboard when working with patient records.

The Ribbon Bar

The ribbon bar contains the tools you will need to work with patients. The buttons are self explanatory:

Add a New Patient

Enter a new patient in the blank Patients pane that you see when the Home screen opens. This patient information is saved when you tap/click Save and Perform New Procedure.

Enter a new patient in the blank Patients pane that you see when the Home screen opens. This patient information is saved when you tap/click **Save and Perform New Procedure**.

If the Patients pane is already populated, get a new blank pane by restarting the Home screen. Tap/click the Exit button from the Home screen.

CAUTION: If you overwrite an existing patient’s information in the Patients pane, you will edit the entire existing patient record when Save and Perform New Procedure is selected. Do NOT do this unless you are intentionally editing a patient record.
Add a New Visit for an Existing Patient

To edit an existing patient record:

1. Tap/click the patient from the patients list.
2. Tap/click New Visit button available in the Patient ribbon toolbar. Tap/click STOP to open the Home screen. You will see the patient information in the Patient pane.
3. Modify the fields in the Patient pane.
4. Tap/click Save and Perform New Procedure button to save the changes made.
5. Tap/click STOP to close the live video window.

You can also edit an existing patient by overwriting patient data in the Report Preview window.

Deleting a Patient

To delete an existing patient record, perform the following steps:

1. Select the patient record from the patients list by tapping or clicking the patient name.
2. Tap/click Delete Patient button in the Patient ribbon toolbar.
3. Confirm patient delete, and the record will be deleted from the database.

Deleting a Visit

To delete a visit from a patient record, perform the following steps:

1. Select the patient record from the Patient List by tapping or clicking the patient name. The Visit pane opens.
2. Select the Visit that you want to delete.
3. Tap/click Delete Visit button in the Patient ribbon toolbar.
   Confirm visit delete, and the record will be deleted from the database.
Sorting the Patient List

The Patient List can be sorted in several different ways so that you can quickly find the patient you need.

Tap/click the field name in the header

Clicking the field name in the header sorts the list alphabetically or by value. For example, tap/click Species to sort patients by species.

Drag the field name into the gray area just above the header

Use an external keyboard to perform this type of sort. Drag the field name into the gray area just above the header. All patients with that field will be listed in alphabetic or value order.

Use the Expand All and Collapse All buttons to view sort information.

You will need to exit and re-enter the Patient List to return to the full list.

Use the date range filter

The date range filter allows you to display patients by date of visit. Complete the From/To fields and tap/click Apply Date Filter.

Tap/click Remove Date filter to return to the complete list.
Capturing Procedure Content

Biovision Media Capture Software is designed for you to be able to view and capture endoscopic procedure videos and still images that are visible during a diagnostic or surgical procedure. You can capture images using either the NeedleView 4000 LD terminal or the SurgView HD System.

The NeedleView 4000 LD terminal is designed mainly for diagnostic procedures.

The HD touchscreen panel terminal can be used with either the NeedleView camera and scope for diagnostic procedures or with the SurgView System for capturing video and images during a laparoscopic surgical procedure.

You can maintain your sterile field while capturing images by using the capture button on the camera. Alternately, from the unsterile field an assistant can use the terminal or keyboard to tap or click buttons as directed.

After capturing a video or series of images, you can go to the Reports pane to prepare report information for export or to simply export captured images.

Captured images appear in the right image pane as thumbnails.

Although you can use the Biovision Media Capture Software System for viewing images, if you need to document the images, you must set up a patient record.

Create a new patient

- Before the procedure begins: In some clinics, the doctor or assistant will set up patient visits for the day. See Add a New Patient for setting up new patients.

- You may populate the new patient fields just before starting the procedure. See Add a New Patient for setting up new patients.

Returning patient

- Open the Patient List and select the patient. Tap/click New Visit to open the live video window. You will see the patient’s information in the Patient pane.

Camera setup

Before starting to capture, you must set up the software for the type of camera and monitor or terminal you are using.

1. Plug in the camera:
   - Plug the SurgView camera into the camera port on the SurgView System unit
   - Plug the NeedleView camera into the 21” HD touchscreen medical terminal or custom 10” medical terminal.

2. Use the touchscreen or external keyboard/touchpad/mouse to navigate to Settings> Camera Settings.

3. Select the camera type:
   - For HD camera source, select HD.
   - For NeedleView camera source, select SD.

4. Close the Camera Settings window. This returns you to the Home screen.

5. Attach the desired scope to the camera unit.
Capture procedure

NOTE: Ensure the correct patient is displayed in the Patient pane.

NOTE: You may use the buttons on the camera or the media capture toolbar options on the medical terminal to capture images.

To capture a video:

1. Open the live video window by clicking or tapping the right arrow on the Home screen.

   While in the live video window, the Live indication and frame count display in the bottom toolbar along with the buttons for the available tools. You will see the video image in the window.

   ![Biovision software capture toolbar](image)

   - **Pause Button**
   - **Capture Button**

2. Point the scope at the area you wish to view/capture.
   a. Camera: Press and hold the Capture button for two seconds, or
   b. Toolbar: Tap or click the Video button.

3. Pause the video
   a. Camera: Press the Capture button, or
   b. Toolbar: Tap or click the Pause button.

4. Resume the video
   a. Camera: Press the Capture button, or
   b. Toolbar: Tap/click Resume button.

5. Stop the video recording
   a. Camera: Press and hold the Capture button for two seconds, or
   b. Toolbar: Tap/click STOP.

6. (Toolbar only) Exit capture mode by tapping or clicking STOP.

To capture a still image:

1. (Toolbar only) From the Home screen, open the live video capture window by clicking or tapping the right arrow on the Home screen.

2. Point the scope at the area you wish to view/capture.
   a. Camera: Press the Capture button briefly, or
   b. Toolbar: Tap or click the Camera button.

3. (Toolbar only) Exit capture mode by clicking STOP.
Reports

Create a Report

The Generate Report option in the Reports pane opens the Report Preview Window which allows you to select images and add visit and patient information that will appear on the report and in the patient record.

Quick Report

For a quick report, you will go directly from capturing images in the live video window to creating a report from the images just captured.

1. Immediately after capturing images (they appear on the right image pane), click/tap STOP and navigate to the Report pane and tap/click Generate Report. The image(s) just captured will appear in the left image pane. The fields will be populated with the patient information from the Patient pane and clinic information from the Report Template (see Configure Report Header Template).

2. Add images to the report by selecting them from the left pane. Tap/click Add to Print List or Add All. The images will transfer to the right pane. Images can be selected for commenting or deletion. Type your comments below the image in the center window.

3. Complete the fields in the Report Preview Window. These fields will display on the report. See Configure Report Header Template for an example report.

4. Tap/click Preview Report. This saves the report and images and appends it to the visit for this patient. View the report.

5. Close the preview window to return to the Report Preview Window and make any edits.

6. See Export Reports and Images for Printing below to print the report.
Patient visit image preview and report

You can create a report later or view images captured during an earlier visit.

**View an image or video**
1. From the Patient List, tap/click the patient’s name. The Visits pane opens in the bottom half of the screen.
2. Select the visit and tap/click Select Visit. The images that were saved during that visit display in the right pane of the Home screen.
3. Tap/click the right arrow to open the live video window. Select an image or video to view it.
4. Tap/click STOP to exit the live video window.

**Generate a report**
1. From Patient List, tap/click the patient’s name. The Visits pane opens in the bottom half of the screen.
2. Select the visit. The images that were saved during that visit display in the right pane of the Home screen.
4. Go to Create a Report above for the remaining steps.

**Advanced report option**
An advanced report option is available for you to add extensive findings text. This is done during report generation using the CommonReport5Images template.

1. Create the report as above.
2. Select the CommonReport5Images in the Report Template dropdown.
3. The Findings window opens. Enter your findings for the visit.
4. Click Preview Report.
Export Reports and Images for Printing

Any captured images, videos or generated reports can be exported for printing or viewing on a Windows-based computer. Files are exported to a user-supplied jump drive, which may need to be inserted into a hub connected to the terminal.

All reports and images are exported as PDF or DICOM files. The type of file exported is set in the header template. See Configure Report Header Template.

Exporting files

1. Insert a USB drive into an available port.
2. Open a patient visit that contains the report or captured images/video you want to export.
3. Select the image(s) you want to export from the images in the right image pane.
5. Tap/click Export Data. The Copy to USB Drive window opens.
6. Browse to the USB drive location.
7. The selected reports and images are listed in the box. Select the file(s) to be exported and tap/click Copy. The files are now copied to the jump drive.
8. Close the window.
Maintenance

SurgView and NeedleView Procedure Completion Protocol

Turn off and disconnect power

When you are finished using the SurgView system, turn off the system in order to conserve illumination source.

When you are finished using the NeedleView system, unplug the NeedleView camera handpiece, press the green power button to power down the NeedleView Medical terminal. It will ask you if you want to close the application, tap Yes (or No if you do not want to exit), and then unplug it from the outlet.

Always disconnect the SurgView or NeedleView system from its power source when performing any kind of maintenance (e.g., cleaning, replacing fuses, etc.).

Single-use endoscope disposal

When disposing of the single-use endoscope and endoscope accessories, follow procedures for biologically hazardous materials.

Cleaning and Maintenance

The following section describes the proper method(s) for cleaning and maintaining your SurgView system.

Note: Never immerse or soak any part of the SurgView or NeedleView system in any liquid, as this can cause significant damage not covered by the warranty.

General cleaning of SurgView and NeedleView system

Use a lightly damp cloth. Wipe down the entire SurgView and NeedleView system except for the LCD touch screen.

Only use a damp cloth on the LCD screens if cellular debris is noted. For routine cleaning, use an optical cloth (a dry, soft, lint-free cloth, preferably a micro-fiber cleaning cloth) that you would typically use on your eyeglasses or TV / monitor.

Periodically clean scope and camera handpiece, cable and C-mount coupler using damp alcohol-soaked cloth.

Allow the system to dry before using it again.

Any blood on the SurgView or NeedleView system can be removed using cotton or gauze soaked in alcohol.
Changing the *SurgView* Line Voltage Level

Verify the SurgView system unit is shipped with the correct voltage displayed on the fuse. If this is not the voltage you require, these steps will show you how to change the voltage.

The fuse is located at the rear of the unit (circled in the photo below).

1. Use a flat screwdriver in the slot at the top of the fuse cover. Gently pry the cover open.
2. Swing cover down to reveal fuse holder. Cover will not detach.
3. Use screwdriver to gently pry the fuse holder out of the unit.
4. Rotate the fuse to reveal the desired voltage.
5. Reinsert the fuse.
6. Close the fuse cover.
7. Ensure that the desired voltage is showing through the cover:
Troubleshooting

**SurgView**

**Unit will not operate, no fans blowing, no light output.**
- Ensure lamp access door is securely closed.
- Ensure that the power entry module switch is in the on position. Reference the photo of the switch.
- Ensure AC power is plugged into wall outlet.

**Fans are blowing but light is not on.**
- Ensure that the Fiber Optic Cable is properly inserted into light source.
- Replace LED module if necessary.

**21” HD medical terminal does not power up**
- Ensure that power cord is connected securely to the DC input of the monitor, use I/O diagram for reference.

**21” HD medical terminal displays no signal message.**
- Ensure that the HDMI cable is connected. If it is not properly connected, you will see a “no signal” message.

**21” HD medical terminal displays a color bar with no video.**
- If the monitor displays a color bar ensure that the camera is plugged in or plugged in all the way. Reference SurgView setup section.

**NeedleView**

**10” NeedleView medical terminal does not power up.**
- Ensure that power cord is connected securely to the DC input of the terminal, use I/O diagram for reference.
- NeedleView medical terminal displays no device found message
- Ensure that the NeedleView cable is connected to the 2.0 USB port. If it is not properly connected or connected to the USB 3.0 port, you will see a “no device found” message.

**NeedleView or SurgView**

**Video image is blurry.**
- Refocus camera by rotating the focus ring to bring image into focus.
- The scope, camera or camera optics may be dirty. Refer to cleaning procedure under Procedure Completion at the beginning of the Maintenance chapter.

**Software not working or not properly working.**
- Exit and restart software application.
- Exit and reboot power to medical terminal.
Appendix A: Warranty and Regulatory Information

Warranty

The Biovision Veterinary Endoscopy capital equipment products, SurgView LED HD 1000 and the NeedleView LD 4000 Systems, and the camera handpieces when delivered to the end user in new condition in the original container, is warranted to be free from defects in material or workmanship for one year from the date of shipment from Biovision Veterinary Endoscopy, LLC. facility in Denver, Colorado to the end user.

The Biovision Veterinary Endoscopy Accessory products, Surgical Endoscopes, Hand tools, and Fiber Optic Cables, when delivered to the end user in new condition in the original container, is warranted to be free from defects in material or workmanship for 90-days from the date of shipment from Biovision Veterinary Endoscopy, LLC. facility in Denver, Colorado to the end user.

Within the above listed time periods, parts that are returned, freight prepaid, to Biovision Veterinary Endoscopy LLC (“Biovision Veterinary Endoscopy or Biovision”) and are determined by Biovision Veterinary Endoscopy to be defective will be repaired or replaced by Biovision Veterinary Endoscopy without charge for parts, labor, or return ground shipping costs. Biovision Veterinary Endoscopy will make every effort to accomplish this repair or replacement within a reasonable time. After the warranty period, you must pay all charges for repair and replacement. This warranty does not cover products intended for single patient use beyond the initial use or consumable items.

The above actions by Biovision Veterinary Endoscopy shall constitute your exclusive remedy and Biovision Veterinary Endoscopy’s sole obligation under this warranty. Biovision Veterinary Endoscopy shall not be responsible for warranty claims made after the warranty period. To obtain warranty repair service, you must contact Biovision Veterinary Endoscopy to obtain a Return Material Authorization (“RMA”) number, then return the product, freight prepaid, to Biovision Veterinary Endoscopy or to a service facility authorized by Biovision Veterinary Endoscopy. The RMA number and a complete explanation of the problem must be included with the product being returned to Biovision Veterinary Endoscopy for warranty service. The product to be repaired must be returned in its original box and packaging, or a similar box and packaging affording an equivalent degree of protection. Upon completion of repairs, Biovision Veterinary Endoscopy will return the product to the end user, freight prepaid.

The warranty period for replacement parts shall begin upon shipment of same, but shall in no event exceed the warranty period of the defective part. Biovision Veterinary Endoscopy shall have no liability or obligation for a product that has been subjected to any of the following: failure caused by or attributable to Acts of God, improper use, abuse, negligent care or handling, accident, faulty installation, improper cleaning, improper maintenance, or other indications of excess voltage. This warranty is also void if the product has been repaired or modified without prior written authorization from Biovision Veterinary Endoscopy, if the end-user has failed to follow the instructions or heed the warnings or specifications in the Operation and User Manual, or if the product’s serial number has been altered or removed.
EXCEPT FOR THE FOREGOING WARRANTIES, BIOVISION VETERINARY ENDOSCOPY HEREBY DISCLAIMS AND EXCLUDES ALL OTHER WARRANTIES, EXPRESS OR IMPLIED, INCLUDING BUT NOT LIMITED TO ANY AND/OR ALL IMPLIED WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE.

BIOVISION VETERINARY ENDOSCOPY HEREBY DISCLAIMS ANY REPRESENTATIONS OR WARRANTY THAT THIS PRODUCT OR ANY OF ITS PARTS IS COMPATIBLE WITH NON-BIOVISION VETERINARY ENDOSCOPY PRODUCTS OTHER THAN VIDEO EQUIPMENT ATTACHED TO ITS VIDEO OUTPUTS, AS DESCRIBED IN THE OPERATOR’S USER MANUAL. THE LIABILITY OF BIOVISION VETERINARY ENDOSCOPY, IF ANY, AND PURCHASER’S SOLE AND EXCLUSIVE REMEDY FOR DAMAGES FOR ANY CLAIM OF ANY KIND WHATSOEVER, REGARDLESS OF THE LEGAL THEORY, SHALL NOT BE GREATER IN AMOUNT THAN THE PURCHASE PRICE OF THE PRODUCT SOLD BY BIOVISION VETERINARY ENDOSCOPY THAT CAUSED ANY ALLEGED DAMAGE. IN NO EVENT SHALL BIOVISION VETERINARY ENDOSCOPY BE LIABLE TO PURCHASER FOR ANY SPECIAL, INDIRECT, INCIDENTAL, OR CONSEQUENTIAL DAMAGES.

Regulatory Compliance

Federal law restricts this device to sale by or on order of a Veterinarian licensed by the law of the state or country in which he practices; to use or order the use of this device. This Device has been designed to comply with all medical IEC60601-1 regulatory requirements but has not been certified by a regulatory body.

- The SurgView LED HD 1000 Visualization System is designed to meet all regulations to be marketed in the United States of America, Canada, and the European Union.
- This device is designed to comply with IEC 60601-1 and all collateral standards.
- This device is designed to comply with part 15 of the FCC rules.
- This device is designed to comply with the Medical Device Directive (Council Directive 93/42/EEC).
- Manufacturer’s Design Guidance - Electromagnetic Emissions (you can use the chart, refer to manual).
- Electromagnetic Design standard (IEC 60601-1-2)
### Manufacturer's Design Specifications - Electromagnetic Emissions

The SurgView™ is intended for use in the electromagnetic environment specified below. The customer or the user of the SurgView™ should assure that it is used in such an environment.

<table>
<thead>
<tr>
<th>Emissions Test</th>
<th>Compliance Level</th>
<th>Electromagnetic Environment - Guidance</th>
</tr>
</thead>
<tbody>
<tr>
<td>RF Emissions</td>
<td>Group 1</td>
<td>The SurgView™ 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.</td>
</tr>
<tr>
<td>CISPR 11</td>
<td></td>
<td></td>
</tr>
<tr>
<td>RF Emissions</td>
<td>Class B</td>
<td>The SurgView™ is suitable for use in all establishments other than domestic and those directly connected to the public low-voltage power supply network that supplies buildings used for domestic purposes.</td>
</tr>
<tr>
<td>CISPR 11</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Harmonic Emissions IEC 61000-3-2</td>
<td>Class A</td>
<td></td>
</tr>
<tr>
<td>Voltage Fluctuations / Flicker Emissions IEC 61000-3-3</td>
<td>Complies</td>
<td></td>
</tr>
</tbody>
</table>

### Manufacturer's Design Specifications - Electromagnetic Immunity

The SurgView™ is intended for use in the electromagnetic environment specified below. The customer or the user of the SurgView™ should assure that it is used in such an environment.

<table>
<thead>
<tr>
<th>Immunity Test</th>
<th>IEC 60601 Test Level</th>
<th>Compliance Level</th>
<th>Electromagnetic Environment - Guidance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Electrostatic Discharge (ESD)</td>
<td>IEC 60601-4-2</td>
<td>+ 6 kV contact</td>
<td>Floors should be wood, concrete or ceramic tile. If floors are covered with synthetic material, the relative humidity should be at least 30%.</td>
</tr>
<tr>
<td>+ 8 kV air</td>
<td>+ 8 kV air</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Electromagnetic Fast</td>
<td>IEC 60601-4-4</td>
<td>+ 2 kV for power supply lines</td>
<td>Mains power quality should be that of a typical commercial or hospital environment.</td>
</tr>
<tr>
<td>Transient/Burst</td>
<td>IEC 60601-4-4</td>
<td>+ 1 kV for input/output lines</td>
<td></td>
</tr>
<tr>
<td>Voltage Dips, short interruptions and voltage variations on power supply input lines</td>
<td>IEC 60601-4-11</td>
<td>30% dip for 5 cycles</td>
<td>Mains power quality should be that of a typical commercial or hospital environment.</td>
</tr>
<tr>
<td>Voltage Dips, short interruptions and voltage variations on power supply input lines</td>
<td>IEC 60601-4-8</td>
<td>100% dip for 5 cycles</td>
<td></td>
</tr>
<tr>
<td>Voltage Dips, short interruptions and voltage variations on power supply input lines</td>
<td>IEC 60601-4-11</td>
<td>70% dip for 5 cycles</td>
<td></td>
</tr>
<tr>
<td>Voltage Dips, short interruptions and voltage variations on power supply input lines</td>
<td>IEC 60601-4-8</td>
<td>40% dip for 5 cycles</td>
<td></td>
</tr>
<tr>
<td>Voltage Dips, short interruptions and voltage variations on power supply input lines</td>
<td>IEC 60601-4-11</td>
<td>5% UT&lt;65% dip in UT for 0.5 cycle</td>
<td></td>
</tr>
<tr>
<td>Voltage Dips, short interruptions and voltage variations on power supply input lines</td>
<td>IEC 60601-4-8</td>
<td>10% UT&lt;65% dip in UT for 5 cycles</td>
<td></td>
</tr>
<tr>
<td>Voltage Dips, short interruptions and voltage variations on power supply input lines</td>
<td>IEC 60601-4-11</td>
<td>10% UT&lt;65% dip in UT for 25 cycles</td>
<td></td>
</tr>
<tr>
<td>Voltage Dips, short interruptions and voltage variations on power supply input lines</td>
<td>IEC 60601-4-8</td>
<td>10% UT&lt;65% dip in UT for 5 sec.</td>
<td></td>
</tr>
<tr>
<td>Power Frequency (50/60Hz) magnetict field</td>
<td>IEC 60601-4-8</td>
<td>100% dip for 5 cycles</td>
<td>Mains power quality should be that of a typical commercial or hospital environment.</td>
</tr>
<tr>
<td>Power Frequency (50/60Hz) magnetict field</td>
<td>IEC 60601-4-8</td>
<td>60% dip for 5 cycles</td>
<td></td>
</tr>
<tr>
<td>Power Frequency (50/60Hz) magnetict field</td>
<td>IEC 60601-4-8</td>
<td>30% dip for 5 cycles</td>
<td></td>
</tr>
<tr>
<td>Power Frequency (50/60Hz) magnetict field</td>
<td>IEC 60601-4-8</td>
<td>100% dip for 5 seconds</td>
<td></td>
</tr>
</tbody>
</table>

NOTE: UT is the ac mains voltage prior to application of the test level.

### Manufacturer's Design Specifications - Electromagnetic Immunity

The SurgView™ is intended for use in the electromagnetic environment specified below. The customer or the user of the SurgView™ should assure that it is used in such an environment.

<table>
<thead>
<tr>
<th>Immunity Test</th>
<th>IEC 60601 Test Level</th>
<th>Compliance Level</th>
<th>Electromagnetic Environment - Guidance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Conducted RF</td>
<td>3 V rms</td>
<td>10 V rms</td>
<td>Portable and mobile RF communications equipment should be used no closer to any part of the SurgView™ including cables, than the recommended separation distance calculated from the equation applicable to the frequency of the transmitter. Recommended separation distance</td>
</tr>
<tr>
<td>IEC 61000-4-8</td>
<td>150 kHz to 80 MHz outside of ISM bands</td>
<td></td>
<td>$d = (3.53) \times P$</td>
</tr>
<tr>
<td>Radiated RF</td>
<td>10 V/m</td>
<td>10 V/m</td>
<td>$d = (3.53) \times P \times 80 \text{ MHz to } 800 \text{ MHz}$</td>
</tr>
<tr>
<td>IEC 61000-4-3</td>
<td>150 kHz to 80 MHz in ISM bands</td>
<td></td>
<td>$d = (7.5) \times P \times 800 \text{ MHz to } 2.5 \text{ GHz}$</td>
</tr>
<tr>
<td></td>
<td>80 MHz to 2.5 GHz</td>
<td></td>
<td>Where P is the maximum output power rating of the transmitter in watts (W) according to the transmitter manufacturer and d is the recommended separation distance in meters (m). Field strengths from fixed RF transmitters, as determined by an electromagnetic site survey, should be less than the compliance level in each frequency range.</td>
</tr>
</tbody>
</table>

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.

### Recommended separation distances between portable and mobile RF communications equipment and the SurgView™

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

<table>
<thead>
<tr>
<th>Rated maximum output power of transmitter (W)</th>
<th>Separation distance according to frequency of transmitter</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.01</td>
<td>0.035 0.035 0.07</td>
</tr>
<tr>
<td>0.1</td>
<td>0.11 0.11 0.22</td>
</tr>
<tr>
<td>1</td>
<td>0.35 0.35 0.7</td>
</tr>
<tr>
<td>10</td>
<td>1.12 1.12 2.21</td>
</tr>
<tr>
<td>100</td>
<td>3.5 3.5 7</td>
</tr>
</tbody>
</table>

For transmitters rated at a maximum output power not listed above, the recommended separation distance 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 80 MHz and 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.