After Disabling an Instrument Arm

After you disable an instrument arm, you still can use the arm clutch and port clutch buttons to move the arm out of the way.

Disabling the Instrument Control Box (ICB)

In the event of an error specific to the ICB, the system presents the option to disable the ICB on the touchscreen and touchpad. Once the ICB has been disabled, it can not be re-enabled until the next power cycle. *Intuitive Surgical* designed this feature to allow a user to complete a procedure without use of the *EndoWrist* instruments that employ the ICB, such as the Vessel Sealer.

Non-Recoverable Faults

If a fault is non-recoverable, the system must be restarted. The following message is displayed:

Non-recoverable fault: XXXX

Restart System to continue.

Restarting the System During a Procedure

If a non-recoverable fault occurs during a procedure, you must completely remove all instruments from the system. The endoscope does not need to be removed. Follow these steps to restart the system:

1. Completely remove all instruments from the system. The endoscope does not need to be removed. If an instrument is grasping tissue, follow the grip release instructions in Chapter 9, Grip Release, on page 9-13.

WARNING: If it is not clinically possible to remove an instrument, closely monitor the instrument arm during restart to ensure that no motion occurs.

2. Power off the system: Press the **Power** button on any system component.

   The system takes several seconds to shut down. When complete, all system **Power** buttons will be lit amber, indicating standby mode, and readiness for restart.
3. Restart the system: Press the **Power** button on any system component.
4. After the system has restarted successfully, then the instruments can be reinserted.

Note: During system restart, video is temporarily unavailable at the Surgeon Console viewer and touchscreen monitor.

Note: If the fault cannot be cleared by a system restart, call *Intuitive Surgical* Technical Support.

Emergency Stop

Press the red **Emergency Stop** button should it be necessary to stop system operation at any time. The **Emergency Stop** button will cease robotic control of the instruments and endoscope. The instruments and endoscope will stay in their last commanded position.

If the instrument grips are closed when the **Emergency Stop** button is pressed, the grips will remain closed. However, the gripping force of the instrument may decrease.

Pressing **Emergency Stop** initiates a recoverable fault, which you can override by pressing Recover on the touchscreen or touchpad. The **Emergency Stop** button illuminates when pressed and remains illuminated until the fault is recovered.

EPO (Emergency Power Off)

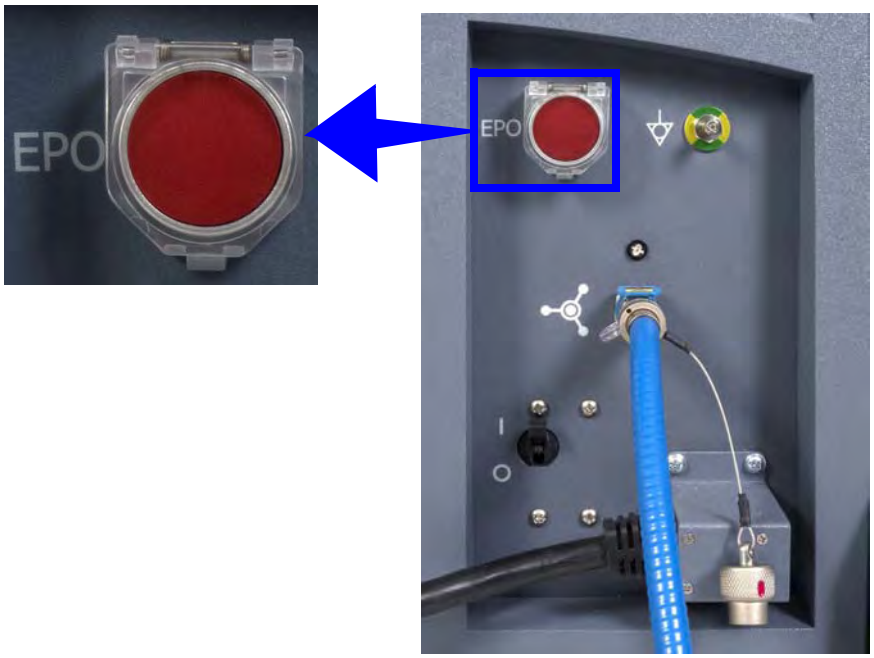


Figure A.3 EPO button on rear of Patient Cart

The **Emergency Power Off (EPO)** button is on the back of the Patient Cart. Press this button to completely remove power to the Patient Cart. The system classifies this a non-recoverable fault. The system must be restarted.

Battery Backup

Should the Patient Cart be unplugged, the system will generate a recoverable fault that must be addressed to continue a procedure. System operation will be allowed to continue on reserve power, but with basic functionality only.

Note: Battery backup is only intended for safe removal of the system components from the patient and is not intended for continuing the procedure.

Battery Low Condition

If there is insufficient battery backup power on the Patient Cart, cart drive is disabled and the user will have to wait for the battery backup to charge.

- To move the cart manually, move the shift switches on the base of the cart to the neutral position. When finished moving the cart, be sure to move the shift switches back to the drive position.

Note: The backup battery is not user-serviceable, and must be replaced by authorized personnel only. Contact *Intuitive Surgical* Technical Support for details.

Note: The Patient Cart battery should be adequately charged. If not, an error message appears on the monitors. You can override the error if the Patient Cart is plugged into AC power.

A.3 Conversion to Open Surgery

If a situation arises where a conversion to open surgery is required, perform the following steps to remove the system from the patient:

1. Remove the instruments and endoscope from the patient. Note the following:

Note: Whenever possible, use Surgeon Console control to release the instrument grips.

   a. In case of system failure while the instrument is grasping tissue, the grips can be manually opened by following the grip release instructions, see Grip Release on page 9-13 (Chapter 9, Patient Cart Use).

WARNING: Do not perform grip release on a non-faulted system without first pressing the Emergency Stop button. Failure to observe this warning may result in unintended instrument motion or damage to the grip release mechanism.

WARNING: Rotating the grip release tool too far and/or in the incorrect direction can cause unintended instrument motion or damage to the grip release mechanism.

2. Disconnect the cannulae from the instrument and camera arms.
3. Move the instrument and camera arms away from the patient.

Note: If the system is in a fault state while converting to open surgery, the Patient Cart will still allow use of the port clutch buttons. If the system loses all power, the arms and setup joints may be overpowered to move the arms as necessary.

End of section

B Appendix B: *da Vinci Si-e* Surgical System

This appendix provides detailed information and specifications for the *da Vinci Si-e* Surgical System, an upgradable configuration of the *da Vinci Si* System, visibly distinguished by a 3-arm Patient Cart. The *da Vinci Si-e* System is designed to be upgradable anytime to a full-featured *da Vinci Si* System (single or dual console) – by *Intuitive Surgical* technicians. This section describes the characteristics that distinguish it from the *da Vinci Si* System.

B.1 System Component Compatibility

The *da Vinci Si-e* System uses the same Surgeon Console, which is interchangeable with any *da Vinci Si* System. In contrast, the 3-arm Patient Cart and the Vision Cart of the *da Vinci Si-e* System are *not* interchangeable with the 4-arm Patient Cart and Vision Cart of a *da Vinci Si* System; the specific *da Vinci Si-e* System components must be used together for the *da Vinci Si-e* System to work. The system software recognizes when you connect an incompatible combination of Patient Cart and Vision Cart, notifies you on screen and prevents use of the disallowed combination.

Note: The *da Vinci Si-e* System does not support dual console surgery.

Use of Third-Party Monitors

The *da Vinci Si-e* System supports use of external monitors in high definition or standard definition, by means of the standard video out connectors on the back of the Core, the Surgeon Console, and the Camera Control Unit (CCU). The table below describes the available video output options on the back of the Core. These are not user-configurable: you cannot select the video output format of the Video Out bay Aux connectors (back of the Core). The *da Vinci Si-e* System selects the appropriate output format based on the device connected to the Aux connector. See section 4.5 Video and Audio Connections and section H.5 Video Patch Panels for more details.

Table B-1 *Si-e* Video Connections

Component	Connector Output Format	Resolution	Overlay
Video Out bay Aux, back of Core	DVI (analog and digital)	XGA, SXGA, WXGA+ or 720p, automatically configured	Surgeon's view
	Composite (analog)	NTSC or PAL[a]	Surgeon's view
	S-Video (analog)	NTSC or PAL[a]	Surgeon's view
	SD-SDI (digital)	NTSC or PAL[a]	Surgeon's view

a. NTSC or PAL is standard definition and is determined by country.

The **Video Out** bay **Aux** supports only one video format at a time.

Note: Video outputs make available only the surgeon's view overlays. No external monitor used with the *da Vinci Si-e* System can support the touchscreen overlays nor functionality of the *da Vinci Si* System.

Note: If the system has *OnSite* installed, the *OnSite* status icons will be present on the Vision Cart monitor even though the touchscreen function is not available. All other *OnSite* features are supported on the *Si-e* System.

B.2 *da Vinci Si-e* Differences

Users of the *da Vinci Si-e* System should note the following differences in features and behavior compared to the *da Vinci Si* System.

Two Instrument Arms

The *da Vinci Si-e* System has only two instrument arms, as reflected on the touchpad display:

Figure B.1 Two instrument arms appear on touchpad

Audio System

Since the monitor includes a microphone and speakers, it provides support for two-way audio communication between the surgeon and patient-side assistant. For the *da Vinci Si-e* System, the volume control slider for the Vision Cart speakers is found on the **Audio** tab of the touchpad, to the right of the Surgeon Console speaker control. Note that there is no microphone mute button; to mute the microphone, drag the slider all the way to the left, as shown.

Figure B.2 Speaker volume control is on touchpad Audio tab

TilePro Not Available

TilePro (multi-image) mode is not available with the *da Vinci Si-e* System, and thus the option is not present on the Display Preferences screen of the touchpad.

Figure B.3 TilePro not present

Furthermore, the QuickClick option for *TilePro* activation is not offered on the touchpad Control Preferences screen.

Figure B.4 TilePro QuickClick option not present

Telestration Not Available

Since telestration is done on the touchscreen, telestration is not possible with the *da Vinci Si-e* System. However, note that the selected **Display Eye** option on the Display Preferences screen (Figure B.3) does still determine whether the surgeon's left (**L**) or right (**R**) eye image from the stereo viewer passes out of the video connectors of the Core's **Video Out** bay **Aux**.

Camera / Scope Setup via Touchpad Only

On the *Si-e* System, no touchscreen dictates that camera / scope setup must be done via the touchpad. This circumstance also requires two people to perform calibration: one sterile person to handle the endoscope and a second non-sterile person to work the touchpad at the Surgeon Console.

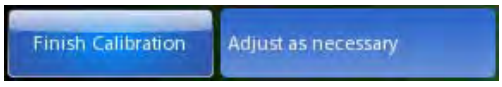
Figure B.5 Camera / Scope Setup on the touchpad

Follow these steps to calibrate the endoscope assembly from the touchpad of a *da Vinci Si-e* System:

1. The sterile person should insert the endoscope tip fully inside the endoscope alignment target, using the proper hole, which depends on the tip angle, so that the target crosshairs are visible on the center of the stereo viewer.

Note: For 3D calibration to be successful, the crosshairs must be well centered on screen and the target must be kept as still as possible on the endoscope.

2. The non-sterile person at the touchpad: From the **Video** tab, go to **Camera / Scope Setup** and then touch the **3D Calibration** button. The button name changes to **Finish Calibration** and **"Adjust as necessary"** appears next to it, and the button and all arrow buttons flash to prompt your input.



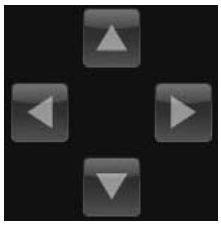
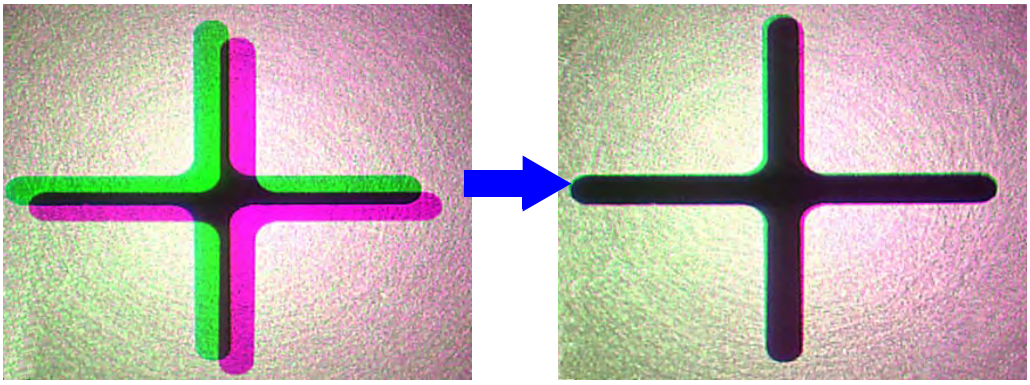
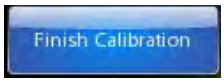


Figure B.6 3D Calibration in progress

3. Touch the arrows on the touchpad to move the green crosshairs until aligned with the magenta crosshairs, as seen in the stereo viewer.





4. **To save the calibration setting and exit calibration mode**, **touch Finish Calibration.**

3D Calibration and Camera Head Button Functionality

For the *da Vinci Si-e* System, the camera head buttons do not support 3D calibration. Without a touchscreen, you must perform 3D calibration from the touchpad, as described above. The **Vision Setup** button, in particular, supports no functionality at all; when you press it the system gives an error beep, but does not display a message. Nothing happens except the error beep. The **Focus In** and **Out** arrow buttons still support focusing of the surgical image from the camera head, and the **Lamp On/Off** button still functions.

End of section

C Appendix C: Illuminator Information

This appendix provides detailed information and specifications for the integrated Illuminator, also known as the Y1903 Xenon Fiber-Optic Light Source.

C.1 General Safety Precautions

Before operating, read all safety instructions. See Endoscopic Procedure Precautions on page 10 for additional safety instructions regarding use of the Illuminator. The Illuminator is a source of high electrical voltage, intense light and heat. When used properly and with normal precautions, it is a safe and effective light source.

CAUTION:

Third party light guides may not withstand light output levels of this light source.

Do not operate the light source without lamp module in place.

Disconnect power supply cord before servicing to avoid electric shock.

To reduce risk of electric shock, do not remove cover. Refer servicing to *Intuitive Surgical* personnel.

CAUTION HOT. Do not remove lamp immediately after operation. Allow lamp to cool 5 minutes with fans running before removing power to the Illuminator.

The end of the light guide may be hot.

Keep cooling vents free from obstructions.

To prevent overheating, replace only with the same type and rating of lamp module. Read instructions before replacing lamp module. (See 12.3 Illuminator Lamp Module Replacement on page 12-2.)

The following label appears on the side of the lamp module above the removal handle.

Note: It may be necessary for the reader to be as close as 6 in (15 cm) from the label to read this information.

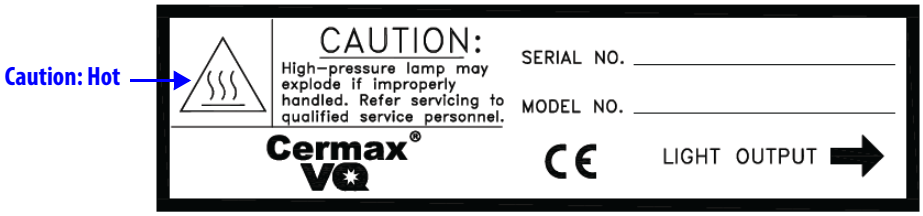


Figure C.1 Lamp module label

Observe the caution statement on the label: "CAUTION: High-pressure lamp may explode if improperly handled. Refer servicing to qualified service personnel."

The label provides space to indicate the "SERIAL NO." and "MODEL NO." of the lamp module. "LIGHT OUTPUT ➡ " indicates that the lamp light emits from the side indicated by the arrow.

Refer to Figure 12.2 on page 12-4 to see an image of the lamp module replacement label affixed to the top of the lamp module.

C.2 Illuminator Features

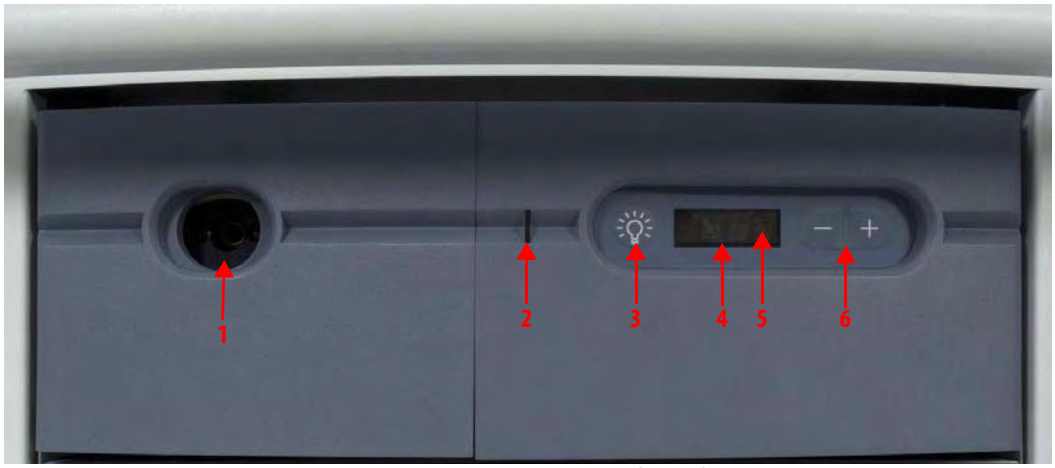


Figure C.2 Illuminator front features

1. **Optic Adapter:** Accepts Olympus™ fiber-optic light cables.
2. **LED Indicator:** Shows the lamp status. Amber: Lamp off; Blue: Lamp on; Blue blinking: No scope selected or detected.
3. **Lamp On/Off Switch:** Toggles the lamp on/off once the system has been powered up. This button switch on the front panel is symbolized by an incandescent lamp. When pushed, the blue **"OFF"** flashes on the display until lamp ignition occurs.
4. **Display Window:** Displays light output level from 0-100 in 10% increments when lamp is on, and will read OFF when lamp is off.
5. **Lamp Hours:** Displays number of usage hours on the lamp module. To read the lamp hours, press the decrease (**–**) and increase (**+**) buttons simultaneously, and read the number displayed on the display window. You may also view lamp hours by selecting **Utilities** > **Inventory Management** on the touchscreen or touchpad, as described in sections 7.2 and 10.3.
6. **Intensity Control (– +):** Control buttons to increase or decrease light output levels in 10% increments.

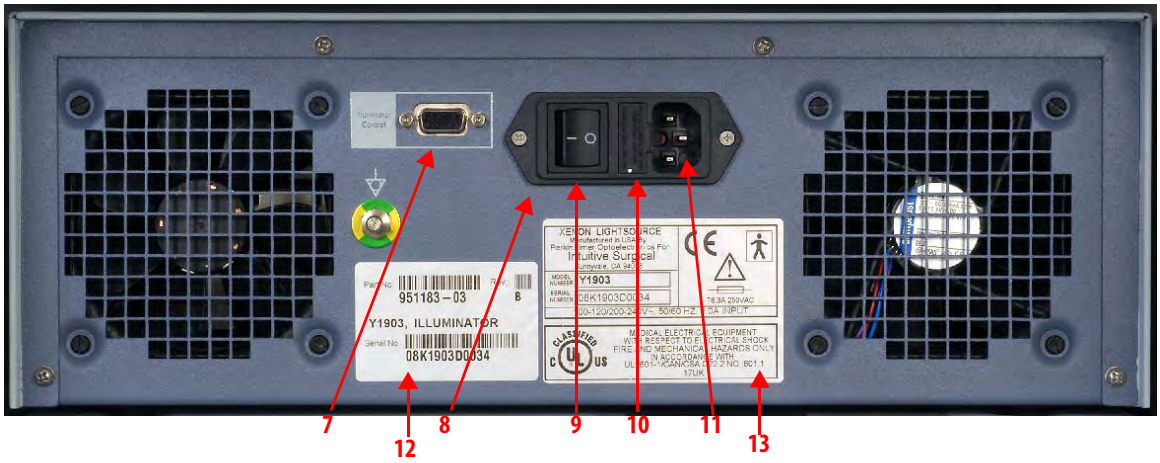


Figure C.3 Illuminator rear features

7. **RS232 I/O Serial Port:** 9-pin D Sub-Miniature interface for RS232 control features. Labeled "Illuminator Control."
8. **Input Power Module:** Consists of the Power On/Off switch, fuse drawer, and AC input power receptacle.
9. **Power On/Off Switch:** The Power On/Off Switch is located on the back panel. When switched ON, the system is energized and initiates standby mode, while the LED indicator (on front) illuminates amber. In addition, the cooling fans run, and the display reads OFF. When switched OFF, the system is de-energized, the LED indicator (on front) is not illuminated, and the display is dark. Energizing the system does not automatically turn the lamp on.
10. **Fuse Drawer:** The fuse drawer is located on the back panel beside the AC input power receptacle. The fuse drawer contains two 6.3 amps main fuses.
11. **AC Input Power Receptacle:** The AC input power receptacle, located on the back panel, is a three-prong receptacle that accepts a detachable AC power cord.
12. **Unit Identifier Label**
13. **Light Source Label:** Shown below.

Note: It may be necessary for the reader to be as close as 6 in (15 cm) from the label to read this information.

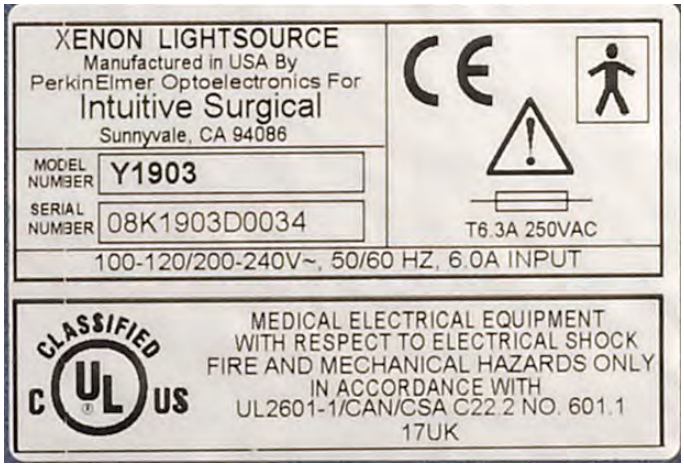


Figure C.4 Light source label example

14. **Lamp Module Access Drawer:** Allows service technician access to the lamp module for replacement. (See 12.3 Illuminator Lamp Module Replacement on page 12-2.) By pushing in on the drawer, the latch mechanism will release, and the drawer will slide forward. To close the drawer, push it in until the latch catches.

Figure C.5 Lamp module access drawer open

C.3 Basic Troubleshooting

Table C-1 Basic Troubleshooting

Symptom	Possible Problems	Remedy
No power to Illuminator	• Vision Cart not connected or not powered on. • Fuse is blown. • Internal power supply not operating. • AC input power receptacle unplugged.	• Connect and power on system. • Replace fuse. • Contact *Intuitive Surgical* Technical Support.
No light emits from unit	• Lamp module access drawer open. • Lamp burned out. • Internal power supply not operating. • Fiber-optic cable not connected.	• Close drawer. • Replace lamp module. • Contact *Intuitive Surgical* Technical Support. • Connect fiber-optic cable correctly.
Lamp flickers or dims	Lamp is getting old.	Replace lamp module.
Field of view is dim	Incorrect settings.	Adjust Brightness controls
Illuminator turns off after a few minutes of operation.	• Obstructed air intake leads to overheating, causes thermal switch to trip. • Fan not running; overheating causes thermal switch to trip.	• Allow unit to cool 10 minutes. Remove obstructions. • Contact *Intuitive Surgical* Technical Support.

C.4 Fuse Replacement

1. Switch power off on the back of the Illuminator and remove the power cord from the back of the Illuminator.
2. Check for blown fuses by removing the fuse cover, located next to the three-prong power receptacle. Carefully pull out the cover using a flat blade screwdriver (medium size) or equivalent, as shown in Figure C.6.

Figure C.6 Remove fuse cover

3. Replace blown fuse(s) with the same size and rating: 6.3A time delay: T6.3A fuses, size 5x20mm.

4. Re-install the fuse cover.
5. Reconnect the power cord
6. On the back of the Illuminator, turn the power switch on. The Illuminator should be operative again.

Contact *Intuitive Surgical* Technical Support if the unit fails to operate properly again.

C.5 Specifications of Y1903 Light Source

Note: The specifications in this section apply to the Y1903 Illuminator only and not the *da Vinci Si* System.

Table C-2 Y1903 Light Source Specifications

Category	Specification	Comments
Electrical Input		
Input Voltage	100 - 240 VAC, 50/60Hz universal, 6.0A input	
AC Power Connector	Located on rear panel, dual fuses	
Line Cord	IEC320, 6' (1.83m), configured for locale	
Performance and Features		
Light Output	• 2450 Lumens nominal initial output using Olympus™ fiber. • Spectral output 386 - 733nm nominal • <10% instability p-p through 6 mm glass rod @ 0-100Hz • Beam profile to have "smooth" distribution with no shadows or sharp peaks	All light output specifications refer to "system only" performance. Light output via optical fibers or other optical components may vary.
Over-temperature Protection	Automatic shutdown in the event of overheating	
Overheat Recovery / Auto Cool	Unit to become fully operational <3 minutes (target) after thermal shutdown and all obstructions to air flow removed at environmental temperature of <22 °C (72 °F)	Fans will remain on in the event of thermal shutdown when power is on. Lamp must be switched on by using **Lamp On/Off** switch located on front panel.
Fiber-Optic Connection Safety Feature	• Lamp will not ignite unless a fiber-optic cable is fully inserted into the active port on the turret • Lamp power is cut or blocked if fiber-optic cable is removed from active port to prevent accidental light leakage	Fans will remain on in the absence of a fiber-optic cable inserted into active port when power is on
Lamp Power Supply	PS300-12 type	
Lamp Module	Cermax VQ (300 Watt)	*Intuitive Surgical* PN 950093
Lamp Module Replacement	By easy access to lamp module via drawer. No tools required.	Lamp replacement drawer "interlocked" for safety. Lamp power will be cut when drawer is opened
Lamp Life	• 1000 hours to 50% of initial output specification measured through 6 mm glass rod • >1000 hours at a minimum output of 1225 Lumens	

Table C-2 Y1903 Light Source Specifications

Category	Specification	Comments
User Interface / Control		
User instructions	In this system user manual	
Lamp On/Off Switch	Located on front panel	User controlled lamp on/off. Fan operation independent of lamp status.
Fiber-Optic Adapter	Olympus™ port to fit Olympus fiber	
Light Attenuation Shutter	• Controlled by membrane buttons on front panel • **(+)** and **(–)** buttons for relative intensity increments • Relative level of illumination indicated by a digital numeric display (blue numerals)	
Lamp Hour Counter	Displays number of elapsed hours of lamp operation when you press **(+)** and **(–)** buttons at same time	
Mechanical & Environmental		
Dimensions	Height 5.5" (Without Feet) x Width 15.5" x Depth ≤17" (without front bezel) (14 x 39.4 x 43.2cm)	Designed for modular expansion
Weight	≤28 lbs.	
Touch Temperature	Per UL60601 -1	
Ground Bound	Per UL60601 –1	
Sterilization	The light source may be wiped-down with hospital approved disinfectants (for example, 10% bleach + 90% water solution) applied with a damp cloth (must not be wet)	
Operating Temperature	6 °C to 35 °C	
Storage Temperature	–20 °C to 75 °C	
Operating & Storage Humidity	10 - 80% relative humidity, non-condensing	
Operating Pressure	1 Atmosphere	
Audible Noise	≤ 40dB	
Shipping, Shock & Vibration	per ISTA 3A	
Cooling	Vents to direct airflow toward the back of the unit	
Regulatory Approvals		
Compliance to standards	• IEC 60601-1:1988+A1:1991+A2:1995+A1.3:1997 • UL 60601-1:2003 • EN 60601-1:1990+A1:1993+A2:1995+A1.3:1997 • EN 60601-1-2:2001 • CAN / CSA C22.2 No. 601.1/M90(R1997),B/98,S1-94 • ANSI/AAMI ES60601-1: 2005 • CAN/CSA-22.2 No. 60601-1 (2008) • EN 60601-1-2: 2007 • CE mark	

C.6 Classification of the Y1903 Light Source

- Class I: The light source relies on connection to the protective earth conductor to prevent shock hazards.
- Type BF: The Y1903 light source is classified as a BF equipment. The optic adapter is grounded and only BF or CF applied parts should be used with the Y1903.

Note: The *da Vinci Si* camera head provides isolation in accordance with a CF applied part and is acceptable for use with the Y1903 Illuminator.

- Provides no protection against ingress of liquids.
- Mode of Operation: Suitable for continuous operation.
- Not suitable for use in the presence of a flammable anaesthetic mixture with air or with oxygen or with nitrous oxide.

C.7 Electromagnetic Compatibility

The Y1903 has been tested and found to comply with the limits for medical devices to the IEC 60601-1-2:2001(E). These limits are designed to provide reasonable protection against harmful interference in a typical medical installation. The Y1903 generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to other devices in the vicinity. However, there is no guarantee that interference will not occur in a particular installation. It can be determined if this equipment causes interference by turning the power to the light source off and on. The user is encouraged to try to alleviate interference problems by one or more of the following measures:

- Re-orient or relocate the receiving device
- Increase the separation between the equipment.
- Connect the equipment into an outlet on a separate electrical circuit from that of other devices.

Warnings

- AC power cords other than those provided with the instrument may result in increased emissions or decreased immunity.
- The Y1903 should not be used adjacent to or stacked with other equipment. However, if adjacent or stacked use is necessary, the Y1903 should be observed to verify normal operation in the configuration in which it is used.

Manufacturer's declaration – electromagnetic immunity			
The Y1903 is intended for use in the electromagnetic environment specified below. The customer or the user of the Y1903 should assure that it is used in such an environment.			
Immunity Test	**IEC 60601 Test Level**	**Compliance Level**	**Electromagnetic Environment Guidance**
Electrostatic discharge (ESD) IEC 61000-4-2	±6 kV contact ±8 kV air	Complies	Floors should be wood, concrete or ceramic tile. If floors are covered with synthetic material, the relative humidity should be at least 30%.
Electrical fast transient/burst IEC 61000-4-4	±2 kV for power supply lines ±1 kV for input/ output lines	Complies	Mains power quality should be that of a typical commercial or hospital environment.
Surge IEC 61000-4-5	±1 kV line(s) to line(s) ±2 kV line(s) to earth	Complies	Mains power quality should be that of a typical commercial or hospital environment.
Voltage dips, short interruptions and voltage variations on power supply input lines IEC 61000-4-11	<5% UT (>95% dip in UT) for 0.5 cycle 40% UT (60% dip in UT) for 5 cycles 70% UT (30% dip in UT) for 25 cycles <5% UT (>95% dip in UT) for 5 sec.	Complies	Mains power quality should be that of a typical commercial or hospital environment. If the user of the Y1903 requires continued operation during power mains interruptions, it is recommended that the Y1903 be powered from an uninterruptible power supply or battery.
Power frequency (50/60 Hz) magnetic field IEC 61000-4-8	3 A/m	Complies	Power frequency magnetic fields should be at levels characteristic of a typical location in a typical commercial or hospital environment.
Note: UT is the AC mains voltage before application of the test level.			

Manufacturer's Declaration – Electromagnetic Emissions		
The Y1903 is intended for use in the electromagnetic environment specified below. The customer or the user of the Y1903 should assure that it is used in such an environment.		
Emissions test	**Compliance**	**Electromagnetic environment guidance**
RF emissions CISPR 11	Group 1	The Y1903 uses RF energy only for its internal function. Therefore, its RF emissions are very low and are not likely to cause any interference in nearby electronic equipment.
RF emissions CISPR 11	Class B	The Y1903 is suitable for use in all establishments, including domestic and those directly connected to the public low-voltage power supply network that supplies buildings used for domestic purposes.
Harmonic emissions IEC 61000-3-2	Class B	
Voltage fluctuations/ flicker emissions IEC 61000-3-3	Complies	

End of section

D Appendix D: *VisionBoom*™ Use Instructions

This appendix provides instructions to use the *da Vinci Si* Surgical System installed in the *VisionBoom* configuration. Integrators seeking installation instructions should refer to the *VisionBoom*™ Installation Guide (PN 550539).

Note: This appendix provides only those instructions specific to the *VisionBoom* configuration. Refer to relevant portions of this manual for instructions to use the surgical system.

The *da Vinci Si VisionBoom* configuration eliminates clutter and improves efficiency in operating room (OR) surgical environments by replacing the *da Vinci* Vision Cart, and its associated cords and cables, with a convenient ceiling-mounted system.

Figure D.1 Recommended side by side (left) and stacked (right) VisionBoom configurations

Note: The *VisionBoom* upgrade supports dual console surgery.

The ceiling-mounted equipment boom is the primary platform for OR integration and, depending on the model selected, the typical boom can provide the support and space to position most necessary clinical devices. The equipment boom is not a product sold by ISI but by manufacturers such as Berchtold™, Steris™, Skytron™, etc., to name just a few vendors that sell such equipment.

D.1 General Notes and Cautions

Note:

- **Air flow sufficient to support adequate cooling of *da Vinci* vision components is critical to their proper function. The entire *da Vinci System* is designed to undergo an automatic, controlled power-down sequence in case a component or subsystem overheats while in normal operating mode, thereby preventing system damage. (See Chapter 5 Startup for details.) To avoid overheating, do not place anything on or near any *da Vinci* vision component on the boom, especially if it might impede air flow. Do not route cables behind the Illuminator on the boom shelf, to avoid blocking air flow behind it.**
- **ISI recommends that the boom be oriented during surgery so that air flow from the components is directed away from the sterile field.**
- **ISI recommends that *da Vinci* vision components be left permanently in the configuration in which they are transferred to the boom by ISI service personnel. Rearrangement of *da Vinci* vision components could result in a configuration that does not support adequate cooling or otherwise may result in an increased risk of damage to or improper function of the components.**
- ***da Vinci* vision components are not designed to support external loads, and therefore ISI discourages placement of any equipment on top of *da Vinci* vision components mounted on the boom shelf.**

CAUTION: **To avoid overloading circuits, do not connect ancillary devices such as insufflators or energy devices in common circuits with any system component, particularly not with the vision components because they have large power requirements. Ancillary devices must be connected to boom outlets on separate circuits from all system components.**

CAUTION: **After a few minutes of use, the rear of *da Vinci* vision components may become hot, particularly the Illuminator. Avoid touching the rear of these units during use and for 10 minutes after use while components cool with internal fan operation.**

D.2 *da Vinci Si* System Connections

In a *VisionBoom* configuration, Surgeon Consoles and the Patient Cart connect to the Core via fiber interface wall plates. These wall plates connect via cabling inside the wall that terminates in the fiber boom plates, which connect via their blue cables (1 m) directly to the back of the Core. Surgeon Consoles and the Patient Cart can connect to any *da Vinci* wall plate in the room. The Core recognizes the units connected to its fiber input ports automatically. Figure D.2 illustrates how the system connections are made.

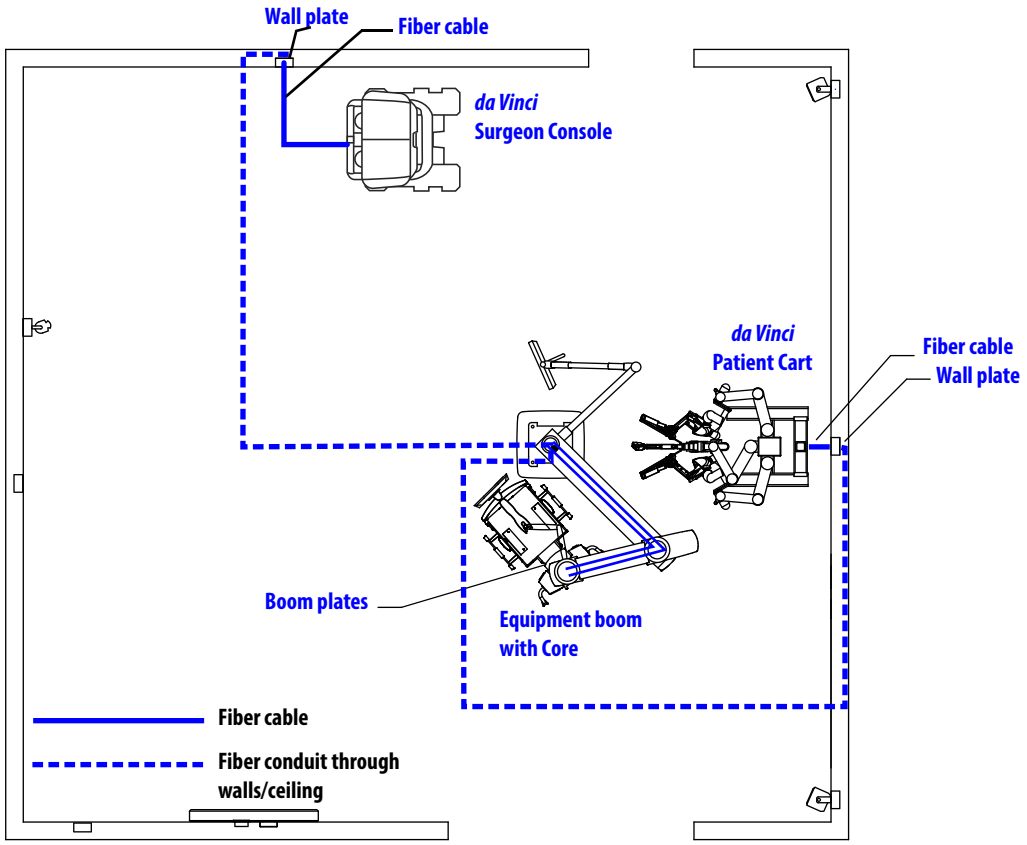


Figure D.2 Fiber cables and conduits connect Core to Patient Cart and Surgeon Consoles

Figure D.3 shows where to find the fiber optic cable connectors on the rear of the Patient Cart and Surgeon Console.

Figure D.3 Fiber connectors on Patient Cart and Surgeon Console

Connecting the Fiber Cables

Note: The connections on the back of the Core (in Step 4: Connect Core, page 5) generally are made only once and left connected unless the Core is removed from the boom.

Follow these steps to connect the Patient Cart and one or two Surgeon Consoles to the Core in the *VisionBoom* configuration.

Step 1: Remove Cap

Before connecting the blue *da Vinci Si* fiber cables, pull to remove the protective cap at each end of the cable (Figure D.4). Note the position of the red alignment mark on the uncapped cable end, which you must align with a similar mark on the fiber cable port for successful insertion.

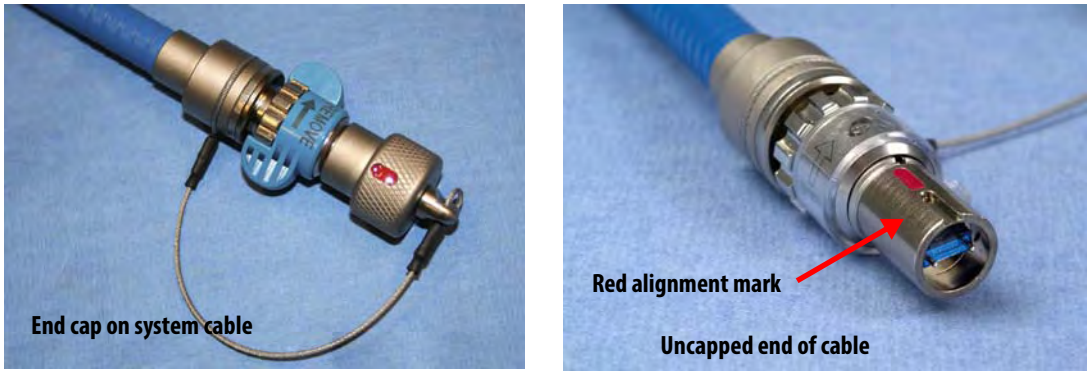


Figure D.4 Remove the cable end cap

Step 2: Connect Patient Cart

Connect a blue fiber cable (20 m) to the back of the Patient Cart (Figure D.5) and to the desired fiber interface wall plate (Figure D.6). When lit solid blue, the LED above the fiber port indicates a good connection to the Core. (It will not light blue until you complete the connection from the boom plate to the Core – see Step 4: Connect Core, page 5.)

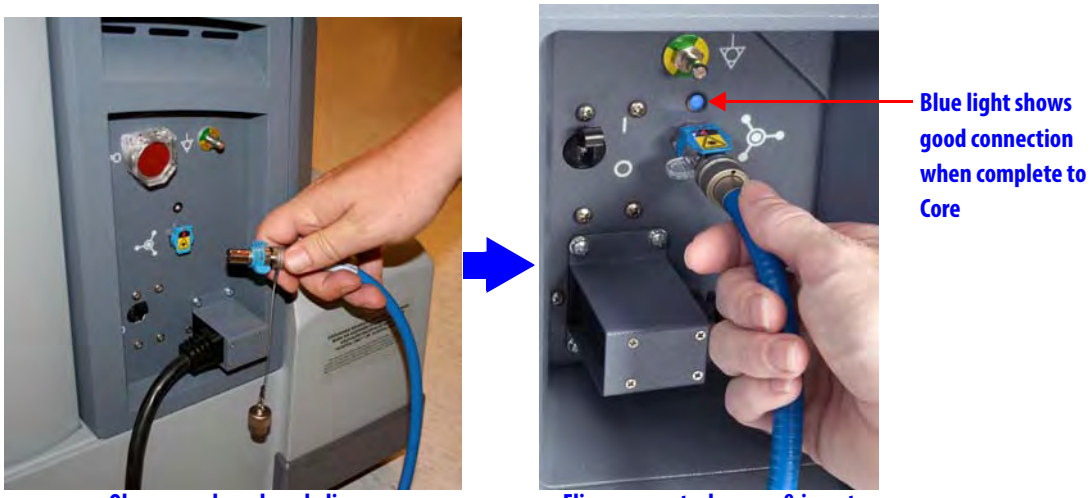


Figure D.5 Connect fiber cable to Patient Cart

Figure D.6 Connect other end of fiber cable to fiber wall plate

Step 3: Connect Surgeon Consoles

For each Surgeon Console you will use, connect a fiber cable to the fiber connector on the back of the console (Figure D.7) and to an available fiber wall plate (as in Figure D.6). Again, a blue LED indicates a good connection to the Core when connections in next step are complete.

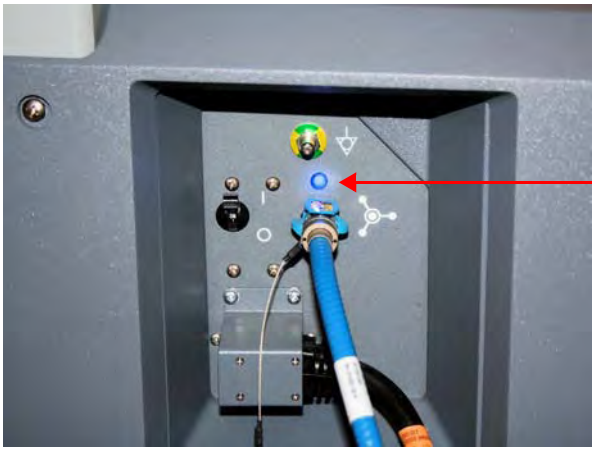


Figure D.7 Connect fiber cables to each Surgeon Console

Step 4: Connect Core

Connect each 1 m (3'-3") cable being used from its boom plate to the back of the Core to complete the connections for each Surgeon Console and the Patient Cart (Figure D.8).

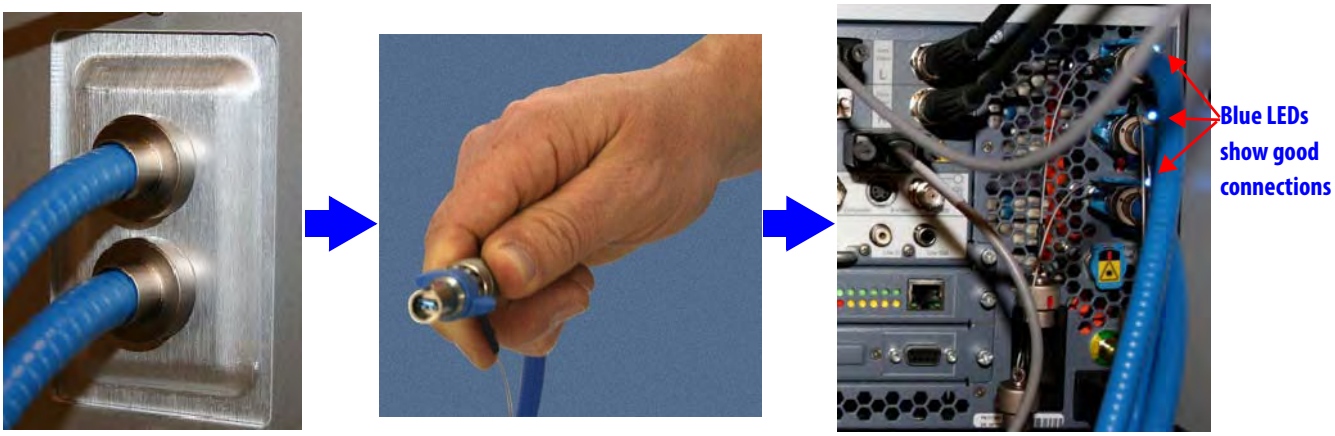


Figure D.8 Connect the boom plate fiber cables to the Core on the boom

Note: If, after connecting all cables as shown in steps 1 through 4, you still do not have a good connection (no blue light) connect the long (20 m) blue fiber cables directly to the core. These blue fiber cables are of sufficient length (20 m) to bypass the wall cabling and connect directly to the core from the surgeon console and patient cart, as illustrated in Figure D.9 below.

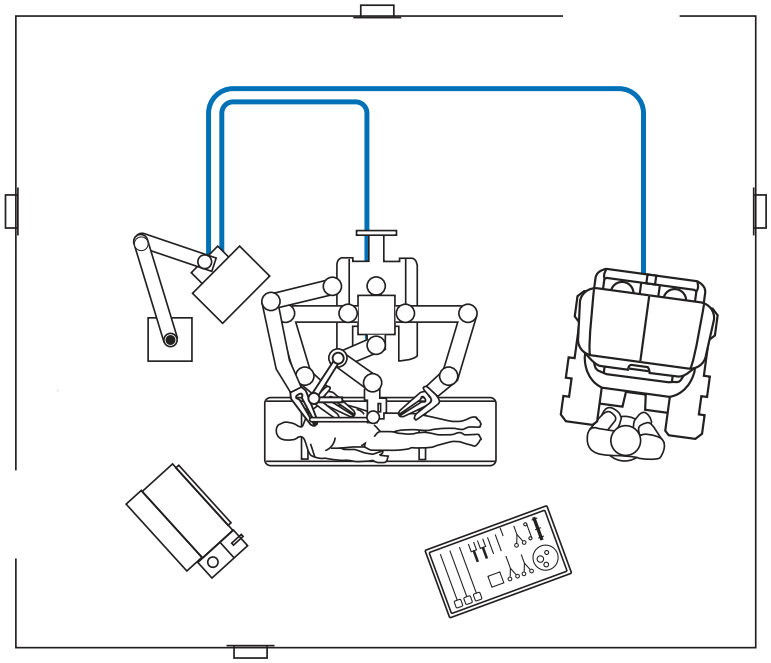


Figure D.9 Bypassing wall cabling

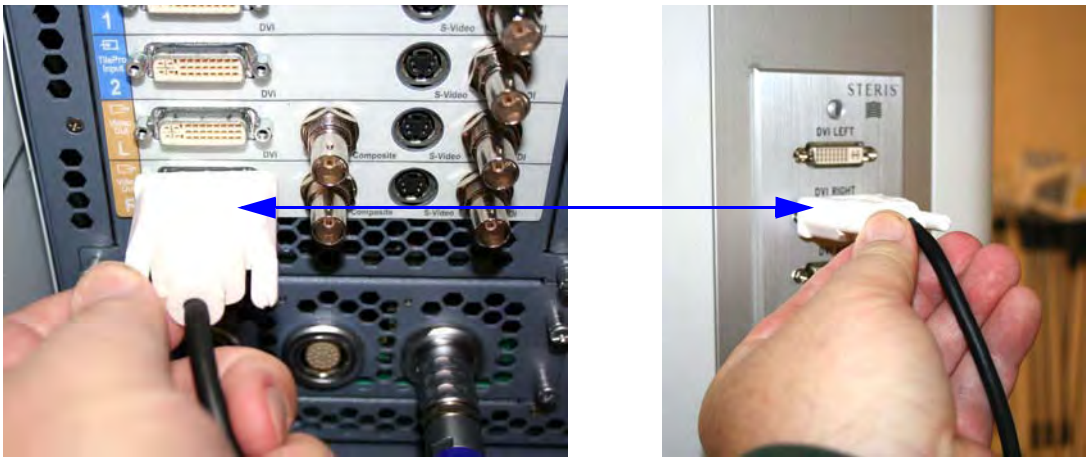
D.3 Optional Core Connections

This section describes the additional, optional connections you can make between the Core and third party devices.

Core Video Connections

Perform this step for each video connection you wish to make between the *da Vinci Si* System and external monitors, recorders or other third party devices.

1. Connect each video output or *TilePro* input on the back of the Core to the desired interface plate, monitor, or third party device. Figure D.10 shows a typical connection from the DVI output to a DVI boom interface plate that supports connection to an OR video switching system.



Core DVI output DVI boom plate

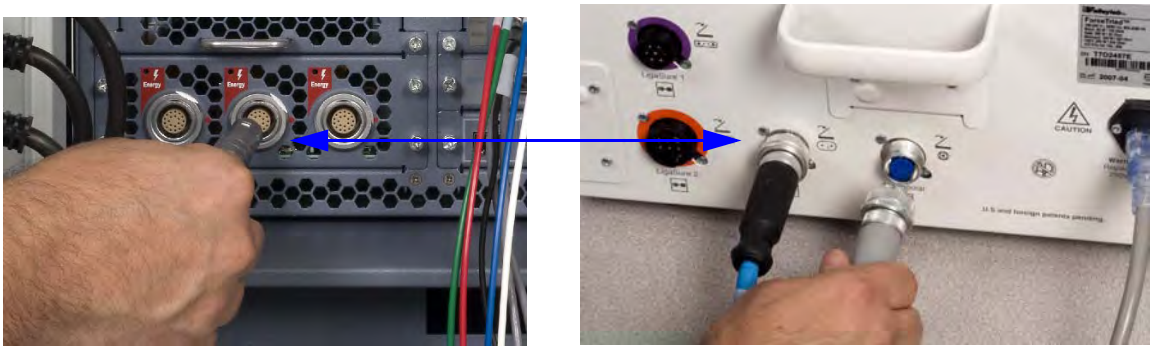
Figure D.10 Example of DVI connection from Core to boom plate

Electrosurgical Unit (ESU) Connections

Note: Refer to 4.4 Auxiliary Device Connections, page 4-9, for detailed instructions.

To connect one or more electrosurgical units (ESU), perform this step:

1. Connect the appropriate energy activation cable between any of the **Energy** receptacles on the back of the Core and the appropriate connectors on the ESU.

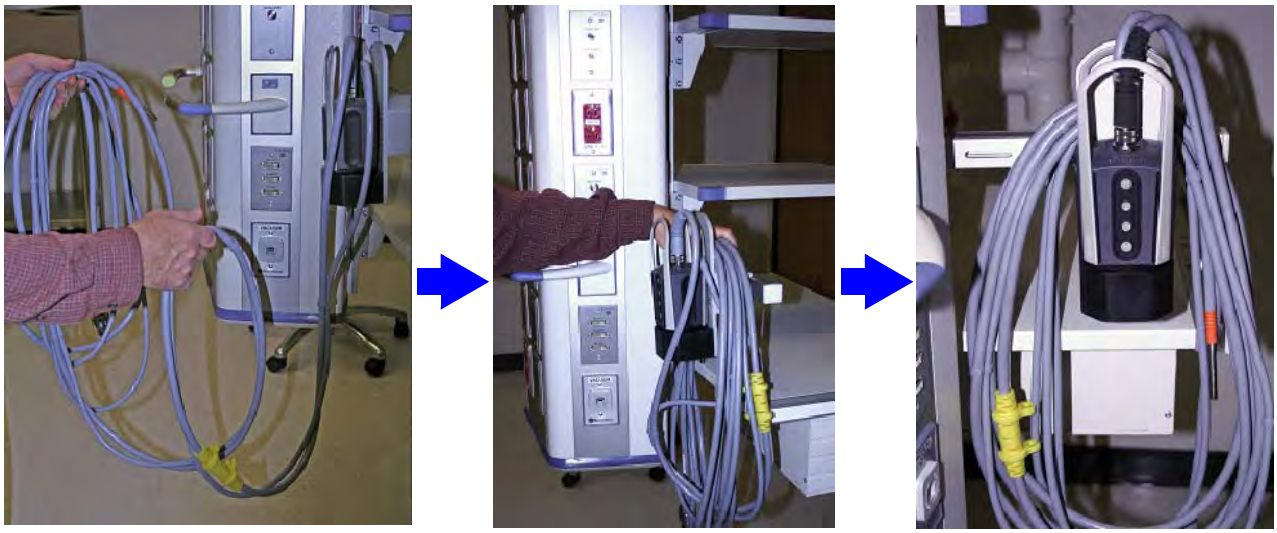


Core Energy connection Sample ESU connections

Figure D.11 Example of ESU connection to Core

D.4 Camera Head and Cable Storage

The camera holster is installed on the boom to provide a convenient location for storing the camera head (without endoscope attached) when not in use. Figure D.12 illustrates how to coil the cables and store the camera head.



Coil camera cables | Hang cables over holster | As when finished

Figure D.12 Camera and cable storage using the boom-mounted holster

D.5 Touchscreen Positioning

The *da Vinci Si* touchscreen mounted on the boom can be positioned to either side of the boom or directly off the front (Figure D.13). Position it according to the needs of the surgical staff. Unless a sterile monitor drape is used, a sterile assistant requires a change of surgical gloves after touching the touchscreen; alternatively, non-sterile surgical staff may operate an undraped touchscreen.

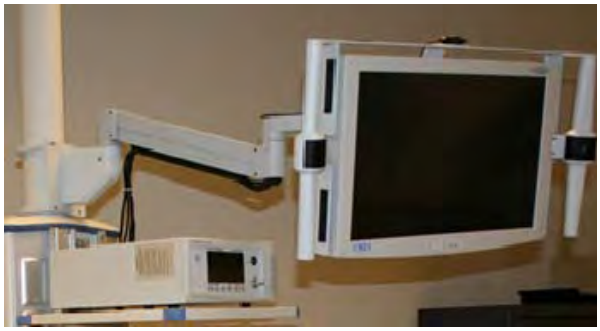


Figure D.13 You can position touchscreen

Note: Refer to 7.4 Working with the Touchscreen Vision Controls, page 7-15, for instructions to use the touchscreen.

D.6 Boom Positioning

Similar to the positioning of the Vision Cart in relationship to the patient, the vision boom needs to be positioned to a location that is convenient to the surgical staff to have access to the equipment. The vision boom positioning also must take into consideration the location of the third *da Vinci* instrument arm during the specific procedure performed. The boom must be placed within reach of the 5.75 m (18'-6") camera cable attached to the front of the Core.

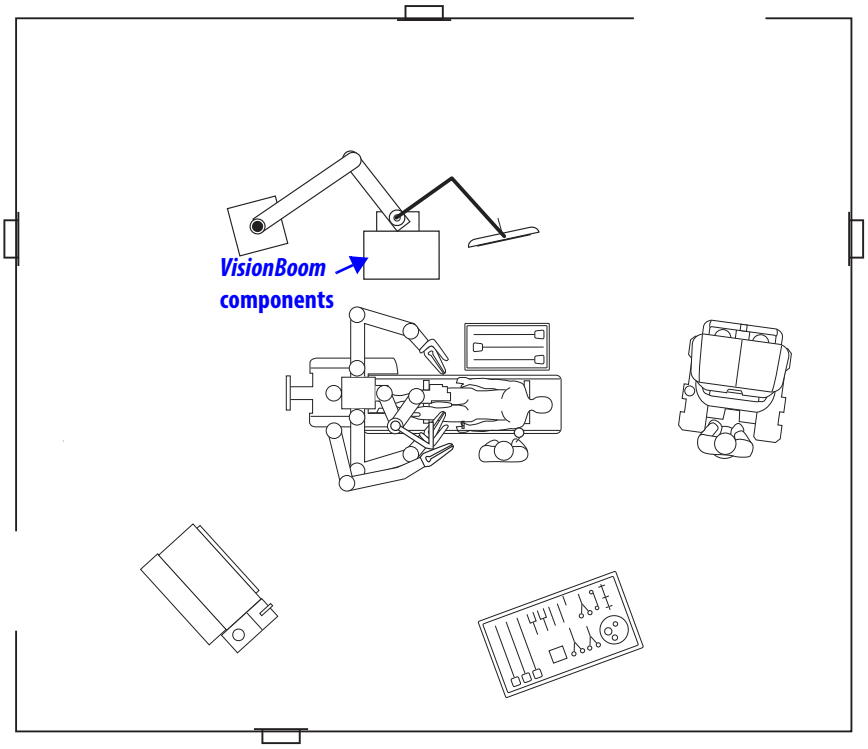


Figure D.14 Typical boom positioning

End of section

E Appendix E: *OnSite*™ for *da Vinci*® Surgical System

E.1 General Information

The following appendix is applicable only if your *da Vinci Si* System has *da Vinci OnSite* enabled.

Contact Information

For Customer Service and Reporting of Complaints or Adverse Events

Use the following information for customer service, including ordering, reporting complaints or adverse events, and general information regarding *Intuitive Surgical* or our products and services.

In the U.S.

Intuitive Surgical, Inc.
1266 Kifer Road
Sunnyvale, CA 94086 USA
Toll free: 1.800.876.1310
Direct: 408.523.2100
Fax: 408.523.2377

In Europe:

Intuitive Surgical Sàrl
1, chemin des Mûriers,
1170 Aubonne, Switzerland
Toll free: +800.0821.2020
Direct: +41.21.821.2020
Fax: +41.21.821.2021

For Technical Support

If the system requires maintenance or service, please call our Technical Support line. In the U.S., call 1-800-876-1310, where phones are staffed 24 hours a day, seven days a week. In Europe, call +41.21.821.2020.

Manufacturer

Intuitive Surgical, Inc.
1266 Kifer Road
Sunnyvale, CA 94086 USA
www.intuitivesurgical.com

Intuitive Surgical Sàrl
1, chemin des Mûriers,
1170 Aubonne Switzerland

General Precautions, Warnings, and Contraindications

Note: All *da Vinci* Surgical System users must follow all instructions for use supplied with the system, its components, instruments, and accessories. This includes the following documents: Instruments and Accessories User Manual (PN 550675), Reprocessing Instructions (PN 550875), and any instructions for use (IFUs) provided with instruments or accessories.

WARNING: **Be sure to read and understand all information, particularly the caution and warning information, found in the applicable user manuals before using these products. Failure to properly follow all instructions, including those in the *da Vinci* Surgical System user manual, and instructions supplied with accessory devices such as generators, may lead to injury and result in improper functioning of the device.**

⚠ CAUTION: ***OnSite*** **components may be installed and serviced only by** ***Intuitive Surgical*** **personnel. Do not attempt to install or service equipment without** ***Intuitive Surgical*** **personnel.**

⚠ CAUTION: **Leakage current from interconnected electrical equipment may exceed safe levels. To maintain the safety of patients and users, interconnect only with devices in compliance with IEC 60601-1-1. It is the user's responsibility to ensure that any interconnected equipment not supplied by** ***Intuitive Surgical*** **maintains compliance with IEC 60601-1-1.**

⚠ CAUTION: **Ethernet networks (both wired and wireless) are subject to losses of connectivity that could disrupt use of** ***OnSite*** **or make data unreliable when it is received at a remote location. Such disruptions, if they occur, have no effect on the performance or functionality of the** ***da Vinci*** **Surgical System.**

E.2 Indications for Use – *OnSite*

OnSite for *da Vinci* Surgical Systems is an accessory indicated for use by trained *Intuitive Surgical* Field Service personnel to: (1) obtain system information for the purpose of diagnosing faults, (2) remotely enable/disable features including configuration updates through either a wired or wireless Ethernet connection between the *da Vinci* Surgical System and the hospital's Internet Protocol (IP) infrastructure.

E.3 Network Connections

OnSite requires a wired RJ45 Ethernet 10bT/100bT and/or wireless 802.11 network connection with Internet access where the *da Vinci* Surgical System will be used.

E.4 Transmitter Module Label

When the optional wireless bridge is installed, the following Federal Communications Commission (FCC) identification label will be affixed to the Surgeon Console.

Contains Transmitter Module FCC ID: SWX-NS2

Figure 1 Transmitter Module Label

E.5 Introduction

OnSite provides connectivity that enables *Intuitive Surgical* service personnel to remotely service the *da Vinci* Surgical System pre-operatively and intra-operatively. It enables the following capabilities.

1. Automated log retrieval, where *da Vinci* Surgical System uploads logs to an *Intuitive Surgical* server when idle
2. Remote system status monitoring
3. Remote diagnostics and servicing
4. Remote configuration changes
5. Enable/disable device features

The monitoring capability enables a faster response time from the *da Vinci dVSTAT*™ (*da Vinci* Surgery Technical Assistance Team) for problem resolution, real time diagnosis, and increased diagnostic accuracy.

To implement remote service capabilities, the *da Vinci* Surgical System must have access to the Internet. *OnSite* is designed to accomplish this using existing hospital networks.

E.6 *OnSite* System Requirements and Connections

The remote servicing features of *OnSite* are designed to be highly secure and to function transparently. The *da Vinci* Surgical System communicates with an *Intuitive Surgical* server via outgoing network connections to enable *Intuitive Surgical* service personnel to remotely monitor and service the system while in use.

In summary, *OnSite* consists of three major components, namely the *da Vinci* Surgical System with installed networking components, the *Intuitive Surgical* server, and the remote user (*Intuitive Surgical* Field Service personnel). The block diagram below illustrates the *OnSite* networking infrastructure.

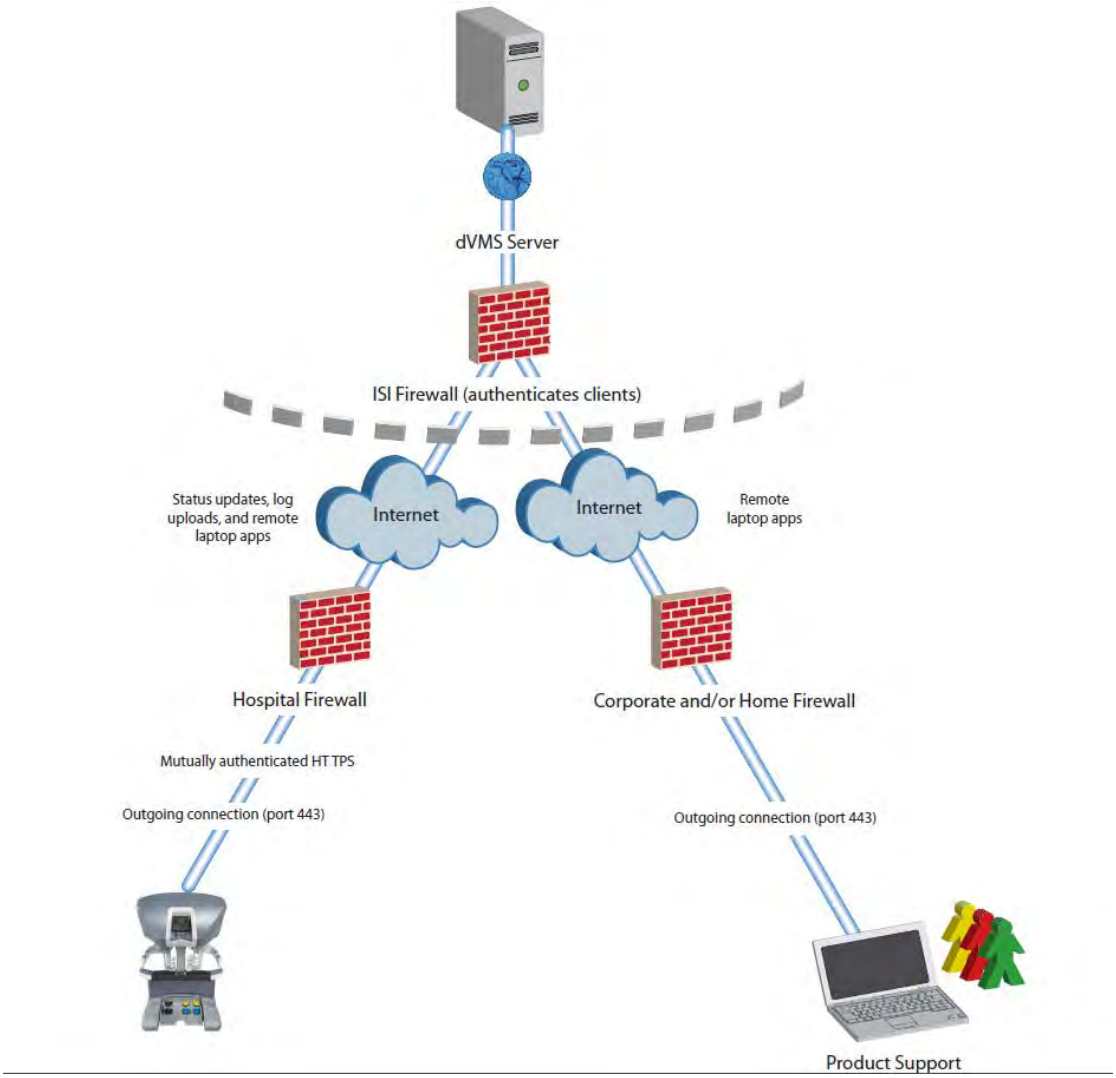


Figure 2 OnSite Networking Infrastructure

Note: To take advantage of the full potential of *OnSite*, the system must remain connected to the network.

Wired Network Connection

Intuitive Surgical field service personnel install a network security device inside the *da Vinci* Surgical System, along with necessary cables and panels to enable a wired network connection for *OnSite*.

Figure 3 Network Security Device

To establish a wired connection:

Connect the *da Vinci* Ethernet connection to the hospital network (wall plate) using a CAT5e industrial style network cable.

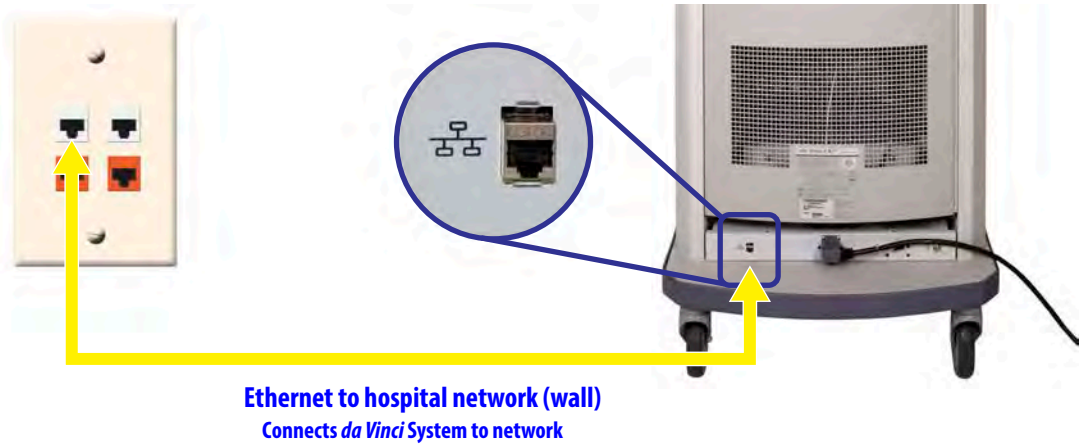


Figure 4 Network Cable Connections (da Vinci Si)

Optional Wireless Connection

There is an optional wireless connection available using the Network Security device and a Wireless Bridge. See Section E.10 Wireless Connectivity Option and section E.13 OnSite Appendix C: Wireless Bridge Data for details on wireless connectivity.

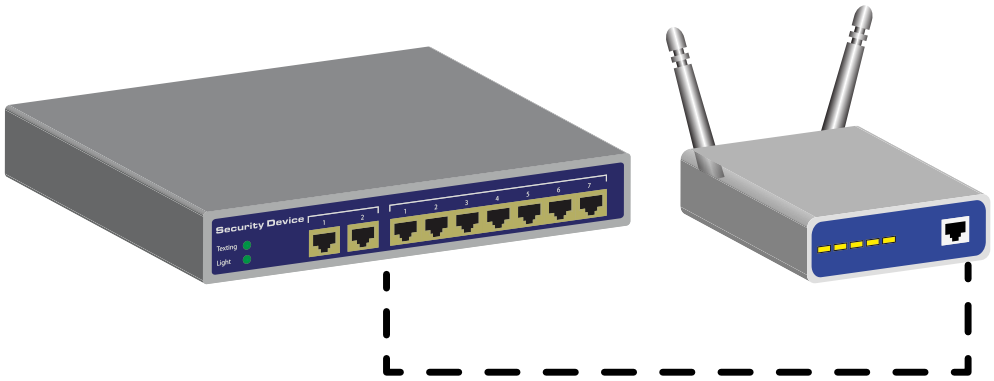


Figure 5 Network Security Device with Wireless Bridge

Note: External connections are not required for the *da Vinci Si* Surgical System.

5.7 Disabling All Network Connectivity

If there is a need to disable all network connectivity for the *da Vinci Si* System, open the back of the Vision Cart and disconnect the RJ-45 (Ethernet) connector at bottom center of the Core, indicated below.

Figure 6 RJ-45 Connector – Core (da Vinci Si)

Note: This action disables all network connectivity for the *da Vinci Si* System, but it does not power off the wired or wireless networking equipment.

Note: To re-establish network connectivity, you must re-connect the indicated RJ-45 connector on the back of the Core.

E.8 Automatic Status and System Log Retrieval

OnSite provides real-time system status monitoring and post-procedure upload of system logs, for the support team to service the *da Vinci* System. When *Intuitive Surgical* field service personnel enable the *OnSite* functionality, the *da Vinci* Surgical System can:

1. Connect to an *Intuitive Surgical* server for these purposes:
   A. Provide status updates – typically every 10 seconds but can be configured for different intervals
   B. Upload all system logs to the *Intuitive Surgical* server after each procedure
2. Connect to field service diagnostic applications running on a remote laptop

E.9 *OnSite* Servicing and Diagnostics

OnSite enables remote servicing using current diagnostic applications that *Intuitive Surgical* Field Service personnel normally use when the technician visits on site. When physically present, the technician troubleshoots the system using a local connection between the laptop and the *da Vinci* System hardware. *OnSite* enables the technician to troubleshoot remotely, using the same set of diagnostic tools. Through a remote *OnSite* connection, the technician can interact with the system in either Normal Mode or Maintenance Mode.

Normal Mode

In Normal Mode, *OnSite* can only enable remote monitoring of system status. This allows *dVSTAT* to passively monitor information transmitted, with no ability to perform any activity that impacts the movement or performance of the surgical system.

In Normal Mode, *dVSTAT* can:

- Receive system logs
- Check the condition of system switches and buttons
- Verify surgical instrument functionality.

Normal Mode – *OnSite* Mode Indications

While in Normal Mode, the *da Vinci Si* System indicates the status of the network connection.

***da Vinci* Network Offline**

***da Vinci* Network Online**

***OnSite* Session In Progress**

Figure 7 OnSite Connection Status Indicators

Note: Once the Ethernet cable is connected, it can take up to two minutes to detect the *da Vinci* network and update the status on the touchscreen.

Maintenance Mode

Note: *Intuitive Surgical* personnel can use Maintenance Mode only when they request it and are granted verbal permission by OR staff present with the *da Vinci* Surgical System.

Maintenance Mode is a state where *Intuitive Surgical* technical support personnel can connect remotely to the *da Vinci* System to perform diagnostic and troubleshooting operations.

When in Maintenance Mode, the *da Vinci* Surgical System ***is not for human use.***

Intuitive Surgical technician requests for this service requires facility staff to place the system in Maintenance Mode at an agreed-upon time.

Putting the System into Maintenance Mode

To put the system into Standby Mode, make sure the following conditions are met:

- All system components are connected to AC power
- Surgeon Console and Patient Cart system cables are connected to the Core

When the system is in Standby Mode, the power buttons on the Surgeon Console, Vision Cart, and Patient Cart are lit amber. When an Intuitive technician connects to the system, they have the option to power on the system in Maintenance Mode.

During an *OnSite* session in Maintenance Mode, the system displays:

Maintenance Mode - Not for Human Use

Remote Session in Progress

System Servicing/ Diagnostics

An example of an *OnSite* servicing capability that requires assistance and feedback from hospital personnel is when remotely testing the control and motion of the manipulators and robotic arms. Refer to the following illustration.

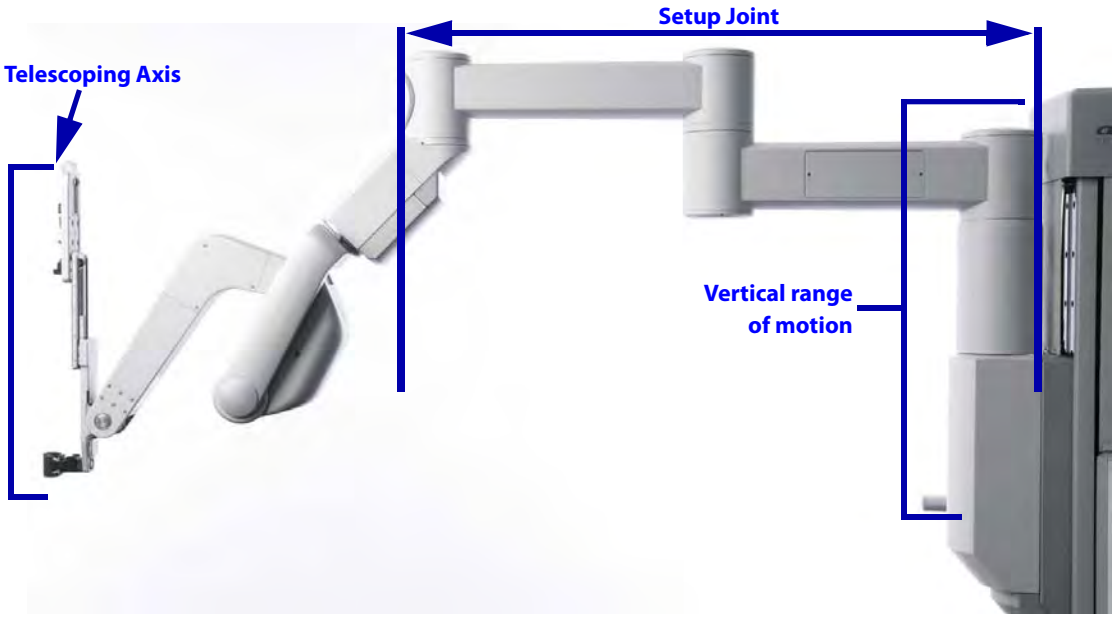


Figure 8 Setup Joint and Instrument Arm

The following list shows several diagnostic capabilities that an *Intuitive Surgical* field service technician can execute remotely when connected in Maintenance Mode via *OnSite*:

1. Test joints, internal sensors, and positioning potentiometers
2. Check condition of system switches and buttons
3. Check synchronization of system configuration
4. Modify system configurations
5. Perform arm motion and other diagnostic tests

6. Verify surgical instrument functionality
7. Check usage hour meter data

E.10 Wireless Connectivity Option

Wireless Overview

A wireless bridge is installed on the *da Vinci* Surgical System to enable the Wireless Connectivity Option. A hospital-supplied Wireless Access Point with Internet access is required to establish wireless connectivity.

Wireless Network Requirements

Intuitive Surgical field service personnel will install and configure the Wireless Connectivity Option. Below are the details of a suitable wireless network to support *da Vinci* wireless applications.

Specifications

- The Wireless Connectivity Option utilizes the IEEE 802.11 wireless standard using either 802.11b or 802.11g at 2.4 GHz Industrial, Scientific, and Medical (ISM) band.
- The Wireless Bridge operates as a client to the hospital-supplied Wireless Access Point, transmitting data back and forth between the hospital network and *da Vinci* applications.
- The Wireless Access Point must be located within 75 feet of the *da Vinci* Surgical System.

Security

- Wireless Network Infrastructure
  - *Intuitive* has tested the Wireless Connectivity Option in WPA2 pre-shared key mode with AES encryption, and recommends that the Wireless Connectivity Option is integrated into the hospital network using this security configuration.
- *OnSite* Software Application
  - The *OnSite* Software Application uses a Secure Socket Layer (SSL) session based on unique certificates on the *da Vinci* System and the *OnSite* server.
  - Data being transmitted from the *da Vinci* Surgical System to the server is 128-bit encrypted.

Quality of Service

- Wireless Bridge
  - Maximum latency of 50 ms between the Wireless Bridge and the hospital-supplied Wireless Access Point
  - Wireless Channel that has 20% or less utilization
- Overall Network
  - Maximum end-to-end packet loss of less than 10%
  - Network latency should not exceed 300 ms

Once successfully installed and configured, *Intuitive Surgical* field service personnel conduct an end-to-end functional test to ensure that *OnSite* functions as expected.

Note: After installation, *Intuitive Surgical* recommends that the hospital routinely monitor to ensure that the Wireless Channel does not exceed 20% utilization, and the latency between the Wireless Access Point and the Wireless Bridge does not exceed 50 ms. If either exceeds the specified levels, contact *Intuitive Surgical* Technical Support.

It is possible that the wireless network conditions might degrade over time or experience periods of disturbance; *da Vinci* applications have been designed to be robust to typical network disturbances, but if an issue persists, contact Technical Support for assistance to resolve the issue.

Note: *Intuitive Surgical* recommends that an active wired port be available when using the Wireless Connectivity Option. The configuration for the Wireless Connectivity Option provides a wired backup that the router will automatically activate when plugged in. Refer to E.11 OnSite Appendix A: IT Requirements for details on how to establish a wired connection.

Note: It is important to note that if the wireless network is modified or updated after the Wireless Connectivity Option is installed, its suitability to support the wireless applications should be re-assessed. In particular, contact Technical Support if any of the following changes are planned or have occurred.

- If the Wireless Access Point or *da Vinci* Surgical System is moved from the location where it resided during installation
- If the Wireless Access Point is replaced with a new make or model

Wireless Coexistence

Wireless coexistence with other devices that transmit in the 2.4 GHz range is a concern since it can impact the reliability of the wireless link. This section summarizes testing conducted by *Intuitive Surgical* in an environment with other wireless devices representative of a typical Operating Room to demonstrate that the Wireless Connectivity Option functioned as expected. The test setup represented the worst case *da Vinci* Surgical System setup, and the position of the common wireless devices was defined to ensure that they were located near the Wireless Connectivity Option or the Wireless Access Point, and the path between the transmitter and receiver for most paired devices passed through the signal path between the Wireless Connectivity Option and the Wireless Access Point. Testing was conducted with a wireless network that satisfied the characteristics identified in Wireless Overview, page 9.

The Wireless Access Point used during the testing was the Cisco Aironet 1240AG Series. The Aironet 1240AG Series was configured to operate as a typical Access Point, and therefore Wireless Access Points from other vendors should result in the same performance. Note that the characteristics for a suitable wireless network are summarized in Wireless Overview, and *Intuitive Surgical* field service personnel will confirm the wireless network is functioning as expected after installation. A complete list of the common wireless devices used during the testing (along with details on position, orientation, and type of data transmission) is summarized in the table in Common Wireless Devices Tested, page 11.

Note: If different types of wireless devices will be used in the Operating Room, or if the wireless devices are used in different locations than what is described below, then *Intuitive* recommends that performance is tested with the wireless devices active, before use. If you encounter issues using the Wireless Connectivity Option in the presence of other wireless devices in the Operating Room, contact *Intuitive Surgical* Technical Support.

Note: The wireless coexistence testing conducted by *Intuitive* does not cover use in the presence of MRI or diathermy machines. The Wireless Connectivity Option should not be used in the vicinity of these devices.

Common Wireless Devices Tested

Common Wireless Devices	Disturbance Details	Test Setup
Wireless Monitor	IOGear Model: GUW2015V (receiver) GUWA200 (transmitter) 3.1 GHz to 4.8 GHz Certified wireless USB RF Modulation: QPSK/DCM; Data Rate: 480 Mbps	Transmitter attached to a desktop PC located 50 inches away from the wireless bridge, and receiver attached to a monitor on the boom. Desktop PC oriented so the transmitter has clear line of sight to the receiver attached to the monitor, and PC streaming 720p video.
Smart Phone/Device	2 iPhone4 (3G and 2.4 GHz wireless) Samsung (2.4GHz wireless)	One iPhone4 sitting on the arm rest of the Surgeon Console paired with a Bluetooth headset with a phone call in progress. The iPhone is also connected to the WAP. The second iPhone4 is paired with the Bluetooth speaker. Samsung phone in the room 72 inches away from a paired Bluetooth headset worn by someone at the patient side.
Laptops with wireless	802.11 b; 2.4 GHz	Two Dell laptops connected to the WAP on the same channel as the Wireless Bridge, with one laptop streaming a video over the network from YouTube. The laptops are approximately 90 inches away from the Wireless Bridge.
Wireless keyboard and mouse	Microsoft Wireless Desktop – Keyboard and Mouse 7000: 2.4 GHz range(2,400 – 2,483.5 MHz) FCC IDs C3K1345, C3K1142 and C3K1123	Wireless keyboard and mouse interfaced with one of the desktop computers, and physically sitting on top of the Vision Cart, 55 inches apart.
Bluetooth keyboard	Microsoft Bluetooth Mobile Keyboard 6000 2.4 GHz range(2,400 – 2,483.5 MHz) FCC ID C3K1390	Keyboard interfaced with one of the desktop computers, and physically sitting on top of the Vision Cart, 55 inches apart.
Bluetooth headset #1	2.402-2.480 GHz range	Jawbone headset paired with the iPhone4, worn by the surgeon at the Surgeon Console and used during the phone call.

Common Wireless Devices	Disturbance Details	Test Setup
Bluetooth headset #2	2.402-2.480 GHz range	Bluetooth headset paired with a Samsung phone, located on the operating room bed, 72 inches apart, with a call active.
Bluetooth Speaker	Creative D100 Wireless; FCC ID IBAMF8090 2.402-2.480 GHz range	iPhone4 paired with the Bluetooth speaker playing music located on the operating room bed, 72 inches apart.
Cordless Telephone	Uniden 2.4 GHz Amplified Cordless Phone System (Clarity-4205)	Phone base is on the desk, and the phone is on the other side of the room, with the base and phone continuously communicating.
Microwave Oven	MagicChef Model MCD11E3W Output Frequency 2450 MHz; FCC ID C5F7NF1AMO100N	In the coexistence test, the microwave oven is placed in the signal path between the Wireless Bridge and the WAP, 20 feet away from the WAP. The Wireless Bridge and WAP are operating at maximum distance in this test. In the isolated test with the microwave oven, it is placed in the signal path between the Wireless Bridge and the WAP at a distance where no impact is observed, and then the Wireless bridge is moved closer until the connection is dropped. Wired connection is then established. In both test cases, the microwave oven is oriented such that the seams in the door are pointing toward the Wireless Bridge and the Wireless Access Point.
RFID tags	Reader: TagMaster LR-3 Pro (PN 154400) 2.435 to 2.465 GHz range ID-Tags: TagMaster S1255 MarkTag and S1240 MarkTag MeM 2.435 to 2.465 GHz range	RFID was tested by placing the Reader and the ID-tags on each side of the signal path, between the Wireless Bridge and the Wireless Access Point. In the coexistence test case, the tags and reader were 30 inches apart. During the isolated test with the RFID setup, they were 36 inches apart in the worst case configuration.
Electrosurgical Unit	Covidien (formerly ValleyLab) Force FX (GSTElectro02) 390 kHz	Located in the Vision Cart, which is placed as close to the Surgeon Console as possible.

Devices Known to Interfere

Microwave Oven

Testing conducted by *Intuitive Surgical* determined that microwave ovens can disrupt wireless communication in certain configurations:

- *Intuitive Surgical* recommends keeping microwave ovens (1000 Watt) at least 25 feet from the Wireless Bridge or Wireless Access Point, especially if it is located in the signal path. Higher wattage microwaves should be placed at larger distances.
- If a microwave oven causes interference, use the wired backup to correct the problem.

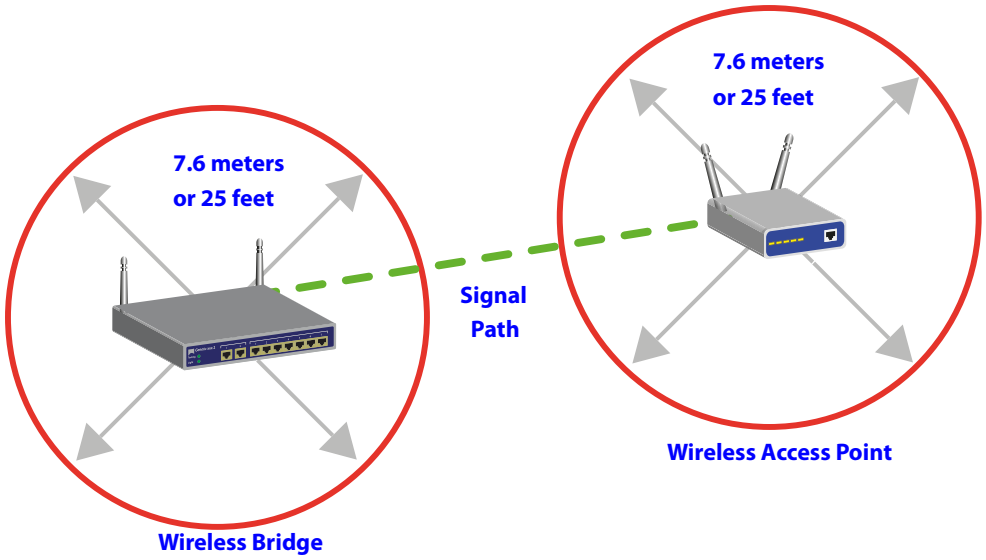


Figure E.1 Placement boundaries for microwave ovens

RFID Reader (2.4 GHz)

Testing conducted by *Intuitive Surgical* determined that RFID readers operating in frequency hopping mode, or configured to operate at a frequency that overlaps the channel being used by the wireless bridge and the WAP, will cause minor network disturbances.

To eliminate the interference, *Intuitive Surgical* recommends the following:

- The RFID reader not operate in frequency hopping mode if it is being used in the same room as the Wireless Connectivity Option.
- A separation of a least 4 MHz exists between the frequency range of the channel being used by the wireless bridge/WAP and the operating frequency of the RFID reader. For example, a wireless bridge/WAP operating on channel 10 spans 2.446 – 2.468 GHz; therefore, to avoid disturbances from the RFID reader, its operating frequency should be less than or equal to 2.442 GHz or greater than or equal to 2.472 GHz.

Figure 6 Valid RFID Reader Operating Frequencies

Note that RFID devices can operate outside the frequency range of what was included in the testing summarized above. If RFID devices operating outside the range shown above exist in the operating room, *Intuitive Surgical* recommends that performance is tested with the RFID device active, before use.

Addressing Wireless Connectivity Problems

If you encounter connectivity problems while using the Wireless Connectivity Option, *Intuitive* recommends you do the following:

- Determine if a device transmitting in the 2.4 GHz range is in the room, and if so, disable the device to see if it resolves the connectivity problems.
- If you experience several disconnections, and the above step did not resolve the issue, or if the interfering device must be used, then establish a wired network connection with the *da Vinci* Surgical System (see Wired Network Connection for more information).

E.11 OnSite Appendix A: IT Requirements

Internet Access

The network security device that will be integrated into the *da Vinci* Surgical System requires Internet access to contact servers at *Intuitive Surgical*.

Intuitive Surgical requires a wired RJ45 Ethernet 10bT/100bT network drop and/or a wireless 802.11 network with Internet access in the OR where the facility's *da Vinci* Surgical System is used. If your *da Vinci* Surgical System is used in multiple locations, then *Intuitive Surgical* requests that be made available in each location.

OnSite is compatible with both DHCP and static networking addresses.

Proxy Server

OnSite is compatible with most proxy servers. In some instances proxy authentication maybe required to be by-passed.

Firewall

OnSite requires outbound port 443 open.

Network Topology

OnSite requires a minimum amount of bandwidth to post log files (generally less than 1 MB per day).

E.12 OnSite Appendix B: Electromagnetic Compatibility

The essential performance for *da Vinci* Wireless Connectivity during EMC testing was defined as follows during any of the required tests:

- No component failures
- Video quality exceeded pre-defined metric demonstrating that the video quality was not impacted
- Audio script test passed demonstrating that the audio link was not impacted
- No changes in programmable parameters
- No resets to factory defaults
- No change in operating mode
- No false alarms
- No initiation of any unintended operation
- No cessation or interruption of any intended operation

Exception: For Voltage Dips and Interrupts, acceptance criteria is no component failures and is restorable to the pre-test state with operator intervention. For Radiated Immunity in the band 2.0 - 2.5GHz, acceptance criteria is no component failures and is restorable to the pre-test state with operator intervention, and restorable during test with a hard-wired connection.

The *da Vinci* Surgical System complies with IEC60601-1-2:2001, General Requirements for safety – Collateral standard: Electromagnetic compatibility. Special precautions and installation information for the *da Vinci* Surgical System for electromagnetic compatibility (EMC) are provided in the following section.

Use only *Intuitive Surgical*-branded interconnection cables and accessories. Performance of cables or accessories other than those specified by *Intuitive Surgical* as replacement parts for internal components cannot be guaranteed. Any resulting damage to the system will not be covered under warranty.

Equipment in the operating room, including the *da Vinci* Surgical System and other portable or mobile communications equipment, can produce Electromagnetic Interference (EMI), which may affect the function of these devices. Such effects are prevented by use of equipment with EMI characteristics proven below recognized limits, as identified in the below tables.

In the event of suspected interference from other equipment, which prevents the proper functioning of the *da Vinci* Surgical System, contact *Intuitive Surgical* and/or discontinue use of the system until the problem can be remedied.

The following Tables contain the Manufacturer's declaration and additional information required by IEC60601-1-2:2001.

Note: This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

Table 1: Manufacturer's Declaration – Electromagnetic Emissions

The *da Vinci* Surgical System is intended for use in the electromagnetic environment specified below. The customer or the user of the *da Vinci* Surgical System should assure that it is used in such an environment.

Emissions Test	Compliance	Electromagnetic Environment – Guidance
RF emissions CISPR 11	Group 1	The *da Vinci* Surgical System uses RF energy only for its internal function. Therefore, its RF emissions are very low and are not likely to cause any interference in nearby electronic environment.
RF emissions CISPR 11	Class A	The *da Vinci* Surgical System is suitable for use in all establishments, other than domestic establishments and those directly connected to the public low-voltage power supply network that supplies buildings used for domestic purposes.
Harmonic emissions IEC 61000-3-2	Class A	
Voltage fluctuations/ flicker emissions IEC 61000-3-3	Complies	

Table 2: Manufacturer's Declaration – Electromagnetic Immunity			
The *da Vinci* Surgical System is intended for use in the electromagnetic environment specified below. The customer or the user of the *da Vinci* Surgical System should assure that it is used in such an environment.			
Immunity Test	**IEC 60601 Test Level**	**Compliance Level**	**Electromagnetic Environment Guidance**
Electrostatic discharge (ESD) IEC 61000-4-2	±6 kV contact ±8 kV air	±6 kV contact ±8 kV air	Floors should be wood, concrete or ceramic tile. If floors are covered with synthetic material, the relative humidity should be at least 30%.
Electrical fast transient/burst IEC 61000-4-4	±2 kV for power supply lines ±1 kV for input/ output lines	±2 kV for power supply lines ±1 kV for input/ output lines	Mains power quality should be that of a U.S. commercial or hospital environment with highly reliable service.
Surge IEC 61000-4-5	±1 kV differential mode ±2 kV common mode	±1 kV differential mode ±2 kV common mode	Mains power quality should be that of a U.S. commercial or hospital environment with highly reliable service.
Voltage dips, short interruptions and voltage variations on power supply input lines IEC 61000-4-11	<5% UT (>95% dip in UT) for 0.5 cycle 40% UT (60% dip in UT) for 5 cycles 70% UT (30% dip in UT) for 25 cycles <5% UT (>95% dip in UT) for 5 sec.	<5% UT (>95% dip in UT) for 0.5 cycle 40% UT (60% dip in UT) for 5 cycles 70% UT (30% dip in UT) for 25 cycles <5% UT (>95% dip in UT) for 5 sec.	Mains power quality should be that of a U.S. commercial or hospital environment with highly reliable service. If the user of the *da Vinci* Surgical System requires continued operation during power mains interruptions, it is recommended that the *da Vinci* Surgical System be powered from an uninterruptedly power supply or a battery.
Power frequency (50/60 Hz) magnetic field IEC 61000-4-8	3 A/m	3 A/m	Power frequency magnetic fields should be at levels characteristic of a typical location in a typical commercial or hospital environment.
Note: UT is the AC mains voltage before application of the test level.			

Table 3: Manufacturer's Declaration – Electromagnetic Immunity			
The *da Vinci* Surgical System is intended for use in the electromagnetic environment specified below. The customer or the user of the *da Vinci* Surgical System should assure that it is used in such an environment.			
Immunity test	**IEC 60601 test level**	**Compliance level**	**Electromagnetic environment – guidance**
Conducted RF IEC 61000-4-6 Radiated RF IEC 61000-4-3	3 Vrms 150 kHz to 80 MHz 3 V/m 80 MHz to 2.5 GHz	3 Vrms 3V/m	Portable and mobile RF communications equipment should be used no closer to any part of the *da Vinci* Surgical System, including cables, than the recommended separation distance calculated from the equation applicable to the frequency of the transmitter. Recommended separation distance $d = 1.2\sqrt{P}$ $d = 1.2\sqrt{P}$ 80 MHz to 800 MHz $d = 2.3\sqrt{P}$ 800 MHz to 2.5 GHz 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,[a] should be less than the compliance level in each frequency range.[b] Interference may occur in the vicinity of equipment marked with the following symbol: 
Note 1: At 80 MHz and 800 MHz, the higher frequency range applies. Note 2: These guidelines may not apply in all situations. Electromagnetic propagation is affected by absorption and reflection from structures, objects, and people. a. Field strengths from fixed transmitters, such as base stations for radio (cellular/cordless) telephones and land mobile radios, amateur radio, AM and FM radio broadcast, and TV broadcast cannot be predicted theoretically with accuracy. To assess the electromagnetic environment due to fixed RF transmitters, an electromagnetic site survey should be considered. If the measured field strength in the location in which the *da Vinci* Surgical System is used exceeds the applicable RF compliance level above, the *da Vinci* Surgical System should be observed to verify normal operation. If abnormal performance is observed, additional measures may be necessary, such as re-orientating or relocating the *da Vinci* Surgical System. b. Over the frequency range 150 kHz to 80 MHz, field strengths should be less than 3 V/m.			

Table 4: Recommended separation distances between portable and mobile RF communications equipment and the *da Vinci* Surgical System

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

Rated maximum output power of transmitter W	**Separation distance according to frequency of transmitter m**		
	150 kHz to 80 MHz $d = 1.2\sqrt{P}$	80 MHz to 800 MHz $d = 1.2\sqrt{P}$	800 MHz to 2.5 GHz $d = 2.3\sqrt{P}$
0.01	0.12	0.12	0.23
0.1	0.38	0.38	0.73
1	1.2	1.2	2.3
10	3.8	3.8	7.3
100	12	12	23

For transmitters rated at a maximum output power not listed above, the recommended separation distance d in meters (m) can be estimated using the equation applicable to the frequency of the transmitter, where P is the maximum output power rating of the transmitter in watts (W) according to the transmitter manufacturer.
Note 1: At 80 MHz to 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.

Table 5: Compliance Information

Network Router:	CAN/CSA-C22.2 No 60950-1-03 ANSI/UL Std No 60950-1 1st Ed.
Wireless Bridge: * Wireless Data Rate	802.11b/g: 2.4-2.4835 GHz 802.11b/g: 2.4-2.4835 GHz

* See OnSite Appendix C: Wireless Bridge Data on page 20 for more information

E.13 OnSite Appendix C: Wireless Bridge Data

UBIQUITI NETWORKS

NanoStation loco

NS2L DATASHEET

SYSTEM INFORMATION	
Processor Specs	Atheros MIPS 4KC, 180MHz
Memory Information	16MB SDRAM, 4MB Flash
Networking Interface	1 X 10/100 BASE-TX (Cat. 5, RJ-45) Ethernet Interface

REGULATORY / COMPLIANCE INFORMATION	
Wireless Approvals	FCC Part 15.247, IC RS210, CE
RoHS Compliance	YES

RADIO OPERATING FREQUENCY 2412-2462 MHz

TX SPECIFICATIONS			
	DataRate	TX Power	Tolerance
802.11b	1Mbps	20 dBm	+/-1dB
	2Mbps	20 dBm	+/-1dB
	5.5Mbps	20 dBm	+/-1dB
	11Mbps	20 dBm	+/-1dB
802.11g OFDM	6Mbps	20 dBm	+/-1dB
	9Mbps	20 dBm	+/-1dB
	12Mbps	20 dBm	+/-1dB
	18Mbps	20 dBm	+/-1dB
	24Mbps	20 dBm	+/-1dB
	36Mbps	18 dBm	+/-1dB
	48Mbps	16 dBm	+/-1dB
	54Mbps	15 dBm	+/-1dB

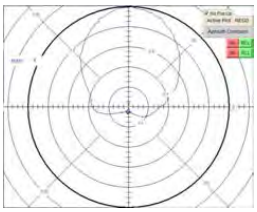
RX SPECIFICATIONS			
	DataRate	Sensitivity	Tolerance
802.11b	1Mbps	-95 dBm	+/-1dB
	2Mbps	-94 dBm	+/-1dB
	5.5Mbps	-93 dBm	+/-1dB
	11Mbps	-90 dBm	+/-1dB
802.11g OFDM	6Mbps	-92 dBm	+/-1dB
	9Mbps	-91 dBm	+/-1dB
	12Mbps	-89 dBm	+/-1dB
	18Mbps	-88 dBm	+/-1dB
	24Mbps	-84 dBm	+/-1dB
	36Mbps	-81 dBm	+/-1dB
	48Mbps	-75 dBm	+/-1dB
	54Mbps	-72 dBm	+/-1dB

ADJUSTABLE CHANNEL SIZE SUPPORT		
5MHz	10MHZ	20MHz

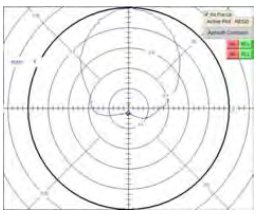
RANGE PERFORMANCE	
Outdoor (BaseStation Antenna Dependent):	Over 5km

ANTENNA

Gain	8dBi (2400-2500MHz)	Surival Wind	216 km /hr
Polarization	Multi-Polarized	3dB Beamwidth Elevation	60 degrees
Polarization Selection	Software Controlled	3dB Beamwidth Azimuth	60 degrees



Azimuth



Elevation

PHYSICAL / ELECTRICAL / ENVIRONMENTAL	
Enclosure Size	16.3 cm. length x 3.1 cm. height x 8cm. width
Weight	0.18kg
Enclosure Characteristics	Outdoor UV Stabalized Plastic
Mounting Kit	Pole Mounting Kit included
Max Power Consumption	4 Watts
Power Supply	12V, 1A (12 Watts). Supply and injector included
Power Method	Passive Power over Ethernet (pairs 4,5+; 7,8 return)
Operating Temperature	-20C to +70C
Operating Humidity	5 to 95% Condensing
Shock and Vibration	ETSI300-019-1.4

SOFTWARE

AirOS™ by Ubiquiti Networks

visit www.ubnt.com/airos

UBIQUITI NETWORKS 495-499 Montague Expwy. Milpitas, CA 95035 CA 95035 T(408)-942-3085 F (408)-351-4973 http://www.ubnt.com

End of Section

F Appendix F: 8.5 mm Endoscope for the *da Vinci Si* System

This section provides details specific to the 8.5 mm 3D endoscope system designed to be used with the *da Vinci Si* Surgical System. It augments the information within this manual regarding endoscopes, especially under Endoscopesin section 7.1 Vision System Overview. Users should consider the following:

- Users should have a thorough understanding of the use of the 12 mm endoscope system in conjunction with the *da Vinci Si* Surgical System before using the 8.5 mm endoscope and components. This section contains important information about the differences between the 8.5 mm and 12 mm endoscopes and components.

WARNING: Be sure to read and understand all caution and warning information found in this manual before using this product.

Indications for Use

The *Intuitive Surgical* 8.5 mm Endoscopic System is intended for endoscopic viewing of internal surgery sites during minimally invasive surgery in the peritoneal cavity, thoracic cavity, and peritoneum. It is designed for use with the *Intuitive Surgical da Vinci Si* Instrument Control System during laparoscopic and thoracoscopic surgical procedures.

F.1 Overview

The 8.5 mm endoscope provides a 3D view of the operative field when used with the *da Vinci Si* High Definition Vision System. The small diameter of the 8.5 mm endoscope enables the *da Vinci Si* Surgical System to be used with a smaller endoscope port. While the system is not docked, you can use the 8.5 mm endoscope for laparoscopy through a *da Vinci* 8 mm instrument cannula.

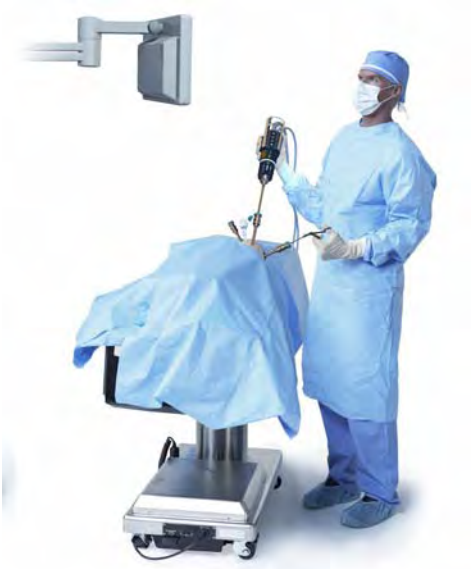


Figure F.1 Using the 8.5 mm endoscope manually

The 8.5 mm endoscope uses a three-piece system concept (endoscope, adapter and camera). The 8.5 mm endoscope is compatible with the High Definition cameras, illuminators and light guides provided with the *da Vinci Si* Surgical System. The 8.5 mm endoscope is available in straight (0°) and angled (30°) tip configurations.

Special considerations for the 8.5 mm endoscope include:

- While the system is docked, the 8.5 mm endoscope requires use of the 8.5 mm Endoscope Cannula or a validated third-party endoscope cannula. Refer to the list of Validated 3rd Party Products for *da Vinci*® Surgical Systems (PN 871770).
- The 8.5 mm endoscope requires use of the 8.5 mm Alignment Target.
- The 8.5 mm endoscope is approximately 90 mm shorter than the 12 mm endoscope.
- The 8.5 mm endoscope tip is not heated.
- The 8.5 mm endoscope is more flexible than the 12 mm endoscope. Therefore, special care in the setup and handling of the 8.5 mm endoscope is required.
- To prevent damage during reprocessing, we strongly recommend you place the endoscope in a properly designed sterilization tray or case, like those we identify in the list of Suggested 3rd Party Products for *da Vinci*® Surgical Systems (PN 871771)
- The 8.5 mm endoscope has lower resolution and less brightness than the 12 mm endoscope.

⚠ **CAUTION: The 8.5 mm endoscope should only be used in cases where the image quality of the 12 mm endoscope is not required. A 12 mm endoscope should be available for use if an increase in image quality is preferred.**

F.2 Working with the 8.5 mm Endoscope

The 8.5 mm endoscope uses the same camera arm and camera head drapes as the 12 mm endoscope. However, the 8.5 mm endoscope requires a specific alignment target and endoscope cannula. The 8.5 mm endoscope, alignment target and cannulae are clearly marked **"8.5 mm"** (see Figure F.2 for examples below).

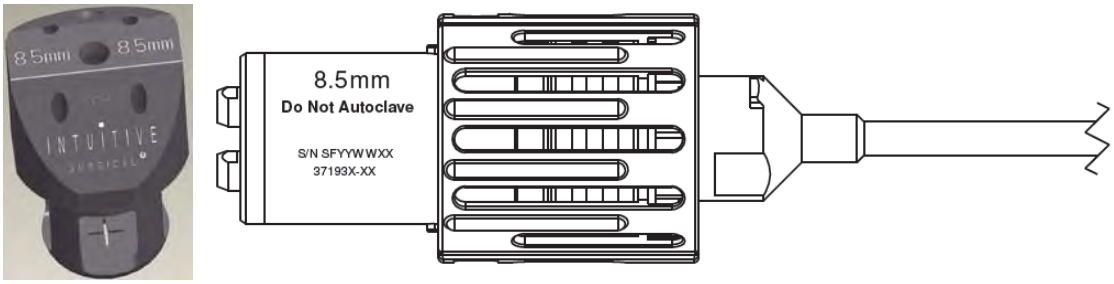


Figure F.2 "8.5 mm" marking on alignment target and endoscope

The following table provides the compatible combinations of reusable cannula, cannula mount and alignment target for use with the 8.5 mm endoscope on *da Vinci Si* Surgical Systems. For a list of disposable endoscope cannulae validated by Intuitive Surgical, refer to the list of Validated 3rd Party Products for *da Vinci*® Surgical Systems (PN 871770).

Table F-1 Compatible combinations of reusable cannula

Alignment Target	Endoscope Cannula Mount	Reusable Endoscope Cannula
371679	371521 (ETH/TAUT)	420260

Refer to appropriate sections of this user manual for general instructions regarding endoscope alignment and setup, including connections to the other components of the Vision System and to the camera arm of the Patient Cart. Refer to the Reprocessing Instructions for compatible sterilization methods and parameters for the 8.5 mm endoscopes.

_____End of section_____

G Appendix G: Symbols, Icons and Text Messages Reference

G.1 Overview

This appendix provides a reference for symbols, LEDs (colored lights), icons and text messages you may see on system components or monitors.

Symbols

Symbols appear on system components and serve these purposes:

- Identification of important system connections and functions
- Provide caution and warning information

LED Status Indicators

Indications of the status of the instrument and camera arms are provided by LEDs on the top of the insertion axis of each instrument and camera arm. The meanings of the colors are as follows:

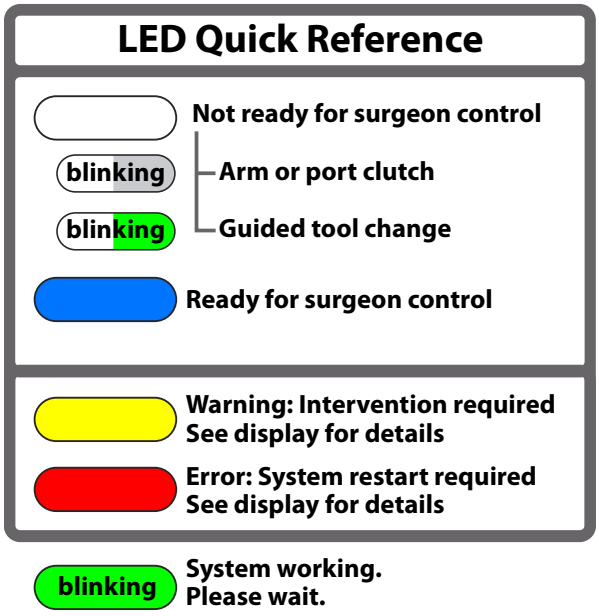


Figure G.1 LED Quick Reference

Corresponding LED icons—graphics that reproduce the LED status—appear simultaneously on the touchscreen and stereo viewer.

On-Screen Icons and Text Messages

Icons and text messages are overlaid on the video displays to provide information regarding the status of the system. The following figures illustrate arrangement of overlaid elements in the stereo viewer and touchscreen displays. Note that many overlaid elements appear only when needed, and others are usually or always present.

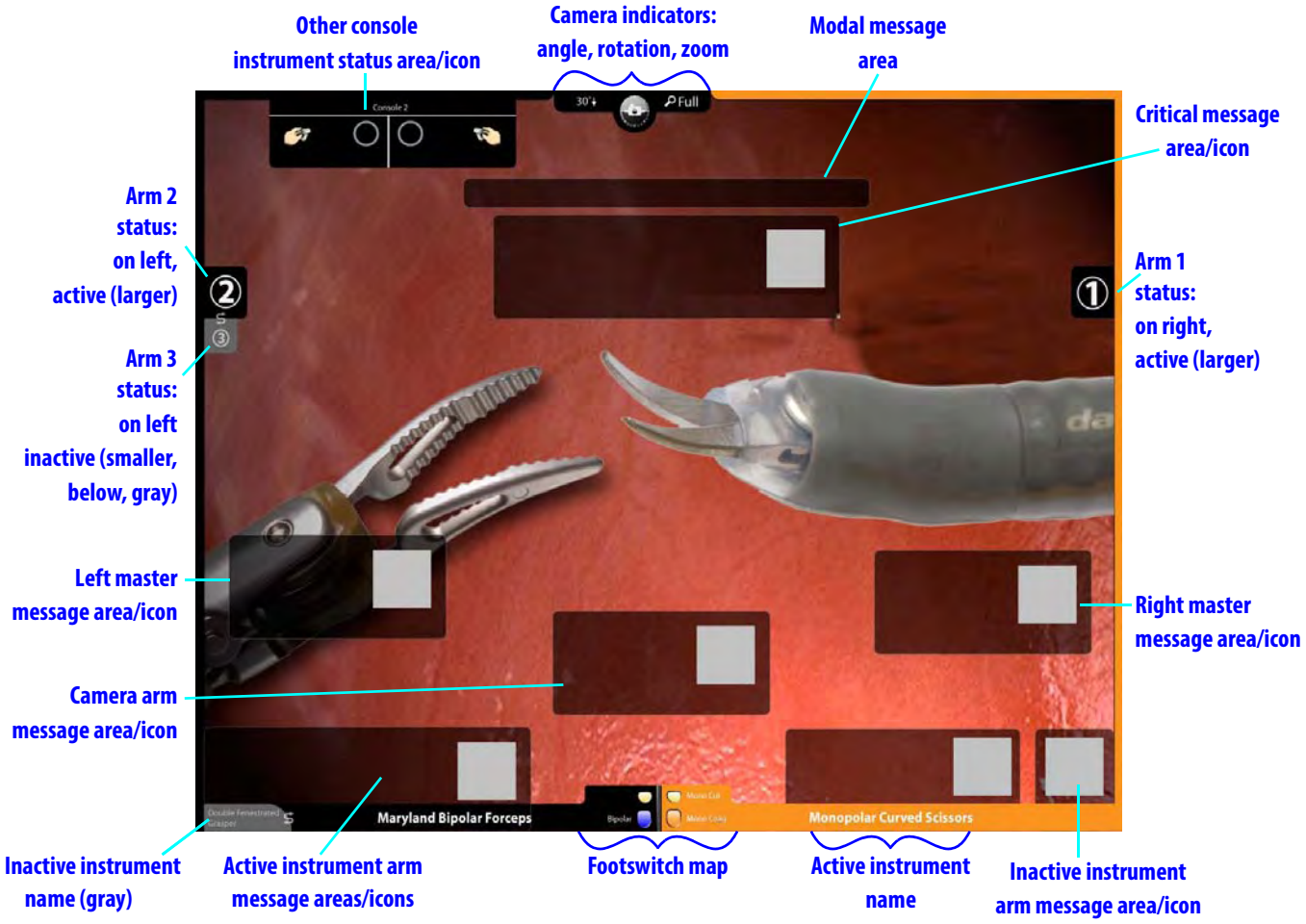


Figure G.2 Stereo viewer display (SmartPedal technology)

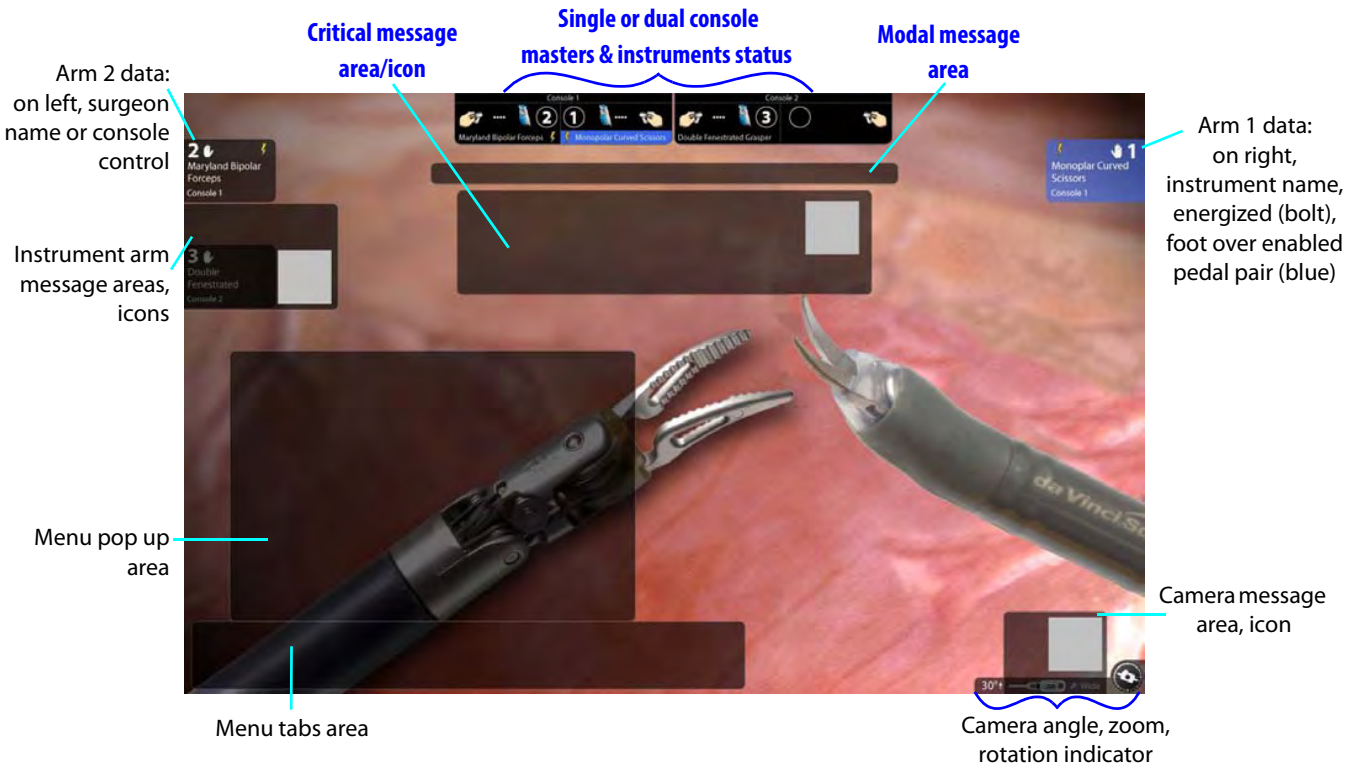


Figure G.3 Touchscreen display

G.2 Symbols and Icons Reference Table

Table G-1 Symbols and Icons

Symbol or Icon	Meaning	Where Found
 or 	Read the operating instructions.	System component labels
	Type CF Applied Part	On camera head and instruments
	Type BF Applied Part	On Illuminator. Note: The *da Vinci Si* camera head provides isolation in accordance with a CF applied part and is acceptable for use with the Y1903 Illuminator.
	Caution: Hot	Illuminator lamp module

Table G-1 Symbols and Icons

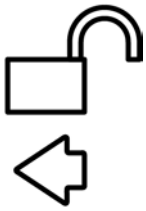
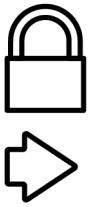
Symbol or Icon	Meaning	Where Found
	Protective ground	Inside (not visible to users) the Camera Control Unit, Core, Vision Cart, Patient Cart and Surgeon Console
	Vision Setup button	Camera head
	Focus In, Focus Out buttons	Camera head
	Lamp On/Off button	Camera head
	Flush Port	On instruments adjacent to flush port
	30 degrees up, indicates which side of scope should be on same side as camera head buttons to achieve this scope orientation.	On one side of endoscope base
	30 degrees down, indicates which side of scope should be on same side as camera head buttons to achieve this scope orientation.	On one side of endoscope base
	Turn as indicated to unlock.	Camera head and endoscope
	Turn as indicated to lock.	Camera head and endoscope

Table G-1 Symbols and Icons

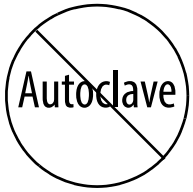
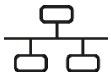
Symbol or Icon	Meaning	Where Found
	Do not autoclave.	Endoscope and camera head
	Fragile, handle with care	Endoscope
	Ethernet Connection	Inside Surgeon Console service panel and rear of Patient Cart
	Alternating Current	On product labels containing rating information on rear of Patient Cart, Surgeon Console and Vision Cart
	Equipotential Terminal	Rear of Surgeon Console, Patient Cart, Vision Cart, Camera Control Unit, Illuminator and Core. Note: The terminal is not required for operation. It is provided for convenience to allow for other equipment to be at the same equalization potential as the *da Vinci* Surgical System.
	Serial Port Connection	Inside Surgeon Console service panel and rear of Patient Cart
	Standby—found on **Power** buttons of Vision Cart, Patient Cart and Surgeon Console, lit amber when in standby mode (connected to mains but not powered on), blue when powered on.	Power buttons on Patient Cart, Vision Cart, Surgeon Console and Core
	Off (power: disconnection from mains)	Rear of Patient Cart, Vision Cart and Surgeon Console, Illuminator, Camera Control Unit and Core
	On (power: connection to mains)	Rear of Patient Cart, Vision Cart and Surgeon Console, Illuminator, Camera Control Unit and Core
DVI	DVI video port	Back of Core and back of Surgeon Console

Table G-1 Symbols and Icons

Symbol or Icon	Meaning	Where Found
Composite	Composite video ports	Back of Core
S-Video	S-Video port	Back of Core and back of Surgeon Console
SDI	SDI video port	Back of Core and back of Surgeon Console
Audio	Audio bay, green	Back of Core and back of Surgeon Console
L	Left	Back of Core and back of Surgeon Console
R	Right	Back of Core and back of Surgeon Console
Core Video	Core Video port	Back of Core and back of CCU
Illuminator Control	Illuminator control ports	Back of CCU
Core Control	Core control ports	Back of CCU
Video Control	Video control ports	Back of Core
Touch Screen Audio	Touchscreen audio connection port	Back of Core
Touch Screen Video	Touchscreen video connection ports	Back of Core
Touch Screen Com	Touchscreen communication ports	Back of Core
SERVICE	Service connection ports	Back of Core
Headset	Headset connection port	Back of Core and back of Surgeon Console
Line In	Audio line in port	Back of Core and back of Surgeon Console
Line Out	Audio line out port	Back of Core and back of Surgeon Console
Video Out	Video out bay, orange, labeled either "**Aux**" for auxiliary (on Core); **L** (left) and **R** (right) (on Surgeon Console); or **1** and **2** (optional bays on Core)	Back of Core and back of Surgeon Console
TilePro Input	Video in bay, blue	Back of Core and back of Surgeon Console

Table G-1 Symbols and Icons

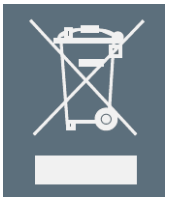
Symbol or Icon	Meaning	Where Found
FIBER	Fiber cable (system cable) receptacle	Next to fiber cable receptacles on back of Core
BRAKE	Indicates the brakes on the Surgeon Console, applied by stepping down.	Both sides of Surgeon Console, near floor
PUSH	Indicates where to push the Surgeon Console.	Both sides of Surgeon Console, near handles
	Master clutch	Clutch pedal on footswitch panel
	Instrument arm swap	Arm swap kick-plate (left side) on footswitch panel
	Do not step here.	On Patient Cart base
	Tip hazard during transport. Stow touchscreen and close rear door before moving cart.	On label on rear door of Vision Cart
	Do not move Surgeon Console from the back.	Back of Surgeon Console
	Dispose of in accordance with local regulations—particularly applies to electronic components.	System labels

Table G-1 Symbols and Icons

Symbol or Icon	Meaning	Where Found
	Fiber cable (system cable) receptacle	Next to system cable receptacles on back of Core, Surgeon Console and Patient Cart
	Caution: Laser hazard	On blue covers of system cable receptacles on Core, Surgeon Console and Patient Cart
	Video output format of associated output ports is configurable via the touchscreen. On Video Settings tab, select Video Output button.	Back of Core, with connection bays
	Energy activation cable connection port	Back of Core
	Video out bay, left video channel; video has no overlays. This is component video, made up of Y (green port), P_R (red port) and P_B (blue port). A similar label appears for the right video channel.	Back of Camera Control Unit (CCU)
	Surgeon head-in sensor	Surgeon Console viewer
	Indicates forward and reverse for the Patient Cart motor drive	Right tiller handle
	Indicates range of speed for the Patient Cart motor drive	Right tiller handle

Table G-1 Symbols and Icons

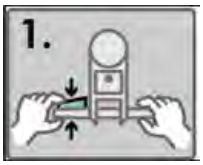
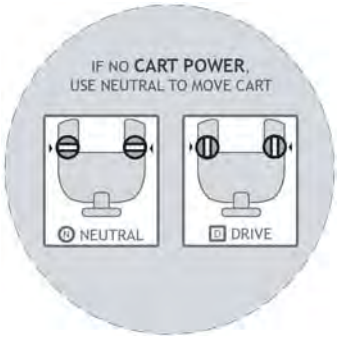
Symbol or Icon	Meaning	Where Found
	Shows use of throttle enable switch	Between the tiller handles
	Shows use of throttle	Between the tiller handles
	Explains N=Neutral and D=Drive positions for the motor drive shift switches. Includes text, "IF NO **CART POWER**, USE NEUTRAL TO MOVE CART"	Top of Patient Cart motor drive tiller.
	"Sweet Spot" label: Its limits indicate recommended distance range of Camera Arm remote center from Patient Cart tower	Camera Arm setup joint
	"Drive" position: Patient Cart drive motor engaged	Patient Cart base near motor shift switches
	"Neutral" position: Patient Cart drive motor disengaged	Patient Cart base near motor shift switches
	Brake release	Near upper port clutch button on instrument and camera arms

Table G-1 Symbols and Icons

Symbol or Icon	Meaning	Where Found
	Pinch/Crush Hazard	On Patient Cart, below upper port clutch button and at junction of setup joint and top of column on instrument and camera arms; on Surgeon Console
EPO	Emergency Power Off	Rear of Patient Cart
	Interference may occur in the vicinity of equipment marked with this symbol.	Not used on IS3000 system but may appear on other equipment in the OR
	Speaker connection port	Back of Core
	Microphone connection port	Back of Core
	The system is preparing to shut down. A message indicating the number of seconds until shut down appears in the body text area.	Critical message area
	General information icon. Appears when the system is providing information that is not fault-related.	Critical message area Camera arm message area
	General warning / recoverable fault. Appears when the system detects a recoverable fault somewhere within the system not associated with a particular arm or master.	Critical message area Touchpad popup dialog Touchpad error handling area

Table G-1 Symbols and Icons

Symbol or Icon	Meaning	Where Found
	General critical warning / non-recoverable fault. Appears when the system detects a non-recoverable fault somewhere within the system not associated with a particular arm or master.	Critical message area Touchpad error handling area Can also appear by itself on the touchscreen and touchpad when a critical startup error has occurred
	Scope not detected. Appears when the system does not detect an endoscope and the user is attempting to go into following.	Critical message area Touchpad popup dialog
	Guided tool change in progress	Instrument arm message area
	The system has detected a problem with the instrument. This can appear when the instrument is expired, when the instrument is incompatible with the system, when the system is not prepared to have an instrument installed on it, or when the system is having difficulty communicating with the instrument.	Instrument arm message area
	General informational icon related to the instrument. This can appear when the system is downloading new instrument information from a plug-and-play instrument.	Instrument arm message area
	Camera arm is currently clutched and is free to be moved by OR staff around its remote center.	Camera arm message area

Table G-1 Symbols and Icons

Symbol or Icon	Meaning	Where Found
	Instrument arm is currently clutched and is free to be moved by OR staff around its remote center.	Instrument arm message area
	The system has detected a non-recoverable fault on the left master.	Left master message area
	The system has detected a non-recoverable fault on the right master.	Right master message area
	The system has detected a non-recoverable fault on an instrument arm.	Instrument arm message area
	The system has detected a non-recoverable fault on the camera arm.	Camera arm message area
	Move the right master grips to match the instrument grips (i.e., “Follow on matching grip”).	Right master message area

Table G-1 Symbols and Icons

Symbol or Icon	Meaning	Where Found
	Move the left master grips to match the instrument grips (i.e., "Follow on matching grip").	Left master message area
	The system has detected a recoverable fault or other resolvable problem on the left master.	Left master message area
	The system has detected a recoverable fault or other resolvable problem on the right master.	Right master message area
	The system has detected a recoverable fault or other resolvable problem on an instrument arm.	Instrument arm message area
	The system has detected a recoverable fault or other resolvable problem on the camera arm. In dual console mode, appears when camera control pedal is pressed on other console, explaining why instruments stop moving and firing.	Camera arm message area Above footswitch map when camera control pedal is pressed on other console.
	The instrument tip is still inside the cannula. To continue, you must clutch the instrument arm and advance the tip into the body.	Instrument arm message area

Table G-1 Symbols and Icons

Symbol or Icon	Meaning	Where Found
	The system has detected excessive force on an instrument arm. This normally means that some external object is pushing on an arm.	Instrument arm message area
	This instrument arm is locked; unlock it via the touchpad to use.	Instrument arm message area
	Hit the arm swap pedal to use the instrument in question.	Instrument arm message area
	The system has detected a problem with a cannula.	Instrument arm message area
	Relax your grip on the left master so that it can self-align.	Left master message area
	Relax your grip on the right master so that it can self-align	Right master message area

Table G-1 Symbols and Icons

Symbol or Icon	Meaning	Where Found
	Roll the left master grip to proceed.	Left master message area
	Roll the right master grip to proceed.	Right master message area
	Your instruments have been reassigned. Tap 'Arm Swap' pedal to acknowledge and continue.	Critical message area Touchscreen instrument arm status area Dual console instrument status area (touchpad and touchscreen)
	The instrument arm is conducting its self test.	Instrument arm message area
	The camera arm is conducting its self test.	Camera arm message area
	The left master is conducting its self test.	Left master message area

Table G-1 Symbols and Icons

Symbol or Icon	Meaning	Where Found
	The right master is conducting its self test.	Right master message area
	Select the desired motion scaling level.	Touchpad popup menu
	The ergonomic settings are being adjusted.	Critical message area
	Setup arm has been moved unexpectedly; press one of the port clutch buttons to continue.	Instrument or camera arm message area
	Energy activation is currently unavailable. Energy may be unavailable because the instrument installed is not an energy instrument or because no compatible ESU for the installed instrument is detected.	Touchscreen instrument arm status area 3D viewer instrument arm status area
	Energy activation is currently available.	Touchscreen instrument arm status area 3D viewer instrument arm status area

Table G-1 Symbols and Icons

Symbol or Icon	Meaning	Where Found
	No scope is detected.	Touchscreen camera status area Touchpad central column on main page (shown vertically)
	Scope detected. This icon is accompanied by 30˚↑, 30˚↓, or 0˚.	Touchscreen camera status area Touchpad central column on main page (shown vertically)
	Digital Zoom. This icon is accompanied by one of the following zoom levels: • Wide • Full • 2x • 4x	Touchscreen camera status area. Touchpad central column on main page
	Indicates which manipulator is currently associated with the surgeon's right hand.	Touchscreen instrument arm status area Touchpad instrument arm status area
	Indicates which manipulator is currently associated with the surgeon's left hand.	Touchscreen instrument arm status area Touchpad instrument arm status area
TilePro 1	Indicates TilePro input 1.	Button on touchscreen display
TilePro 2	Indicates TilePro input 2.	Button on touchscreen display

Table G-1 Symbols and Icons

Symbol or Icon	Meaning	Where Found
	Camera	Button on touchscreen display (for selecting endoscopic camera view) Camera control foot pedal Touchscreen master status area (shown when Surgeon Console is in camera control)
	Surgeon Console	Button on touchscreen display (for selecting "surgeon's TilePro view")
	Electronic brightness control (does not affect Illuminator light output).	Touchscreen and touchpad displays
	Increase setting.	Touchscreen display buttons; can be used as an alternative to sliders
	Decrease setting.	Touchscreen display buttons; can be used as an alternative to sliders
	Close tab menu.	Touchscreen display; used to close the tab menu
	Mute microphone.	Touchscreen and touchpad displays; used to mute the local microphone (touchpad version mutes the Surgeon Console microphone and touchscreen version mutes the Vision Cart microphone)
	Enable microphone.	Touchscreen and touchpad displays; used to enable the local microphone (touchpad version enables the Surgeon Console microphone and touchscreen version enables the Vision Cart microphone)

Table G-1 Symbols and Icons

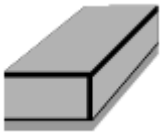
Symbol or Icon	Meaning	Where Found
	Speaker volume	Touchscreen and touchpad displays; labels the slider that controls the local speaker volume
	Erase telestration marks.	Touchscreen display
	Instrument arm locked (when on screen). Brake applied (when brake pedal is depressed on Surgeon Console).	Instrument arm message area on touchscreen. Touchpad instrument arm lock button Above applied brakes on Surgeon Console
	Adjust right.	Touchscreen / touchpad displays for camera calibration
	Adjust left.	Touchscreen / touchpad displays for camera calibration
	Adjust up.	Touchscreen / touchpad displays for camera calibration
	Adjust down.	Touchscreen / touchpad displays for camera calibration
	Secondary Energy Pedal	3D viewer footswitch map

Table G-1 Symbols and Icons

Symbol or Icon	Meaning	Where Found
	Secondary Energy Pedal (when pressed)	3D viewer footswitch map
	Primary Energy Pedal	3D viewer footswitch map
	Primary Energy Pedal (when pressed)	3D viewer footswitch map
	Arm Swap Pedal	3D viewer footswitch map
	Arm Swap Pedal (when pressed)	3D viewer footswitch map
	Master Clutch Pedal	3D viewer footswitch map

Table G-1 Symbols and Icons

Symbol or Icon	Meaning	Where Found
	Master Clutch Pedal (when pressed)	3D viewer footswitch map
	Camera Control Pedal	3D viewer footswitch map
	Camera Control Pedal (when pressed)	3D viewer footswitch map
	Masters status	3D viewer footswitch map
	Masters status: left finger clutch activated	3D viewer footswitch map
	Masters status: right finger clutch activated)	3D viewer footswitch map
	Masters status during camera control: indicates that roll-to-focus is available	3D viewer footswitch map
	Masters status during camera control, when master roll is causing camera to focus in the + direction	3D viewer footswitch map
	Master controls status during camera control, when master roll is causing camera to focus in the – direction)	3D viewer footswitch map

Table G-1 Symbols and Icons

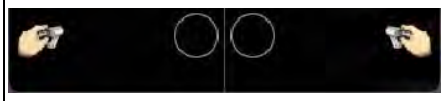
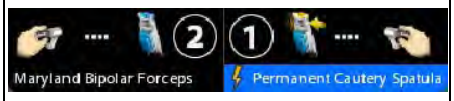
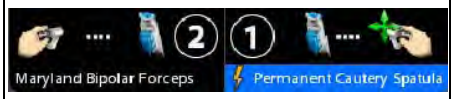
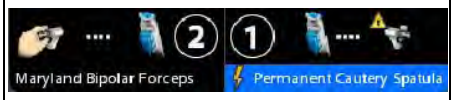
Symbol or Icon	Meaning	Where Found
	Camera rotation indicator	3D viewer (top center) Touchscreen (lower right)
	Camera rotation indicator when angle is indeterminate; this can happen when no scope is selected or when scope is looking straight up or straight down.	3D viewer (top center) Touchscreen (lower right)
	Left and right master are not associated with an instrument arm.	Touchscreen masters & instruments status area (top center) 3D viewer (upper left) in dual console mode
	Left master is associated with an instrument on arm 2 and right master is associated with an instrument on arm 1.	Touchscreen masters & instruments status area (top center) 3D viewer (upper left) in dual console mode
	Cautery instrument on arm 1 with right master is not energized for some reason.	Touchscreen masters & instruments status area (top center) 3D viewer (upper left) in dual console mode
	Energized instrument on arm 1 with right master is locked.	Touchscreen masters & instruments status area (top center) 3D viewer (upper left) in dual console mode
	There is a problem with the cannula on arm 1 with the right master.	Touchscreen masters & instruments status area (top center) 3D viewer (upper left) in dual console mode
	The instrument on arm 1 with right master is experiencing excessive external force.	Touchscreen masters & instruments status area (top center) 3D viewer (upper left) in dual console mode

Table G-1 Symbols and Icons

Symbol or Icon	Meaning	Where Found
	System reports "No instrument installed" on instrument arm 1 with right master.	Touchscreen masters & instruments status area (top center) 3D viewer (upper left) in dual console mode
	Right master is finger clutched.	Touchscreen masters & instruments status area (top center) 3D viewer (upper left) in dual console mode
	Recoverable problem with right master.	Touchscreen masters & instruments status area (top center) 3D viewer (upper left) in dual console mode
	Instrument arm 1 clutched.	Touchscreen masters & instruments status area (top center) 3D viewer (upper left) in dual console mode
	***da Vinci* Network Offline**.	Touchscreen lower right
	***da Vinci* Network Online**.	Touchscreen lower right
	***OnSite* Session In Progress**.	Touchscreen lower right

G.3 Text Messages Reference Table

Table G-2 contains a list of text messages that can appear on screen, sorted alphabetically. The text messages can appear in one or several contexts and locations and are written so as to be understood in each context on screen, and therefore not explained further. Variables are shown in italics inside angled brackets, like this: <*variable*>. This table is provided as a reference and to support translation into languages not supported in the system software.

Table G-2 Text Messages

Message
A B C P1 P2 P3 P4 T
<*button name*> Button Stuck During Self-Test.
<*ESU name*> is currently connected to your system. Would you like to continue or disconnect?
<*Left master, Right master*> switches have been disabled by system. [This is repeated in table for optional “Left” and “Right” starting letters.]
<*Monopolar, Bipolar, etc.*> energy disabled; only one <*Monopolar, Bipolar, etc.*> device is allowed
<*Monopolar, Bipolar, etc.*> and <*Monopolar, Bipolar, etc.*> energy disabled during simultaneous control
<*Surgeon Console, Patient Side*> Overlay [This is repeated in table for optional “Surgeon” and “Patient” starting letters.]
<*User name*> has connected.
<*User name*> has disconnected.
<*User name*> has invited you to join a conference. Would you like to accept?
0
2D
2x
30
3-arm Patient Cart not supported. Power down, connect 4-arm Patient Cart, and restart.
3D
3D Calibration
3D Viewer Blocked
4-arm Patient Cart not supported. Power down, connect 3-arm Patient Cart, and restart.
4x
A fault has occurred.
A remote user
Accept
Account Info
Account Management
Adjust as necessary
Adjust the 3D viewer height until it is in a comfortable position.

Table G-2 Text Messages

Message
Adjust the 3D Viewer tilt until it is in a comfortable position.
Adjust the foot switch panel depth until the controls are easily accessible.
Adjust your chair height to a point at which your legs are at a slight downward angle.
Adjusting Ergonomics
Advance instrument to return to previous location.
Advanced Video Adjustments
Aligning...
Are you sure you want to disable <*manipulator name; e.g., Instrument arm 1, camera arm, left master, etc.*>?
Are you sure you want to disable <*manipulator name; e.g., left master, instrument arm 2, camera arm, etc.*>?
Are you sure you want to disable the master switches for <*left master, right master*>?
Are you sure you want to disable the master switches?
Are you sure you want to swap control of all instrument arms?
Are you sure you want to unlock instrument arm <*1, 2, or 3*>?
Arm clutched at patient cart.
Arm locked.
Arm not ready. Remove instrument to continue.
Arm Stowed
Attention
Audio
Audio Fault - System May Have Reduced or No Audio Feedback
Auto
Auto 3D Calibration
Auto-calibration
Auto-calibration in progress...
Auto Fluorescence Calibration (Part 1)
Auto Fluorescence Calibration (Part 2)
Back
Blue
Both master switches have been disabled by system.
Both surgeon consoles must have same foot tray type.
Brightness
Button Stuck During Self-Test
Calibration
Camera / Scope
Camera / Scope Calibration – Press 'Finish Calibration' to Exit
Camera / Scope Setup
Camera and set-up arm clutched at patient cart.

Table G-2 Text Messages

Message
Camera Arm
Camera arm clutched at patient cart.
Camera arm not free to move.
Camera control pedal pressed
Cancel
Canceled
Cannula is invalid, please remove.
Caution: Instrument motion may be non-intuitive
Channel 1 & 2 Configuration
Check video connections. Press 'Recover Fault' to continue.
Check view port for obstructions.
Click 'New User' to create an account.
CLOSE
Close grip to allow cutting.
Clutching
Composite / S-Video / SD-SDI
Conference in Progress
Configure
Confirm
Connect
Connected to Conference
Connection Status
Console
Console *<1 or 2>*
Contact customer service.
Contact ISI Technical Support for additional information.
Contact ISI Technical Support for assistance.
Contact ISI Technical Support if you require technical assistance.
Continue
Contrast
Control Preferences
Cut complete. Release grip to disable.
Cut is enabled. Press again to cut. Release grip to disable.
Data Collection in Progress...
da Vinci Network Offline
da Vinci Network Online
Delete Users
Disable

Table G-2 Text Messages

Message
Disable <*name of manipulator; e.g., instrument arm 1, camera arm, right master, etc.*> or restart system to continue.
Disable Arm
Disable Node
Disable Switches
Disconnect
Disconnect one console and reset system to continue.
Disconnect one surgeon console and press 'Recover Fault' to continue.
Disconnect or unpower <*ESU name*> or <*ESU name*> to resolve. [Note: This message appears when two ESUs have conflicting features. Both are listed by name, so one example would be: "Disconnect or unpower Conmed or ValleyLab to resolve."]
Display Eye
Display Name is required.
Display name must be unique.
Display Name: <*Name*>
Display Preferences
Does this calibration look correct?
Done
Don't show this message again
Downloading data, please wait: <#>
Dr. <*Name*>
Dual Console Mode Not Supported
Dual console not supported. Power down, disconnect Surgeon Console, and restart.
DVI-D (720p)
DVI-I
DVI-I (1024x768)
DVI-I (1280x1024)
DVI-I (1440x900)
Edge Enhancement
Edit
Edit <*user name*> Account
Edit User
Emergency Stop Activated
Enable
Endoscopic View
Energy Device Conflict
Ensure the network cable is properly connected.
<*ESU name*> is currently connected to your system. Would you like to continue or disconnect?

Table G-2 Text Messages

Message
Event Logs
Excessive force detected. Examine arm.
Experimental instrument – Not for human use
Experimental scope – Not for human use
Exit
Failed
Failed: Not white
Failed: Possible dirty scope
Failed: Scope may be damaged
Failed self-check. Remove instrument.
Failed: Target not found
Failed: Too bright
Failed: Too dim
Far
Fault Code: <#####>
Fiber cable connectors require cleaning.
Fiber optic connectors require cleaning.
Fine (3:1)
Finger Clutch
Finish assigning masters at touchpad and press 'OK' to continue.
Finish Calibration
First Name is required.
First Name: <*Name*>
Fluorescence
Fluorescence Calibration (Part 1)
Fluorescence Calibration (Part 2)
Fluorescence Finger Switch
Focusing...
Foot position sensors blocked. Check for obstructions.
Foot position sensors have been disabled by the system.
Footswitch
Format
Full
Give
Graphics
Haptic Zoom
HD-SDI (1080i)

Table G-2 Text Messages

Message
HD-SDI (720p)
Illuminator
Illuminator bulb expired; Power down system and replace when possible.
Illuminator door is open. Close door and press 'Recover Fault' to continue.
Illuminator lamp module error: Please reseat or replace lamp module
Image Depth
Image Enhancement
Image Quality
Information displayed in 3D viewer
In progress.
Incoming Call
Independent
Insertion axis not free to move. Check for obstructions.
Instrument and set-up arm clutched at patient cart.
Instrument arm <*1,2, or 3*> is currently associated with a master on the other console. Are you sure you want to take control of it?
Instrument Arm 1
Instrument Arm 2
Instrument Arm 3
Instrument arm not free to move.
Instrument is expired. Remove.
Instrument not compatible with cannula, please resolve.
Instrument not fully connected. Check all cable connections.
Instrument not fully connected. Check all cable connections and re-install instrument.
Instrument not recognized. Remove and reinstall.
Instrument not supported. Remove.
Instrument tip in cannula; clutch and advance.
Instrument too long for cannula. Remove instrument.
Instrument will expire after procedure.
Instruments Reassigned
Insufficient Battery Charge
Interface Options
Invalid Instrument Installed
Inventory Management
Invited to Conference
L
Large
Last Name is required.
Last Name: <*Name*>

Table G-2 Text Messages

Message
Left Master
<*Left master, Right master*> switches have been disabled by system. [This is repeated in table for optional “Left” and “Right” starting letters.]
Left video lost. Check video connections and power.
Lock
Login
Logout
Maintenance Mode – Not for human use
Maintenance Mode – Not for human use (Console 1)
Maintenance Mode – Not for human use (Console 2)
Manage Users
Manual
Master Associations
Master Associations Incomplete
Master Controller Assignments Incomplete
Master not free to move.
Master Scaling
Master Switch Error
Maximum of two arms per side.
Move master grip to match instrument.
Networking hardware fault. OnSite and Connect functionality no longer available. Press 'Recover Fault' to continue.
Network Detected
Network Unavailable
New User
New User (Step <*step number*> of <*total number of steps*>)
Next
Next Log
No
No battery backup.
No battery backup. Contact customer service.
No cannula detected. Remove instrument and check cannula.
No Instrument Installed
No Scope Detected
No user logged in.
No video signal. Check video connections and power.
Non-recoverable Fault
Non-recoverable Fault <*fault number*> Restart system to continue.
Non-recoverable Subsystem Fault

Table G-2 Text Messages

Message
Non-recoverable Subsystem Fault <*fault number*>
Non-recoverable Subsystem Fault <*fault number*>. Disable arm or restart system to continue.
Normal
Normal (2:1)
Not available
Not connected to Vision Cart.
Off
OK
On
OnSite Session in Progress
Page Down
Page Up
Patient cart and surgeon console either not connected or not powered.
Patient cart battery is charging. Please wait.
Patient Cart Disconnected
Patient cart either not connected or not powered.
Patient cart running on battery. Check AC power.
Patient-Side
Patient-Side Touchscreen Failed Self-Test
<*Surgeon Console, Patient Side*> Overlay [This is repeated in table for optional “Surgeon” and “Patient” starting letters.]
Pedal Conflict. Remove conflicting instrument to enable.
Pending
Please wait. Self-test in progress
Preparing to Shut Down
Press and Hold to Restore Settings
Press 'Arm Swap' pedal to activate arm.
Press 'OK' to continue
Press 'Recover Fault' or disable <*name of manipulator; e.g., instrument arm 1, right master, etc.*> to continue
Press 'Recover Fault' or 'Disable Switches' to continue.
Press 'Recover Fault' to continue
Press 'Recover Fault' to continue. Contact customer service.
Preventive maintenance recommended. Contact customer service.
Previous Log
Quick (1.5:1)
R
Recover
Recover Fault

Table G-2 Text Messages

Message
Recoverable Fault
Recoverable Fault <*fault number*> Press 'Recover Fault' to continue
Red
Reject
Relax hold on master so it can self-align.
Remote Session in Progress
Remove Instrument
Restart system to continue.
Restart system to continue. Contact customer service.
Restore Factory Settings
Restore Settings
Reverse
<*Left master, Right master*> switches have been disabled by system. [This is repeated in table for optional “Left” and “Right” starting letters.]
Right Master
Right video lost. Check video connections and power.
Roll master grip.
Rotate master to match instrument.
Scaling
Scope
Scope Angle
Select a motion scaling level.
Select a scope
Select a zoom level
Select scope angle to continue.
Service recommended. Contact customer service.
Session Available
Session Enabled
Session Ended
Session in Progress
Session Unavailable
Set-up arm clutched at patient cart.
Set-up arm moved unexpectedly. Press port clutch button to clear.
Shutting down in <#> seconds. Press power button to cancel.
Silence
Silence Alarm
Size
Skip Login
Slide to unlock

Table G-2 Text Messages

Message
Small
Some ergonomic adjustments are unavailable.
Start Calibration
Step <*step number*> of <*total number of steps*>: Press the center of the cursor.
Stereo Pair
Successful
Surgeon Console
Surgeon console either not connected or not powered.
<*Surgeon Console, Patient Side*> Overlay [This is repeated in table for optional “Surgeon” and “Patient” starting letters.]
Surgeon Console Touchpad Is Not Functional
Surgeon monitor tilt sensor error.
Swap All
Switch Error
System communication failure. Restart system to continue.
System Diagnostic Mode – Not for human use.
System is overheating. Ensure adequate ventilation.
System overheating. Shutting down in <#> seconds. Restart not possible; contact customer service.
System shutting down.
Take
Telestration Eye
Test was run. Restart system for normal use.
TFO Mode – Not for human use.
the other console's left master
the other console's right master
TilePro
TilePro QuickClick
Touchscreen Calibration: <*step number*>/<*total number of steps*>
Touchscreen is not available, but other system functions are unaffected. Press 'Recover Fault' to continue.
Training instrument – Not for human use
Training scope – Not for human use
Trial Software – Not for human use
Troubleshooting
Unknown
Unlock
Unsupported Parts Installed on System
Use the da Vinci ergonomic controls on the left side pod to adjust the arm rest until your arms can rest comfortably with your shoulders relaxed.

Table G-2 Text Messages

Message
Utilities
Verify 3D Calibration
Video
Video Fault: Ensure auxiliary video device is powered, then clear fault. If necessary, restart da Vinci system.
Video Output
Video Settings
Video Source
Video Sync Error
Video System Not Ready
Viewer Mode
Visualization
Warning: Ensure proper scope selection (0 degree scope selected).
Warning: Ensure proper scope selection (30 degree down scope selected).
Warning: Ensure proper scope selection (30 degree up scope selected).
Warning: Ensure proper scope selection (No Scope selected).
Warning: No scope detected. Ensure proper scope selection.
Warning: Patient cart is able to move
White Balance
White balance failed.
White balance failed: image not close enough to white.
White balance failed: image too bright.
White balance failed: image too dim.
White balance failed: possible dirty scope.
White balance in progress.
White balance successful.
Wide
Working Distance
Would you like to connect?
Would you like to connect to a conference?
Would you like to continue?
Yellow
Yes
You are about to reassign instruments in use at the other console. Are you sure?
You are the only member of this conference. Would you like to continue waiting?
Your instruments have been reassigned. Tap 'Arm Swap' pedal to acknowledge and continue.
Zoom

End of section

H Appendix H: System Specifications

H.1 Power Specifications

	Surgeon Console	Patient Cart	Vision Cart
Voltage	100/120/230 VAC 50/60Hz Auto Sense	100/120/230 VAC 50/60Hz Auto Sense	100/120/230 VAC 50/60Hz Auto Sense
Rating and Typical Current	1000VA Continuous 8.4A at 115V~ 4.2A at 230V~	1000VA Continuous 8.4A at 115V~ 4.2A at 230V~	1500VA Continuous 12A at 115V~ 6A at 230V~
Backup Power	NA	5 min	NA
Surge Protected	Yes	Yes	No

H.2 Physical Dimensions

	Surgeon Console	Patient Cart	Vision Cart
Height	70 in. (178 cm)	69 in. (175 cm)	76 in. (193cm) with touchscreen stowed
Width	38 in. (97 cm)	36 in. (91 cm)	26.6 in. (67.6cm)
Depth	34 in. (86 cm)	50 in. (127 cm)	36.5 in. (92.7cm)
Weight	~580 lbs. (264 kg)	~1200 lbs. (544 kg)	446 lbs. (202.3kg)
Ground Clearance	1.9 in. (48 mm)	1.9 in. (48 mm)	4 in. (10.2cm)

H.3 Environmental Specifications

See specifications listed on page 1-7.

H.4 Crate Dimensions

	L x W x H	Weight
Surgeon Console	47.5" x 48" x 65.5″ (1.21m x 1.22m x 1.66m)	793 lbs (360 kg)
Patient Cart	67.3″ x 47.3″ x 77.3″ (1.71m x 1.20m x 1.96m)	1540 lbs (698.5 kg)
Vision Cart	44" x 43" x 83″ (1.12m x 1.09m x 2.11m)	720 lbs (326.6 kg)

H.5 Video Patch Panels

Figure H.1 Video and audio connections (back of Core)

Note: One video output is standard. Optional upgrades can provide up to two additional video outputs.

Selecting Core Video Output

To select the video output format used at each output bay, from the touchscreen, touch **Video Output** on the **Video Settings** tab, which gives access to the following user interface.

Figure H.2 Example of video output option selections

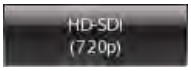
The software buttons on this screen correspond to the applicable Video Out connector bay as explained below in Table H-1 Video Output Connections – Core.

Core Video Connections

Table H-1 Video Output Connections – Core

Connector Label	Connector Type	Software Button(s)	Output Format	Resolution
DVI	DVI-I	DVI-I (1280x 1024)	DVI (analog and digital)	Automatically configured[a]
		DVI-D (720p)	DVI (digital)	720p (720 x 1280 x 59.94Hz)

Table H-1 Video Output Connections – Core

Connector Label	Connector Type	Software Button(s)	Output Format	Resolution
Composite	BNC		Composite (analog)	NTSC (720 x 486 x 29.97Hz) or PAL (720 x 576 x 25Hz)[b]
S-Video	4-pin mini-DIN		S-Video (analog)	NTSC (720 x 486 x 29.97Hz) or PAL (720 x 576 x 25Hz)[b]
SDI	BNC		SD-SDI (digital)	NTSC (720 x 486 x 29.97Hz) or PAL (720 x 576 x 25Hz)[b]
			HD-SDI (digital)	720p (720 x 1280 x 59.94Hz)
			HD-SDI (digital)	1080i (1920 x 1080 x 29.97Hz)

a. Automatically configured video format supports XGA, SXGA, WXGA-Plus analog and digital; 720p digital only. Not all DVI receiving devices support automatic configuration. To assure format 720p video output, select the **DVI-D (720p)** button instead.
b. NTSC or PAL is determined by country.

Table H-2 Video Input Connections – Core

Connector Label	Connector Type	Input Format	Resolution
DVI	DVI-I	DVI (analog and digital)	Automatically configured[a]
S-Video	4-pin mini-DIN	S-Video (analog)	NTSC (720 x 486 x 29.97Hz) and PAL (720 x 576 x 25Hz)
SDI	BNC	SDI (digital)	NTSC (720 x 486 x 29.97Hz) and PAL (720 x 576 x 25Hz)
		HD-SDI (digital)	1080i (1920 x 1080 x 29.97Hz) and 720p (720 x 1280 x 59.94Hz)

a. Automatically configured video format supports XGA, SXGA, WXGA-Plus analog and digital; 720p digital only.

Note: Each input and output bay supports only one video format at a time.

Surgeon Console Video Connections

TilePro Inputs Video Out L, R Audio

Figure H.3 Connections on back of Surgeon Console

Table H-3 Video Output Connections – Surgeon Console

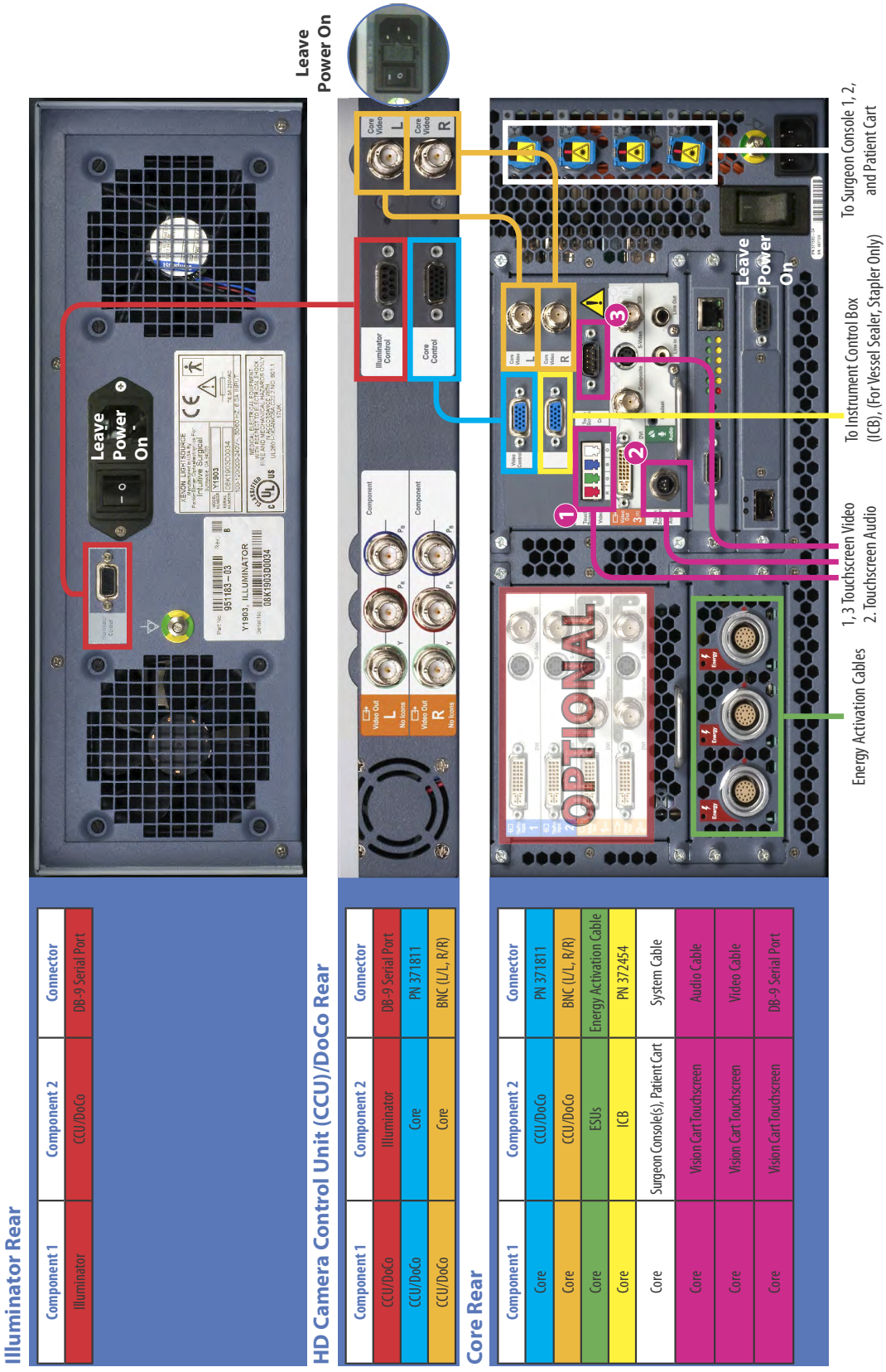
Connector Label	Connector Type	Output Format	Resolution
DVI (SXGA)	DVI-I	DVI (analog and digital)	SXGA

Table 9: Video Input Connections – Surgeon Console

Connector Label	Connector Type	Input Format	Resolution
SDI	BNC	SDI (digital)	NTSC (720 x 486 x 29.97Hz) and PAL (720 x 576 x 25Hz)
		HD-SDI (digital)	1080i (1920 x 1080 x 29.97Hz) and 720p (720 x 1280 x 59.94Hz)
S-Video	4-pin mini-DIN	S-Video (analog)	NTSC (720 x 486 x 29.97Hz) and PAL (720 x 576 x 25Hz)
DVI	DVI-I	DVI (analog and digital)	Automatically configured[a]
a. Automatically configured video format supports XGA, SXGA, WXGA-Plus analog and digital; 720p digital only.			

Note: Each input and output bay supports only one video format at a time.

Core Connections Diagram



End of section

Appendix I: Natural Rubber Latex

The following *Intuitive Surgical* products referenced in this manual are not made with natural rubber latex:

- Camera Arm Drape, PN 420279
- Camera Head Drape, PN 420273
- Disposable Accessory Kit, 3-Arm, PN 420290
- Disposable Accessory Kit, 4-arm, PN 420291
- *EndoWrist One* Suction/Irrigator, PN 410299
- *EndoWrist One* Vessel Sealer, PN 410322
- Instrument Arm Drape, PN 420015
- Monitor Drape, PN 420281

_____End of section_____

J Appendix J: Glossary of Terms

Table J-1 Glossary

Term	Meaning
3D	Three-dimensional.
3D Display	The three dimensional image created by two cameras. You view this image via the stereo viewer on the Surgeon Console.
AC	Alternating Current, also represented by the AC symbol: ~. "AC" or "AC power" refers to electrical connection via a wall outlet, as opposed to battery power.
Arms	The part of the *da Vinci Si* system that holds a grip, instrument or camera. There are six arms on the *da Vinci Si* System. Two master arms with master grips are located on the Surgeon Console. The Patient Cart has four arms, one for the camera and three for the instruments.
Camera Arm	The arm on the center setup joint of the Patient Cart that controls the camera/endoscope according to the surgeon's movements of the masters.
Camera Rotation Indicator	Shows the orientation of the camera with respect to the floor. It appears in the lower right corner of the touchscreen display, and top center of the stereo viewer display.
CF or Type CF	An IEC 60601-1 classification for patient applied parts. Type CF is the most stringent classification, being required for those applications where the applied part is in direct conductive contact with the heart or other applications as considered necessary.
Endoscope Cannula Mount	The accessory that attaches a camera cannula to the camera arm.
Carriage	The portion of the instrument arm to which an instrument sterile adapter attaches. The carriage moves up and down under control of the system, or manually by using the instrument arm clutch.
CAUTION	An important level of concern. Failure to heed a CAUTION may result in unintended motion of the *da Vinci Si* System that may result in injury to a patient.
Circulating nurse vs. scrub nurse	A scrub nurse is prepared to work within the sterile surgical field while a circulating nurse is not.

Table J-1 Glossary

Term	Meaning
Clutch (verb)	1. To master clutch is the act of disengaging the masters from the instrument arms and camera arm so the masters can be repositioned in a more comfortable working space for the surgeon. This action is similar to lifting a computer mouse off the mouse pad and repositioning it. A clutch is also used at the Patient Cart to position the instruments and the camera/endoscope. 2. To finger clutch is to disengage the one master from control of its associated instrument so the master can be repositioned. 3. To arm clutch allows the instrument or camera to float, allowing manual adjustment of the instrument or camera arms. 4. To port clutch allows repositioning of the remote center of a Patient Cart arm by disengaging the brakes on the setup joint.
Clutch (noun)	1. As in arm clutch button, which allows clutching of the instrument arm, or port clutch button, which allows clutching an arm setup joint. 2. As in master clutch pedal, the footswitch pedal used to control master clutching. 3. As in the finger clutch (sliding button on each master), which allows clutching that master separately.
Console	See **Surgeon Console.**
DANGER	The highest level of concern. Failure to heed a DANGER warning can result in injury to a patient.
ESU	Electrosurgical Unit or Electrosurgical Generator Unit.
Endoscope	An instrument used for the examination of the interior of a canal or a hollow space; also called a "scope."
***EndoWrist*® Instruments**	Instruments with a wrist located near the tip.
Emergency Stop State	A state where the motors of are turned off and a screen message is sent to the user.
Faulting	The transition from a working state to either a soft-locked or brake-locked state.
Footswitch	A pedal or switch located on the footswitch assembly of the Surgeon Console.
Footswitch Assembly	Located at the base of the Surgeon Console, containing all of the foot controls.
Head Sensor	Infrared sensor on either side of the view port of the Surgeon Console, located above the stereo viewer.
Illumination System or Illuminator	See **Light Source.**

Table J-1 Glossary

Term	Meaning
Instrument	Any one of several tools used to effect the procedure in the patient once attached to an instrument arm and inserted into the patient. Instruments include, for example, Large Needle Drivers, DeBakey Forceps and Round Tip Scissors.
Instrument Arms	The arms on the outer setup joints of the Patient Cart that manipulate the instruments according to surgeon's movement of the masters.
Left-Side Pod	The appendage on the left end of the Surgeon Console armrest that provides ergonomic adjustment controls.
LED	Light emitting diode.
Light Source	Endoscopic illumination system. The *da Vinci Si* System has a single light source integrated in the Vision Cart and attached to the endoscope assembly by the light guide cable. It provides illumination inside the body for vision.
Master	The control arms and grips in the Surgeon Console that the surgeon grasps and moves. The surgeon's movements are translated to the instruments and camera attached to the Patient Cart arms.
MIS	Minimally Invasive Surgery.
Notes	User information to emphasize an important point.
Patient Cart	The part of the *da Vinci Si* System that is located on the patient side and consists of the column that supports the setup joints that in turn support the instrument and camera arms.
Patient Cart Arms	The arms that are components of the Patient Cart: three instrument arms and one camera arm.
Remote Center	A fixed point in space around which the Patient Cart arms move, indicated by the thick black band on instrument cannulae. Remote center technology enables the System to maneuver instruments and endoscopes in the surgical site while exerting minimal force on the patient's body wall.
Right-Side Pod	The appendage on the right end of the Surgeon Console armrest that provides power buttons.
Scope	Endoscope.
Screen	The monitor display, located in the stereo viewer and/or the touchscreen display.
Setup Joint	The joints on the Patient Cart that support the instrument arms and the camera arm. These joints are used to set up the initial positions of the arms on the Patient Cart.

Table J-1 Glossary

Term	Meaning
Stereo Viewer or 3D Viewer	The viewing system that comprises the upper portion of the Surgeon Console, where the surgeon looks to see the 3D image.
Sterile Adapter	Interface device that allows the sterile barrier to be maintained between the camera arm and the endoscope or the instrument arm and the instrument attached to the arm. There are various types of sterile adapters: a sterile endoscope adapter, camera arm sterile adapter and an instrument sterile adapter. They are not interchangeable.
Surgeon Console	The part of the *da Vinci Si* System consisting of a structure that supports the masters and the stereo 3D viewer.
TilePro®	A feature which allows display of the 3D image of the operative field and up to two additional images provided by auxiliary inputs.
Touchpad	The touchpad in the center of the Surgeon Console armrest.
Touchscreen	The touchscreen monitor mounted on the Vision Cart.
View Port	The recessed area near the top of the Surgeon Console where the surgeon inserts his or her head to view the stereo viewer display. It includes the fixed eyepieces of the stereo viewer, infrared head sensors, speakers and contoured headrest.
Vision Cart	The *da Vinci* System component that houses the central processing and vision system, including the Core, Camera Control Unit (CCU) and Illuminator. It includes a touchscreen monitor and provides adjustable shelves for optional ancillary surgical equipment such as ESUs and insufflators.
WARNING	High level of concern. Failure to heed a WARNING could result in harm to a patient.

End of section

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