®

X7000

Light Source Operating and Maintenance Manual

stryker®
ENDOSCOPY

Table of Contents

Warnings and Cautions

Please read this manual and follow its instructions carefully. The words **warning**, **caution**, and **note** carry special meanings and should be carefully reviewed:

Warning The personal safety of the patient or physician may be involved. Disregarding this information could result in injury to the patient or physician.

Caution Special service procedures or precautions must be followed to avoid damaging the instrument.

Note Special information to make maintenance easier or important information more clear.

An exclamation mark within a triangle is intended to alert the user to the presence of important operating and maintenance instructions in the literature accompanying the product.

A lightning bolt within a triangle is intended to warn of the presence of hazardous voltage. Refer all service to authorized personnel.

To avoid potential serious injury to the user and the patient and/or damage to this device, the user must:

1. Read this operating manual thoroughly and be familiar with its contents prior to using this equipment.
2. Carefully unpack the unit and check if any damage occurred during shipment. If damage is detected, please refer to the *Service and Claims* section in this manual.
3. Be a qualified physician, having complete knowledge of the use of this equipment.
4. Test this equipment prior to a surgical procedure. This unit was fully tested at the factory before shipment.
5. Attempt no internal repairs or adjustments not specifically detailed in this operating manual.
6. Never sterilize any part of the X7000 console.
7. Disconnect the X7000 from the electrical outlet when inspecting the fuses.

The warranty is void if any of these warnings is disregarded.

Stryker Endoscopy accepts full responsibility for the effects on safety, reliability, and performance of the equipment only if:

- Readjustments, modifications, and/or repairs are carried out exclusively by Stryker Endoscopy.
- The electrical installation of the relevant operating room complies with the applicable IEC, CEC, and NEC requirements.

Stryker Endoscopy reserves the right to make improvements in the product(s) described herein. Product(s), therefore, may not agree in detail with the published design or specifications. All specifications are subject to change without notice. Please contact the local Stryker Endoscopy Distributor listed in the *Other Service* section, or phone your local Stryker Endoscopy sales representative or agent for information on changes and new products.

Warning Federal law (United States of America) restricts this device to use by, or on order of, a physician.

Other Symbol Definitions:

Type CF Applied Part

Protective Earth Ground

Equipotentiality

Denotes compliance to CSA 22.2 No.601.1-M90 and UL2601-1.

Product Description / Intended Use

The Stryker Endoscopy X7000 Xenon Light Source is a light-generating unit designed to illuminate surgical sites during endoscopic applications. The X7000 uses a 300-watt xenon lamp to generate bright, crisp light, which it delivers to the surgical site via a fiberoptic light cable. The X7000 is compatible with all Stryker light cables, and, with the proper light cable and adapters, can connect to any flexible or rigid endoscope.

The X7000 is equipped with Electronic Scope Sensing Technology (ESST), a special safety feature that helps prevent accidental burns caused by an unattended light cable. When operated with an ESST light cable, the X7000 senses when the scope and the light cable are separated and places the light source in STANDBY mode. In STANDBY mode, the X7000 will reduce light output to a minimum, preventing the light cable from generating excessive heat.

The Stryker Endoscopy X7000 Xenon Light Source consists of one of each of the following:

- light source console
- power cord
- video cable (purchased separately)
- xenon lamp module (spare or replacement lamp modules can be purchased separately)

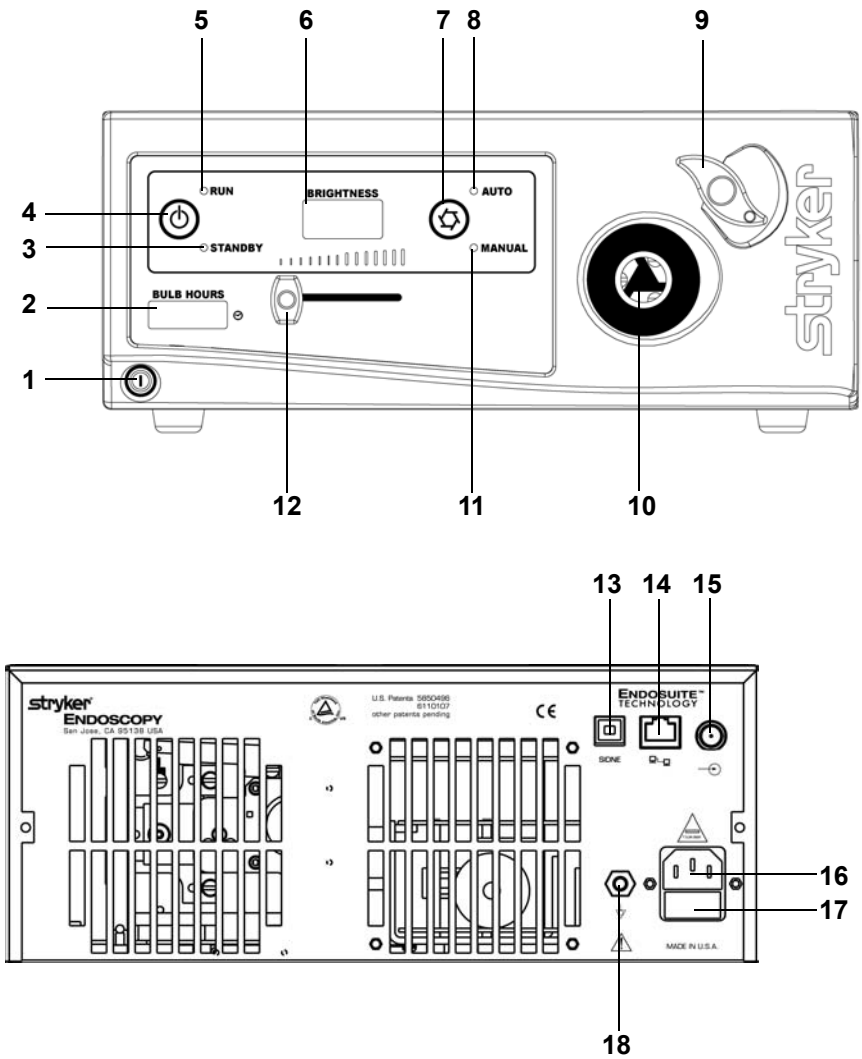The features of the X7000 console are described in Figure 1 on the following page.

Figure 1: The X7000 console, front panel (top) and rear panel (bottom)

1. **Power Button**: Powers the unit on and off.

2. **Bulb-Hours LCD**: Displays the total number of hours the lamp has operated since the last lamp change.

3. **STANDBY LED**: Illuminates when the unit is operating in the STANDBY mode. In STANDBY mode, light output is reduced to a minimum level.

4. **Mode Switch**: Selects either STANDBY or RUN mode when pressed. STANDBY is the default mode when the light source is powered on.

5. **RUN LED**: Illuminates when the unit is operating in the RUN mode. In RUN mode, light output is determined by the automatic or manual shutter.

6. **Brightness LCD**: Indicates the light intensity level (0-100%).

7. **Shutter Switch**: Selects either the AUTO or MANUAL shutter mode when pressed. MANUAL is the default mode when the light source is powered on.

8. **AUTO LED**: Illuminates when the shutter is in the AUTO mode. In AUTO mode, light output is determined by the brightness setting and the input video signal.

9. **Jaw Handle**: Opens the fiberoptic-cable holder.

10. **Cable Clamp**: Grasps the light-source end of an inserted fiberoptic cable. (When no cable is inserted, the lamp automatically turns off to save bulb hours.)

11. **MANUAL LED**: Illuminates when the shutter is in the MANUAL mode. In MANUAL mode, light output is determined by the Brightness Slide Bar.

12. **Brightness Slide Bar**: Increases light intensity when moved to the right; decreases light intensity when moved to the left.

13. **Voice-Control Port**: Connects to Stryker voice-control systems.

14. **Ethernet Port**: Provides an ethernet connection.

15. **Video-In Port**: Provides a BNC connection for camera video input.

16. **AC Inlet**: Connects to the provided power cord for AC power supply.

17. **Fuse Holder**: Contains two 5A fuses.

18. **Equipotentiality Plug**: Provides a grounding post for common grounding with other equipment.

Setting Up the X7000

Note   Your local Stryker Endoscopy sales representative will perform at least one inservice at your convenience to help set up the equipment and instruct you and your staff on its operation and maintenance. Please contact your local Stryker Endoscopy sales representative to schedule an inservice after the equipment has arrived.

Note   When selecting a setup location for the X7000, consult the "Electromagnetic Compatibility" section included in this manual to determine the best location.

To set up the X7000, make the following connections:

- Connect the AC power cable
- Connect the camera and monitor
- Connect the light cable

Connecting the AC Power Cable

1. Plug in the AC power cord to the AC Inlet on the rear console panel.

2. Plug in the other end of the AC cord to a hospital-grade outlet.

Connecting the Camera and Monitor

Figure 2 below illustrates a sample system in which a Stryker medical camera, monitor, and X7000 are connected. The letters in the figure correspond to the letters in the instructions.
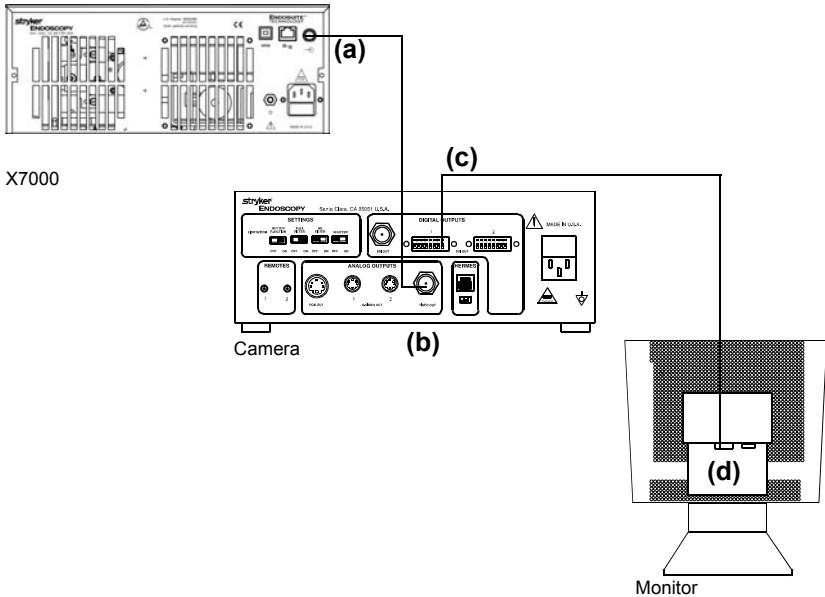
Figure 2: A sample system including a medical camera, monitor, and the X7000

1. Connect a BNC cable to the VIDEO IN port (a) on the rear panel of the X7000.

2. Connect the other end of the BNC cable to the VIDEO OUT port (b) on the rear panel of the camera.

3. Connect a DVI cable to the DVI Out 1 (c) on the rear panel of the camera.

4. Connect the other end of the DVI cable to the DVI input (d) on the rear of the flat-panel monitor.

Note   BNC cables have push-and-turn connectors. DVI cables have push-only 29-pin connectors.

Warning ***When the X7000 is interconnected with other medical electrical equipment, leakage currents may be additive. To minimize total patient leakage current, any Type CF applied part should be used together with other Type CF applied parts. Ensure all systems are installed according to the requirements of IEC 60601-1-1.***

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Connecting the Light Cable

Warning *Use only nonconductive fiberoptic cables with the*
⚠ *X7000 to maintain electrical isolation.*

Note The X7000 Xenon Light Source is compatible with all
Stryker Light Cables.

1. Lock open the cable clamp by turning the jaw handle clockwise
    until it stops (see Figure 3).

Figure 3: Locking open the cable clamp

Warning *Keep fingers away from the cable clamp as the clamp*
⚠ *may inadvertently deploy and cause injury.*

Warning *Do not look directly into the cable port. The high-*
⚠ *intensity light may cause damage to the eyes.*

2. Insert a clean, dry fiberoptic cable into the cable port until the jaw latch releases and the jaw clamps the cable in place (see Figure 4). Pull gently on the fiber optic cable to test that it is securely seated in the cable port.

Figure 4: Inserting the light cable into the cable port

3. Connect an endoscope to the opposite end of the fiber optic cable.

4. To remove the light cable, turn the jaw handle clockwise until it latches fully open.

Note   The Light Source will default to STANDBY mode when a light cable is inserted.

Operating the X7000

Note   Before operating the X7000, follow the steps in the "Setting Up the X7000" section of this manual.

Powering the System On and Off

Caution *Do not power the system on and off in rapid succession. Allow the lamp to run for at least five minutes once it has been powered on. Failure to do so can cause the lamp to rapidly darken and fail.*

To power on the X7000:

1. Confirm that the X7000 contains a properly installed lamp. If no lamp is installed, follow the instructions in the "Replacing the Lamp" section of this manual before proceeding.

2. Press the power switch on the front panel. The STANDBY LED will illuminate, indicating the unit is in STANDBY mode.

Note   The lamp will not illuminate unless a light cable is installed in the cable port.

To power off the X7000:

1. Disconnect the light cable from the X7000 console.

2. Run the fan for at least one minute to cool the unit.

3. Press the power switch on the front panel of the X7000.

Warning *To allow for adequate cooling, never block the rear or side fan vents.*

Selecting the Operation Mode

The X7000 has two operation modes, RUN and STANDBY.

- **RUN mode**: The RUN mode is used during normal operation. It enables light output to be controlled by the brightness controls on the front console panel.

- **STANDBY mode**: The STANDBY mode is used when the X7000 is powered on but not in immediate use. It reduces the light output to a minimum and minimizes the heat generated at the tip of an unattended light cable or scope.

To select either the RUN or STANDBY mode, press the Mode Switch. The LED for the selected mode will illuminate.

Warning ⚠ *To prevent burns and possible fire, always put the X7000 in STANDBY mode whenever the endoscope is removed from a non-ESST light cable.*

Adjusting the Brightness

The X7000 has two shutter settings for adjusting the lamp brightness: AUTO and MANUAL.

- **AUTO shutter**: The AUTO shutter automatically adjusts brightness to compensate for variable light levels in the surgical site. Receiving input from the medical camera, the AUTO shutter adjusts light levels around the brightness selected on the Brightness LCD. (For optimal AUTO-shutter performance, use the Brightness Slide Bar to set the brightness between 30 and 70%.)

- **MANUAL shutter**: The MANUAL shutter allows the operator to adjust brightness manually with the Brightness Slide Bar. Move the Brightness Slide Bar to the right to increase brightness and to the left to decrease brightness. The selection will appear on the Brightness LCD as a percentage between 0 and 100.

To select either the AUTO or MANUAL shutter, press the Shutter Switch. The LED for the selected shutter will illuminate.

Note   For the AUTO shutter to work properly, a medical video camera must be connected to the Video-In Port on the rear X7000 console panel.

Warning **The higher the brightness, the more heat energy that will be generated at the endoscope tip. Always adjust the light source to the minimum brightness necessary to illuminate the surgical site.**

Warning **The surface temperature near the scope adapter and at the tip of the scope may exceed 41º C if the unit is operated at maximum brightness for extended periods of time. The heated scope and adapter may cause burns.**

Receiving Feedback from the X7000

The X7000 provides feedback through the Brightness LCD and the Bulb-Hours LCD.

- **The Brightness LCD** shows the intensity level of the light as a percentage between 0 and 100. For example, if the LCD shows "75," the light output to the fiberoptic cable is running at 75 percent of capacity.

- **The Bulb-Hours LCD** shows how many total hours the lamp has operated. For example, if the LCD shows "250," the lamp has operated 250 total hours. The Hour-Meter LCD also displays warning and error codes. The table below lists and defines the warning and error codes displayed.

Code	Definition	Recommended Action
E-1	All conditions are met for the lamp to illuminate, yet it remains off.	Return the X7000 for repair.
E-2	All conditions are not met for the lamp to illuminate, yet it remains on.	Return the X7000 for repair.
E-3	The lamp-identification system is not working properly.	Replace the lamp with a Stryker lamp. If the condition persists, return the X7000 for repair.

Code	Definition	Recommended Action
E-5	The lamp is kept off because the ballast fan-sensing circuit has detected an error.	Return the X7000 for repair.
E-6	The lamp is kept off because the bulb fan-sensing circuit has detected an error.	Return the X7000 for repair.
BULB	The X7000 does not detect a lamp.	Install a Stryker lamp. If the condition persists, return the X7000 for repair.
OVER	The lamp has significantly exceeded its recommended lifetime.	Install a new Stryker lamp.
WARM	The X7000 is looking for an ethernet connection to check for software upgrades.	See the "Using the Ethernet Interface" section of this manual.

Safety Shutoff

The X-7000 Xenon Light Source is equipped with a Safety Shutoff feature which will temporarily turn off the bulb in the event of excessive heat.

Warning ⚠ ***WARNING Once the Light Source cools down (after 7-10 minutes), power will resume to the bulb and the unit will restart in STANDBY mode. To prevent accidental burns, ensure that the following precaution is taken: Always securely place the scopes and/or fiber-optic cables to assure safe resumption of light output.***

Note If the X-7000 Xenon Light Source experiences a temporary shutdown, it is recommended that the device is submitted for service.

Caution ⚠ *Do not abruptly interrupt power to the unit. This will turn off the fan and may cause severe damage to the internal cooling system.*

Checking the ESST Feature

The X7000 is equipped with Electronic Scope Sensing Technology (ESST), a special safety feature that helps prevent accidental burns caused by an unattended light cable. When operated with an ESST light cable, the X7000 senses when the scope and light cable are separated and places the light source in STANDBY mode. In STANDBY mode, the X7000 will reduce light output to a minimum, preventing the light cable from generating excessive heat.

To verify the ESST feature is active, perform the following test before every surgical procedure:

1. Set up the X7000 system with an ESST light cable and scope, and then power on the system.

2. Place the X7000 in RUN mode.

3. Remove the light cable from the ESST scope adapter.

The X7000 should return to STANDBY mode, indicating that the ESST feature is functioning properly.

Warning ⚠ *If the unit fails to return to STANDBY mode, there may be a fault with the ESST feature. In this case, do not assume ESST safety protection.*

Warning ⚠ *Even with ESST protection, never place the tip of the light cable directly on drapes or on the patient as burns or fire may result.*

Using the X7000 with a Voice-Controlled System Interface

The X7000 can be used in conjunction with Stryker voice-control systems (Sidne™). For more information about using the X7000 with Stryker voice-control systems, refer to the *Sidne™ Operating and Maintenance Manual* (p/n 1000-400-653).

Using the Ethernet Interface

The ethernet connection on the rear panel of the X7000 enables remote connection to the Stryker Endoscopy Software Management Site. Connecting to this site enables remote diagnostics and software updates.

Note   This system feature is not necessary for regular light-source operation.

1.   Prior to powering on the X7000, connect one end of a CAT5 ethernet cable to the Ethernet Port on the rear console panel, and the other end to the existing hospital network.

Note   The hospital network must have a Dynamic Host Configuration Protocol (DHCP) server that can assign an IP address to the unit.

2.   Power on the X7000. The unit will search for, download, and install any necessary software updates. It may also transmit diagnostic information. This period will typically take less than one minute. (The Brightness LCD will display the word "WARM" during this period.) Press the MODE Switch to reset the LCD.

Note   The Ethernet Interface checks for updates each time the X7000 powers on.

Cleaning the X7000

Warning Unplug the X7000 before cleaning the unit.

1. Clean the external surfaces of the X7000 using a cloth or sponge dampened with a mild detergent or disinfectant.

2. Clean and maintain the light cable according to the manufacturer's instructions.

Caution *Do not use any abrasive cleaners. Do not allow any liquid to drip into the unit.*

Caution *Do not sterilize or immerse the X7000.*

Caring for the Lamp Module

The X7000 uses a Xenon Cermax lamp, which has a guaranteed life of 500 hours when used properly. Always follow these guidelines to ensure maximum lamp life:

1. Clean the lamp face with alcohol and a cotton swab if it is touched. Dirt or oil on the lamp face will cause the lamp to heat unevenly and fail.

2. Do not power on and off the lamp in rapid succession. Allow the lamp to run for at least five minutes once it has been powered on. Failure to do so can cause the lamp to rapidly darken and fail.

3. The X7000 has been designed to start the lamp under most conditions, even when it is hot. However, if the lamp does not start within 10 seconds after the X7000 has powered on and completed its Ethernet activity (see the "Using the Ethernet Interface" section of this manual), turn the unit off and wait at least five minutes for the lamp to cool before restarting. Further attempts to start the lamp can damage the lamp and possibly the internal circuitry.

Replacing the Lamp Module

Replace the lamp module when the Bulb-Hours LCD indicates 500 hours or when the lamp no longer sufficiently illuminates the surgical site. If possible, replace the lamp module between surgical procedures.

> *Warning* ⚠️ ***During operation, the lamp and the housing around the lamp may be hot. Wait at least three minutes for the lamp to cool before handling it.***

To replace the lamp module,

1. Power down the X7000.

2. Open the lamp door (see Figure 5).

Figure 5: Opening the lamp door

Note   If the unit is on, opening the lamp door will turn off the bulb.

3. Grasp the lamp module by the handle and remove the lamp. (See Figure 6.)
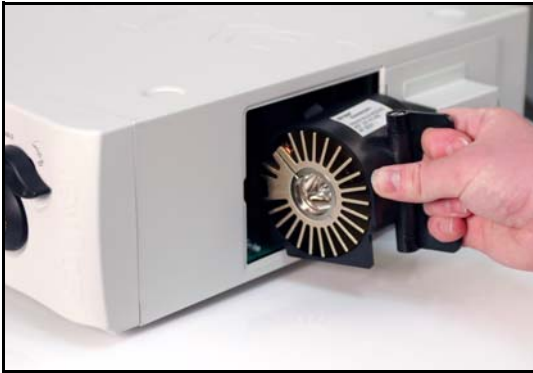
Figure 6: Removing the lamp module

Warning ⚠ *Do not reach inside the lamp door for any reason other than replacing the lamp module. Touching parts other than the lamp module may cause burns or product damage.*

Warning ⚠ *Do not touch any part of the lamp module except for the handle. The module may be very hot and cause burns.*

4. Slide in the new lamp module (Stryker part number 220-191-000) until it is fully seated on the mating connectors.

5. Close and latch the lamp door.

6. Power on the unit.

7. Power on the bulb (if not already on) and verify that the hour meter reads "0."

Note   Using a non-Stryker replacement bulb module will result in no light output.

Note   Do not operate the X7000 with a burned out lamp or with no lamp installed.

Replacing the Fuses

1. Unplug the light source from the AC outlet and remove the power cord from the rear of the unit.

2. Unlatch the fuse holder (13) and remove the fuse(s).

3. Replace the fuse(s) with the same value and rating.

Warning To avoid the risk of fire, use only 5.0A 250V fuses.

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4. Reinstall the fuse holder.

Disposing of the X7000

The device must be disposed of according to local laws and hospital practices. The device does not contain any hazardous materials.

Troubleshooting

Problem	Possible Solution
No light output	• Ensure the AC power cord is properly connected to a hospital-grade power outlet and the inlet on the rear console panel.
	• Ensure the power switch on the front panel is powered on. (It will illuminate when powered on.)
	• Ensure all fuses are operating. See the "Replacing the Fuses" section of this manual for further instructions.
	• Ensure the lamp is properly seated in the lamp housing.
	• Ensure the lamp is in operating condition. Replace the lamp if necessary.
	• Ensure the light cable is correctly engaged with the cable port. As a safety feature, the X7000 will provide no light output unless a fiberoptic light cable is properly seated in the cable port.
	• Ensure the bulb access door is completely shut.
	• Check for error codes E-1, E-3, E-5, E-6, or BULB. See the "Receiving Feedback from the X7000" section of this manual for details.
	• Check that vents are not obstructed.
	• The Safety Shutoff may have been activated. If power to the unit does not resume within 10 minutes, please submit the X7000 for service.

Too much or too little light output

- Ensure the light cable is correctly engaged with the cable port.

- Ensure the lamp has adequate lamp life remaining. The display on the Bulb-Hours LCD should be less than 500 total hours.

- Ensure the X7000 is in RUN mode. (The RUN LED should be illuminated.) If necessary, press the Mode button to switch from STANDBY to RUN. If the unit remains in STANDBY,

  1. Ensure the light cable is correctly engaged with the cable port.
  2. If an ESST cable is connected to the X7000, ensure the cable is attached to the scope using an ESST scope adapter.

- If the Shutter is in AUTO mode, use the Brightness Slide Bar to adjust the brightness. Ensure the camera signal is connected properly to the VIDEO-IN connector on the rear console panel. For details, see the "Adjusting the Brightness" section in this manual.

- If the Shutter is in MANUAL mode, use the Brightness Slide Bar to adjust the brightness. For details, see the "Adjusting the Brightness" section in this manual.

- Ensure the fiberoptic cable is transmitting light correctly. Hold the light-source end of the cable up to an overhead room light and look into the scope end of the light cable. If the pattern contains any black spots, the light cable may be worn out and require replacement.

- Ensure the light cable is of an adequate size for the application. The cable diameter may be too small to provide adequate light transmission for the medical video camera in the endoscopic application.

Excessive glare in the video

- If the Shutter is in AUTO mode, ensure the camera signal is connected properly to the VIDEO-IN connector. Adjust the brightness control setting as necessary.

  Note Stryker Endoscopy has designed the AUTO-shutter feature of the X7000 for use only with Stryker Endoscopy medical video cameras. The AUTO feature may not provide sufficient light when connected to non-Stryker Endoscopy medical video cameras.

- If the Shutter is in MANUAL mode, ensure the electronic shutter on the camera is operating properly to control video signal brightness. Adjust the brightness control setting as necessary.

Technical Specifications

Electrical

    Primary: 100 - 240VAC, 50/60 Hz, 450W
    Fuses (2):   5.0A 250V

Dimensions

    Height: 5.0" (12.7 cm)
    Width: 12.5" (31.8 cm)
    Depth: 16.8" (42.7 cm)
    Weight: 18.0 lbs. (8.2 kg)

Fiber Optic Cable Range:

    2 mm to 6.5 mm diameter

Lamp

    Type: 300 Watt Xenon Cermax (Elliptical)
    Life: Approximately 500 hours

Operating Conditions

    10 to 40°C
    30% to 75% Relative Humidity

Transportation & Storage

    -20 to 60°C
    10% to 75% Relative Humidity
    700hPa to 1060hPa

Classifications & Approvals

    Complies with medical safety standards:
    IEC60601-1:1988 + A1:1991 + A2:1995
    CAN/CSA C22.2 No.601.1-M90
    UL2601-1: 2nd Edition

    Complies with medical EMC standard:
    IEC60601-1-2:2001

    Class 1 Equipment
    Type CF applied parts
    Water Ingress Protection, IPX0 - Ordinary Equipment
    Continuous Operation

Patent Protection

U.S. #5,850,496 and 6,110,107. Other patents pending.

Stryker European Representative:

Stryker France
ZAC Satolas Green Pusignan
Av. De Satolas Green
69881 MEYZIEU Cedex
France

Electromagnetic Compatibility

Like other electrical medical equipment, the X7000 requires special precautions to ensure electromagnetic compatibility with other electrical medical devices. To ensure electromagnetic compatibility (EMC), the X7000 must be installed and operated according to the EMC information provided in this manual.

Note   The X7000 has been designed and tested to comply with IEC 60601-1-2:2001 requirements for EMC with other devices.

Caution Portable and mobile RF communications equipment may affect the normal function of the X7000.

Warning *Do not use cables or accessories other than those provided with the X7000, as this may result in increased electromagnetic emissions or decreased immunity to such emissions.*

Warning *If the X7000 is used adjacent to or stacked with other equipment, observe and verify normal operation of the X7000 in the configuration in which it will be used prior to using it in a surgical procedure. Consult the tables below for guidance in placing the X7000.*

Guidance and Manufacturer's Declaration: Electromagnetic Emissions		
X7000 is intended for use in the electromagnetic environment specified below. The customer or the user of X7000 should ensure that it is used in such an environment.		
Emissions test	**Compliance**	**Electromagnetic Environment - guidance**
RF emissions CISPR 11	Group 1	X7000 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	X7000 is suitable for use in all establishments, including domestic establishments and those directly connected to the public low-voltage power supply network that supplies buildings used for domestic purposes.
Harmonic emissions IEC61000-3-2	Class A	
Voltage Fluctuations/ flicker emissions IEC61000-3-3	Complies	

Guidance and Manufacturer's Declaration: Electromagnetic Immunity			
X7000 is intended for use in the electromagnetic environment specified below. The customer or the user of X7000 should ensure that it is used in such an environment.			
Immunity Test	**IEC 60601 Test Level**	**Compliance Level**	**Electromagnetic Environment: Guidance**
Electrostatic Discharge (ESD) IEC61000-4-2	±6kV contact ±8kV air	±2,4,6kV contact ±2,4,8kV 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 IEC61000-4-4	±2kV for power supply lines ±1kV for input/ output lines	±2kV line to ground ±1kV line to line	Mains power quality should be that of a typical commercial or hospital environment.
Surge IEC61000-4-5	±1kV differential mode ±2kV common mode	±0.5, 1kV differential mode ±0.5, 1, 2kV common mode	Mains power quality should be that of a typical commercial or hospital environment.
Voltage dips, short interruptions and voltage variations on power supply input lines IEC61000-4-11	<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 typical commercial or hospital environment. If the user of X7000 requires continued operation during power mains interruptions, it is recommended that X7000 be powered from an uninterruptible power supply or a battery.
Power frequency (50/60Hz) magnetic field IEC 61000-4-8	3 A/m	N/A	Power-frequency magnetic fields should be at levels characteristic of a typical location in a typical commercial or hospital environment.
NOTE: Ut is the a.c. mains voltage prior to application of the test level.			

	Guidance and Manufacturer's Declaration: Electromagnetic Immunity		
X7000 is intended for use in the electromagnetic environment specified below. The customer or the user of X7000 should ensure that it is used in such an environment.			
Immunity Test	**IEC 60601 Test Level**	**Compliance Level**	**Electromagnetic Environment: Guidance**
			Portable and mobile RF communications equipment should be used no closer to any part of the X7000 system, including its cables, than the recommended separation distance calculated from the equation applicable to the frequency of the transmitter.
			Recommended Separation Distance
Conducted RF IEC 61000-4-6	3 Vrms 150 kHz to 80 MHz	3 V	$d = 1.17\sqrt{P}$
Radiated RF IEC 61000-4-3	3 V/m 80MHz to 2.5 GHz	3 V/m	$d = 1.17\sqrt{P}$ 80 MHz to 800 MHz $d = 2.33\sqrt{P}$ 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 X7000 system is used exceeds the applicable RF compliance level above, the X7000 system should be observed to verify normal operation. If abnormal performance is observed, additional measures may be necessary, such as reorienting or relocating the X7000 unit. (b) Over the frequency range 150 kHz to 80 MHz, field strengths should be less than 3 V/m.			

Recommended Separation Distances Between Portable and Mobile RF Communications Equipment and the X7000 System			
The X7000 system is intended for use in an electromagnetic environment in which radiated RF disturbances are controlled. The user of the X7000 system can help prevent electromagnetic interference by maintaining a minimum distance between portable and mobile RF communications equipment (transmitters) and the X7000 system as recommended below, according to the maximum output power of the communications equipment.			
Rated maximum output power (W) of transmitter	**Separation distance (m) according to frequency of transmitter**		
	150 kHz to 80 MHz $d = 1.17\sqrt{P}$	**80 MHz to 800 MHz** $d = 1.17\sqrt{P}$	**800 MHz to 2.5 GHz** $d = 2.33\sqrt{P}$
0.01	0.12	0.12	0.23
0.1	0.37	0.37	0.74
1	1.17	1.17	2.33
10	3.70	3.70	7.37
100	11.70	11.70	23.30
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 and 800 MHz, the separation distance for the higher frequency range applies.			
NOTE 2: These guidelines may not apply in all situations. Electromagnetic propagation is affected by absorption and reflection from structures, objects, and people.			

Warranty

Stryker Endoscopy warrants the X7000 Xenon Light Source against defects in both materials and workmanship to the registered owner at the time of purchase. All components except the lamp are covered by the warranty for a period of one year from the date of purchase. The lamp module is covered by the warranty for a period of 60 days from the date of purchase.

This warranty does not apply to any unit that has been subject to misuse, abuse, neglect, improper installation or operation, or that has been altered, adjusted, or tampered with by any person other than Stryker Endoscopy authorized service personnel.

The customer is responsible for returning the defective equipment to the factory at his or her own expense. Stryker Endoscopy or its representative will service the unit, repair or replace any defective parts thereof, and return the unit to the customer.

If, upon examination, it is determined that the fault has been caused by misuse or abnormal conditions of operation, the repairs will be billed to the customer in the same manner as out-of-warranty repairs.

Instruments repaired by Stryker Endoscopy will be issued a thirty day warranty against defects in both materials and workmanship, provided the original warranty period has passed. Instruments submitted due to defects in materials and workmanship during the warranty period will be repaired at no charge to the customer.

The warranty as set forth herein is exclusive and in lieu of all other warranties, remedies, obligations, and liabilities of Stryker Endoscopy Inc., expressed or implied, including the implied warranties of merchantability and fitness for use and of consequential damages. These products are sold only for the purpose described herein, and such warranty runs only to the purchaser. In no event shall Stryker Endoscopy be liable for any breach of warranty in any amount exceeding the purchase price of the product.

No agent, employee, or representative of Stryker Endoscopy has the authority to bind the Company to any other warranty, affirmation, or representation concerning this instrument.

This warranty is valid only to the original purchaser of Stryker Endoscopy products obtained directly from Stryker Endoscopy or from a Stryker Endoscopy authorized agent. The warranty cannot be transferred or assigned by the original purchaser.

The X7000 Xenon Light Source warranty is void if any WARNINGS, CAUTIONS, or NOTES are disregarded.

All Stryker products are warranted against defects in materials and workmanship.

Service and Claims

This equipment is carefully packaged to prevent damage during transit and is shipped freight outbound (F.O.B.) from San Jose, CA. Therefore, Stryker's responsibility for ensuring damage-free delivery ends upon remission of the equipment to the carrier. Examine the shipment promptly upon receipt.

If the product packaging appears damaged at the time of delivery, immediately check the device for damage. If there is a malfunction, return the device to the distributor.

To return equipment damaged during shipment:

1. File a claim with both the carrier and the distributor.

2. Repack the equipment in its original shipping container and ship it prepaid and insured to:

> Stryker Endoscopy Customer Service Department
> 5900 Optical Court
> San Jose, CA 95138

If service is needed either during or after the warranty period:

1. Contact Stryker Endoscopy at 1-800-624-4422 or phone your local Stryker Endoscopy sales representative.

2. Package all the components carefully in the original shipping container if possible.

3. Ship the light source, prepaid and insured to:

> Stryker Endoscopy Customer Service
> Attention: Repair Department
> 5900 Optical Court
> San Jose, CA 95138

Note To maximize the longevity, performance, and safety of this device, package it in the original shipping container when storing or transporting.

Note The light source described in this manual is continually reviewed, and improvements may be made without notice. A replacement part may not appear the same as the original, but all parts with the same part number will be completely interchangeable.

Other Service

For service in the U.S.A., call your Stryker Endoscopy representative or call Stryker Endoscopy Customer Service at 1-800-624-4422. Outside of the U.S.A., please contact your Stryker Endoscopy distributor at one of the following locations:

Stryker Corporation
2725 Fairfield Road
Kalamazoo, MI 49002
USA
Phone:1-269-385-2600
Telex:224464 STRYKER KMZ
Fax:1-269-385-1996

Stryker Canada
45 Innovation Drive
Hamilton, Ontario, Canada
L9H 7L8
Phone: (905) 690-5700
(800) 668-8323 (toll free)
Fax: +1(905) 690-5698

Stryker Deutschland GmbH
Gewerbeallee 18, D-45478
Mulheim an der Ruhr
GERMANY
Phone:49-208-999-060
Fax:49-208-999-0666

Stryker Latin America
15100 N.W. 67th Ave. Suite 210
Miami, Florida 33014
USA
Phone:1-305-821-1888
Fax:1-305-826-0067

Stryker B.V.
Marinus van Meelweg 17
P.O. Box 8747
5657 En Eindhoven
THE NETHERLANDS
Phone:31-40-2922522
Fax:31-40-2922555

Stryker Osteonics, SA
5, Chemin des Aulx 5
1228 Plan-les-Ouates
Case Postale 725
1212 Grand-Lancy 1
Geneve, SWITZERLAND
Phone:41-22-884-0111
Fax:41-22-884-0199

Stryker European Rep - RA/QA
Manager
ZAC Satolas Green Pusignan
Av. De Satolas Green
69881 MEYZIEU Cedex, France
Phone:33-1-48175000
Fax:33-1-48632175

Stryker India Private Limited
First Floor
C-5, SDA Commercial Complex
New Delhi 110 017
INDIA
Phone:91-11-686-6740
Fax:91-11-696-6020

Stryker Australia
No. 50 Broughton Road
Artarmon, NSW 2064
AUSTRALIA
Phone:61-2-9415-5100
Fax:61-29-4294127

Stryker Singapore PTE/LTD
70 Bendemeer Road
#03-32 Hiap Huat House
SINGAPORE 339940
Phone:65-293-0119
Fax:65-293-7028

Stryker Pacific Ltd.
Suite 2501, Citibank Tower
Citibank Plaza
3 Garden Road, Central
HONG KONG
Phone:61-2-9415-5100
Fax:61-29-4294127

Stryker Mexico, S.A. de C.V.
Calle Sacramento 410
Col. Insurgentes San Borja
C.P. 03100
Mexico, D.F.
MEXICO
Phone:525-488-0890
Fax:525-488-0891

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Stryker Finland
PL 80 (Makelankatuz)
FIN 00501 Helsinki
FINLAND
Phone:358 (0) 9 7744 680
Fax:358 (0) 9 7744 6820

Stryker Korea
11F Dong Sung Bldg.
154-24 Samsung-dong
Kangnam-ku
Seoul, KOREA 135-090
Phone:82-2-34517572
Fax:82-2-552-4156

Stryker China Limited
Room 903-905, Office Tower 2
Beijing Sun Dong An Plaza
138 Wang Fu Jing Da Jie
Beijing 100006, P.R. China
Phone:86-10-65136183
Fax:86-10-83913571

Stryker Japan
Dai Tokyo Kasai Shinjuku Bldg.
3-25-3, Yoyogi
Shibuya-ku, Tokyo 151-0053
Phone:813-535-29106
Fax:813-535-21789

Stryker Europe Headquarters
Cite-Centre, Grand Rue 92
CH-1820 Montreux
SWITZERLAND
Phone:41-21-966-1201
Fax:41-21-966-1200

Stryker Taiwan
5F-1,23 Pa Te Road
Section 1, Taipei, TAIWAN, R.O.C.
Phone:886-2-2322-2895
Fax:886-2-2357-8543

Stryker U.K. Ltd.
Hambridge Road
Newbury
Berkshire RG14 5 EP
United Kingdom
Phone:44-1635-262400
Fax:44-1635-262464

Stryker Middle East / Africa
Via Della Posta
6934 Bioggio
Switzerland
Phone:(4021) 212-1122
Fax:(4021) 212-1133

NV Stryker SA (Belgium)
Ikaros Business Park Fase III
Ikaroslaan 12
1930 Zaventem
Brussels, BELGIUM
Phone:32-2-717-92-10
Fax:32-2-717-92-49

Stryker Chile
Avenida Nueva Tajamar 481
Oficina 805 Piso 8 Torre Norte
Santiago, CHILE
Phone:562-244-3600
Fax:562-244-3696

Stryker Spain
Manuel Tovar 35
28034 Madrid
SPAIN
Phone:34-91-7283500
Fax:34-91-3580748

Stryker AB Scandinavia
Krossverksgatan 3
S-216 10 Malmö
SWEDEN
Phone:46 40-69-18-100
Fax:46 40-69-18-190

Stryker AB Denmark
Sankt Annae Plads 9
1021 Copenhagen, Denmark
Phone:45 33 9360 99
Fax:45 33 9320 69

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