Operations/Service Manual

✳ smith&nephew
LENS 4K
Camera Control Unit

LENS 4K

✳ smith&nephew

CE MR

Symbol	Description	Symbol	Description	Symbol	Description
	Follow instructions for use		Electrical Equipment Safety System (EESS)		Color Camera
CE	CE Mark	EC | REP	Authorized representative in the European community		Keep dry
REF	Catalog number		Manufacturer	MR	MR Unsafe
	On/Off	TÜVRheinland	TUV certification	SN	Serial number
	Up and Down Buttons		Video output		Type CF equipment
	White balance		Video input		Fuse Rating
	Menu		USB output		EU: Not for general waste
SELECT	Select button	%	Humidity limitation		Non-ionizing electromagnetic radiation
	Brightness		Power plug		Temperature limitation
	Do not plug in wet		Equipotentiality		Ethernet
	This way up		Atmospheric pressure		Date of Manufacturer
i	Consult Instructions for use		Wi-Fi	!	Caution
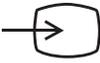
Preface

Preface

This manual provides the information needed to operate and maintain the Smith & Nephew LENS 4K Camera Control Unit. Prior to using this equipment, read this manual thoroughly, paying particular attention to the operating instructions, warnings, and precautions. Smith & Nephew surgical equipment is designed for use only by medical professionals who are completely familiar with the appropriate surgical techniques and video procedures.

Table of Contents

Device Description

The Smith & Nephew LENS 4K Camera Control Unit (CCU), Wi-Fi and non-Wi-Fi systems is a state-of-the-art video system designed for use in arthroscopic and endoscopic surgical procedures. The System enables control of camera features (enhancement features and zoom capabilities) and accessories (video printers, and image management systems) through either the Camera Head, Control Unit buttons, or the optional Tablet Application (Wi-Fi enabled CCU version only). The System includes an integrated LED Light Source, which provides illumination during the procedure via designated light guides and endoscopes.

The Wi-Fi enabled version of the System provides image management features in conjunction with the Tablet Application. These features Include image capture, video capture, patient management, media object management, sharing, and archiving.

Refer to the Tablet Application Instructions for Use (REF 10601295) for information regarding the Tablet Application.

Refer to the LENS 4K Camera Head Instructions for Use (REF 10601349) or (REF 10601459 US Only) for information regarding the Camera Head.

Intended Use

The LENS 4K Camera Control Unit and Camera Head are intended to provide illumination, visualization and capture of still and motion pictures of surgical sites.

Indications for Use

The LENS 4K Camera Control Unit and Camera Head are used in diagnostic and operative procedures for arthroscopic and endoscopic procedures to provide illumination, visualization and capture of still and motion pictures of surgical sites within articular cavities, body cavities, hollow organs and canals. Additionally, the LENS 4K Camera Control Unit and Camera Head are indicated for use in endoscopic surgical procedures in the thoracic cavity when used with an appropriately indicated thoracoscope.

Contraindications

None known.

⚠ Warnings

- **It is the surgeon's responsibility to be familiar with the appropriate surgical techniques prior to use of this device.**
- **Read these instructions completely prior to use.**
- **DANGER: Risk of explosion if used in the presence of flammable anesthetics.**
- **Use aseptic technique in accordance with standard operating room procedures.**
- **To prevent electric shock, do not remove any covers or screws from the control unit. There are no user-serviceable components inside. Dismantling the equipment will void the warranty.**
- **To prevent electric shock, unplug the unit from the electrical outlet before attempting to replace the fuses.**
- **To avoid fire hazard, use only fuses of the correct type, voltage rating, and current rating.**
- **If this unit is configured as part of a system, the entire system should be tested for compliance with IEC 60601-1.**
- **If the leakage current of the configured system exceeds the limits of IEC 60601-1, install an appropriately rated IEC 60601-1 approved isolation transformer with a minimum of 1000 VA and retest the system.**
- **To avoid System power loss, use an uninterruptible power supply (UPS).**
- **The use of accessory equipment not complying with the equivalent safety requirements of this equipment may lead to a reduced level of safety. Consider the following when choosing accessory devices:**
  – **Use of the accessory in the patient vicinity.**
  – **Evidence that the safety certification of the accessory has been performed in accordance with IEC 60601-1.**
- **Use of accessories and cables with this equipment, other than those specified or provided by the Smith & Nephew, could result in increased electromagnetic emissions or decreased electromagnetic immunity and result in improper operation.**

Warnings

- To prevent damage to internal optics only use compatible light cables.

- To avoid damaging the optics and light guide detector, do not use wet light cables.

- To avoid damage to the turret use only compatible light cables.

- When the light source is turned on, do not look directly at the LED light guide without protective goggles. The high- intensity of the light guide may cause burns to the skin, or permanent damage to eyes.

- Hazardous high voltage and energy are present at the output and in the internal circuitry of this unit.

- When inspecting the light cable, NEVER aim the light cable at, or peer directly into the light source. Retinal damage may occur.

- Connect only accessory items that have been specified as part of the System or have been specified as compatible. Use of the accessory, transducer, or cable with equipment and systems other than those specified may result in increased emissions or decreased immunity of the equipment or system.

- During operation, avoid prolonged contact of the scope tip to patient tissue or flammable materials. The scope tip may reach high temperatures due to high intensity light transmission.

- Do not leave the operating light cable on a patient or the drapes. Failure to observe this warning may result in burns to the patient and/or the surrounding drapes.

- Do not use this device in oxygen rich environments (>25%).

- To avoid the risk of electric shock, this equipment must only be connected to supply mains with protective earth.

- No modification of this equipment is allowed

- Electrical Interference. This equipment is designed to be used as a stand-alone, or in proximity too other medical equipment. Although this equipment is designed and tested to minimize interference with, or by, other electrical equipment; interference may occur. If interference occurs with other equipment it may be corrected by one or more of the following measures:

    - Reorient or relocate this equipment, the other equipment, or both.
    - Increase the separation between the pieces of equipment
    - Connect the pieces of equipment into different outlets or circuits.
    - Consult a biomedical engineer.

- Abnormal performance, due to Electromagnetic Disturbances, may be manifested by a failure to properly maintain illumination and visualization of the surgical field. If abnormal performance is observed, it may be corrected by one or more of the following measures:

    - Reorient or relocate this equipment, the other equipment, or both.
    - Increase the separation between the pieces of equipment.
    - Connect the pieces of equipment into different outlets or circuits.
    - Consult a biomedical engineer.

- High Frequency (HF) Interference: This equipment was designed and tested to be used with HF Electrical Surgical Unit (ESU) equipment. If interference occurs with other equipment it may be corrected by one or more of the following measures:

    - Reorient or relocate this equipment, the other equipment, or both.
    - Increase the separation between the pieces of equipment
    - Connect the pieces of equipment into different outlets or circuits.
    - Consult a biomedical engineer.

If using the Wi-Fi enabled control unit

- Portable and mobile RF communication equipment (including peripherals such as antenna cables and external antennas) should be used no closer than 30 cm (12 inches) to any part of the LENS 4K Camera Control Unit, including cables specified by the manufacturer. Otherwise, degradation of the performance of this equipment could result.

- Use of this equipment adjacent to or stacked with other equipment should be avoided because it could result in improper operation. If such use is necessary, this equipment and the other equipment should be observed to verify that they are operating normally.

- Use of accessories and cables other than those specified or provided by the manufacturer of this equipment could result in increased electromagnetic emissions or decreased electromagnetic immunity of this equipment and result in improper operation.

Precautions

℞ ONLY U.S. Federal law restricts this device to sale by or on the order of a physician.

- Prior to each use, inspect the device to ensure it is functioning properly and is not damaged. Do not use a damaged device.

- Do not spill liquids, or allow fluids to enter the device. If liquid enters the unit through the vents, permanent damage may result.

- Electrical safety testing should be performed by a biomedical engineer or other qualified person.

- All products used in conjunction with this control unit, such as video monitors, video printers, etc., are likely to have an inherent leakage current at their video connections. Connection to this control unit likely will increase the leakage current at the control unit's chassis.

- When looping the video output to more than one piece of equipment, the termination switch on the last looping piece of equipment should be in the 75 Ω (ohm) or the ON position if the equipment provides that option.

- Do not plug the camera cable connector into the camera control unit if wet. Moisture on the camera cable connector, including the gold fingers, on the card edge of the camera head cable will damage the circuitry and void the warranty. Ensure that the camera cable connector is completely dry prior to plugging the camera head into the camera control unit.

- 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 in an industrial installation. This equipment generates uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one of the following measures:

  - Reorient or relocate the receiving antenna.
  - Increase the separation between the equipment and receiver.
  - Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
  - Consult the dealer or an experienced radio/TV technician for help.

- This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

- Maintain a minimum separation distance of 20 cm between the antenna and the patient's body.

- Any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate this equipment.

- Environmental Protection: This equipment contains electronic printed circuit assemblies. At the end of the useful life of this equipment, it should be disposed of in accordance with any applicable national or institutional policy relating to obsolete electronic equipment.

- Products may wear over time as a result of normal use. Periodic retesting of the leakage current is recommended.

- Do not operate at line voltages other than those stipulated on the back of the unit.

- Handle the unit with care. If the unit is dropped or damaged in any way, it must be returned immediately for service.

- To avoid loss of or damage to the control unit, remove the antenna from the Wi-Fi enabled control unit prior to transport.

- Disconnect the power cord before cleaning the unit or light source.

- Ensure that the unit is installed in an environment in which the vents and fans are not obstructed. Insufficient ventilation can cause the unit to overheat and shut down.

- In the event that the unit overheats and shuts down but the cooling fans are still running, do not turn off or unplug the unit. Continue to run the fans to prevent further damage to the unit.

- Ensure that the light guide is inserted into the proper front panel port. Damage to the unit may occur if the light guide is not inserted into the port associated with the correct light guide manufacturer.

- The mains inlet is used as the means of isolation from mains and shouldn't be bypassed. Ensure the equipment allows access to the plug.

- This product contains Nickel (Ni) which may cause allergic reactions.

System Components

The complete System includes the control unit, LENS 4K Camera Head (sold separately), and the optional Tablet Application. It is configured to be connected as a stand-alone system on an endoscopic cart or tower. The System can be used in conjunction with compatible HD/UHD flat panel displays, image capture devices, and print and video recording devices.

Accessories

Refer to the Ordering Information section in this manual for more information.
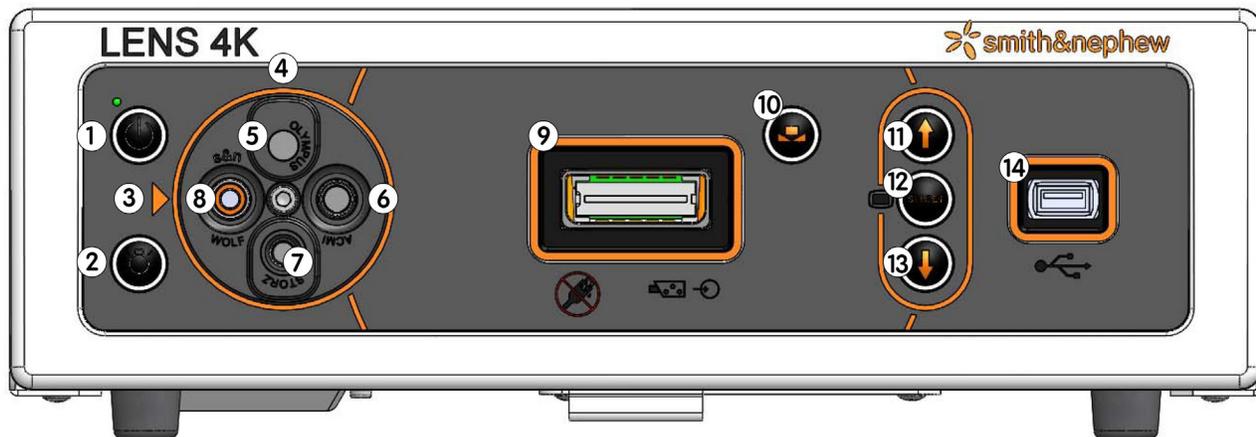
System Controls

Front Panel Overview

Figure 1. LENS 4K Camera Control Unit Front Panel

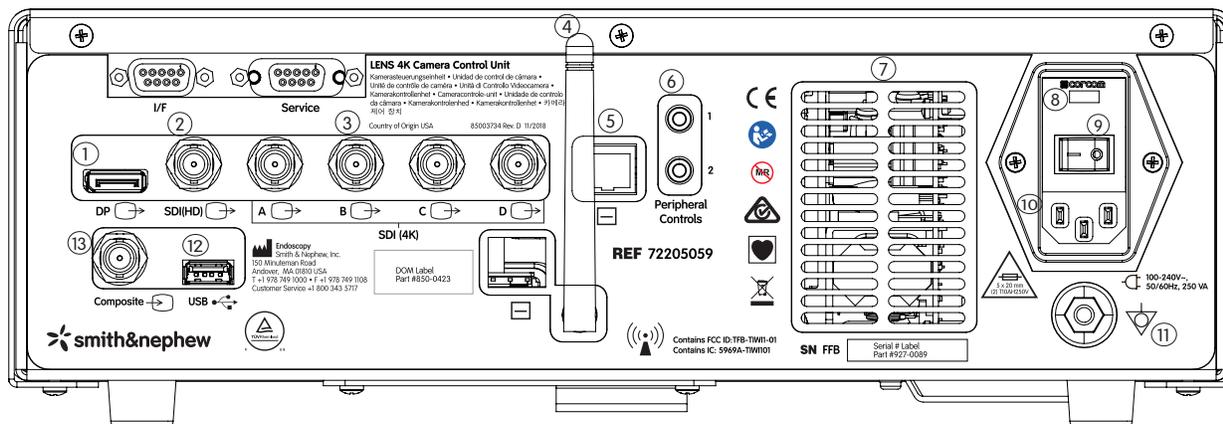|	Front Panel Control/Connector	Function
1	**Standby System Power** button	Turns the control unit on and off. The rear power switch must be switched to the (I) position in order to provide mains power to the system.
2	**Standby Illumination** button	When the **Standby Illumination** button is not illuminated, the light source is in standby mode and the light source is off. When illuminated, the button turns standby off and turns the light source on.
3	**Active Light Guide port indicator**	The light guide port to be used must be aligned with this orange arrow.
4	**Light Cable Selection Turret**	Rotate and click into position to select the port for the Smith & Nephew/Wolf™, Olympus™, ACMI™, or Storz™ Light Guide.
5	**Olympus Light Guide port**	This self-closing light port is designed to accept Olympus Light Guides.
6	**ACMI Light Guide port**	This self-closing light port is designed to accept ACMI Light Guides.
7	**Storz Light Guide port**	This self-closing light port is designed to accept Storz Light Guides.
8	**Smith & Nephew/Wolf Light Guide port**	This self-closing light port is designed to accept the Smith & Nephew/Wolf Light Guide end-fittings.
9	**Camera Cable Connector receptacle**	Smith & Nephew 4K camera head is connected via the camera cable connector. Be sure the camera cable connector side with the triangle faces upward. Firmly push the camera cable connector into the keyed receptacle.
10	**White Balance** button	The **White Balance** button automatically adjusts the camera for optimal white balance when the button is depressed. The camera must be focused on a white object during the white balance process.
11	**Up Arrow** button	The **Up Arrow** button causes the cursor to scroll upward or left through the available menu selections after the OSD (On- Screen Display) menu has been accessed via the **SELECT** button. When the end of a menu is reached, the next **Up Arrow** button press will bring the user to the bottom of the menu.
12	**SELECT/Menu** Button	The **SELECT** button allows the user to either select a menu command or call up the MAIN MENU screen. When the MAIN MENU is present, the **SELECT** button selects the highlighted menu command.
13	**Down Arrow** button	The **Down Arrow** button causes the cursor to scroll down or right through the available menu selections after the OSD menu has been accessed via the **SELECT** button. When the end of a menu is reached, the next **Down Arrow** button press will bring the user to the top of the menu.
14	**USB receptacle**	The LENS 4K supports compatible USB storage devices with partition scheme as Master Boot Records (MBR) and keyboards.

Rear Panel Overview

Figure 2. LENS 4K Camera Control Unit Rear Panel (REF 722050059 - Wi-Fi enabled)

Note: The rear panel of the non-Wi-Fi (REF 72205185), not shown, is the same as the Wi-Fi; minus the antenna and Wi-Fi symbol.

	Rear Panel Connections	Function
1	DP	DisplayPort Connector: Video output port supporting Native 4K 60fps output.
2	HD-SDI Output	Serial digital interface with component digital video output for HD-SDI-compatible video displays or video transmission equipment. The HD-SDI connector support 1080i and 1080p. To configure the connector, select the **Advanced Settings** icon from the SYSTEM CONFIGURATION MENU screen.
3	HD-SDI (A, B, C, D)	Quad 3G HD-SDI video output connectors supporting native 4K video resolutions.
4	Wi-Fi antenna connector	Accommodates the removable antenna for communication with supported Wi-Fi devices.
5	Top Ethernet Port	For service use only.
	Bottom Ethernet Port	For use with Integration Broker installation.
6	Peripheral Controls	Two standard 1/8" mini phono plug (3.5 mm) peripheral cable connectors allow control of peripheral devices such as printers and image capture devices from the Camera Head.
7	Exhaust port for power supply	Exhaust port for venting of air through the system. To avoid the risk of the System overheating, do not block.
8	Fuse Holder	The clip holds a dual fuse. Refer to the System Specifications section of this manual.
9	AC Mains Power	The switch applies power to the control unit. The switch can be set to off (**O**) or on (**I**).
10	Power Cord Connector	Accommodates the hospital grade power cord accessory. This receptacle is an integral part of the power input module.
11	Equipotential Compensator Terminal (case ground)	Brings other equipment to the same case potential as the device.
12	USB Receptacle	The LENS 4K supports compatible USB storage devices with partition scheme as Master Boot Records (MBR) and keyboards.
13	Composite Input	Standard composite video (CV) provides a video input for the supported composite output devices (C-arms, operating room cameras, etc.). This input supports NTSC or PAL, but it must be configured for the desired input. Refer to the Advanced Settings section of this manual for information about how to configure the composite input but must be configured from the Advanced Settings screen to match the input to be used.

System Controls

Camera Head Controls

The LENS 4K Camera Head (Figure 3) is a three button Camera Head. Each button can be customized to provide two separate functions as part of a customized Camera Setup. The two functions are activated by a short press (<1.0 seconds) and a long press (>1.0 seconds). These buttons can be customized based on the user's needs. Refer to the Button Settings section of this manual for instructions regarding how to customize the buttons.
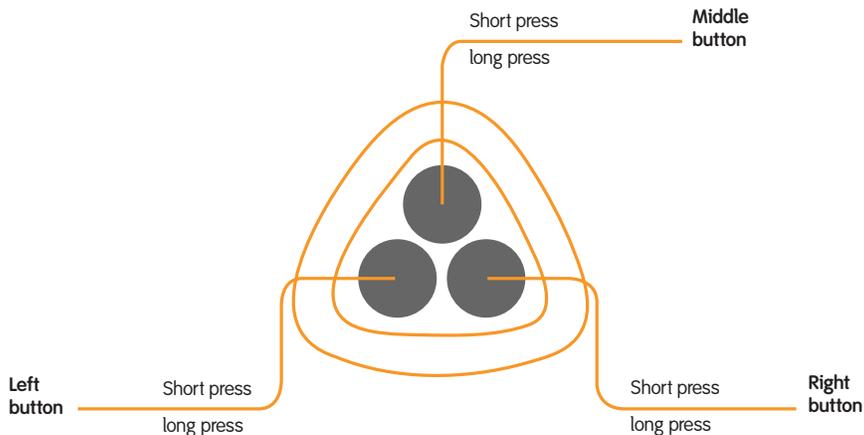
Figure 3. Smith & Nephew LENS 4K Camera Head

Button Function

Table 1, Live Video Functions, summarizes the default button functions for the Camera Head in the Live Video mode. Refer to the Button Settings section of this Operations/Service Manual for more information regarding default and customized button settings.

Camera Head Control	Short Press (<1.0 seconds)	Long Press (>1.0 seconds)
Left Button	Frame Capture (Single from Primary)	Light Mode
Middle Button	Brightness (Up/Down)	Menu Access
Right Button	Zoom	White Balance
*Button mapping is context-sensitive. Button settings may change, depending on the menu screen that is displayed on the monitor.		

Table 1. Default Live Video Button Functions*

Table 2, Optional Programmable Button Functions, provides an overview of the programmable custom button functions available on the system. Customization can be set with the front panel buttons, Camera Head buttons, or with the Tablet Application. Refer to the Tablet Application Instructions for Use (REF 10601295) for information about how to customize settings with the Tablet Application.

Function	Effect
BRIGHTNESS	Control the luminance level of the video output
ENHANCEMENT	Enhance the sharpness of the displayed video
ZOOM	Digital zoom of field of view
ALT PAUSE	Pause the video while recording to a device connected to a rear panel port
PAUSE VIDEO	Pause the video from Camera Head
ALT VIDEO	Start or stop video capture from the secondary input source and save to the Tablet Application or USB
ALT FRAME	Capture a still picture from the secondary input source and save to the Tablet Application
FRAME CAPTURE	Capture a still picture from the endoscopic field of view and save to the Tablet Application or USB
LIGHT MODE	Activates and deactivates the illumination device on the control unit
VIDEO CAPTURE	Start or stop video capture from the endoscopic field of view and save to the Tablet Application or USB
LAST IMAGE	Displays the last known frame captures to the Tablet Application for review
MENU ACCESS	Access the graphical menu system of the control unit [MAIN MENU]
WHITE BALANCE	Correct for ambient color temperature
Peripheral Port 1 (Top port)	Triggers the accessory connected to the top port
Peripheral Port 2 (Bottom port)	Triggers the accessory connected to the bottom port
* **Note:** Software updates to either the LENS 4K Camera Head or Camera Control Unit, may reset the button-mappable functions to the factory settings.	

Table 2. Optional Programmable Button Functions*

For information regarding how to customize Camera Head button settings, refer to the Button Settings section of this manual.

General Screen Navigation

Figure 4 indicates the general information areas of the on-screen display.
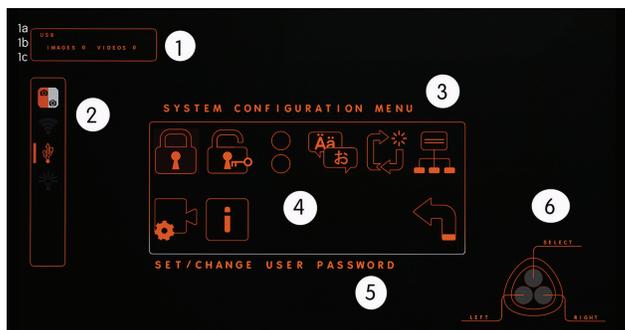

Figure 4. General Screen Navigation

1. Patient information box. This box appears when the Tablet Application and/or a USB storage device are connected to the System.

   a. patient name

   b. number of images and videos recorded

   c. current camera setup name

   Note: When both a Tablet Application and a USB are connected, the Tablet Application information will appear on the OSD. Images and videos will be saved to both devices.

2. Device status bar

3. Screen name

4. Active menu area

5. Name of highlighted function

6. Button navigation map (top = short press (<1 seconds), bottom = long press (>1 seconds)).

Installation

Unpacking and General Inspection

Prior to using the LENS 4K Camera Control Unit, it is essential that all system components be inspected for damage, which can negatively impact the system's performance. Inspection should include all equipment to be used in surgery, including cables and peripheral devices.

1. Remove the control unit and accessories from the shipping container. Be certain to open and inspect all boxes and sealed plastic bags to ensure that all components are accounted for.

   If any parts are missing or damaged, contact an authorized Smith & Nephew representative. Save the carton and packing materials in the event that a component needs to be returned for repair.

2. Inspect all video components for damage during shipment. If damage is found, contact an authorized Smith & Nephew representative. For more information, consult the Instructions for Use provided with the component.

LENS 4K Camera Control Unit

The following parts should have been received:

REF	Description
72205059 72205185	Smith & Nephew LENS 4K Camera Control Unit (1 ea) - Wi-Fi enabled - non Wi-Fi
(included with REF 72205059, 72205185)	USB Type A Male/Female cable 3 ft. (1 ea)
(72204938 included only with REF 72205059)	Wi-Fi antenna (1 ea)
Refer to the country kits for the Ref Number.	Hospital-grade power cord, country-specific (1 ea)
	Smith & Nephew LENS 4K Camera Control Unit Operations/Service Manual, country-specific version (1 ea)
72201420	HD-SDI coaxial cable, 10 ft. (5 ea)
7206083	1/8" (3.5 mm) mono mini-plug to 1/8" (3.5 mm) mono mini-plug accessory cable, 6 ft. (1.8 m) (2 ea)
72205276	DisplayPort, LENS 4K CCU cable 10 ft. (1 ea)
72205277	Cat 5e, LENS 4K CCU cable 30 ft. (1 ea)

Setup

Only a qualified technician should install the System.

Secure the Control Unit

If the control unit will be placed on a platform or cart shelf equipped with a screw mount, follow these instructions to secure the control unit to the platform or shelf.

1. Center the control unit on the shelf and ensure that the screw hole located on the base of the control unit aligns with the captured #10-32 UN screw in the center of the shelf.

2. Hand-tighten the screw to secure the control unit to the shelf.

IEC 60601-1 Compliant System Configuration

⚠️ Warnings

- **If this unit is configured as part of a system, the entire system should be tested for compliance with IEC 60601-1.**

- **If the leakage current of the configured system exceeds the limits of IEC 60601-1, install an appropriately rated IEC 60601-1 approved isolation transformer with a minimum of 1000 VA and retest the system.**

- **The use of accessory equipment not complying with the equivalent safety requirements of this equipment may lead to a reduced level of safety of the resulting system. Consider the following when choosing accessory devices:**
  - **Use of the accessory in the patient vicinity.**
  - **Evidence that the safety certification of the accessory has been performed in accordance with IEC 60601-1.**

Setup Configurations Summary

The System can be used with a variety of peripheral components to broaden the capabilities of the video system. Each setup is dependent upon the peripherals included in the video system. Contact an authorized Smith & Nephew representative for assistance with assembling the system to optimize system function.

Note: For best image, use a Quad 3G HDSDI signal (control unit output to monitor input). A direct connection between the control unit and a 4K monitor will always produce the highest quality image.

Equipment Required

- LENS 4K Camera Control Unit
- 4K Flat panel display

Optional

- 660HD or 660HD-E Image Management System(s)
- iPad and Tablet Application
- USB storage device

Cable Connectors

The System uses the following types of cables: BNC/SDI and BNC/HDSI coaxial cables, S-VHS cables which have a 4-pin mini-DIN connector, HD-DVI, and HD-SDI connectors.

BNC/SDI (composite)
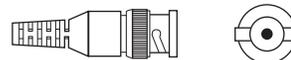
To connect, push in and turn.

BNC/HDSI

To connect, push in and turn.

Note: BNC/SDI and BNC/HDSI connectors appear identical. For the highest quality image, be sure to use the cable provided with the System.

Mini Phono Plug

To connect, push in firmly.

DisplayPort

To connect, push in firmly.

Ethernet

To connect, push in firmly

Recommended System Configuration for the Wi-Fi-Enabled System

This section explains the recommended equipment connections for optimum performance. Perform this procedure each time that the System is installed or reconfigured (Figure 5).

Required Equipment:

- LENS 4K Camera Control Unit, Wi-Fi-enabled (REF 72205059)
- LENS 4K Camera Head (REF 72205058)
- Wi-Fi Antenna
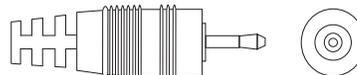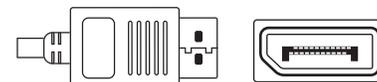- 4K Flat Panel Display

Optional Equipment:

- iPad and Tablet Application
- USB storage device. The USB can be connected to either the USB port on the front panel or the port on the rear panel of the control unit.

Set-up

- For best image, use a DisplayPort connector (control unit output to monitor input). A direct connection between the control unit and a high definition monitor will always produce the highest quality image.
- It is strongly suggested that a minimum of two outputs be connected at all times to provide a back-up signal if necessary.

1. Attach the antenna.

2. Connect the supplied hospital-grade power cord to the power receptacle on the control unit's rear panel.

3. To record still or video images from the camera, connect the Tablet Application to the LENS 4K Camera Control Unit Wi-Fi network or a insert a USB storage device in one of the USB ports on the control unit. refer to the System Specification section listed in this manual for a list of the requirements and compatibility. Refer to the Tablet Application IFU (REF 10601295) for details.

4. Connect the supplied hospital-grade power cord to the power receptacle on the flat panel display and plug it in.

5. If the flat panel display has a termination switch, set it to the 75 Ω or ON position.

6. After connecting all components, including the Camera Head, turn the video components on using the appropriate power switches.

Once the Wi-Fi-enabled System has been turned on, the iPad can be connected using the Tablet Application. If using the non-Wi-Fi version of the System, the iPad and Tablet Application cannot be used.

Configure the peripheral ports

The default settings for the peripheral ports on the rear of the control unit are FRAME CAPTURE (Port 1, or the top port) and VIDEO CAPTURE (Port 2, or the bottom port. Each of the peripheral control ports can be configured for FRAME CAPTURE, GENERAL PURPOSE, or VIDEO CAPTURE. For information on how to customize the peripheral ports, refer to the Configure Peripheral Ports section of this manual.

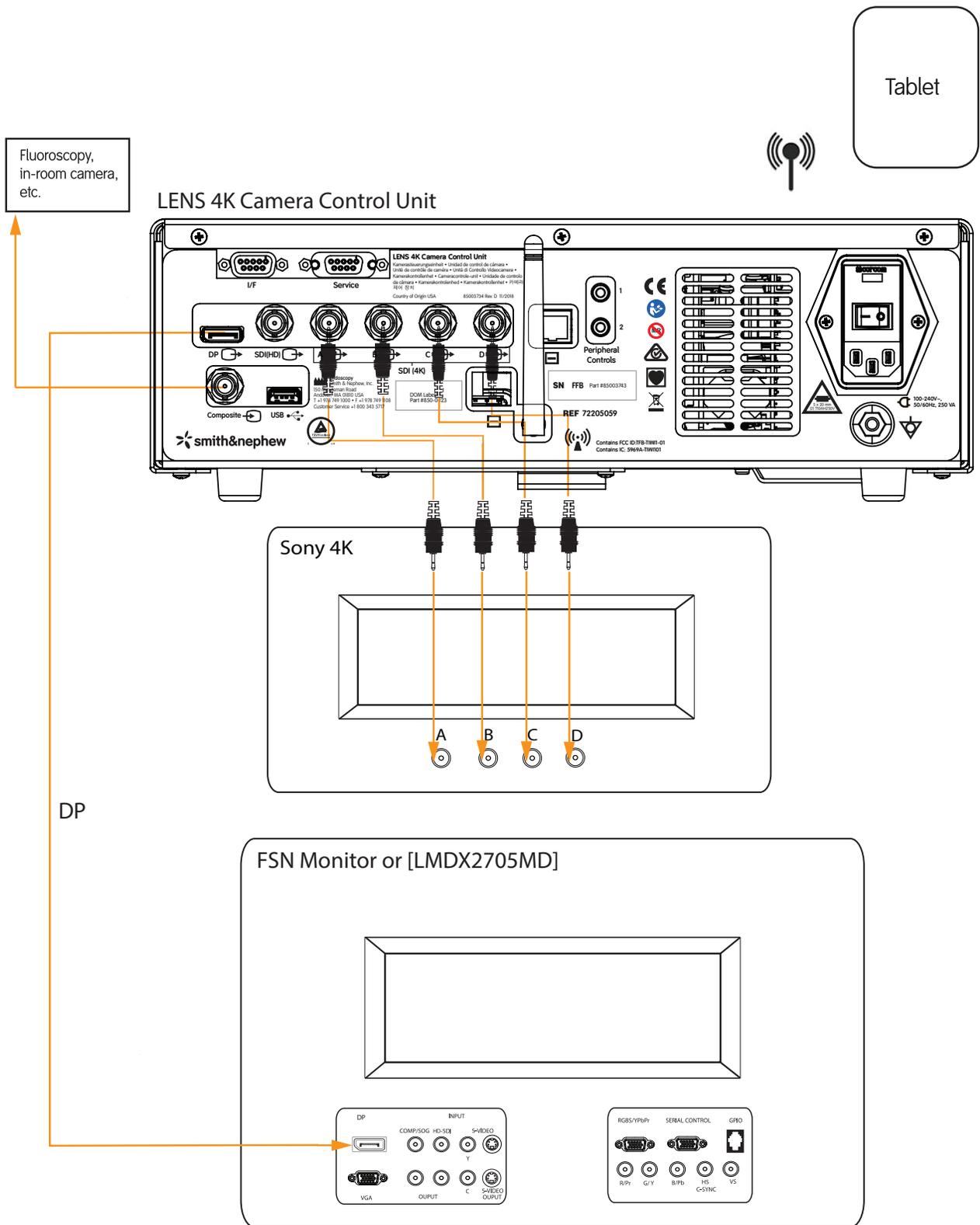**Note:** A USB storage device, iPad are not required in order to use the System.

Figure 5. Recommended setup configuration, Wi-Fi enabled System

Recommended System Configuration, Non Wi-Fi

This section explains the recommended equipment connections for optimum performance. Perform this procedure each time that the System is installed or reconfigured (Figure 6).

Required Equipment:

- LENS 4K Camera Control Unit (REF 72205185)
- Flat Panel Display
- LENS 4K Camera Head (REF 72205058)

Optional Equipment:

- Smith & Nephew 660HD or 660HD-E Image Management System: required for connection to hospital system (PACS/EMR through the Integration Broker device)
- USB storage device. The USB can be connected to either the USB port on the front panel or the port on the rear panel of the control unit

Set-up

Notes:

- For best image, use a DisplayPort or Quad 3G HDSDI signal (control unit output to monitor input). A direct connection between the control unit and a high definition monitor will always produce the highest quality image.

- It is strongly suggested that a minimum of two outputs be connected at all times to provide a back-up signal if necessary.

1. Connect the supplied hospital-grade power cord to the power receptacle on the control unit's rear panel.

2. Connect the supplied hospital-grade power cord to the power receptacle on the 660HD or 660HD-E Image Management System and plug it in.

3. Connect the HD-SDI output, refer to Figure 2, connection #2 from the control unit to the HD-SDI input of the 660HD or 660HD-E Image Management System. Then connect the 660HD or 660HD-E HD-SDI output to the flat panel display. The 660HD image management system is compatible only with 1080i output. Refer to the Advanced Settings section of this manual for information about how to configure input and output settings.

4. To record still images from the camera, connect the 3.5 mm mini phono plug from one of the control unit's peripheral controls outputs (Peripheral 1 or 2, or top port or bottom port), to the image management system's Still Capture IN port.

   Note: The Camera Head buttons must be mapped so that they will trigger the peripheral ports. Refer to the Button Settings section of this manual for information about how to map the Camera Head buttons.

5. To record live video images from the camera, connect the 3.5 mm mini phono plug from one of the control unit's peripheral controls outputs (Peripheral 1 or 2, or top port or bottom port) to the image management system's Video Capture IN port.

6. Connect the supplied hospital-grade power cord to the power receptacle on the flat panel display and plug it in.

7. If the flat panel display has a termination switch, set it to the 75 Ω or ON position.

8. After connecting all components, including the Camera Head, turn the video components on using the appropriate power switches.

Configure the peripheral ports

The default settings for the peripheral ports on the rear of the control unit are FRAME CAPTURE (Peripheral 1, or the top port) and VIDEO CAPTURE (Peripheral 2, or the bottom port. Each of the peripheral control ports can be configured for FRAME CAPTURE, GENERAL PURPOSE, or VIDEO CAPTURE. For information on how to customize the peripheral ports, refer to the Configure Peripheral Ports section of this manual.
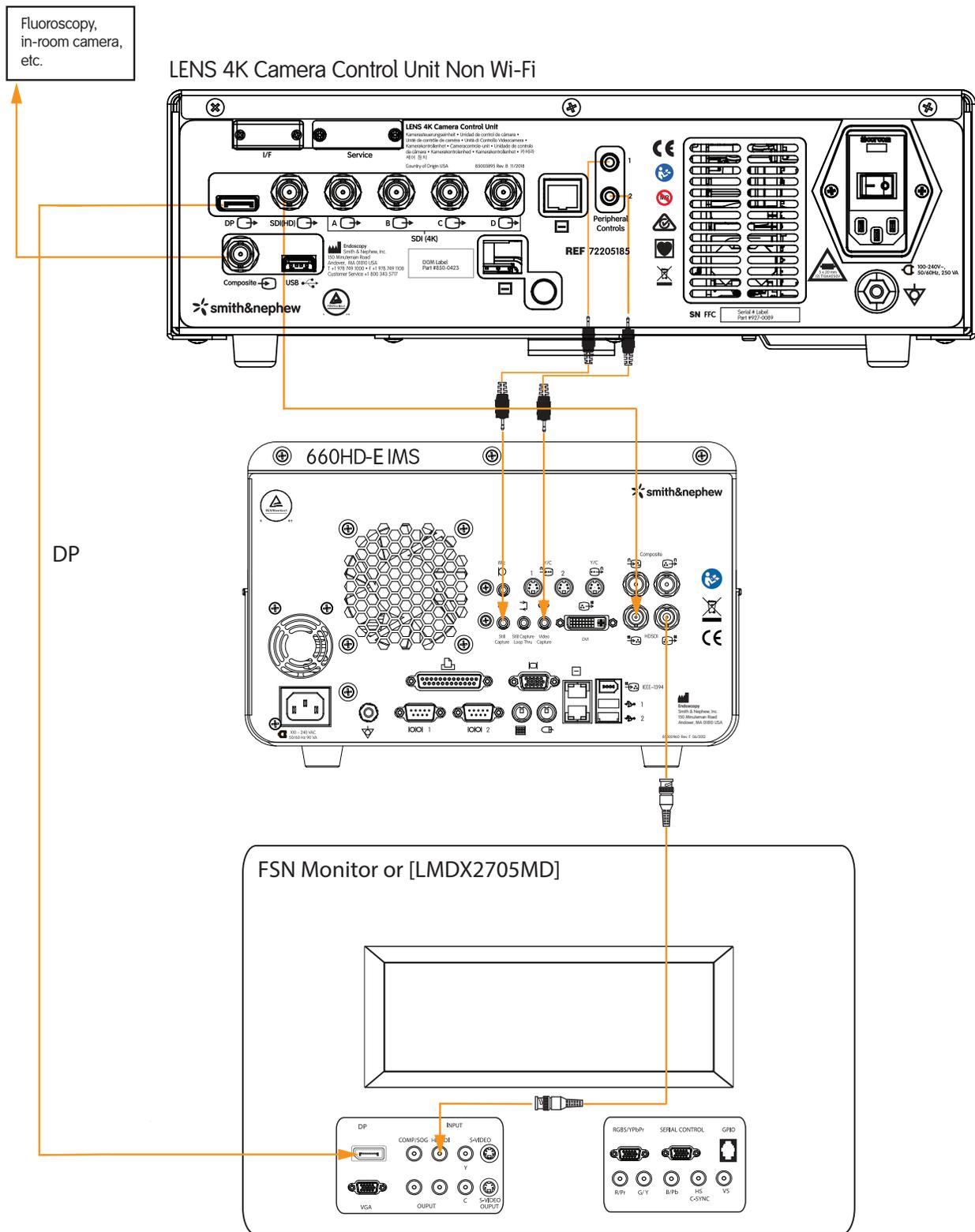
Figure 6. Recommended setup configuration, Non Wi-Fi enabled

Inspect the System Components

Prior to using the LENS 4K Camera Control Unit, it is essential that all system components be inspected for damage which can negatively impact the system's performance. Inspection should include all equipment to be used in surgery, including cables and peripheral devices.

CAUTION: Prior to each use, inspect the device to ensure it is functioning properly and is not damaged. Do not use a damaged device.

Electrical Connections

Examine the electrical connections.

- Electrocautery and other electrical noise-inducing medical equipment can interfere with the performance of control units and monitors. To prevent interference, plug monitors and camera equipment into an outlet on a wall separate from noise-inducing equipment.

- Check that the electrical equipment is properly grounded (i.e., plugs contain a ground prong). The control unit must be plugged into a hospital-grade AC outlet.

- If the monitor has a termination switch, it needs to be set to 75 Ω . If two or more monitors are used, only the termination switch on the last monitor needs to be on. If there is no termination switch on the last monitor; the monitor is self-terminating.

Double-check the equipment setup diagrams to ensure that all connections are correct.

Inspect the Fiber Optic Light Cable

⚠️ **WARNING: When inspecting the light cable, NEVER aim the light cable at, or peer directly into the light source. Retinal damage may occur.**

- Check the sheath for damage. Cuts, abrasions, or tears in the cable's silicone sheath will reduce overall light transmission.

- Aim one end of the cable toward a bright light, such as a room light, and inspect the other end for damaged fibers, e.g., black dots or dark gray areas (Figure 7). A combination of broken fibers in the cable or endoscope will result in reduced light transmission. The combined percentage of dark spots viewed in the cable end should not exceed 20% of its total area.
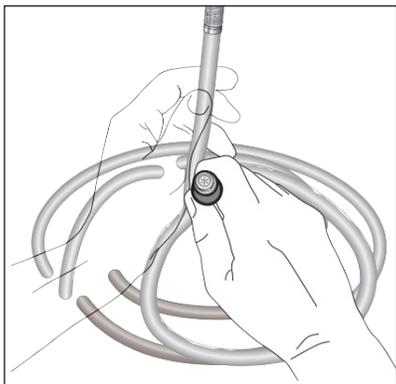
Figure 7. Inspect the fiber optic light cable

- Perform a visual fiber bundle diameter comparison. For optimal light transmission, the diameter of the fiber bundles in the endoscope's fiber optic light post should match the fiber bundle diameter of the light cable. This will prevent unnecessary heat buildup at the scope/light guide connection

Service Life Checklist

Perform a performance check for the installation and before each use case begins.

Check the following items to ensure that they function properly and the system is ready to use.

- ☐ Plug in the light guide and ensure that the light illuminates.

- ☐ Confirm that the video works correctly and that visualization is correct.

- ☐ Check the OSD status bar to confirm connection to the Wi-Fi.

- ☐ Check front panel to ensure that all buttons and connectors are functioning properly.

- ☐ Check the OSD status bar to confirm that the light is turned on and detected.

- ☐ Check the OSD status bar to confirm that the USB device is detected.

- ☐ Check for any damage to the camera head receptacle (cracks, corrosion, buildup or damage to the card edge receptacle).

- ☐ Check that the labeling information on the Camera Control Unit is still readable.

Apply Power to the Camera Control Unit

Notes:

- Perform the following steps only upon the initial power up of the system, if the system is powered down, or if a loss of power occurs.

- If the power to the system is controlled by the power switch on a cart or tower, these steps will not need to be repeated each time the system is powered up.

1. Make sure the AC mains power switch on the back panel is set to off (**O**).

2. Plug the female end of the power cord into the power receptacle on control unit rear panel.

3. Plug the power cord into a hospital-grade AC power outlet. Verify that the third pin on the plug is properly grounded.

4. Turn on the monitor.

5. Set the power switch module on the rear panel to (I) . The green LED on the front panel blinks green, and the monitor displays a progress bar as the system configures itself.

    Notes:

    – All front panel buttons are disabled until the system is configured. The green LED on the front of the control unit blinks while the system configures itself. The green LED illuminates a steady green when the buttons are enabled.

    – Refer to the Alternative Power Up section for ways to power up the system in the event of a power failure.

6. When the LED changes to a constant green and the progress bar disappears, the monitor will display the READY screen (Figure 8).
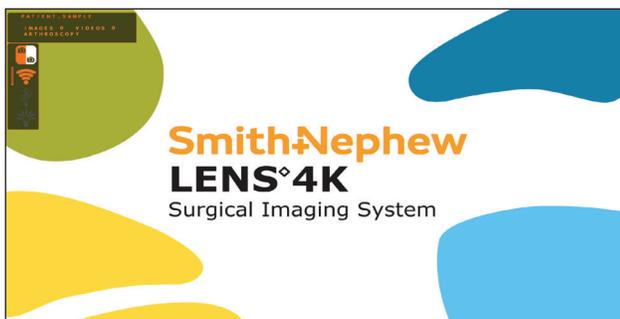

Figure 8. READY screen

The READY screen displays the status of main and secondary video inputs, Wi-Fi, USB, and the light source. When each feature is ready and confirmed to operate correctly, it will appear orange. If the feature icon is not orange, use the following key to identify the problem:

A. Primary (left) and secondary (right) inputs:

Color	Explanation
Orange	Ready
White	Input is not ready
Red	Recording or busy

For example, in Figure 8, the left side of the icon is orange, which indicates that the Camera Head port is available for connection. The right side of the icon is white, which indicates that the secondary video input (image management system, fluroscopic device, etc.) is not operational or not connected and should be checked.

B. Wi-Fi:

Attempt to connect the Tablet Application to the control unit in order to ascertain the status of the Wi-Fi connection.

Color	Explanation
Orange	Connected, valid patient
Yellow	Tablet Application is connected, no patient selected
White	Input is not working, need to check
Gray	Not connected

Note: The Wi-Fi icon notifies the user the that the Tablet Application is communicating or not communicating with the control unit. If the Wi-Fi connection between the Tablet Application and the control unit is lost, the Wi-Fi icon on both the OSD status bar and the iPad will change from orange to gray. Should the connection be lost or interrupted during surgery, all control unit control features can be accessed either from the front panel of the control unit or the Camera Head buttons.

C. USB storage device:

Insert a USB to check its status.

Color	Explanation
Orange	USB detected
Yellow	Reconfiguring/Not ready
White	No USB detected
Red	Recording or busy

D. Illumination:

Insert a light guide into the appropriate port and press the standby illumination button to ascertain illumination status.

Color	Explanation
Orange	On
Gray	Off

Perform the Network Setup

Refer to the Customize the System, or the Network sections of this manual for more information about network setup.

Preoperative

Prepare the Camera Head

Clean and sterilize the LENS 4K Camera Head as described in the cleaning and sterilization procedures in the Instructions for Use received with the Camera Head.

Notes:

- Allow the Camera Head to cool to room temperature after it has been autoclaved.
- The Camera Head may be used immediately after chemical sterilization.

Connect the Camera Head

CAUTION: Do not plug the camera cable connector into the camera control unit if wet. Moisture on the camera cable connector, including the gold fingers, on the card edge of the camera head cable will damage the circuitry and void the warranty. Ensure that the camera cable connector is completely dry prior to plugging the camera head into the camera control unit.

Note: The Camera Head is not specific to any single LENS 4K Camera Control Unit. It can be used with multiple LENS 4K Camera Control Units.

To connect the camera cable connector to the Control Unit, plug the card edge connector into the Camera Head receptacle on the front of the Control Unit and push in firmly (Figure 9).
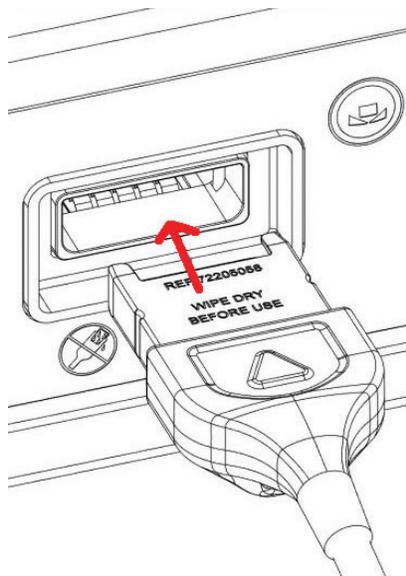

Figure 9. Connect the camera head to the control unit

Endocoupler focal length determines the image size on the monitor. For optimal image size use the LENS Coupler, 19.5 (72200315).

Connect the Coupler/Videoendoscope to the Camera Head

The System is designed to be used with instruments such as a videolaparoscope, videoarthroscope, or the coupler.

⚠️ **WARNING: Use aseptic technique in accordance with standard operating room procedures.**

1. Attach a videoscope or coupler with a sterilized direct-view endoscope to the Camera Head.
2. Attach the fiber optic light guide from the light source to the scope.

Insert Light Guide

⚠️ **Warnings**

- **During operation, avoid prolonged contact of the scope tip to patient tissue or flammable materials. The scope tip may reach high temperatures due to high intensity light transmission.**
- **Do not leave the operating light cable on a patient or the drapes. Failure to observe this warning may result in burns to the patient and/or the surrounding drapes.**

Set the multiport light guide adaptor turret for the light guide that will be used. To set the turret to the appropriate light port, rotate the turret in either direction until the desired light port is aligned with the orange arrow to the left of the turret (Figure 10).

Insert the light cable into the appropriate light port by pushing in firmly. To remove the light cable, grasp the cable connector and pull straight out of the light port. Do not pull out by pulling on the cable.

CAUTION: Ensure that the light guide is inserted into the proper front panel port. Damage to the unit may occur if the light guide is not inserted into the port associated with the correct light guide manufacturer.
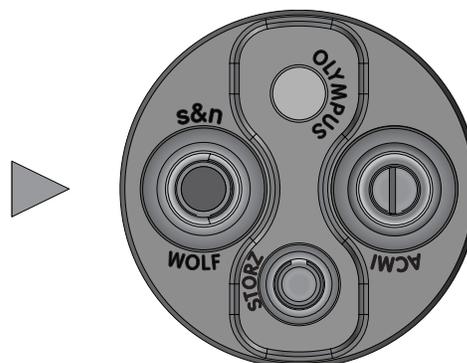

Figure 10. Multiport light guide adaptor turret

Turn the Camera Control Unit On

1. Press the **Standby Power** button on the front of the control unit. The button illuminates green. This **Power** button acts as a standby button for the System.

    The buttons on the front panel of the control unit activate and the STARTUP menu (Figure 11) opens. The default camera setup is **Arthroscopy**.
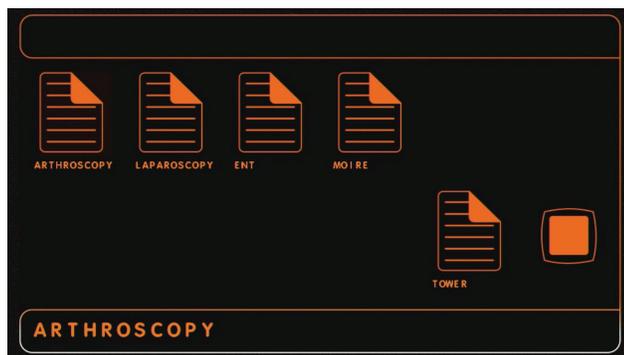

Figure 11. Arthroscopy

The STARTUP menu remains on the screen until a camera setup or the **Menu Access** icon is selected.

Notes:

- When a camera setup is selected, the camera will automatically perform a white balance. If a Camera Head is connected, ensure that the Camera Head is pointed at a white object such a piece of gauze or a piece of paper. At this point, the camera is in Live Video mode.

- Camera setups stored on the Tablet Application will not appear on the STARTUP menu. However, the name of the camera setup in use appears in the patient information box on the OSD.

- If a Camera Head is not plugged in, or if the Camera Head is unplugged while the control unit is on, the monitor will display a color bar pattern. When the Camera head is plugged back in, perform a White Balance.

2. Press the **Illumination** button on the front of the control unit to turn on the light source. The button illuminates orange.

Connect the iPad

If the control unit in use has a Wi-Fi feature, the Tablet Application can now be connected to the system. Refer to the Tablet Application Instructions for Use (REF 10601295) for information about how to download the Tablet Application and connect it to the LENS 4K Camera Control Unit.

Note: The Wi-Fi icon notifies the user the that the iPad is communicating or not communicating with the control unit. If the Wi-Fi connection between the Tablet Application and the control unit is lost, the WiFi icon on both the OSD status bar and the Tablet Application will change from orange to gray. The Tablet Application will automatically connect when the signal is available again. Should the connection be lost or interrupted during surgery, all control unit control features can be accessed either from the front panel of the control unit or the Camera Head buttons.

Operation

During a procedure, the user can access any of the functions available in the system either through the Camera Head button mappings or via the **Select/Menu Access** button on the front panel of the control unit. Any settings changed during the camera setup will be temporarily saved until the system is powered down. To customize camera setups and save settings permanently, refer to the Customize the System section of this manual. Refer to the menu maps for an overview of how to access System screens.

When setup is complete and service life checks have been performed, the System is ready for the surgeon to use. The list below summarizes the initial portion of the operative case:

1. Obtain a sterile Camera Head.

2. Plug the Camera Head into the control unit.

3. Connect the light guide to the appropriate light guide receptacle on the front of the control unit.

4. Turn on the illumination by pressing the **Illumination** button

5. White Balance from within the sterile field.

For detailed information about how to operate the System, read this Operations section.

Select a Camera setup

To select a camera setup, use the **Up** and **Down arrow** buttons or the left and right Camera Head buttons to highlight the desired camera setup. Press the **Select** button. The default camera setup is the Arthroscopy camera setup.

To change the default camera setup, refer to the System Configuration section of this manual. To customize a camera setup, refer to the Customize a Camera setup section of this manual.

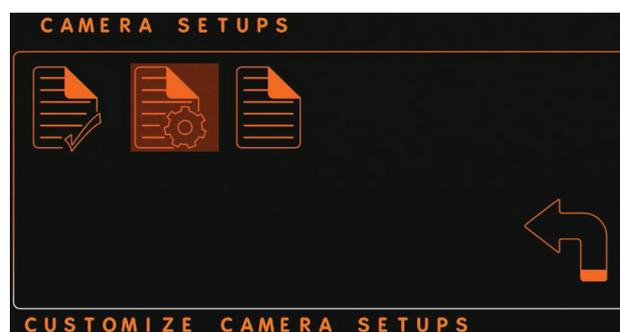To access the MAIN MENU screen, select the **Menu Access** icon on the STARTUP screen (Figure 12).

Figure 12. Select Camera setup Access

MAIN MENU

The MAIN MENU screen (Figure 13) allows the user to access and change settings for the various features and functions of the System. Use the **Up** and **Down** arrows on the control unit or the left and right Camera Head buttons to navigate to the desired feature or function.

Note: Settings changed directly from the MAIN MENU are temporary settings and will not be saved after the system is powered down or another camera setup is selected. To save settings permanently, refer to the Camera setups section of this manual.
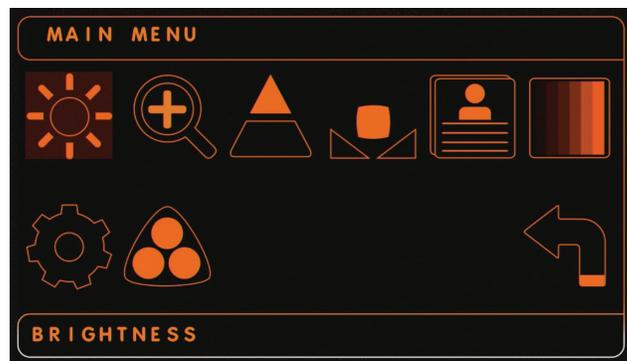

Figure 13. MAIN MENU screen

Brightness

To adjust Brightness, navigate to the **Brightness** icon and press **Select**. Use the **Up** and **Down** arrows on the control unit or the left and right Camera Head buttons to adjust Brightness to the desired level.

Zoom

To adjust Zoom, navigate to the **Zoom** icon and press **Select**. Use the **Up** and **Down** arrows on the control unit or the left and right Camera Head buttons to adjust Zoom to the desired level.

Enhancement

To adjust Enhancement, navigate to the **Enhancement** icon and press **Select**. Use the **Up** and **Down** arrows on the control unit or the left and right Camera Head buttons to adjust Enhancement to the desired level.

White Balance

To perform a White Balance, a Camera Head and scope must be connected to the front of the control unit. Point the end of the scope at a white object (a 4" x 4" gauze pad or flat white piece of paper) and focus (Figure 14). Fill as much of the screen as possible with the white object, but do not hold the scope close enough to touch the white object. Press the **White Balance** button at the upper right corner of the Camera Head connector (Figure 1). When the camera completes the White Balance process, the message White Balance Complete appears briefly on the screen, and a long tone sounds to indicate that the White Balance is complete. If the White Balance fails, a chirping tone will sound.

Notes:

- Each time the **White Balance** button is pressed, a single tone will sound. Press **Select** to return to the MAIN MENU.

- When a camera setup is chosen from the STARTUP screen, the camera automatically performs a White Balance.
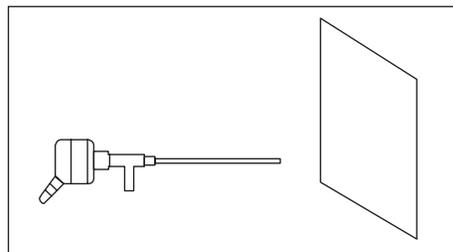
Figure 14. White Balance

Camera Setups

Camera setups consists of 1-3 screens:

- Setup Selection
- Customize Camera Setups
- Set Default Startup Camera setup

Setup Selection

To select or customize a camera setup, or to set the default camera setup, navigate to the **Camera setups** icon on the **MAIN MENU** and press Select. The Camera setups menu opens (Figure 15).

Figure 15. Setup Selection

Camera setup Selection

To select a camera setup from the Camera setup menu, navigate to the **SETUP SELECTION** icon and press **Select**. The CAMERA SETUPS menu (Figure 16) opens.

Figure 16. Camera Setup Selection

Because **Arthroscopy** is set as the default Camera Setup, it will blink. Including the **Laparoscopy,** ENT, MOIRE, ARTHROSCOPY, the system contains 10 customizable camera setups. The Moire camera setup defaults to the optimal settings for fibroscopes. For more information about Camera Setups, refer to the Camera setup section of this manual.

Use the **Up** and **Down** arrows on the control unit or the left and right Camera Head buttons to navigate to the desired camera setup and press **Select** to select that camera setup.

Customize a Camera setup

To customize a camera setup, highlight the **Customize Camera setups** icon on the CAMERA SETUPS menu (Figure 17) and press **Select**.
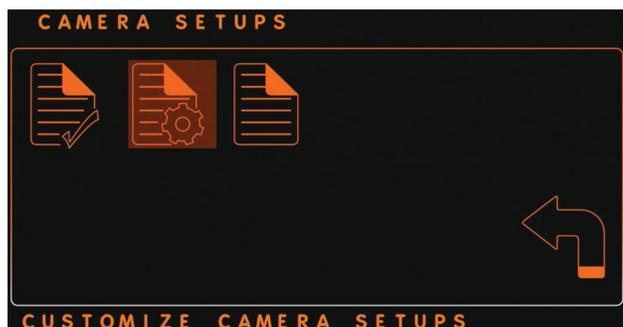

Figure 17. Customize Camera Setups

Press **Select** to open the SETUP SELECTION screen (Figure 18). Refer to the Customize Camera setup Settings section of this manual for information about how to customize or create a camera setup.
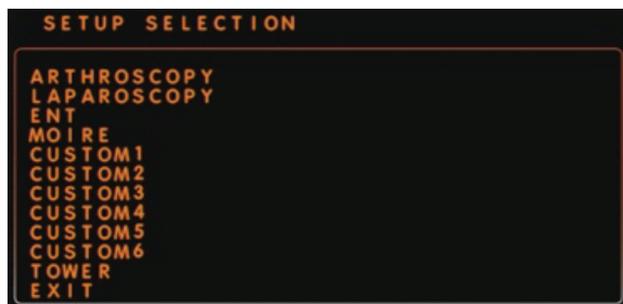

Figure 18. Select Setup Selection to Customize

To exit the SELECT Camera setup menu, highlight the **Menu Access** icon and press the **Select** button.

Set Default Startup Camera setup

Set Default CAMERA SETUP allows the user to set the camera setup that is highlighted on the STARTUP screen and so can be selected immediately. For information about how to customize a default camera setup, refer to the Customize the System section of this manual.

Color Bar

To calibrate the monitor, navigate to the **Color Bar** icon and press **Select**. The monitor screen shows the color bars. Adjust the color bars on the monitor according to that monitor's instructions for use. To exit, press any button or wait approximately 30 seconds.

System Configuration

The System is shipped with a default configuration. For information about how to change the configuration, refer to the Customize the System section of this manual.

Buttons

To view the current button configuration, navigate to the **Buttons** icon and press **Select**. The button map in the lower right corner of the monitor will indicate the current short (top setting) and long (bottom setting) press button configurations for the Camera Head. To change the button configurations, refer to the Button Settings section of this manual.

Exit

To exit the SYSTEM CONFIGURATION MENU screen, navigate to the **Exit** icon and press **Select**.

Capture Images

Ensure that the camera icon on the OSD status bar indicates Ready and that the button mappings are set for image capture. The System defaults to Live Video after a White Balance has been performed. Images can be captured when the System is in Live Video mode. The button map for the selected camera setup appears in the lower right corner of the OSD. Refer to Table 1 in the Camera Head section of the System Controls section of this manual for the System's default button settings for the Camera Head.

Note: When both an iPad and a USB or other image storage device are connected, the information displayed in the patient information box (Figure 4) is the information from the Tablet Application. The Tablet Application supersedes the USB information on the OSD, but information is recorded to both devices.

To Capture a Still Image

To record a still image, firmly press the button mapped to **Frame Capture (or ALT FRAME)**. If using the Tablet Application or a USB for image storage, when the image is captured, the image counter in the upper left corner of the OSD increases by one. If the counter does not increase, the image has not been recorded. If the image counter does increase, the image is saved to the connected image storage devices. For information regarding how to capture still images from the Tablet Application, please refer to Tablet Application Instructions for Use (REF 10601295). For information about how to customize button settings, refer to the Button Settings section of this manual.

Note: If the Tablet Application and a USB are connected to the System, the captured image will be saved to both devices.

If using the 660HD or 660HD-E, images will be stored directly to that device. Buttons must be mapped to the appropriate peripheral port. The patient information box will not appear on the OSD.

To Capture Video Images

Tablet/USB capture only:

To record a video image, press the button mapped to **Video Capture** and release the button. To stop recording, press and release the **Video Capture** button again. The camera icon on the OSD remains red until the video has been transferred to the storage device(s) and confirmed as saved. The video counter in the upper left corner of the OSD increases by one. If the counter does not increase, the video has not been recorded.

For information regarding how to capture video images from the Tablet Application, please refer to Tablet Application Instructions for Use (REF 10601295). For information about how to customize button settings, refer to the Button Settings section of this manual.

If capturing video to the 660HD or the 660HD-E image management system, ensure that the ports are mapped to the Camera Head buttons (**Acc1** or **Acc2**) correctly. Videos will be saved directly to the image management system.

Security Settings

The default factory settings do not require passwords and allow access to all system functions. Each site can choose to customize the security settings as part of its security processes.

The user password allows the user to prevent unwanted access to their customized camera setup settings. The administrator password allows the site to prevent any changes to the system settings.

For more information, refer to the Set/Change Password Protection and Set/Change Admin Password sections of Customize the System in this manual.

Resetting the system if the user password is lost

If the user password is lost, the system can be reset to the factory defaults from the **Reset Factory Defaults** icon on the SYSTEM CONFIGURATION MENU screen.

Note that if an administrator password has been set, the System will ask the user for the administrator password before allowing passwords to be reset.

Note: The system clears access either on power down or by accessing the power standby button on the front panel.

Alternative Power Up

The System can be configured to automatically restart under conditions set by the administrator. In the event of a mains power failure, it can be set to automatically restart, always, never, or only in the case of a mains power loss.

ALWAYS skips the READY screen and goes directly to the STARTUP screen.

NEVER skips the READY screen. The user needs to press the Standby button to turn on system power.

POWER LOSS only skips the READY screen upon power loss.

For information about how to configure AUTO START, refer to the To configure Automatic Start section of the Camera setups section of this manual.

Menu Maps

APPLY MAIN POWER

AUTO STARTUP ENABLED

N

Y

READY

STANDBY POWER

STARTUP

MAIN ACCESS

EXIT

SELECT PROCEDURE

FRONT PANEL/ CAMERA HEAD

LIVE VIDEO

WHITE BALANCE

CAMERA BUTTON MAPPINGS

MAIN MENU

CAMERA SETUP

COLOR BAR

SYSTEM CONFIGURATION

BUTTONS

CAMERA SETUP SUB MENU

CAMERA SETUP SELECTION

CAMERA SETUPS

ARTHROSCOPY

EXIT TO MAIN MENU

SYSTEM CONFIGURATION SUB MENUS

SET/CHANGE USER PASWORD

SET/CHANGE ADMIN PASSWORD

CONFIGURE ACCESSORY PORTS

LANGUAGE

RESET FACTORY DEFAULTS

NETWORK

ADVANCED SETTINGS

EXIT TO MAIN MENU

POP UP MENUS

BRIGHTNESS

ZOOM

ENHANCEMENT

WHITE BALANCE

EXIT TO MAIN MENU

Postoperative

To avoid possible burns or fire, be sure to turn off the illumination. To turn off the illumination, either press the **Standby illumination** button or unplug the light guide.

Turn the System off to erase all temporary changes to the current camera setups and ensure security by ending administrative password access. To turn off the System, press the **Standby power** button or turn off the power switch on the tower.

To print:

- From the Tablet Application, refer to the Tablet Application's Instructions for Use (REF 10601295) for information.
- From the 660HD Image Management System, refer to that product's manual for information (REF 10600055).
- From the 660HD-E Image Management System, refer to that product's manual for information (REF 10601236)
- If a USB is used for data storage, all images are saved as MP4 files to a media directory. To print from the media directory, the user must have the directory structure and know how to navigate the directory (Figure 19).
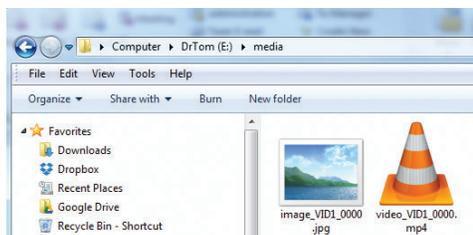

Figure 19. Media Directory

If the Tablet Application is connected and a patient file was created, and a USB storage device is connected to the control unit, media files will be saved to that patient's MRN directory on the USB (Figure 20).
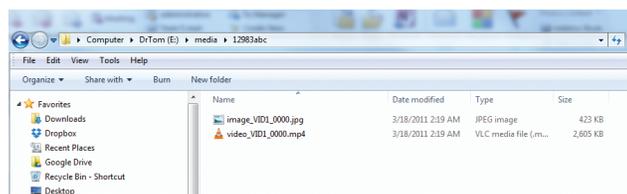

Figure 20. MRN Directory

Customize the System

The System is shipped with a default configuration. The System's default settings can be customized and saved for any procedure. Navigate to the **System Configuration** icon on the MAIN MENU and press **Select** to open the SELECT SYSTEM CONFIGURATION MENU screen.

1. From the MAIN MENU, select the **System Configuration** icon to open the SYSTEM CONFIGURATION MENU screen (Figure 21).
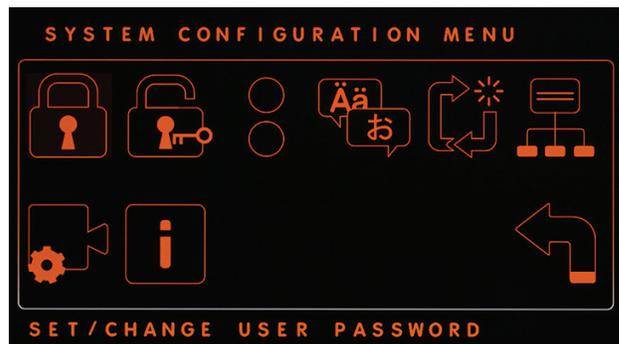
Figure 21. System Configuration Menu

The SYSTEM CONFIGURATION MENU contains the following icons:

Set/Change User Password Protection

Set/Change Admin Password.

Configure Accessory Ports

Language

Reset Factory Defaults

Network

Advanced Settings

Versions. Lists software versions of attached devices.

Exit

2. Navigate to the icon representing the feature to be customized and press **Select**.

Set/Change Password Protection

A user password enables an individual to change and protect the settings for all the custom camera setups. No one else will be able to access the camera setup's settings.

To set or change an individual's user password:

1. Select the **Set/Change User Password** icon on the SYSTEM CONFIGURATION MENU screen to open the CHANGE PASSWORD screen (Figure 22). **PASSWORD REQUIRED** is blinking. The default is set to **NO**.

Figure 22. Set/Change Password

Set/Change Password

2. Select **PASSWORD REQUIRED**. The current setting (**YES** or **NO**) will blink.

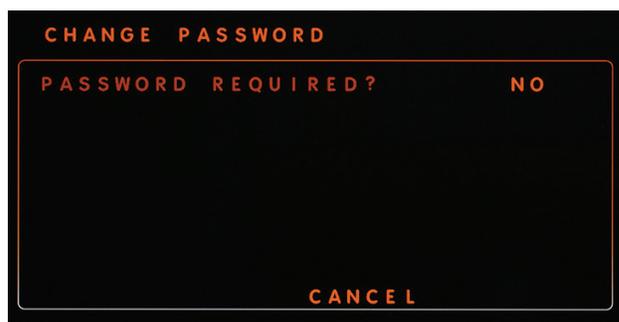3. Use the **Up** and **Down** arrows on the control unit or the left and right Camera Head buttons to switch between **YES** or **NO**.

4. Press **Select** to select either **Yes** or **NO**. To save the setting, navigate to **SAVE AND EXIT** and press **Select**. To return to the System Configuration menu without saving any changes, select **CANCEL**.

If Yes is selected, a blinking **NEW PASSWORD** = option appears on the screen (Figure 23).

Figure 23. New Password

5. Press **Select** to select **NEW PASSWORD** =. An OSD keyboard appears below the CHANGE PASSWORD menu (Figure 24).

Figure 24. Change Password

6. Use the **Up** and **Down** arrows on the control unit or the left and right Camera Head buttons to navigate to the desired letters on the keyboard.

   – A short press moves the highlighted cursor left or right.

   – A long press moves the cursor up or down from line to line.

   – To select a letter, number, or symbol, press **Select**.

   – To exit the keyboard, navigate to the **Return** key and press **Select**.

7. To save the changes and exit the CHANGE PASSWORD screen, select **SAVE AND EXIT** to return to the SYSTEM CONFIGURATION MENU screen. To exit the screen without saving any changes, navigate to **CANCEL** and press **Select** to return to the SYSTEM CONFIGURATION MENU screen.

Set/Change Admin Password

The administrator password allows the site to prevent any changes to the system settings.

Note: A user will still be able to create a user password to allow controlled access to the CAMERA SETUPS menu.

To set or change the administrative password:

1. Select the **SET/CHANGE ADMIN PASSWORD** icon to open the CHANGE PASSWORD screen.

2. Select **PASSWORD REQUIRED**. The current setting (**YES** or **NO**) will blink.

3. Use the **Up** and **Down** arrows on the control unit or the left and right Camera Head buttons to switch between **YES** and **NO**.

4. Press **Select** to select either **YES** or **NO**. To save the setting, navigate to **SAVE AND EXIT** and press **Select**. To return to the System Configuration menu without saving any changes, select **CANCEL**.

   If **Yes** is selected, a blinking **NEW PASSWORD** = option appears on the screen (Figure 25).
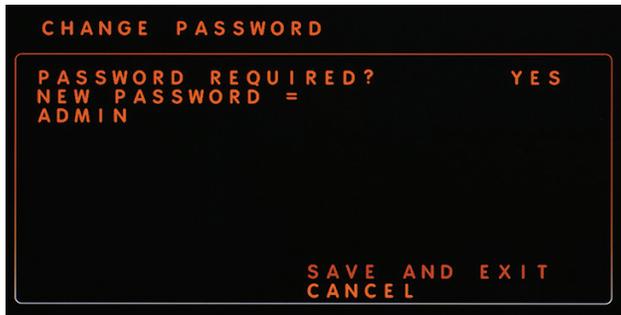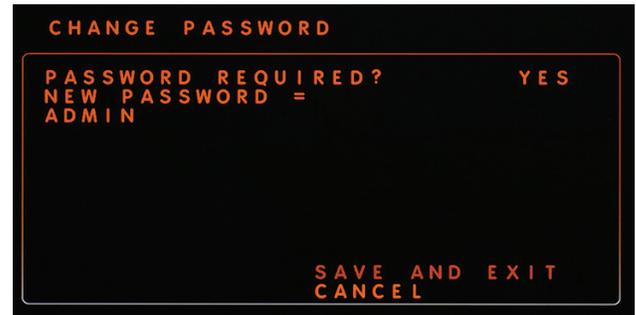

Figure 25. Set/Change Admin Password

5. Press Select to select **NEW PASSWORD** =. An OSD keyboard appears below the CHANGE PASSWORD menu (Figure 26).

Figure 26. New Admin Password

6. Use the **Up** and **Down** arrows on the control unit or the left and right Camera Head buttons to navigate to the desired letters on the keyboard.

   Note: A short press moves the highlighted cursor left or right. A long press moves the cursor up or down from line to line. To select a letter, number, or symbol, press **Select**. To exit the keyboard, navigate to the **Return** key and press **Select**.

7. To save the changes and exit the CHANGE PASSWORD screen, select **SAVE AND EXIT** to return to the SYSTEM CONFIGURATION MENU screen. To exit the screen without saving any changes, navigate to **CANCEL** and press **Select** to return to the SYSTEM CONFIGURATION MENU screen.

   Note: Do not lose the administrative password. This will prevent the recovery of passwords through the RESET FACTORY DEFAULTS function. If the administrator password is lost, please contact Smith & Nephew.

Configure Peripheral Ports

The CONFIGURE ACCESSORY PORTS MENU screen allows the user to configure the peripheral ports on the rear panel of the control unit to the desired function. To configure the peripheral ports:

1. Select the **CONFIGURE ACCESSORY PORTS** icon on the SYSTEM CONFIGURATION MENU screen to open the CONFIGURE ACCESSORY PORTS MENU screen (Figure 27). **TOP PORT** = will blink. The default setting is **FRAME CAPTURE**.

Figure 27. Configure Accessory Ports

2. To customize the **TOP PORT**, press Select. The current setting to the right of **TOP PORT** will begin to blink.

3. Use the **Up** and **Down** arrows on the control unit or the left and right Camera Head buttons to scroll through the available options

4. Navigate to the desired setting (Figure 28) and press **Select**:

   – Select **FRAME CAPTURE** the CCU will send a still frame of the digital image captured on the device.

   – Select **GENERAL PURPOSE** to send a still frame to the printer.

   – Select **VIDEO CAPTURE** to send video recordings to the digital image capture device. When **VIDEO CAPTURE** is in use, the first button press starts the recording, and the second button press stops the recording.

   > FRAME CAPTURE
   > GENERAL PURPOSE
   > VIDEO CAPTURE

   Figure 28. Select Setting

5. To customize the settings for the **BOTTOM PORT**, navigate to **BOTTOM PORT** and press Select. Repeat Steps 2 and 3 to change the current settings for **BOTTOM PORT**.

6. To save changes and exit the screen, select **SAVE AND EXIT**. To exit the screen without saving any changes, return all settings to their original settings and select **Save** and **Exit**.

Language

To customize the language that appears on the OSD:

1. Select the **LANGUAGE** icon on the SYSTEM CONFIGURATION MENU screen to open the LANGUAGE MENU screen (Figure 29).

Figure 29. Language Menu

2. Use the **Up** and **Down** arrows on the control unit or the left and right Camera Head buttons to scroll through the available languages.

3. When the desired language blinks, press **Select** to select it. The System will return to the SYSTEM CONFIGURATION MENU screen. The OSD will change to the language that was selected.

Reset Factory Defaults

To reset the System to the original factory default settings:

1. Select the **RESET FACTORY DEFAULTS** icon on the SYSTEM CONFIGURATION MENU screen to open the RESET FACTORY DEFAULTS screen (Figure 30). **RESET FACTORY DEFAULTS** will blink.

Figure 30. Open Reset Factory Defaults

Select **EXIT** to exit the RESET FACTORY DEFAULTS screen and return to the SYSTEM CONFIGURATION MENU screen without resetting to the factory defaults

2. To reset the System to the original factory default settings, select **RESET FACTORY DEFAULTS**. A confirmation screen containing the question **ARE YOU SURE?** will open (Figure 31). **YES** will blink
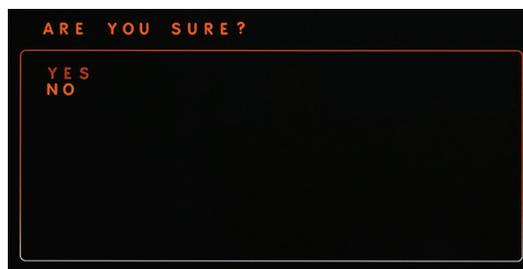
Figure 31. Select Reset Factory Defaults

3. Select **YES** to restore the original factory default settings. The System will replace all previously customized settings for all camera setups and advanced settings with the original factory default settings and return to the SYSTEM CONFIGURATION MENU screen.

   Select **NO** to retain previously saved settings and exit the RESET FACTORY DEFAULTS screen without making any changes. The System returns to the SYSTEM CONFIGURATION MENU screen.
   Note: Ensure to power cycle the system, after re-setting the factory defaults.

Network

Note: This section applies only to the Wi-Fi enabled version of the control unit.

The NETWORK SETTINGS screen allows the user to change the settings that enable the System network to connect to the Tablet Application. The LENS network ID and network password are required in order to connect the Tablet Application to the System network. To change the network settings:

1. Navigate to the **NETWORK** icon on the SYSTEM CONFIGURATION MENU screen. Press **Select** to open the NETWORK SETTINGS screen (Figure 32).

```
NETWORK SETTINGS


RESET WIFI
NETWORK ID  =    SSDDFFGG
NETWORK PW  =    12345678
MAC ADDRESS=     A4:D5:78:8A:67:7B
NET CHANNEL=     09
IP ADDRESS  =    192.168.10.114
FCC POWER   =    YES

SAVE AND EXIT
CANCEL
```

Figure 32. Network Settings

2. To reset the Wi-Fi or image management system, select **RESET WIFI**, whichever one appears on the screen.

To change the network ID:

1. Navigate to **NETWORK ID** = and press **Select**. An OSD keyboard appears below the NETWORK SETTINGS menu.

2. Use the **Up** and **Down** arrows on the control unit or the left and right Camera Head buttons to navigate to the desired letters on the keyboard.

   Note: A short press moves the highlighted cursor left or right. A long press moves the cursor up or down from line to line. To select a letter, number, or symbol, press **Select**. To exit the keyboard, navigate to the **Return** key and press **Select**.

3. To save the changes and exit the NETWORK SETTINGS screen, select **SAVE AND EXIT** to return to the SYSTEM CONFIGURATION MENU screen. To exit the screen without saving any changes, navigate to **CANCEL** and press **Select** to return to the SYSTEM CONFIGURATION MENU screen.

To change the network password:

1. Navigate to **NETWORK PW** = and press **Select**. An OSD keyboard appears below the NETWORK SETTINGS menu.

2. Use the **Up** and **Down** arrows on the control unit or the left and right Camera Head buttons to navigate to the desired letters on the keyboard.

   Note: A short press moves the highlighted cursor left or right. A long press moves the cursor up or down from line to line. To select a letter, number, or symbol, press **Select**. To exit the keyboard, navigate to the **Return** key and press **Select**.

3. To save the changes and exit the NETWORK SETTINGS screen, select **SAVE AND EXIT** to return to the SYSTEM CONFIGURATION MENU screen. To exit the screen without saving any changes, navigate to **CANCEL** and press **Select** to return to the SYSTEM CONFIGURATION MENU screen.

MAC address:

All LENS 4K System control unit's ships with a set MAC address and is not changeable.

The MAC address is the address that identifies a particular LENS 4K control unit on the network.

To change the network channel:

There are 12 available network channels available in the System: channels 0–11. If the System performance seems to be slowing or otherwise degrading, change to a different network channel to try to resolve the problem. For more information about how to troubleshoot a slowing system, refer to the Wi-Fi Troubleshooting section of this manual.

To change the network channel:

1. Navigate to **NET CHANNEL** =. When **NET CHANNEL** = blinks, press Select to select it. The current channel will blink.

2. Use the **Up** and **Down** arrows on the control unit or the left and right Camera Head buttons to navigate to the desired channel and press **Select**.

3. To save the changes and exit the NETWORK SETTINGS screen, select **SAVE AND EXIT** to return to the SYSTEM CONFIGURATION MENU screen. To exit the screen without saving any changes, navigate to **CANCEL** and press Select to return to the SYSTEM CONFIGURATION MENU screen.

IP Address:

This section is used to indicate what IP address has been assigned by the hospital network to the CCU if enabling the optional communication to Integration Broker. Refer to Network section listed in this document. If the system has not been given an IP address, this field will indicate NO IP.

Note: Refer to Configure the Settings for Integration Broker section in the Tablet Application document #10601295).

Customize the System

To activate FCC power:

FCC power is a regional setting that affects Wi-Fi signal strength. In the United States, FCC power is typically set to **YES**. In the European Union, FCC power is typically set to **NO**. If the System is located outside of the US and EU, contact a local sales representative for information regarding the optimal System setting.

To activate FCC power:

1. Navigate to **FCC POWER** =. When **FCC POWER** = blinks, press **Select** to select it. The current setting will blink.

2. Use the **Up** and **Down** arrows on the control unit or the left and right Camera Head buttons to switch between **YES** and **NO**. Press **Select** to select the desired setting.

3. To save the changes and exit the NETWORK SETTINGS screen, select **SAVE AND EXIT** to return to the SYSTEM CONFIGURATION MENU screen. To exit the screen without saving any changes, navigate to **CANCEL** and press **Select** to return to the SYSTEM CONFIGURATION MENU screen.

ADVANCED SETTINGS

The ADVANCED SETTINGS feature allows the user to configure the System's video signal settings. If an administrative password has been set up on the system, that password will be needed.

1. From the SYSTEM CONFIGURATION MENU screen (Figure 33), use the **Up** and **Down** arrows on the control unit or the left and right Camera Head buttons to navigate to the **Advanced Settings** icon. Press **Select** to open the ADVANCED SETTINGS screen (Figure 34). To exit the ADVANCED SETTINGS screen, navigate to **SAVE AND EXIT** and press **Select**.
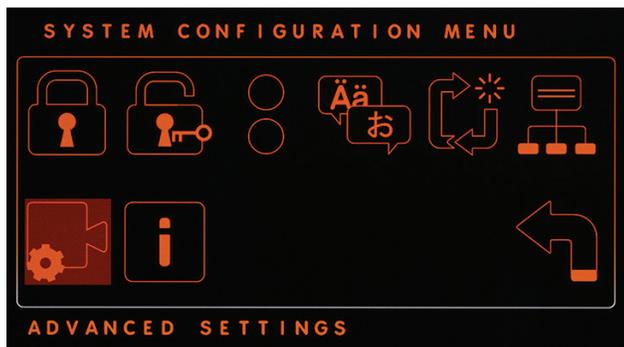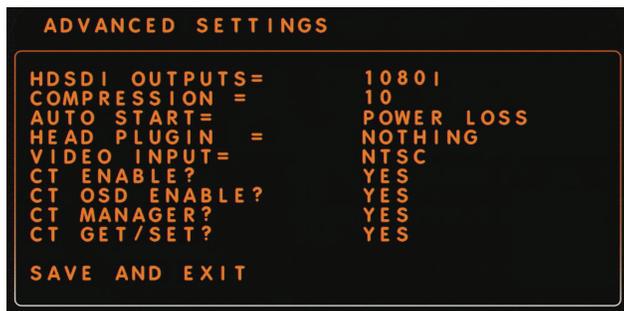

Figure 33. System Configuration Menu

Figure 34. Advanced Settings

To configure HDSDI Outputs:

1. Press **Select** to select the blinking **HDSDI OUTPUTS** =. The current setting will blink.

2. Use the **Up** and **Down** arrows on the control unit or the left and right Camera Head buttons to switch to 1080i. Refer to Figure 2, connection #2. Press **Select** to activate the output.

   Note: The System does not allow the selection of an incompatible output. If the monitor in use is not compatible with the selected output, the screen will flash and return to the CONFIGURE SETTINGS menu after approximately 10 seconds.

To configure COMPRESSION:

COMPRESSION provides the user with the ability to adjust the video compression bit rate.

Note: The higher the number, the less compression of the video, which will result in higher quality and longer transfer times.

1. Navigate to **COMPRESSION.** Press Select to select the blinking **COMPRESSION**.

2. Use the **Up** and **Down** arrows on the control unit or the left and right Camera Head buttons to select the video bit rate from 1 to 30. Press **Select** to activate the desired output.

3. Select **No** to return to the Advanced Settings screen without saving any changes. Select **YES** to save the change and return to the Advanced Settings screen.

To configure AUTO START:

The AUTO START option allows the user to configure how the system behaves on a mains power-up. To configure when the System should automatically restart:

1. Navigate to **AUTO START**. When **AUTO START** blinks, press **Select** to select it. The current setting will blink.

2. Use the **Up** and **Down** arrows on the control unit or the left and right Camera Head buttons to scroll through the available options (Figure 35). Press **Select** to activate the desired option. Press **Select** to activate the desired option.
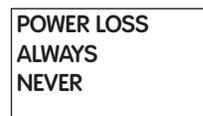
Figure 35. AUTO START

To configure the HEAD PLUGIN

The HEAD PLUGIN = option allows the user to customize the System's behavior when the Camera Head plugged in.

To configure HEAD PLUGIN:

1. Navigate to **HEAD PLUGIN** =. When **HEAD PLUGIN** = blinks, press **Select** to select it. The current setting will blink.

2. Use the **Up** and **Down** arrows on the control unit or the left and right Camera Head buttons to switch between **POWER** and **NOTHING**..

3. Select **POWER** to automatically turn on the System upon connection of the Camera Head to the System.

   Select **NOTHING** to not automatically turn the system on upon connection of the Camera Head to the System.

To configure VIDEO INPUT:

The VIDEO INPUT option allows the user to configure the video input format for either NTSC or PAL on the rear panel.

Note: NTSC inputs are used in North America and parts of South America. PAL inputs are typically used in the EU and other countries. Please contact an authorized Smith & Nephew representative with any questions regarding which input is correct for your location.

To configure VIDEO INPUT:

1. Navigate to **VIDEO INPUT**. When **VIDEO INPUT** blinks, press **Select** to select it. The current setting will blink.

2. Use the **Up** and **Down** arrows on the control unit or the left and right Camera Head buttons to switch between **NTSC** and **PAL**.

3. Select **NTSC** for an NTSC video input. Select **PAL** for a PAL video input.

To save the settings and exit the CONFIGURE SETTINGS screen, navigate to **SAVE AND EXIT** and press **Select** to return to the SYSTEM CONFIGURATION MENU screen.

Versions

Versions allows the user to view the software version currently in use on the system. To view the software versions currently in use:

1. Navigate to **VERSIONS**. When **VERSIONS** blinks, press **Select** to open the VERSIONS screen.

2. To exit the VERSIONS screen, press any button to return to the SYSTEM CONFIGURATION screen.

Customize Camera setup Settings

1. From the MAIN MENU, highlight the **camera setups** icon and select it to open the Camera Setups menu.

2. Use the **Up** and **Down** arrows on the control unit or the left and right Camera Head buttons to navigate to the **CUSTOMIZE CAMERA SETUPS** icon and press Select to open the SETUP SELECTION screen.

3. Navigate to the camera setup (Figure 36) to be customized and press **Select** to open that camera's setup customization screen. The CUSTOMIZE BUTTON SETTINGS option will blink (Figure 39).

   Note: Changes to the camera setup are not saved until **SAVE AND EXIT** is selected.
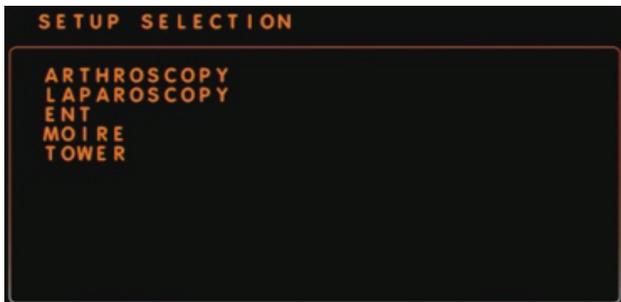

Figure 36. CUSTOMIZE CAMERA Setups SETTINGS screen

The Camera setup screen contains a MORE SETTINGS menu; refer to the MORE SETTINGS section in this document.

Customize Button Settings

Camera Head button settings can be customized to the user's preferred settings for short and long button presses. To customize button settings:

1. Press **Select** to open that Customize button Settings screen (Figure 37).

Figure 37. Camera Head button settings

2. Use the **Up** and **Down** buttons on the control unit or the right and left buttons on the Camera Head to navigate to the button press to be customized (**MIDDLE SHORT**, **RIGHT LONG**, etc.).

3. Press **Select** to select the desired button press. To the right of the button press name, the current setting for that button press will begin to blink.

4. Use the **Up** and **Down** buttons on the control unit or the right and left buttons on the Camera Head to scroll through the list of options (Figure 38). Press Select to select the setting for that button press.
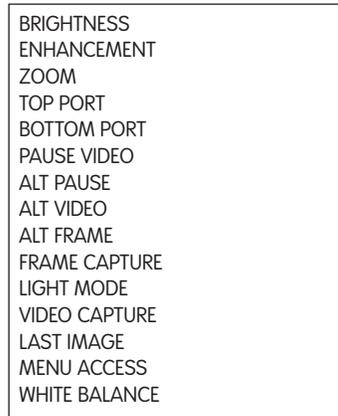
Figure 38. Up and Down buttons

Refer to Table 2 in the System Controls section of this manual for an explanation of each setting option.

5. When all button presses have been customized as desired, use the **Up** and **Down** buttons on the control unit or the right and left buttons on the Camera Head to navigate to the **Exit** button. Select **Exit** to save the settings, exit the button settings screen, and return to the camera setup's customization menu.

IMAGE CAPTURE OSD

The IMAGE CAPTURE OSD setting allows the user to determine if the on screen display graphics appear in the image and video captures. The default setting is OFF. To customize Image Capture OSD:

1. Navigate to **IMAGE CAPTURE OSD** (Figure 39). When **IMAGE CAPTURE OSD** blinks, press **Select** to select it. The current setting will blink.
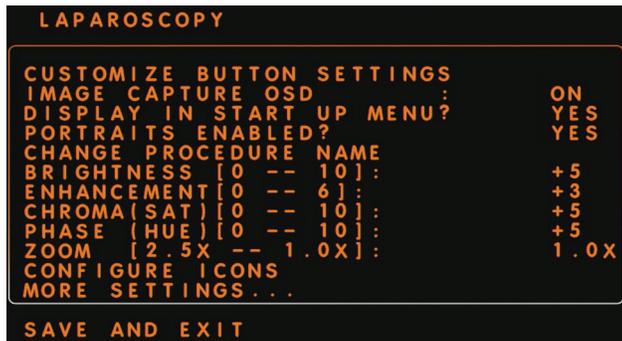

Figure 39. Image Capture OSD

2. Use the **Up** and **Down** arrows on the control unit or the left and right Camera Head buttons to switch between **OFF** and **ON**. Press Select to select the desired setting.

3. To save the changes and exit the Camera setups Settings screen, select **SAVE AND EXIT**.

DISPLAY IN STARTUP MENU?

The DISPLAY IN STARTUP MENU? setting allows the user to choose whether or not to display the customized camera setup in the STARTUP menu. To customize DISPLAY IN STARTUP MENU?:

1. Navigate to **DISPLAY IN STARTUP MENU?**. When **DISPLAY IN STARTUP MENU?** blinks, press **Select** to select it. The current setting will blink.

2. Use the **Up** and **Down** arrows on the control unit or the left and right Camera Head buttons to switch between **OFF** and **ON**. Press **Select** to select the desired setting.

3. To save the changes and exit the CAMERA SETUPS SETTINGS screen, select **SAVE AND EXIT**.

   Note: This setting cannot be changed for the ARTHROSCOPY or TOWER camera setup. The ARTHROSCOPY or TOWER camera setup will always appear on the STARTUP screen.

PORTRAITS ENABLED?

The PORTRAITS ENABLED? setting allows the user to choose whether or not to briefly display image portraits on the OSD during image capture.

1. Navigate to **PORTRAITS ENABLED?**. When **PORTRAITS ENABLED?** blinks, press **Select** to select it. The current setting will blink.

2. Use the **Up** and **Down** arrows on the control unit or the left and right Camera Head buttons to switch between **YES** and **NO**. Select **YES** to have image portraits appear in the upper right corner of the OSD. Select **NO** to prevent image portraits from appearing on the OSD.

3. To save the changes and exit the CAMERA SETUPS SETTINGS screen, select **SAVE AND EXIT**.

CHANGE PROCEDURE NAME

The CHANGE PROCEDURE NAME setting allows the user to rename a camera setup. To rename a camera setup:

1. Navigate to **CHANGE PROCEDURE NAME**. When **CHANGE PROCEDURE NAME** blinks, press **Select** to select it. The RENAME PROCEDURE NAME screen will open and the current camera setup name will blink.

2. Press **Select** to select the current camera setup name. An OSD keyboard will appear below the RENAME PROCEDURE NAME screen.

3. Use the **Up** and **Down** arrows on the control unit or the left and right Camera Head buttons to navigate to the desired letters on the keyboard.

   Note: A short press moves the highlighted cursor left or right. A long press moves the cursor up or down from line to line. To select a letter, number, or symbol, press **Select**. To exit the keyboard, navigate to the Return key and press **Select**.

4. When the new name of the camera setup is spelled out, exit the keyboard. **ENTER** will blink.

5. Select **ENTER** to change the camera setup name and return to the CAMERA SETUPS SETTINGS screen. Select **CANCEL** to keep the original camera setup name and return to the CAMERA SETUPS SETTINGS screen.

6. To save the changes and exit the CAMERA SETUPS SETTINGS screen, select **SAVE AND EXIT**.

BRIGHTNESS

The BRIGHTNESS setting allows the user to set the starting luminance level of the video output during the camera setup. Increase BRIGHTNESS to better illuminate the parts of an image that are normally dark, such as a recess in a knee.

BRIGHTNESS settings range from 0 to 10 in whole number increments. The default value is +5. Once the starting BRIGHTNESS level has been set for a camera setup, BRIGHTNESS can be increased or decreased from that point within the available range. To customize the BRIGHTNESS:

1. Navigate to **BRIGHTNESS**. When **BRIGHTNESS** blinks, press **Select** to select it. The current setting will blink.

2. Use the **Up** and **Down** arrows on the control unit or the left and right Camera Head buttons to scroll through the **BRIGHTNESS** level settings. Press **Select** to select the desired level.

3. To save the changes and exit the CAMERA SETUPS SETTINGS screen, select **SAVE AND EXIT**.

ENHANCEMENT

The ENHANCEMENT setting allows the user to set the starting enhancement level of the video output during the camera setup. Increase ENHANCEMENT to sharpen the edges in the image and increase contrast. Decrease ENHANCEMENT to soften the edges in the image and decrease contrast.

ENHANCEMENT settings range from 0 to 6 in whole number increments. The default value is +3. Once the starting ENHANCEMENT level has been set for a camera setup, ENHANCEMENT can be increased or decreased from that point within the available range. To customize ENHANCEMENT:

1. Navigate to **ENHANCEMENT**. When **ENHANCEMENT** blinks, press **Select** to select it. The current setting will blink.

2. Use the **Up** and **Down** arrows on the control unit or the left and right Camera Head buttons to scroll through the **ENHANCEMENT** level settings. Press **Select** to select the desired level.

3. To save the changes and exit the CAMERA SETUPS SETTINGS screen, select **SAVE AND EXIT**.

CHROMA (SAT)

The CHROMA (SAT) setting allows the user to set the color saturation level of the video output during the camera setup. Increase saturation to increase the intensity of the colors. Decrease saturation to decrease the intensity of the color. A saturation level of zero produces a monochrome image.

CHROMA (SAT) settings range from 0 to 10 in whole number increments. The default value is +5. To customize the **CHROMA (SAT)** level:

1. Navigate to **CHROMA (SAT)**. When **CHROMA (SAT)** blinks, press **Select** to select it. The current setting will blink.

2. Use the **Up** and **Down** arrows on the control unit or the left and right Camera Head buttons to scroll through the **CHROMA (SAT)** level settings. Press **Select** to select the desired level.

3. To save the changes and exit the CAMERA SETUPS SETTINGS screen, select **SAVE AND EXIT**.

PHASE (HUE)

The PHASE (HUE) setting allows the user to set the color hue of the video output during the camera setup. PHASE (HUE) settings range from 0 to 10 in whole number increments. Higher settings (longer wavelengths) will contain more red. Mid-range settings (medium wavelengths) will contain more green, and lower range (shortest wavelengths) settings will contain more blue. The default value is +5. To customize the PHASE (HUE) level:

1. Navigate to **PHASE (HUE)**. When **PHASE (HUE)** blinks, press **Select** to select it. The current setting will blink.

2. Use the **Up** and **Down** arrows on the control unit or the left and right Camera Head buttons to scroll through the **PHASE (HUE)** level settings. Press **Select** to select the desired level.

3. To save the changes and exit the CAMERA SETUPS SETTINGS screen, select **SAVE AND EXIT**.

ZOOM

See trace for detail [560: ZOOM - Increase or decrease from 1.0X to 2.5X. Each time the button is pressed, the zoom factor increases by approximately 10%, going through the following discrete zoom factors: 1.0X, 1.2X, 1.3X, 1.5X, 1.7X, 1.9X, 2.1X, 2.3X, 2.5X.]

CONFIGURE ICONS

The CONFIGURE ICONS setting allows the user to customize which icons appear in the status bar on the OSD. The default setting for all icons is **YES**.

To customize the icons display in the status bar:

1. Navigate to the camera setup to be customized and press **Select**. The CAMERA SETUPS screen opens.

2. Navigate to **CONFIGURE ICONS** and press **Select** to select it. The CONFIGURE ICONS screen opens (Figure 40). Each icon listed can be configured to **YES** (display) or **NO** (do not display).
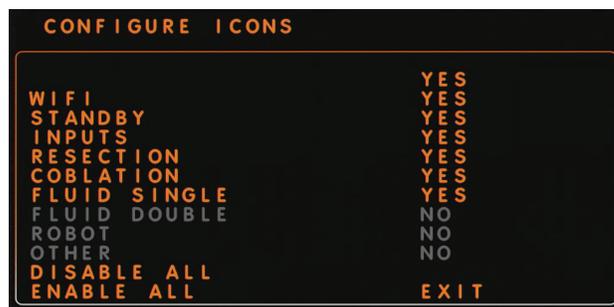

Figure 40. Configure Icons

3. Navigate to the desired icon. When the icon blinks, press **Select** to select it. The current setting will blink.

4. Use the **Up** and **Down** arrows on the control unit or the left and right Camera Head buttons to switch between **YES** and **NO**. Press Select to select the desired setting.

Note: The icons Fluid Double, Robot and Other are not available at this time.

Icons displayed can be enabled or disabled individually or as a group.

To **ENABLE** all icons in the status bar, navigate to **ENABLE ALL**. When **ENABLE ALL** blinks, press Select to select it. All icons listed on the screen will immediately be reconfigured to YES and will appear in the status bar on the OSD.

To **DISABLE** all icons in the status bar, navigate to **DISABLE ALL**. When **DISABLE ALL** blinks, press **Select** to select it. All icons listed on the screen will immediately be reconfigured to **NO** and will not appear in the status bar. This is not recommended.

To exit the CONFIGURE ICONS screen, highlight the **EXIT** option and press **Select** to return to the CAMERA SETUP SETTINGS screen.

MORE SETTINGS

The MORE SETTINGS menu (Figure 41) is an extension of the Camera setup Selection menu.
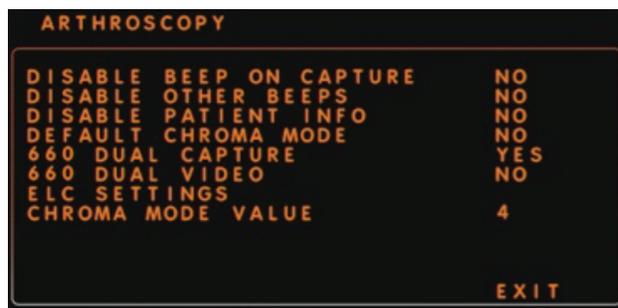

Figure 41. MORE SETTINGS Menu

1. From the MAIN MENU, highlight the **camera setups** icon and select it to open the Camera setup Selection menu.

2. Use the **Up** and **Down** arrows on the control unit or the left and right Camera Head buttons to navigate to the **Customize Camera Setups** icon and press Select to open the Setup Selection setup screen.

3. Navigate to the camera setup to be customized and press **Select** to open that camera's setup customization screen. The CUSTOMIZE BUTTON SETTINGS option will blink (Figure 37).

    Note: Changes to the camera setup are not saved until **SAVE AND EXIT** is selected.

DISABLE BEEP ON CAPTURE

Disable beep is the post capture beeps that indicate whether it is successful or not. To customize DISABLE BEEP ON CAPTURE:

1. Navigate to **DISABLE BEEP ON CAPTURE**. When **DISABLE BEEP ON CAPTURE** blinks, press **Select** to select it. The current setting will blink.

2. Use the **Up** and **Down** arrows on the control unit or the left and right Camera Head buttons to switch between **YES** and **NO**. Press **Select** to select the desired setting.

3. To save the changes and exit the CAMERA SETUPS SETTINGS screen, select **SAVE AND EXIT.**

DISABLE OTHER BEEPS

The DISABLE OTHER BEEPS setting allows the user to choose whether or not to have any audible beeps occur. To customize DISABLE OTHER BEEPS:

1. Navigate to **DISABLE OTHER BEEPS**. When **DISABLE OTHER BEEPS** blinks, press **Select** to select it. The current setting will blink.

2. Use the **Up** and **Down** arrows on the control unit or the left and right Camera Head buttons to switch between **YES** and **NO**. Press **Select** to select the desired setting.

3. To save the changes and exit the CAMERA SETUPS SETTINGS screen, select **SAVE AND EXIT**.

DISABLE PATIENT INFO

The DISABLE PATIENT INFO allows the user to choose whether or not to display the upper left screen containing the patient information.

1. Navigate to **DISABLE PATIENT INFO**. When **DISABLE PATIENT INFO** blinks, press **Select** to select it. The current setting will blink.

2. Use the **Up** and **Down** arrows on the control unit or the left and right Camera Head buttons to switch between **YES** and **NO**. Press **Select** to select the desired setting.

3. To save the changes and exit the CAMERA SETUPS SETTINGS screen, select **SAVE AND EXIT**.

DEFAULT CHROMA MODE

Default CHROMA Mode allows the user to choose whether or not to enable or disable Chroma mode to access an alternate color rendition.

Refer to CHROMA MODE VALUE section in this document.

1. Navigate to **DEFAULT CHROMA MODE**. When **DEFAULT CHROMA MODE** blinks, press **Select** to select it. The current setting will blink.

2. Use the **Up** and **Down** arrows on the control unit or the left and right Camera Head buttons to switch between **YES** and **NO**. Press **Select** to select the desired setting.

3. To save the changes select **EXIT**.

660 DUAL CAPTURE

660 Dual Capture – when the 660 is connected and the Dual Capture is selected it will trigger (capture) the tablet to send the image to the 660 when triggered from the camera head.

1. Navigate to **660 DUAL CAPTURE**. When **660 DUAL CAPTURE** blinks, press **Select** to select it. The current setting will blink.

2. Use the **Up** and **Down** arrows on the control unit or the left and right Camera Head buttons to switch between **YES** and **NO**. Press **Select** to select the desired setting.

3. To save the changes and exit the CAMERA SETUPS SETTINGS screen, select **SAVE AND EXIT**.

660 DUAL VIDEO

660 Dual Video - is the same as Capture and this will mirror the capture from the camera head buttons.

1. Navigate to **660 DUAL VIDEO**. When **660 DUAL VIDEO** blinks, press Select to select it. The current setting will blink.

2. Use the **Up** and **Down** arrows on the control unit or the left and right Camera Head buttons to switch between **YES** and **NO**. Press **Select** to select the desired setting.

3. To save the changes and exit the CAMERA SETUPS SETTINGS screen, select **SAVE AND EXIT**.

ELC Settings

ELC (Electric Light Control) Settings allows the user to customize the response of the ELC. The recommended setting is **AUTO**, which is also the default setting. It can also be set to sensitivity levels 1–16.

If flicker occurs while the ELC is set to **AUTO**, reset the ELC to 1 to remove the flicker, then increase the sensitivity level until the speed of the ELC response is sufficient. When sensitivity is set to 1, the response time of the ELC is slow, but more stable. At 16, the response time is quick, but less stable..

To customize **ELC Settings**:

1. Navigate to **ELC Settings** and press **Select** to select it. The ELC Settings screen (Figure 42) opens.

Figure 42. ELC Settings

2. Press **Select** to select **SENSITIVITY**. The current setting will blink.

3. Use the **Up** and **Down** arrows on the control unit or the left and right Camera Head buttons to scroll through the settings options. Press Select to select the desired sensitivity level or **AUTO**.

4. To exit the ELC SETTINGS screen, highlight the **EXIT** option and press **Select** to return to the CAMERA SETUP SETTINGS screen.

CHROMA MODE VALUE

Works in conjunction with the Default CHROMA Mode, when enabled, the user can adjust the CHROMA MODE VALUE level. Refer to DEFAULT CHROMA MODE section in this document.

1. To **INCREASE** or **DECREASE** the value, navigate to the CHROMA MODE VALUE. When the VALUE blinks, press Select to select.

2. Use the **Up** and **Down** arrows on the control unit or the left and right Camera Head buttons to navigate to the desired value on the keyboard.

3. To exit the CAMERA SETUPS SETTINGS screen, highlight the **EXIT** option and press **Select**.

Save and Exit

To save all changes to the camera setup, navigate to **SAVE AND EXIT**. Press **Select** to save changes and exit to OSD. To exit without saving changes, custom settings will need to be changed manually to their original settings prior to selecting **SAVE AND EXIT**.

Set the Default Startup Camera setup

Set Default Startup Camera setup allows the user to set the camera setup that is highlighted on the STARTUP screen and so can be selected immediately. To set the default startup camera setup:

1. Navigate to the **Camera setup** icon and press the **Select** button to select it.

2. Highlight the **Set Default Startup Camera setup** icon (Figure 43) and press the **Select** button to select it. A screen showing the available camera setup opens.

3. Use the **Up** and **Down** arrows on the control unit or the left and right Camera Head buttons to scroll to the camera setup to be set as the default camera setup. Press **Select** to select the camera setup and return to the OSD.

Figure 43. Set Default Startup Camera setup

Cleaning

To Clean the LENS 4K Camera Control Unit

CAUTION: Disconnect the power cord before cleaning the unit or light source.

- Prior to cleaning the equipment, turn off the control unit and disconnect the Camera Head.

- Wipe down the control unit with a clean, dry cloth after every procedure.

- Use a damp cloth or sponge to remove dirt or debris. Avoid getting liquid into the side vents, and never immerse the control unit in any solution.

- Wipe down the control unit with alcohol or a neutral pH cleaner.

- After cleaning, store the equipment in a cool, dry place out of direct sunlight or excessive heat.

Note: It is important to periodically inspect and clean the fan grill on the rear of the unit and the exhaust holes on the side of the unit. The most effective method is to use a vacuum with a soft brush attached. A soft, damp cloth may also be used to remove any accumulations in these areas.

To Clean and Sterilize the Camera Head

Refer to the Instructions for Use provided with the LENS 4K Camera Head (REF 10601349).

Note: It is important to select the appropriate sterilization method for each type of equipment.

For sterilization of a light guide, refer to the Sterilization section of that light guide's Instructions for Use.

For sterilization of a coupler, refer to the Sterilization section of that coupler's Instructions for Use.

For sterilization of an endoscope, refer to the Sterilization section of that endoscope's Instructions for Use.

Troubleshooting

The Smith & Nephew LENS 4K Camera Control Unit is designed to provide the highest quality video image available. However, should problems occur, use the following guide to make troubleshooting easier. If the problem persists, contact an authorized Smith & Nephew representative.

Problem	Try This	Probable cause
Image too bright/excess glare	Decrease the Brightness setting. Use the **BRIGHTNESS** button on the camera head or access **BRIGHTNESS** from the *MAIN MENU* screen.	**BRIGHTNESS** was set too high
Image too grainy	Decrease the Enhancement setting. Use the **ENHANCEMENT** button on the camera head or access **ENHANCEMENT** from the *MAIN MENU* screen. or	**ENHANCEMENT** was set too high
	Increase the Brightness setting. Use the **BRIGHTNESS** button on the camera head or access **BRIGHTNESS** from the *MAIN MENU* screen.	**BRIGHTNESS** was set too low
Image is cloudy or hazy	Adjust the focus on the coupler or the video endoscope or	Camera was out of focus
	Clean both the scope and the coupler. Refer to the Instructions for Use for the respective scope and the coupler in use.	Dirty optics
	If the scope or coupler has fogged, use a suction tube to remove the moisture or dry the equipment using the manufacturer's recommended procedure.	Fogging results when the light in the scope warms or because the air space and trapped moisture has condensed on the glass window.
	Clean any anti-fogging agent off of the lenses. The use of an anti-fogging agent is not recommended	Anti-fogging agent had been applied to the lenses.
	Increase the Enhancement setting. Use the **ENHANCEMENT** button on the camera head, the **ENHANCEMENT** adjustment on the iPad, or access **ENHANCEMENT** from the *MAIN MENU* screen.	**ENHANCEMENT** was set too low.
	Ensure that the **Moire** procedures are not selected.	A fibroscope procedure type was selected for a non-fribroscope setup.
Intermittent picture	Disconnect the camera head from the control unit	If the intermittent behavior is resolved, then refer to the camera head's Instructions for Use to troubleshoot camera head issues.
		If buildup of contaminants on the proximal end of the camera connector appear, (refer to the Cleaning and Sterilization section in the LENS 4K Camera Head for US Ref #10601459, or OUS Ref #10601349).
	Replace the cable on that video output and check the intermittent video output on another monitor.	Bad Cable
	Connect all video outputs to a compatible monitor directly from the control unit with known compatible cables, then switch between outputs at the monitor controls and monitor issue. Do not pass signals through to other devices, for example, the 660 & 660HD-E Image Management System.	
	Restore connections through other devices (for example, the 660 & 660HD-E Image Management System).	If intermittent video behavior persists, contact Smith & Nephew Customer Service.

Problem	Try This	Probable cause
Cannot establish a connection from the iPad to the control unit	1. Go to the VERSIONS screen on the control unit and determine the **NETWORK ID**. 2. Follow the instructions in the System's Operations/Service Manual to reconnect.	User attempted to connect to the wrong control unit.
	• Check uniqueness of SSID	Network conflict due to non-unique SSID (network name)
	• Change the Wi-Fi channel in the network menu in following the order 1, 4 or 11 • Restart the Camera Control Unit	Conjested Wi-Fi channel, or missing Wi-Fi.
	• Ensure that the iPad is within visible range (within 150 ft) of the control unit. If this works but persists within the O.R., contact technical support.	The iPad is out of range of the control unit wireless network
	• Check Wi-Fi antenna is connected on back of system.	Damaged Wi-Fi antenna
Loss of Wi-Fi during a worklist pull	• Ensure the Integration Broker (REF 1061567) is set-up correctly and the configuration is the expected workflow on the Integration Broker server.	Corrupted Workflow list on the Integration Broker server
Cannot capture images/video to the App	• Ensure connection to the control unit Wi-Fi network.	iPad is not connected to the control unit
	• Check that Wi-Fi antenna is connected on to the back of control unit. – If yes, replace the Wi-Fi antenna. – If no, connect a Wi-Fi antenna.	The Wi-Fi antenna was damaged or missing
Cannot capture images/video to the USB storage device	• Refer to the compatible devices in this manual and attempt to reconnect.	Call tech support
	• Inspect for damage to the USB ports on the system (use the alternate port).	Physical damage to port
Camera color is not correct	• Perform a white balance per instructions in IFU.	White balance was not successfully completed
	• Restore factory defaults from system configuration menu (note this will erase all current settings and restore to factory).	Color phase or hue were incorrectly customized in the procedures
	• Unplug and plug in the camera head and perform white balance. If this works and is repeatable, call tech support	
System AC Mains LED is not lit	• Check AC mains switch on back of unit and ensure that the proper mains cable and outlet are used.	Mains switch should be enabled on (I)
	• Replace the fuse.	Fuse was blown
	If this problem persists contact local facilities, then call technical support.	

Troubleshooting

Problem	Try This	Probable cause
No video displayed on the monitor or 660HD or 660HD-E System	Check cables (correct cable, actual connection, integrity of the cables (cracks, breaks, etc.). **Note:** Ensure the correct functional cables are in use.	Bad cables.
	Bring up the color bar from MAIN MENU and check all video outputs on the monitor. **Note:** Try using another Camera Head and re-try.	Bad camera head.
	Check the video output format in Advanced Settings menu of the control unit and ensure that settings are compatible with monitor or 660HD or 660HD-E Image Management System. Refer to the Advanced Settings section of this Instructions for Use for more information. **Note:** The 660HD or 660HD-E System accepts only 1080i HD-SDI output.)	Mismatched video format setting
Arthroscope is too hot	Ensure that the proper light guide diameter is in use for the current operative procedure.	Incorrect light guide
	Ensure that the light guide to light post connection is secure.	Faulty connection
	Turn down the brightness of the control unit and contact Smith & Nephew Customer Service.	Not known

Service and Maintenance

Service

There are no user-serviceable components inside the control unit. Repairs and adjustments are to be performed only by Smith & Nephew authorized service centers.

If service becomes necessary, call an authorized Smith & Nephew Customer Service Representative prior to returning the device and request a Return Authorization (RA) number. A representative can also explain the available Service Replacement and Repair Programs.

Service items should be carefully disinfected, repackaged and returned post-paid to Smith & Nephew. A Smith & Nephew Customer Service Representative can provide additional instructions.

Note: Returned product that is found to have been serviced by an unauthorized third party repair facility and/or sterilized with a sterilization method other than one approved by Smith & Nephew will incur additional costs, regardless of warranty status.

It is not necessary to include accessory items (i.e., power cords, paper trays, footswitches, remote controls, etc.) when returning a device for service.

Do not remove any digital interface boards that may be installed in the unit.

Maintenance

Recommended Annual Performance Checks

Smith & Nephew recommends that dielectric strength, earth leakage current, and protective earth testing be performed annually to assure continued compliance with applicable safety requirements. These tests should be conducted in accordance with specifications IEC 60601-1:2005 + A1:2012 IEC 60601-2-18:2009, IEC 60601-1-2:2014

CAUTION: Electrical safety testing should be performed by a biomedical engineer or other qualified person.

To Replace Fuses

⚠ Warnings

- **To prevent electric shock, unplug the unit from the electrical outlet before attempting to replace the fuses.**
- **To avoid fire hazard, use only fuses of the correct type, voltage rating, and current rating.**

  Note: Fuses that require frequent replacement may indicate an internal problem with the control unit. If fuses continue to blow, contact Smith & Nephew Customer Service for assistance.

To change the fuse carrier:

1. Unplug the power cord from the power outlet and from the control unit.

2. Use a screwdriver to open the fuse compartment door on the AC receptacle (Figure 44) and slide out the two fuse carriers. Refer to the Rear Panel Layout section to locate the AC receptacle on the rear panel.
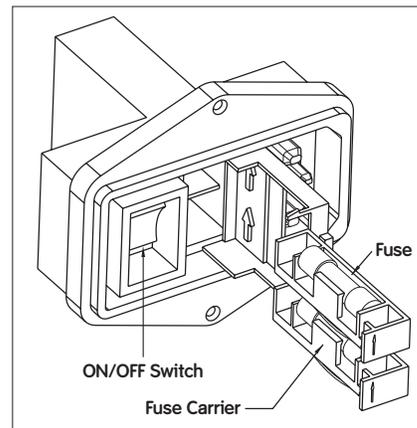

Figure 44. AC receptacle with fuses

3. Replace fuses. Refer to the System Specifications section for replacement fuse types.

4. Reinsert the fuse carriers using the arrows on the inside of the fuse compartment door as a guide.

5. Snap the fuse compartment door closed.

System Specifications

LENS 4K Camera Control Unit Specifications

Specifications subject to change without notice.

Power Requirements	100–240VAC, 50/60 Hz; dual fuse
Equipment Classification	Class 1, type CF equipment.
Unit Dimensions	4.6 in. H x 14 in. W x 15.5 in. L / 11.684 cm. H x 35.56 cm. W x 39.37 cm L.
Unit Weight	13.7 pounds / 6.2kg
Resolution	3840 x 2160p (native) 4K
Shutter	1/60 second through 1/10,000 second shutter speed (60 Hz)
Wi-Fi	2.4Ghz 802.11 b/g/n WPA-2 RF Module
External Storage	8 GB minimum; 32 GB recommended. FAT32 (for drives smaller than 32 GB) or NTFS partitions.

Note: Drives must be formatted to support MBR partition tables. The system does not support GPT formatted drives.

The following devices have been validated for use with the System:

- 8 GB USB flash drives (Transcend, Corsair™, Imation™, Kingston)
- 16 GB USB flash drives (ADATA™, Mushkin, Silcon Power™)
- 32 GB USB flash drives (Corsair, Patriot™, PNY™, Silcon Power)
- 64 GB USB flash drives (Mushkin, & ADATA)
- 1 TB external SSD hard drives (Buffalo & Western Digital)

USB Output	Two (2) Type A connectors; provides USB-compatible connection to flash or hard drives.
USB Type	USB 2.0 or greater
Video Input	NTSC or PAL composite input
Video Outputs	
HD Serial Digital Interface (HD-SDI)	One serial digital interfaces (HD-SDI) with 4:2:2 component digital video output on BNC connector
4K Serial Digital Interface (4K-SDI)	Four serial digital interfaces (HD-SDI) with 4:2:2 component digital video output on BNC connector
DisplayPort (DP)	Single stream transport (SST) version 1.2
Video Accessory Controls	Two mini-phono connectors (3.5 mm)
Compliance	IEC 60601-1:2005 + A1:2012, IEC 60601-2-18:2009, IEC 60601-1-2:2014 and EN 60601-1-2:2015
Fuses	F10AH250V; V and I rating: 250V, 10A
Modes of Operation	Continuous

Environmental Conditions

Condition	Transport and/or Storage	Use
Temperature	-20 +140° F (-29 +60° C)	+50 - 104° F (+10 –40° C)
Humidity	15–85% (no condensation allowed)	30–75%
Atmospheric Pressure	70–106 kPa	70–106 kPa
Altitude	3000 meters maximum	3000 meters maximum

Ordering Information

LENS 4K Camera Control Unit - Wi-Fi

Each Smith & Nephew LENS 4K Camera Control Unit includes a 10-foot HD-SDI cable, two mini-phono plug accessory cables, a DisplayPort cable, a Cat 5e Ethernet cable, an Operations/Service Manual, and a power cord. The International System (REF 72205222) includes a European Continental power cord.

REF	Description
72205059	LENS 4K Camera Control Unit, (Wi-Fi)
72205211	LENS 4K Camera Control Unit, U.S. (Wi-Fi)
72205212	LENS 4K Camera Control Unit, German (Wi-Fi)
72205213	LENS 4K Camera Control Unit, Spanish (Wi-Fi)
72205214	LENS 4K Camera Control Unit, French (Wi-Fi)
72205215	LENS 4K Camera Control Unit, Swedish (Wi-Fi)
72205216	LENS 4K Camera Control Unit, Portuguese (Wi-Fi)
72205217	LENS 4K Camera Control Unit, Danish (Wi-Fi)
72205218	LENS 4K Camera Control Unit, Norwegian (Wi-Fi)
72205219	LENS 4K Camera Control Unit, Dutch (Wi-Fi)
72205220	LENS 4K Camera Control Unit, Korean (Wi-Fi)
72205221	LENS 4K Camera Control Unit, Italian (Wi-Fi)
72205222	LENS 4K Camera Control Unit, International (Wi-Fi)
72205223	LENS 4K Camera Control Unit, Chinese (Wi-Fi)
72205224	LENS 4K Camera Control Unit, UK (Wi-Fi)

Compatible Camera Head

REF	Description
72205058	LENS 4K Camera Head
72205344	LENS 4K Camera Head (OUS)
72205343	LENS 4K Camera Head (US Only)

Accessories

REF	Description
72204699	Tablet Application
72204938	LENS Wi-Fi Antenna
72200315	LENS Coupler, 19.5

LENS 4K Camera Control Unit - Non Wi-Fi

Each Smith & Nephew LENS 4K Camera Control Unit non Wi-Fi includes a 10-foot HD-SDI cable, two mini-phono plug accessory cables, a displayport cable, a Cat 5e Ethernet cable, an Operations/Service Manual, and a power cord. The International System (REF 72205224) includes a European Continental power cord.

REF	Description
72205185	LENS 4K Camera Control Unit, (Non-Wi-Fi)
72205239	LENS 4K Camera Control Unit, U.S. (Non-Wi-Fi)
72205240	LENS 4K Camera Control Unit, German (Non-Wi-Fi)
72205241	LENS 4K Camera Control Unit, Spanish (Non-Wi-Fi))
72205242	LENS 4K Camera Control Unit, French (Non-Wi-Fi)
72205243	LENS 4K Camera Control Unit, Italian (Non-Wi-Fi)
72205244	LENS 4K Camera Control Unit, Swedish (Non-Wi-Fi)
72205245	LENS 4K Camera Control Unit, Portuguese (Non-Wi-Fi)
72205246	LENS 4K Camera Control Unit, Danish (Non-Wi-Fi)
72205247	LENS 4K Camera Control Unit, Norwegian (Non-Wi-Fi)
72205248	LENS 4K Camera Control Unit, Dutch (Non-Wi-Fi)
72205249	LENS 4K Camera Control Unit, Korean (Non-Wi-Fi)
72205250	LENS 4K Camera Control Unit, Chinese (Non-Wi-Fi)
72205224	LENS 4K Camera Control Unit, International (Non-Wi-Fi)
72205252	LENS 4K Camera Control Unit, UK (Non-Wi-Fi)

Guidance and Manufacturer's Declaration

Electromagnetic Emissions		

The Smith & Nephew LENS◦ 4K Camera Control Unit is intended for use in the electromagnetic environment specified below. The customer or the user of the LENS◦ 4K Camera Control Unit should assure that it is used in such an environment.

The Smith & Nephew LENS 4K Camera Control Unit was tested to the following:

IEC/EN 60601-1-2: 2014/2015		
Specification	IEC 60601-1-2 (2014) / EN 60601-1-2 (2015) MEDICAL ELECTRICAL EQUIPMENT - Part 1-2: General requirements for basic safety and essential performance - Collateral Standard: Electromagnetic disturbances - Requirements and tests	
Test Method	IEC CISPR 11 (2010) / EN 55011 (2010), Industrial, scientific and medical equipment - Radio-frequency disturbance characteristics - Limits and methods of measurement Radiated	
Emissions Test	**Compliance**	**Electromagnetic Environment – Guidance**
RF emissions CISPR 11	Group I Environment, Professional Healthcare Facility, and not compatible with a Magnetic Resonance (MR) environment.	The LENS 4K Camera Control Unit is suitable for use in a Professional Healthcare environment where utility mains are privately used by the Healthcare Facility.
RF emissions CISPR 11	Class A	**Note:** The EMISSIONS characteristics of this equipment make it suitable for use in industrial areas and hospitals (CISPR 11 class A). Not to be used in a residential environment (for which CISPR 11 class B is normally required) as this equipment might not offer adequate protection to radio-frequency communication services. ⚠ **WARNING: Use of accessories and cables with this equipment, other than those specified or provided by the Smith & Nephew, could result in increased electromagnetic emissions or decreased electromagnetic immunity and result in improper operation.**
Harmonic emissions EN 61000-3-2	N/A	
Voltage fluctuations/ flicker emissions EN 61000-3-3	N/A	

Guidance and Manufacturer's Declaration – Guidance for Separation Distances

Recommended Separation Distances Between Portable and Mobile RF Communications Equipment and the Smith & Nephew LENS 4K Camera Control Unit

The LENS Integrated System is intended for use in an electromagnetic environment in which radiated RF disturbances are controlled. The customer or user of the LENS 4K Camera Control Unit can help prevent electromagnetic interference by maintaining a minimum distance between portable and mobile RF communications equipment (transmitters) and the LENS Integrated 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 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.

Guidance and Manufacturer's Declaration

Electromagnetic Immunity

The Smith & Nephew LENS 4K Camera Control Unit is intended for use in the electromagnetic environment specified below. The customer or the user of the LENS 4K Camera Control Unit should assure that it is used in such an environment.

Specification	IEC 60601-1-2 (2014) / EN 60601-1-2 (2015) MEDICAL ELECTRICAL EQUIPMENT - Part 1-2: General requirements for basic safety and essential performance - Collateral Standard: Electromagnetic disturbances - Requirements and tests.
Test Method	EN 61000-4-2 (2009) / IEC 61000-4-2 (2008), Electromagnetic compatibility (EMC) – Part 4-2: Testing and measurement techniques – Electrostatic discharge immunity test EN 61000-4-3 (2010) / IEC 61000-4-3 +A1+A2 (2010), Electromagnetic compatibility (EMC) – Part 4-3: Testing and measurement techniques – Radiated, radio-frequency, electromagnetic field immunity test EN 61000-4-4 (2012) / IEC 61000-4-4 (2012), Electromagnetic compatibility (EMC) – Part 4-4: Testing and measurement techniques – Electrical fast transient/burst immunity test EN 61000-4-5 (2006) / IEC 61000-4-5 (2005), Electromagnetic compatibility (EMC) – Part 4-5: Testing and measurement techniques – Surge immunity test EN 61000-4-6 (2014) / IEC 61000-4-6 (2013), Electromagnetic compatibility (EMC) – Part 4-6: Testing and measurement techniques – Immunity to conducted disturbances, induced by radio-frequency fields EN 61000-4-8 (2010) / IEC 61000-4-8 (2009), Electromagnetic compatibility (EMC) – Part 4-8: Testing and measurement techniques – Power frequency magnetic field immunity test EN61000-4-11 (2004) / IEC 61000-4-11 (2004), Electromagnetic compatibility (EMC) – Part 4-11: Testing and measuring techniques – Voltage dips, short interruptions and voltage variations immunity tests

Immunity Test	IEC 60601 Test Level	Compliance Level	Electromagnetic Environment – Guidance
Electrostatic discharge (ESD) IEC 61000-4-2	+/- 8 kV contact +/- 15 kV air	+/- 8 kV contact +/- 15 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 typical commercial or hospital environment.
Surge IEC 61000-4-5	+ 2 kV line to P.E. + 1 kV line to line	+ 2 kV line to P.E. + 1 kV line to line	
Voltage dips, short interruptions and voltage variations on power supply input lines IEC 61000-4-11	0% Unom, ½ cycle 40% Unom, 5 cycles 70% Unom, 25 cycles 0% Unom, 250 cycles	0% Unom, ½ cycle 40% Unom, 5 cycles 70% Unom, 25 cycles 0% Unom, 250 cycles	Mains power quality should be that of a typical commercial or hospital environment. If the user of the LENS 4K Camera Control Unit requires continued operation during power mains interruptions, it is recommended that the LENS 4K Camera Control Unit be powered from an uninterruptible power supply or a battery.
Power frequency (50/60 Hz) magnetic field IEC 61000-4-8	30 A/m	30 A/m	Power frequency magnetic fields should be at levels characteristic of a typical location in a typical commercial or hospital environment.
Conducted RF IEC 61000-4-6	3 ^{V}RMS 150 kHz to 80 MHz	3 ^{V} 3 ^{V}/m	⚠ **WARNING: Portable and mobile RF communication equipment (including peripherals such as antenna cables and external antennas) should be used no closer than 30 cm (12 inches) to any part of the LENS 4K Camera Control Unit, including cables specified by the manufacturer. Otherwise, degradation of the performance of this equipment could result.**
Radiated RF IEC 61000-4-3	3 ^{V}/m 80 MHz to 2.7 GHz		

			Field strengths from RF transmitters, such as base stations for radio, (cellular/cordless) telephones, land mobile radios, amateur radios, AM and FM radio broadcasts, and TV broadcasts cannot be predicted. The Professional Healthcare Facility must assess the electromagnetic environment due to RF transmitters, an electromagnetic site survey should be considered to ensure compatibility with the immunity levels contain in IEC/EN 60601-1-2.
			The LENS 4K Camera Control Unit normal operation is for general surgical purposes throughout the duration of orthopedic and arthroscopy applications.
			⚠ **Abnormal performance, due to Electromagnetic Disturbances, may be manifested by a failure to properly maintain illumination and visualization of the surgical field. If abnormal performance is observed, it may be corrected by one or more of the following measures:**
			— Reorient or relocate this equipment, the other equipment, or both.
			— Increase the separation between the pieces of equipment.
			— Connect the pieces of equipment into different outlets or circuits.
			— Consult a biomedical engineer.
			⚠ **WARNING: Use of accessories and cables with this equipment, other than those specified or provided by the Smith & Nephew, could result in increased electromagnetic emissions or decreased electromagnetic immunity and result in improper operation.**

Note: Unom = Nominal AC input voltage (90, 240VAC/50Hz)

Special Environment

The LENS 4K Camera Control Unit is intended for use in a Special Environment using HF surgical equipment.

⚠ **WARNING - High Frequency (HF) Interference: This equipment was designed and tested to be used with HF Electrical Surgical Unit (ESU) equipment. If interference occurs with other equipment it may be corrected by one or more of the following measures:**

– **Reorient or relocate this equipment, the other equipment, or both.**

– **Increase the separation between the pieces of equipment.**

– **Connect the pieces of equipment into different outlets or circuits.**

– **Consult a biomedical engineer.**

Warranty

Smith & Nephew products are warrantied to be free from defects in material and workmanship for the warranty period for a particular product, beginning from date of invoice. Refer to the current Smith & Nephew Product Catalog or contact Smith & Nephew Customer Service for specific warranty information.

This limit ed warranty is restricted to repair or replacement by Smith & Nephew, at its option, of any product found to be defective during the warranty period. Damage inflicted to a product by the user will result in additional charges and may void the warranty. This includes but is not limited to normal use related damage, any attempted repairs by unauthorized service providers, use of a sterilization method not approved by Smith & Nephew, and use of the product in a way that is not intended by Smith & Nephew. All warranties apply to the original buyer only. In no event shall Smith & Nephew be liable for any anticipated profits, consequential damages or loss of time incurred by the buyer with the purchase or use of any product.

NO OTHER WARRANTY, EXPRESSED OR IMPLIED, IS GIVEN.

Service Replacement Units Warranty

Smith & Nephew service replacement units are warranted to be free from defects in material workmanship for the warranty period for a particular product, beginning from date of invoice. Refer to the current Smith & Nephew Product Catalog or contact Smith & Nephew Customer Service for specific warranty information.

Service Replacement Program

Smith & Nephew offers a 24-hour Service Replacement Program for its products to minimize downtime in the operating room. Our goal is to ship a service replacement unit within 24 hours** of a call (during normal business hours). For a Return Authorization (RA) number or for additional information on this program, call Customer Service at +1 800 343 5717 in the U.S., or contact an authorized representative.

** 24-hour shipment is not offered in all countries.

Repair Service Program

For devices no longer under warranty, repairs can be made by Smith & Nephew or by an authorized agent. Non-warranty repairs will be made at the list price of replacement parts, plus labor. If requested, we will provide an estimate of repair cost and time required for the repair before any work is done. Repair items should be carefully disinfected, repackaged, marked with the Return Authorization (RA) number, and returned postpaid to the appropriate Smith & Nephew Service Center. Smith & Nephew Customer Service or a local authorized representative can provide shipping information.

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