



## Image 1®

Image and Video Capture, SCB Ready, NTSC & PAL  
Camera Control Unit Model 22201020-1XX (High Definition)  
Camera Control Unit Model 22200020-1XX

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## Important user information

Thank you for your expression of confidence in the KARL STORZ brand name. Like all of our other products, this Camera System is the result of years of experience and great care in manufacture. You and your organization have decided in favor of a state-of-the-art, high-quality piece of equipment from KARL STORZ.

This instruction manual is intended to serve as an aid in the proper setup, installation, and operation of the Image 1 CCU. All essential details of the equipment and all actions required on your part are clearly presented and explained. We ask that you read this manual carefully before proceeding to work with the equipment. Keep this manual available for ready reference in a convenient and conspicuous location near the equipment.

### Indication for use

The Karl Storz Image 1 is a color video camera system which can be used as an endoscopic accessory with rigid or flexible endoscopes. The camera head is coupled to the endoscope. Any compatible Image 1 camera head may be used with the Image 1 Karl Storz Camera Control Unit (CCU). The endoscopic image can be displayed on any standard operating room video monitor and all standard endoscopic light sources may be used with Image 1 camera heads.

### General description

The Image 1 CCU is a revolutionary endoscopic camera control unit for use with, single, three chip and HD Image 1 camera heads. It provides many state-of-the-art features, including:

- Camera features and functions can be programmed for access via the camera head buttons
- Reprogrammable circuitry to allow the CCU to reprogram its settings (based on the camera head in use) for an optimal image
- All-digital circuitry for increased image accuracy, less noise in the image, and no image degradation from camera head to output device
- Digital image enhancement and fiberoptic endoscope filtering capabilities to increase the level of contrast and definition of the image
- Options for exposure control, including patented automatic exposure system.
- High Definition still image capture and Standard Definition still image and video capture.

A keyboard may be included with the Image 1 CCU to access camera functions and set displays such as time/date and patient information.

The Image 1 CCU incorporates the Karl Storz Communication Bus (SCB) system for integration into a complete operating room system. The SCB system allows communication between the Karl Storz devices connected to the system. From this communication, parameters of the SCB devices can be displayed centrally. For further information on the use and function of the SCB system, please refer to the "Karl Storz Communication Bus" (SCB) - System Instruction manual (IM-SCB-XX).

### Warnings and cautions

Please read this manual and follow its instructions carefully. The words **WARNING**, **CAUTION**, and **NOTE** convey special meanings. When they are used throughout this manual, they should be carefully reviewed to ensure the safe and effective operation of this product.

**WARNING** A WARNING indicates that the personal safety of the patient or physician may be involved. Disregarding a WARNING could result in injury to the patient or physician.

**CAUTION** A CAUTION indicates that particular service procedures or precautions must be followed to avoid possible damage to the product.

**NOTE** A NOTE indicates special information to improve the ease of maintaining the product, or to clarify important information.



The symbol of an exclamation mark within a triangle is intended to alert the user to the presence of important operating and maintenance instructions in the product's accompanying documents.

## Important user information

**WARNING** Read this instruction manual thoroughly and be familiar with its contents prior to connecting or using this equipment.

**WARNING** Test this equipment prior to each surgical use. In the event that the image becomes unusable during surgery, the camera may be disengaged from the endoscope and the procedure continued optically. If this is not possible, it is up to the discretion of the surgeon how best to proceed. Availability of a spare system is recommended.

**WARNING** Grounding reliability can only be achieved when the equipment is connected to "Hospital Only" or "Hospital Grade" receptacle (i.e., approved for use in an operating room environment). Routinely inspect electrical plug and cord. Do not use if inspection reveals damage.

**WARNING** To avoid burns during endoscopic procedures, operators must use caution when employing non-BF/CF type equipment while using electrosurgical devices.

**WARNING** High energy radiated light through endoscopes may give rise to high temperatures in front of the light outlet and to the tip of the endoscope. To minimize the risk of burns, always adjust the light source to the minimum illumination intensity necessary to achieve optimum illumination of the endoscopic scene when coupled to the video camera.

**WARNING** Keep out of reach of patients.

**WARNING** The electrical installation of the relevant operating room must comply with the applicable IEC, CEC and NEC requirements. Use only in hospital grade receptacles.

**WARNING** To reduce the risk of electrical shock, do not remove cover of unit. Refer servicing to qualified personnel. Removal of cover by unauthorized personnel will void the unit's warranty.

**WARNING** Perceived shocks may be experienced when using the camera system in conjunction with electrosurgical units.

**WARNING** Electrostatic discharge (ESD) events may be perceived as shocks when initially touching the camera system.

**WARNING** Refer to the appropriate section of this manual for validated cleaning, disinfection, and sterilization instructions.

**CAUTION** Do not store liquids above unit.

**CAUTION** Federal law restricts this device to sale to or on the order of a physician.

**NOTE** Disposal of these system products, at the end of their useful life, must be in accordance with local regulations. CCU component contains lithium battery.

**NOTE** Do not discard as unsorted municipal waste.

**NOTE** Discard as electrical/electronic waste; recycle or reuse accordingly.

**NOTE** Consult local authorities for reuse/recycle instructions.

**WARNING** Accessory equipment connected to the analog and digital interfaces must be certified according to the respective IEC standards (e.g. IEC 60950 for data processing equipment and IEC 60601-1 for medical equipment). Furthermore, all configurations shall comply with the system standard IEC 60601-1. Any person who connects additional equipment to the signal input part or signal output part configures a medical system, and is therefore responsible for ensuring that the system complies with the requirements of the system standard IEC 60601-1. If in doubt, consult the technical service department or your local representative.

**WARNING** To ensure safe operation, do not simultaneously touch the device output connectors and the patient.

**WARNING** Before each use, the outer surface of the portions of the endoscope and any endoscopically-used accessories which are intended to be inserted into the patient should be checked to ensure there are no unintended rough surfaces, sharp edges or protrusions which may cause a safety hazard.

**WARNING** When endoscopes are used with energized endoscopically-used accessories, the patient leakage currents may be additive. This is particularly important if a Type CF endoscope is used, in which case a Type CF endoscopically-used accessory should be used in order to minimize the total patient leakage current.

**WARNING** Gas which may support combustion is sometimes present in the gastrointestinal tract of an unprepared patient and certain patient preparation substances used prior to GI endoscopy can enhance methane production. This is particularly relevant to colonoscopy, but has also been recorded in the upper GI tract and during transurethral resection of the prostate. It has been recorded that hydrogen can accumulate in the bladder above the irrigant solution. Dissipate any flammable gasses in the colon, bladder, or other body cavities prior to use of high frequency surgical equipment.

**WARNING** When using the camera system in a surgical discipline employing a laser, caution should be taken to prevent eye damage to the operator. The operator should wear protective glasses whenever viewing the surgical site directly through the endoscope.

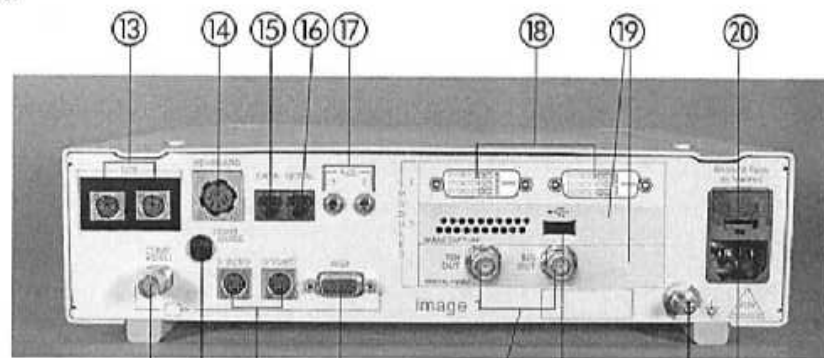
**WARNING** During a defibrillation discharge, the display image may be interrupted by  $\leq 1$  second.

CCU diagrams

- ① Power switch
- ② USB storage device output.
- ③ Camera head cable receptacle - High Definition Head (HD CCU only)
- ④ Camera head cable receptacle - Standard Definition Head
- ⑤ Composite video output connector
- ⑥ Light guide receptacle (for future use)
- ⑦ S-video output connectors
- ⑧ RGB output connector
- ⑨ SDI outputs
- ⑩ USB Printer output
- ⑪ Potential equalization connector, per DIN 42801
- ⑫ Power supply cord receptacle
- ⑬ SCB I/O connections
- ⑭ Keyboard receptacle
- ⑮ Data port
- ⑯ RS-232 serial port
- ⑰ Accessory control outputs for remote control of peripheral units
- ⑱ HD - DVI output connectors (HD CCU only)
- ⑳ Module expansion slots
- ㉑ Power fuses



- ①
- ②
- ③
- ④



- ⑤
- ⑥
- ⑦
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- ⑨
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- ⑪
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- ⑭
- ⑮
- ⑯
- ⑰
- ⑱
- ⑳

**Camera head diagram**

- ① Instrument coupler
- ② Focus ring
- ③ Zoom ring
- ④ User control button: Menu scrolling (Up) or activation of one camera function (left button on H3-Z & F3)
- ⑤ User control button: Menu access/Select (bottom button on H3-Z and center button on F3)
- ⑥ User control button: Menu scrolling (Down) or activation of one camera function (right button on H3-Z & F3)

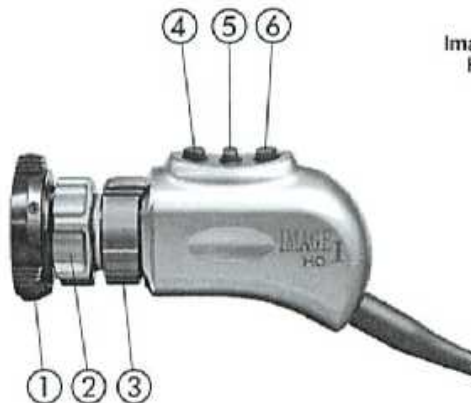


**Image 1 Pendulum Head, 16.8mm**  
 P1® 1-CCD, NTSC, CE 22210132-X\*  
 P1® 1-CCD, PAL, CE 22210032-X\*  
 P3® 3-CCD, NTSC, CE 22220132-X\*  
 P3® 3-CCD, PAL, CE 22220032-X\*

**Image 1 Pendulum Head, 14mm**  
 P1® 1-CCD, NTSC, CE 22210131-X\*  
 P1® 1-CCD, PAL, CE 22210031-X\*  
 P3® 3-CCD, NTSC, CE 22220131-X\*  
 P3® 3-CCD, PAL, CE 22220031-X\*



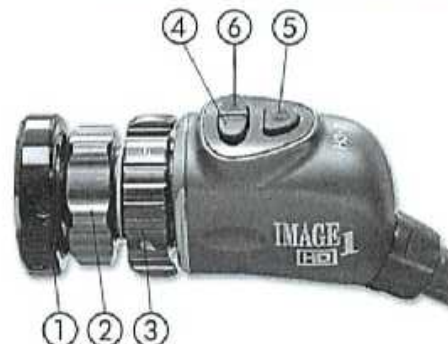
**Image 1 Fixed Focal Length Head**  
 F3 3-CCD, NTSC, CE 22220133-X\*  
 F3 3-CCD, PAL, CE 22220033-X\*



**Image 1 High Definition Zoom Head**  
 H3 3-CCD, 60Hz, CE 22220150-X\*  
 H3 3-CCD, 50Hz, CE 22220050-X\*



**Image 1 DCI Head**  
 1-CCD, NTSC, CE 22260131-X\*  
 1-CCD, PAL, CE 22260031-X\*



**Image 1 High Definition Zoom Head**  
 H3-Z, 3-CCD, 60Hz & 50Hz, CE 22220055-X\*



**Image 1 High Definition Microscope Head**  
 H3-M, 3-CCD, 60Hz, CE 22220154-X\*  
 H3-M, 3-CCD, 500Hz, CE 22220054-X\*































**Image 1 Zoom Head**  
 S1® 1-CCD, NTSC, CE 22210130-X\*  
 S1® 1-CCD, PAL, CE 22210030-X\*  
 S3® 3-CCD, NTSC, CE 22220130-X\*  
 S3® 3-CCD, PAL, CE 22220030-X\*

**Image 1 Zoom Head, Autoclavable**  
 A1® 1-CCD, NTSC, CE 22210140-X\*  
 A1® 1-CCD, PAL, CE 22210040-X\*  
 A3® 3-CCD, NTSC, CE 22220140-X\*  
 A3® 3-CCD, PAL, CE 22220040-X\*

\* The '-X' represents a software version and does not appear on the camera head. However, it will appear on-screen when the camera head is plugged in.

## Product identification

### Symbols employed

	Read the instructions carefully before operating the equipment		Still image and video capture
	Read the instructions carefully before operating the equipment		USB output
	Power off		Output
	Power on		Input
	Equipotentiality		Color video monitor
	Type CF equipment, defibrillation proof		Fragile, handle with care
	<b>DANGER:</b> Risk of explosion if used in the presence of flammable anesthetics.		Keep dry
	<b>CAUTION:</b> To reduce the risk of electrical shock, do not remove cover. Refer servicing to qualified service personnel.		Storage temperature and humidity
	Protective earth (ground)		Wizard - Signifies that this feature/option is available in the Setup Wizard.
	Alternating current		Signifies that this feature/option is available in the Options Menu.
	Replace fuse with T 1.6A, 250V, 5 x 20mm fuse, IEC 127		Signifies that this feature/option can be controlled by the User Menu.
	Color video camera		Signifies that this feature/option can be controlled by the camera head buttons.
	Video input	<i>Italics</i>	Signifies camera default.
	Video output		Device is subject to the requirements of the WEEE Directive, 2002/96/EC
	White balance		

## Safety Instructions

Please read these safety instructions carefully. Before using the camera system on a patient, it is imperative that you are familiar with the equipment operation and control.

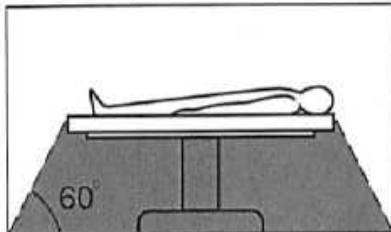
### Normal use

The Image 1 is a video camera system which is attached to either a rigid or flexible endoscope and is intended and designed for use during general endoscopic procedures. Use of the camera in other applications is not allowed for safety reasons.

The Image 1 CCU may only be used with accessories, wearing parts, and disposable items which are designated by KARL STORZ as suitable for the camera or the safe use of which is proven. For safety reasons, do not perform unauthorized conversions or modifications to the camera.

### User qualification

**WARNING:** The Image 1 CCU may only be used by physicians and medical assistants who have a corresponding specialized qualification and are instructed in the use of this equipment.



### Safety precautions at the site of installation

The unit may only be used in medical rooms installed according to applicable national standards.

It is not intended for use in hazardous zones. This means, for example, that when using easily combustible and explosive inhalation anesthetics or mixtures thereof, the camera system must not be operated inside the demarcated hazard zone. Examples of such substances are: anesthetic ether (diethyl ether, cyclopropane) as well as combustible, volatile skin cleansers and skin disinfectants which may create an explosive atmosphere (e.g. detergent ether, petroleum ether).

The CCU is equipped with a connector for attaching a ground line. It should be connected according to applicable national standards.

### Safety precautions when operating the equipment (electromagnetic compatibility)

It is the user's responsibility to make sure the equipment is safe and operates properly before use.

CE marked equipment has been tested and found to comply with the EMC limits for the Medical Device Directive 93/42/EEC (EN 55011 Class A and EN 60601-1-2). These limits are designed to provide reasonable protection against harmful interference in a typical medical installation. The 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 other devices in the vicinity. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference with other devices, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving device
- Increase the separation between the equipment
- Connect the equipment into an outlet on a circuit different from that to which the other device(s) is connected
- Consult the manufacturer or field service technician for help.



**NOTE:** A Karl Storz camera system that is compliant with the Medical Device Directive consists of a camera processor box and a camera head, both of which bear the CE marking. If either the head or the processor box are not CE marked, then this combination of components does not meet the requirements of the directive.



### Unpacking the Image 1 system

Carefully unpack the Image 1 CCU and its accessories. Check for missing items; call the manufacturer or supplier immediately with any problems. If there is evidence of shipping damage, please refer to "shipping damage" section of this manual. Retain the original packing materials for future transporting of the CCU.

### Product contents

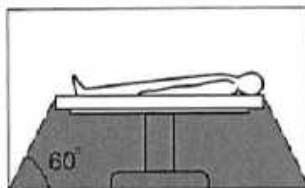
Product description	Catalog #
Image 1 HD CCU, NTSC + PAL	22201020-1XX
<i>Cables:</i>	
S-Video Cable	547S
Composite Cable	536MK
Accessory Cables (2)	20221070
SCB Cable	20090170
HD-DVI Cables (1) [HD CCU only]	20040089
Power Cord	400B (110V~) U.S. 400A (240V~) Intl.
Keyboard	20200130
Instruction Manual, CCU	IM-60-205-02XX
Instruction Manual, Karl Storz Communication Bus (SCB)	IM-SCB-XX

### Compatible heads

Product description	Catalog #
<b>Image 1 High Definition Zoom Heads</b>	
H3-Z 3-CCD, 50Hz & 60Hz, CE	22220055-X*
H3 3-CCD, 60Hz, CE	22220150-X*
H3 3-CCD, 50Hz, CE	22220050-X*
<b>Image 1 Zoom Heads</b>	
S1® 1-CCD, NTSC, CE	22210130-X*
S1® 1-CCD, PAL, CE	22210030-X*
S3® 3-CCD, NTSC, CE	22220130-X*
S3® 3-CCD, PAL, CE	22220030-X*
<b>Image 1 Zoom Heads, Autoclavable</b>	
A1® 1-CCD, NTSC, CE	22210140-X*
A1® 1-CCD, PAL, CE	22210040-X*
A3® 3-CCD, NTSC, CE	22220140-X*
A3® 3-CCD, PAL, CE	22220040-X*
<b>Image 1 High Definition Microscope Head</b>	
H3-M, 3-CCD, 60Hz, CE	22220154-X*
H3-M, 3-CCD, 50Hz, CE	22220054-X*

Product description	Catalog #
<b>Image 1 Pendulum Heads, 16.8mm</b>	
P1® 1-CCD, NTSC, CE	22210132-X*
P1® 1-CCD, PAL, CE	22210032-X*
P3® 3-CCD, NTSC, CE	22220132-X*
P3® 3-CCD, PAL, CE	22220032-X*
<b>Image 1 Pendulum Heads, 14mm</b>	
P1® 1-CCD, NTSC, CE	22210131-X*
P1® 1-CCD, PAL, CE	22210031-X*
P3® 3-CCD, NTSC, CE	22220131-X*
P3® 3-CCD, PAL, CE	22220031-X*
<b>Image 1 DCI Camera Head</b>	
1-CCD, NTSC, CE	22260131-X*
1-CCD, PAL, CE	22260031-X*
<b>Image 1 Fixed Focal Length Camera Head, 16.8mm</b>	
F3 3-CCD, NTSC, CE	22220133-X*
F3 3-CCD, PAL, CE	22220033-X*

\* The '-X' represents a software version and does not appear on the camera head. However, it will appear on-screen when the camera head is plugged in.



### Installing the Image 1 CCU

**WARNING:** The Image 1 CCU may be used only in medical facilities having electrical installations conforming to applicable national, state, and local electrical codes.

**This CCU is not intended for use in hazardous zones. Do not operate the CCU within demarcated hazard zones while explosive anesthetic gases are in use.**

The CCU is equipped with a connector for attaching an equipotential wire (redundant grounding wire) line. The CCU's equipotential line should be installed by a qualified electrician.

#### 1. Connecting power

Set the CCU on a flat surface. Make sure there is sufficient distance on all sides to other equipment (especially radio frequency surgical equipment) and objects. Before plugging in the CCU, ensure that the voltage on the nameplate corresponds to the voltage of the local power line.

Connect power cord. Insert power cord into power cord receptacle as far as it will go. (This should only be done outside potentially explosive locations.)

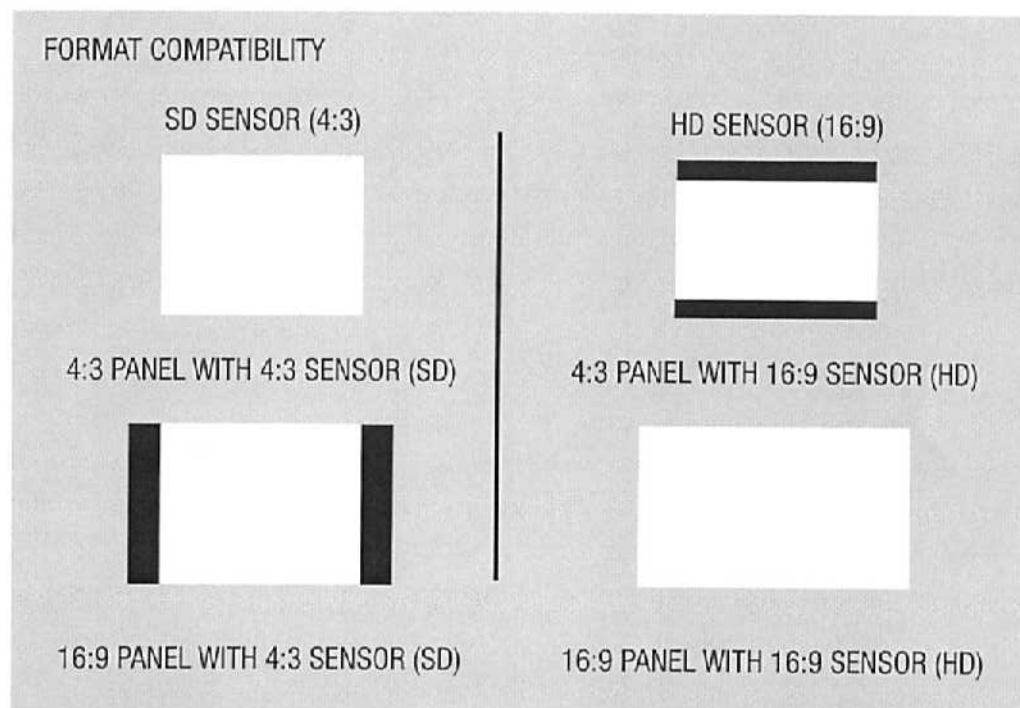


**WARNING:** Always use a hospital grade power cord with this camera.

## 2. Connecting the Image 1 CCU

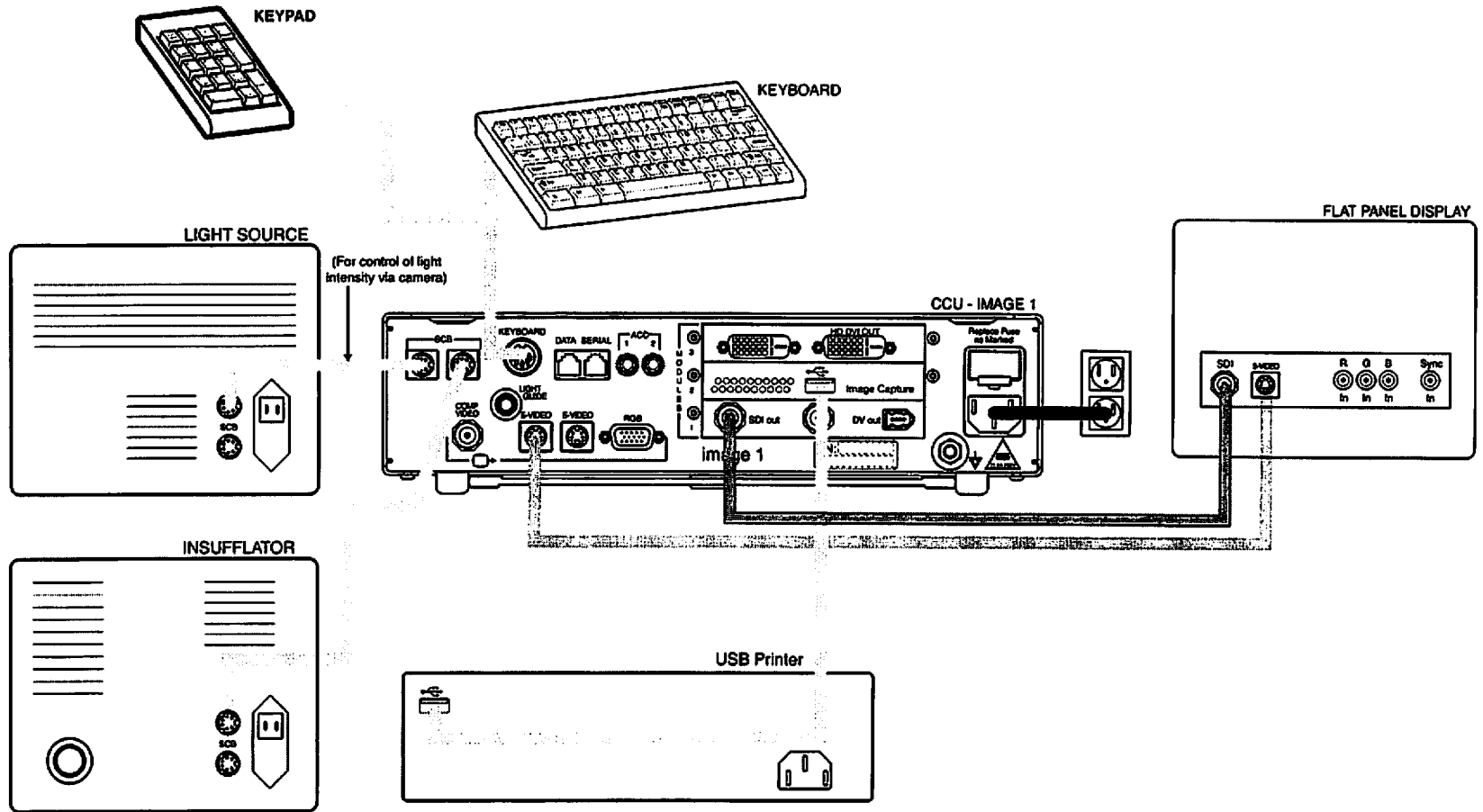
The Image 1 offers several standard definition video outputs: RGB, S-Video, Composite; SDI and DV are offered as module options. The Image-1 HD Module Upgrade includes two High Definition DVI-D monitor outputs. These will display the HD image when an HD head is plugged in and will display an SD image when a SD head is plugged in.

The Various combinations of inputs and output result in various image configurations on the monitor screen, as shown in the chart below.



## Installation

### 3. Connecting the Image 1 CCU to a USB printer, flat panel display, light source and insufflator (Standard Definition)



**NOTE:** The Image Capture System is compatible with USB printers only.

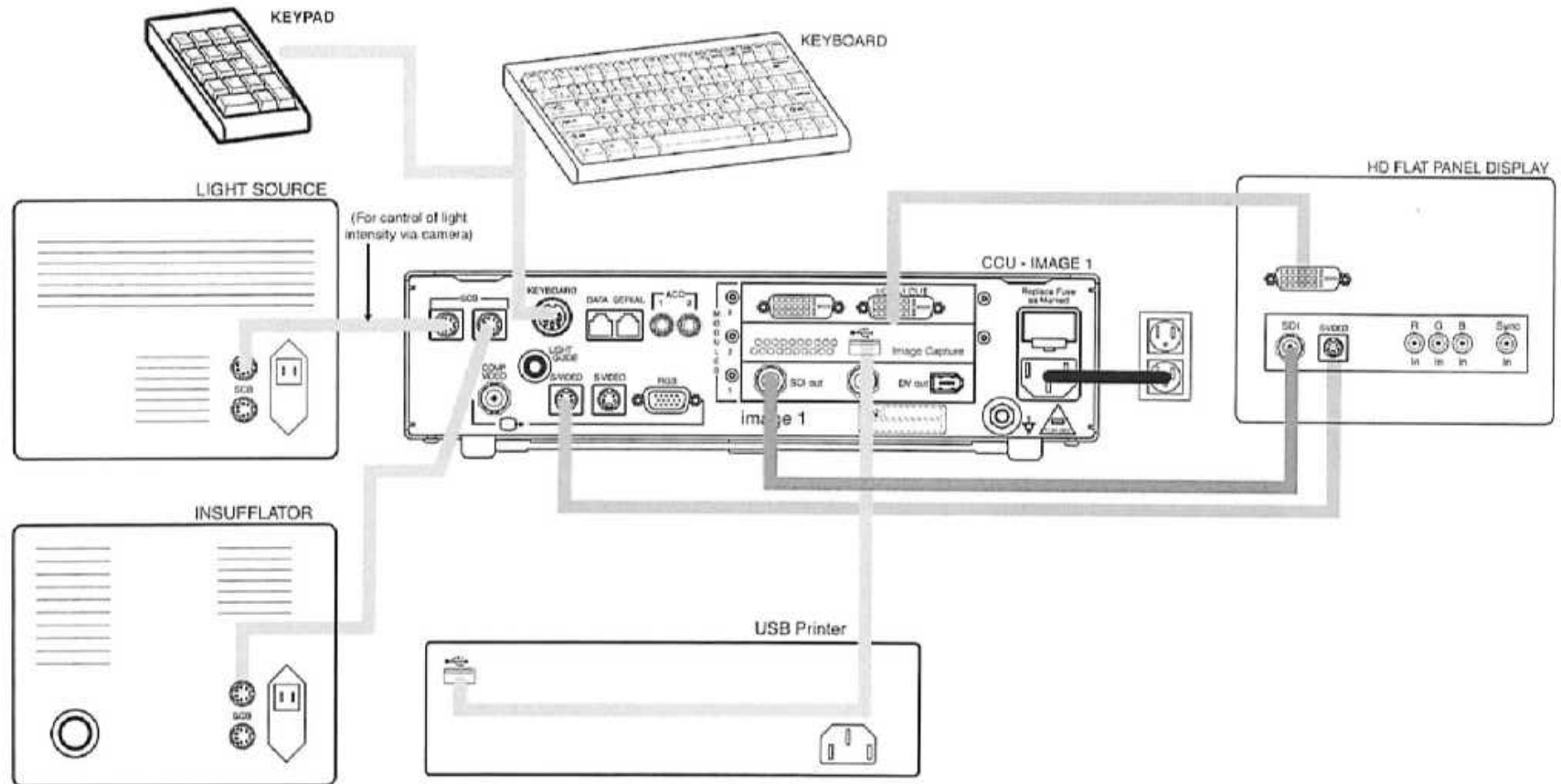
**NOTE:** Optional keypad may be used with the H3-M HD, Microscope Head only.

**NOTE:** A Karl Storz insufflator may also be connected to the light source via SCB cable.

**NOTE:** An optional Karl Storz single pedal footswitch may be connected to the Acc1 port and configured to activate still or video capture.

## Installation

### 4. Connecting the Image 1 CCU to a USB printer, HD flat panel display, light source and insufflator (High Definition)



**NOTE:** The Image Capture System is compatible with USB printers only.

**NOTE:** Optional keypad may be used with the H3-M HD, Microscope Head only.

**NOTE:** A Karl Storz insufflator may also be connected to the light source via SCB cable.

**NOTE:** An optional Karl Storz single pedal footswitch may be connected to the Acc1 port and configured to activate still or video capture.



5

### 5. Powering up CCU

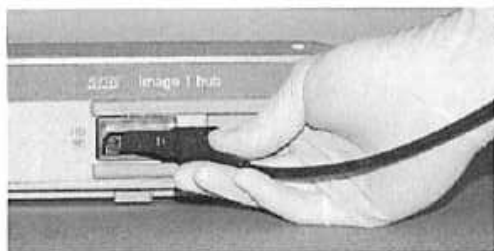


**WARNING:** Test the video camera system before each procedure. Ensure that the proper video image appears on all video monitors before beginning each procedure.

Switch on the camera control unit and the video monitor. A color test pattern will appear on-screen.

### 6. Monitor color test-pattern

1. Color bars appear when the CCU is turned on without a camera head connected. (Color bars can also be activated through head buttons or User Menu if programmed to these controls. For instructions on programming, please see "Setup Wizard" or "Options Menu" sections of this manual.)



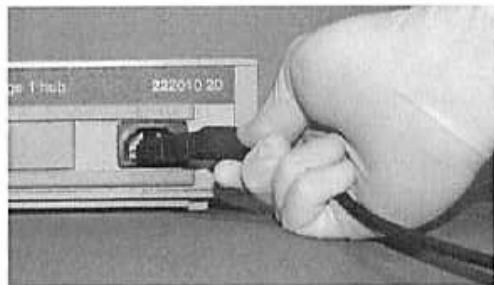
7 a

### 7. Connecting camera head

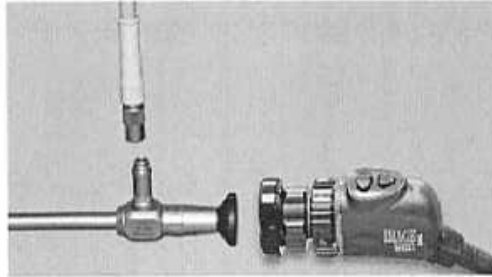
The Image 1 HD CCU is equipped with two camera head input receptacles, one for HD camera heads [see Figure 7a] and one for standard definition (SD) camera head [see Figure 7b]. The camera can only accept one head at a time. To use an HD head, slide the door on the front panel to the right, revealing the HD input receptacle. To use an SD head, slide the door on the front panel to the left, revealing the SD input receptacle.

**NOTE:** Always ensure the camera head connector is completely clean and dry prior to insertion into the CCU.

Plug the camera head connector into the camera head cable receptacle on the CCU's front panel. The head connector should be inserted firmly until an audible click is heard. If the camera head is not plugged into the CCU correctly and completely, the color test pattern will remain on the monitor.



7 b



8

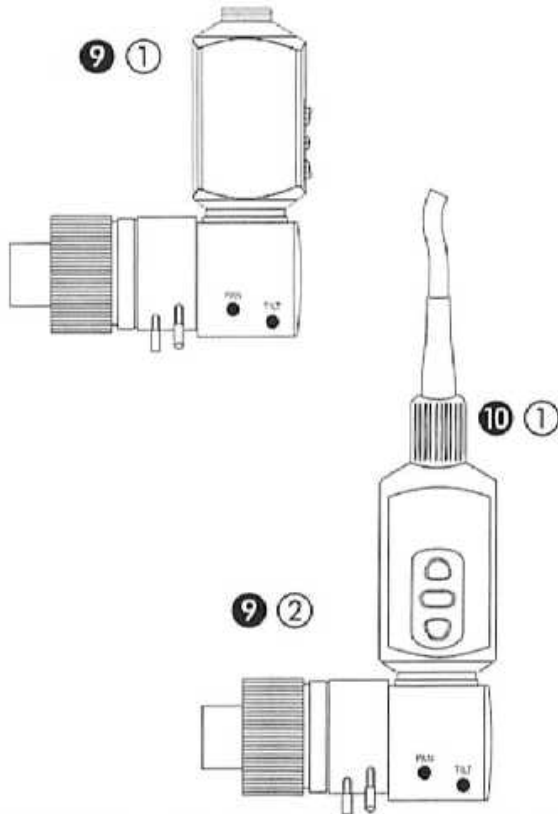
### 8. Connecting an endoscope and light guide cable

The Image 1 single- and three-chip camera heads have an integrated instrument coupler and optics. To connect an endoscope to a camera head, rotate the instrument coupler and insert the endoscope's ocular into the coupler.

Connect the light cable to the endoscope's ocular by twisting the thumbscrew on the light cable through one-quarter turn.

**NOTE:** The entrance and exit faces of the camera head assembly, light cable and endoscope must be kept clean if optimal light transmission is to be maintained. Clean these faces with a cotton swab dipped in a neutral soap solution and then wipe them with a cotton swab soaked in alcohol.

**CAUTION:** Heat from the light source can cause residue from the disinfectant on the light cable and on the light entrance of the endoscope to burn. This can have a detrimental effect on the light conduction and hence the image accuracy.



### 9. Connecting H3-M HD Microscope camera head to microscope

1. The C-mount camera head requires a microscope adaptor. To attach a c-mount adaptor, gently screw the adaptor clockwise onto the camera head.
2. Attach the camera head cable to the camera head after the camera is installed to the adaptor.

### 10. Connecting and disconnecting the H3-M HD Microscope camera removable head cable

The H3-M HD Microscope camera head comes standard with a removable 10 meter cable. Replacement 10 meter cables (catalog #22220071) and optional 3 meter cables (catalog #22220070) may be purchased separately. Please contact your Karl Storz Sales Representative for more information.

1. To disconnect the head cable from the camera head, gently unscrew the cable connector counter clockwise. To connect the head cable to the camera head, carefully align the cable key to the camera head receptacle and gently screw the cable connector clockwise onto the camera head.

## Operating instructions

### Head button basics

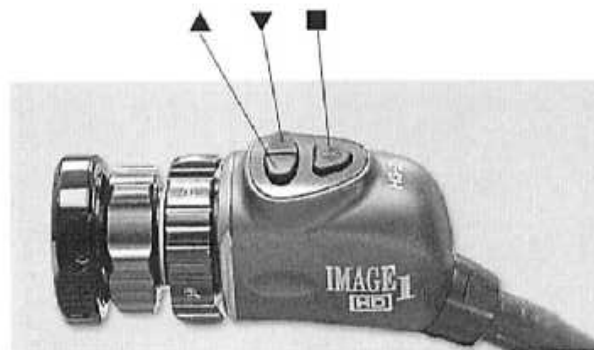
The Image 1 camera head has the following three buttons for feature/function access, menu control, and programming:

- ▲ - **scroll up**: Scrolls up the menus, options, etc. Also activates one camera function.
- ▼ - **scroll down**: Scrolls down the menus, options, etc. Also activates one camera function.
- - **menu / select**: Displays the *User Menu*. Once the *User Menu* is displayed, this button selects the highlighted option (identical to **ENTER** on a computer keyboard). In addition, hold this button down for seven seconds to access the *Options Menu*.

For simplicity, this manual provides keyboard instructions for programming (i.e., "Press **ENTER** to select"). However, camera head buttons can also be used (i.e., "Press **■** to select").

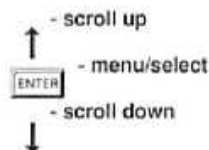
The ▲ button and the ▼ button can also be programmed to operate one function each (i.e. white balance & enhancement). For programming instructions, see "Customizing the camera - Options Menu" section of this manual.

**NOTE:** The head buttons are opposite for the H3-M HD Microscope Head since it is inverted when attached to a microscope.



### Keyboard basics

A keyboard is available to access, program, and control camera features and functions. The keys which operate the menu function identically to the camera head buttons:

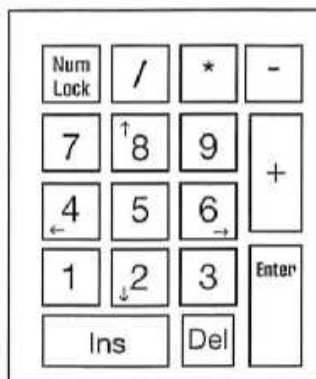
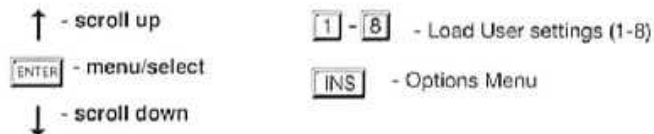


The keyboard is also used to input patient information. When inputting patient information, all text keys are functional and specific control keys are available. For more information, see "Operating Instructions - Patient Information input or editing" section of this manual.



### Keypad basics (H3-M HD Microscope Head only)

An optional keypad may be used to access, program, and control camera features and functions. The keys which operate the menu function identically to the camera head buttons:



**User Menu**

Exit  
White Balance  
Enhancement (value) ▶  
Brightness (value) ▶  
Capture Still  
Capture Video  
Light Source Control  
Insufflator Control  
Program Head Buttons ▶

**Menu basics**

Software menus are provided to program and control the camera features/functions.

The *User Menu* is accessed by pressing the bottom button on the camera head (■) or **ENTER** on the keyboard.

The *Options Menu* is accessed by holding down the **SHIFT** key and pressing **ENTER** on the keyboard, or holding down the camera head's center button for seven seconds.

The *Setup Wizards* are accessed through the *Options Menu*.

The symbols used in the menus include:

- ▶ Indicates that options are available with that particular menu item. To access the options, highlight the menu item then press **ENTER** on the keyboard or the center button on the camera head.
- ... Indicates that there are sub-menus within that menu item. To display the sub-menu(s), highlight the menu item then press **ENTER** on the keyboard or the center button on the camera head.
- ▼ Indicates that more menu items are available below those displayed.
- ▲ Indicates that more menu items are available above those displayed.
- ( ) Indicates a selected value within the parenthesis.

For complete instructions on menu operation, see "Operating instructions - User Menu" and "Customizing the Camera" sections of this manual.



## Operating Instructions

### Key to Symbols



Signifies that this feature/option is programmed in the Setup Wizard (CCU).



Signifies that this feature/option is programmed in the Setup Wizard (Camera Head).



Signifies that this function is available in the Options Menu, and can be programmed into the User Menu or camera head buttons

*Italics*

Signifies camera default

### Camera functions description

The Image 1 video system has the following functions:

**Capture Still:** Captures a still image and for use with a Karl Storz AIDA image and video capture system. ⤴

**Capture Video:** Captures a video and for use with a Karl Storz AIDA image and video capture system. ⤴

**Automatic Exposure Control:** Patented system automatically sets exposure depending on the available light.

**Brightness:** Selects the brightness of the image, including *Low*, *Medium*, *High*, *Peak*, *Small Scope A* and *Small Scope B* settings. *Peak*, *Small Scope A* and *Small Scope B* may be used to reduce glare of small, bright objects in an otherwise dark endoscopic view. ⤴ ⤴

**Button Hints:** Turns Button Hints display *On* or *Off*. If *On*, displays settings for the camera head buttons. ⤴ ⤴

**Button Settings:** Determines the programming for both the ▲ and ▼ camera head buttons simultaneously depending on a specific procedure and/or camera head (i.e. dual white balance for stroboscopy). ⤴ (NOTE: Additional options for button programming are available under "Program Head Buttons" feature ⤴).

**Color bars:** Turns the SMPTE color bar test pattern *On* or *Off*. ⤴

**Date and Time Setup:** Allows entry of date and time and selects display. ⤴

**Display Type:** Allows selection of either Universal or HD 1920X1080 DVI-D monitor types to optimize the image. ⤴

**Dual White Balance:** Performs white balance for two light sources when used intraoperatively for stroboscopy procedures. ⤴

**Enhancement:** Electronically controls the level of contrast and definition of the image, including *Off*, *Low* and *High* settings. Special filters may also be available with certain camera heads to maximize fiberoptic endoscope images. ⤴ ⤴

**Light Mode:** Toggles between *Light Source 1* and *Light Source 2* for stroboscopy procedures. ⤴

**Insufflator:** Allows control of Karl Storz electronic insufflators ⤴

**Image Capture:** Allows still image and video capture to a connected USB storage device and/or USB printer ⤴

**Light Source:** Allows selection of light source intensity of 25%, 50%, 75%, 100%, or Standby (0%). ⤴

#### Patient Information

**Patient Information Display:** Turns patient information display *Off* or *On*. *On* enables the user to view, edit, and enter patient information using the options listed below. ⤴

**Patient Information Page Select:** Selects page for display (1 - 10). ⤴

**Clear Patient Information:** Deletes text from all patient information pages. ⤴

**Edit Patient Information:** Allows entering or editing of patient information. ⤴

**Program Head Buttons:** Allows select features/options to be activated by the camera head buttons (▲ or ▼). ⤴ (NOTE: Additional options for button programming are available under "Button Settings" feature ⤴).

**SCB -** (not available in H3-M HD Microscopy Head)

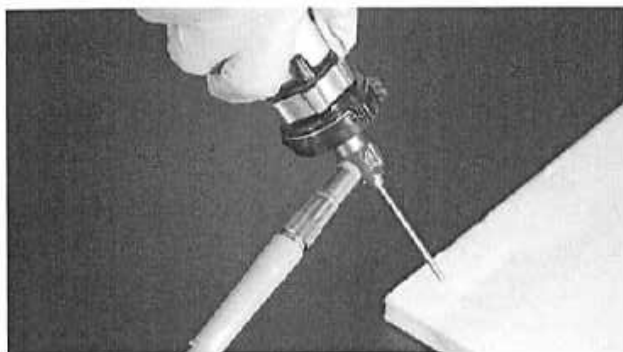
**SCB Text(On/Off):** Turns SCB text display *On* and *Off* with the exception of SCB Warning/Status messages. This command overrides SCB parameter display set in 'Configure SCB Display' below. ⤴

**Configure SCB Display:** Displays up to eight SCB devices for on-screen monitoring (four on the top of the screen and four on the bottom). NOTE: "SCB Text On/(Off)" command overrides this function. ⤴

**SCB Warning/Status Display:** Turns SCB "warning" and "status" text *On* or *Off* ("alarms" and "errors" cannot be turned off, as these involve personal safety of the patient or physician). ⤴ NOTE: "SCB Text On/(Off)" command does not override this function.

**Shutter (exposure control):** Selects the camera exposure control, including automatic and seventeen manual shutter speeds ranging from 1/60 - 1/17,000 second. ⤴

**White Balance:** Determines the camera system's color controls to conform to the color temperature of the light source in use. ⤴



### White balance

The white balance determines the camera system's color controls based on the light source in use. To perform this adjustment:

1. Turn on the light source and point the camera head (with attached endoscope) at a white surface, with no colored objects visible within the camera's field of view. The view should fill at least 70% of the area of the screen.
2. Activate the white balancing mode via the camera head buttons or keyboard (for complete instructions, refer to "Customizing the Camera" section of this manual). Once activated, "White balancing" appears on the monitor.
3. The white balance has been successfully performed when "White balance O.K." appears on the monitor. If white balancing has not been performed correctly, one of the following messages will appear:

"White balance fail - dark": Indicates that the field of view is too dark. Shorten the distance between the endoscope and the white surface. Activate white balance again.

"White balance fail - bright": Indicates that the field of view is too bright. Lengthen the distance between the endoscope and the white surface. Activate white balance again.

"White balance fail - color": Indicates the color temperature exceeds the white balance range.

**NOTE:** The last white balance setting remains stored even after the camera has been switched off. When the camera is next used, a new white balance should be performed if a different light source, light cable, or endoscope is used.

### Dual white balance

The dual white balance feature white balances two light sources when used intraoperatively (for stroboscopy). This feature can only be accessed from the head buttons when programmed via "Button Settings" (for complete instructions, see "Customizing the Camera - Options Menu" section of this manual). When the "Button Settings" function (within the Options list) is set to "Dual White Balance," one head button (▼) will perform white balance, the other head button (▲) will be assigned to light mode selection. To perform the dual white balance function:

1. Turn on the light source and point the camera head (with attached endoscope) at a white surface, with no colored objects visible within the camera's field of view. The view should fill at least 70% of the area of the screen.
2. Press the head button assigned to "light mode" selection (▲). "Light 1 Setting" or "Light 2 Setting" will appear on-screen. To activate the white balance mode, press the other head button (▼). "White balancing light 1 Setting" or "White balancing light 2 Setting" will appear. After this white balance is completed, repeat the procedure to perform white balance on the other light source.
3. The white balance has been successfully performed when "White balance O.K." appears on the monitor. If white balancing has not been performed correctly, one of the following messages will appear:

"White balance fail - dark": Indicates that the field of view is too dark. Shorten the distance between the endoscope and the white surface and activate white balance again.

"White balance fail - bright": Indicates that the field of view is too bright. Lengthen the distance between the endoscope and the white surface and activate white balance again.

"White balance fail - color": Indicates the color temperature exceeds the white balance range.

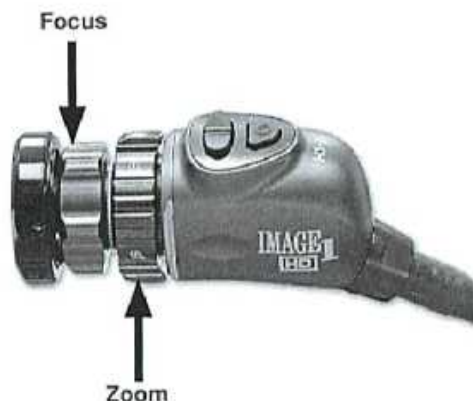
After the two white balance settings have been stored in memory, pressing the assigned head button repeatedly will toggle between the two stored white balance settings.

**NOTE:** The last white balance setting remains stored even after the camera has been switched off. When the camera is next used, a new white balance should be performed if a different light source, light cable, or endoscope is used.

Red	▲ 631 ▼
Green	220
Blue	338

### Manual White Balance

H3-M HD Microscope Head only. Allows the color temperature to be changed manually by selecting different values for Red, Green and Blue.



### Exposure control (including automatic)

This camera features a patented auto exposure mode which selects exposure automatically depending on the available light. The auto exposure system may be overridden to select one of seventeen manual shutter speeds ranging from 1/60 to 1/17,000 second.

**CAUTION:** When using "Auto Exposure" mode, do not use an automatically controlled cold light source; this would cause control range overlap and thus a considerable reduction in image quality. Automatically controlled light sources may only be operated in the manual exposure mode.

**CAUTION:** Heat from the light source can cause residue from the disinfectant on the light cable and on the light entrance of the endoscope to burn. This can have a detrimental effect on the light conduction and hence the image accuracy.

For all Image 1 heads except the H3-M HD Microscope exposure settings can be changed through the "Shutter" camera function. For the H3-M HD Microscope Head, exposure settings can be changed through the "mode" camera function. This function can be programmed for control via the camera head buttons, *User Menu* or *Options Menu*. For information on programming, see "Customizing the camera" sections of this manual.

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### Adjusting focus

Image sharpness can be adjusted by rotating the camera lens focus ring.

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### Adjusting image size

Image size or focal length can be adjusted by rotating the zoom ring.

---

### Controlling a Karl Storz AIDA capture device

If a Karl Storz AIDA digital image capture device is connected to outputs ACC1 or ACC2, the following functions can be activated via the camera head buttons, *User Menu*, or *Options Menu* depending on customization of camera (see "Customizing the Camera" section of this manual for instructions):

**Capture Still:** Capture a still image (ACC1 output).

**Capture Video:** Start and stop video recording (ACC2 output).

### Insufflator Control - HD Heads Only

Allows control of Karl Storz electronic insufflators, Endoflator Model 26430520-1 and ThermoFlator Model 26432020-1. To use insufflator control, connect the SCB ports of the camera and insufflator. Only one insufflator can be controlled by the camera.

The Setup Wizard (Head) allows customization of the insufflator menu to control some or all of the following insufflator functions:

- Gas on/off
- Flow Control
- Pressure Control
- Volume reset

Please see Insufflator Instruction Manual for further information on insufflator functions.

**NOTE:** Camera controls the insufflator in "Intermittent Mode" only. If the insufflator is in "Semi Continuous" or "Initialization Insufflation" modes, the user will be prompted to switch to "Intermittent Mode".

**NOTE:** If the camera has been used to start insufflation (Gas On), when the camera is powered down then restarted at the beginning of a new case, the camera reverts to an off condition. If it is connected to an insufflator that is already on, the camera head will recognize that and register the "on" condition in the software.

**NOTE:** When the insufflator is first turned on, the user is required to acknowledge the initial settings by touching one of the pressure or flow controls once. If this has been done at the insufflator, only one depression of the camera button is required to begin insufflation. If however, the insufflator has been powered on, but the initial settings have not been confirmed at the insufflator, two depressions of the Gas On button on the camera are required - one to accept the settings and another to begin the actual flow.

**WARNING:** In the event of camera malfunction always refer to insufflator front panel displays and controls.

**WARNING:** After connecting camera and insufflator via SCB cable, monitor display must be compared with insufflator display for functional testing.

**WARNING:** To check that the camera insufflator control is operating properly, activate or change at least one function using the camera control and test the reaction on the insufflator.

### Image and Video Capture

#### 1. USB storage device and Printer connection

**NOTE:** A USB storage device must be formatted to FAT 32 in order to store still images and/or video. A list of compatible USB devices can be obtained by calling KARL STORZ Technical Support at 800-421-0837.

A USB storage device and/or a USB printer may be inserted/connected directly into the USB output on the front panel of the Image1 CCU or the USB output on the back of the CCU at any time during a procedure. On-screen messages will temporarily appear on the surgical monitor indicating connection or disconnection. Only one storage device and one printer may be connected at the same time. If two USB storage devices or printers are connected at the same time, an error message will appear. If two printers are connected at the same time, both printers must be disconnected and one printer then reconnected in order to print.

**NOTE:** It is recommended to always have a USB storage device connected to ensure captured stills are not "lost" in the event of accidental powering off of the CCU prior to the completion of printing.

#### 2. Starting a Capture Session

To start a capture session, power on the CCU, connect a camera head and a USB storage device and/or a USB printer. If a keyboard is attached, the patient information menu will appear.

**NOTE:** To start a capture session using a USB printer only, with no USB storage device connected, "Print During Capture" must be set to "On" in the Image Capture Menu. See "Print During Capture Feature" section on the next pages.

#### 3. Entering patient information (USB storage device and keyboard required)

A capture session may be started with or without first entering patient information. Entered patient information will be added to the folder name (stored to the USB storage device) that already includes the date and time of the capture session.

After powering on the Image1 CCU and inserting a USB storage device, if a keyboard is connected, the patient information menu will appear. If a keyboard is not connected this menu will not appear. Using a keyboard input the desired patient information. Use the Tab, Enter, or Down/Up Arrow keys to move to the next field and press Enter when "Exit" is highlighted to exit the menu.

#### 4. Image Capture Menu

The Image Capture Menu provides access to the capture and print functions and to the Image Capture Setup menu.

To access the Image Capture Menu, hold the middle camera head button down for approximately 7 seconds, then use the down head button to scroll to "Image Capture Menu" and press the middle head button again to select. Alternatively, press Shift+Enter on the keyboard and use the Down Arrow key to scroll down to "Image Capture Menu", then press Enter or simultaneously press the Shift + F4 keys on the keyboard. Once in the Image Capture Menu, use the head buttons or keyboard Down/Up Arrows to scroll through the functions and press the middle head button or the Enter key to activate the desired function or to access the Image Capture Setup menu.

- Capture Still: Activates a still image capture. See "Capturing Still Images" section below for more information.
- Capture Video: Activates and deactivates recording of standard definition video. See "Recording Video" section below for more information.
- Print Now: Instantly prints all images in the print queue. The print queue size is based upon the selected number of prints per page (see "Prints Per Page" section on the next page) in the Image Capture Setup menu.

**NOTE:** To print all captured still images, "Print During Capture" must be set to "On". See "Image Capture Setup" and "Print During Capture Features" sections on the next pages.

```
Image Capture
Exit
Capture Still
Capture Video
Print Now
Image Capture Setup...
```

```
Image Capture Setup
Exit
Print During Capture (On)/Off
Prints Per Page ▶
Print Copies ▶
Paper Size ▶
Counter Display ▶
Print Counter (On)/Off
Print Icon (On)/Off
Video Counter On/(Off)
Video Marker ▶
```

### •Image Capture Setup:

Before beginning a capture session, check the settings to insure that the system is set to the desired preferences. The Image Capture Setup menu allows selection of the following settings:

- **Print During Capture:** Selects the ability to print all still images immediately after they are captured, and the selected prints per page layout is full. When set to "On", this feature also enables still image capture with only a USB printer (no USB storage device) connected. See "Print During Capture Feature" section on the next page.
- **Prints Per Page:** Selects 2, 4, or 8 images to print on one page.
- **Print Copies:** Selects 1, 2 or 3 copies of each printed page.
- **Paper Size:** Selects paper size.
- **Counter Display:** Selects the display of the Print Counter and Video Counter below. The display options are Off (never display), Temporary (temporarily display upon each still image capture and video capture), or Permanent (always display).
- **Print Counter:** Displays the number of captured stills currently in the print queue based on the selected prints per page (above), in the lower left corner of the surgical monitor. Options are On or Off.
- **Print Icon:** Displays a graphic representation of the Print Counter (above) based on the selected prints per page (above) in the lower left corner of the surgical monitor. Options are On or Off.
- **Video Counter:** Displays the remaining minutes of video that will fit onto the connected USB storage device in the lower right corner of the surgical monitor. Options are On or Off.
- **Video Marker:** When recording 4:3 aspect ratio Standard Definition video using a High Definition camera head, an on-screen video marker may be set to display. The display acts as a "sight" to show the 4:3 video being recorded from the 16:9 surgical image. The user selectable options are Off, Corner-Transparent, Corner-Solid, Frame-Transparent or Frame-Solid.

**NOTE:** Messages generated by the Image Capture system could interfere with SCB messages that are displayed in the same location on the surgical monitor.

### 5. Capturing Still Images

The Image Capture system captures High Definition still images when used with a High Definition camera head and captures Standard Definition still images when using a Standard Definition camera head. To capture still images, a USB storage device or a USB printer must be connected to one of the USB outputs on the Image1 CCU. A USB storage device and a USB printer may also be connected at the same time.

**NOTE:** If using a printer only, with no USB storage device connected, "Print During Capture" must be set to "On" in the Image Capture Menu. See "Print During Capture Feature" under "Printing Still Images" section on the next page.

Still images may be "captured" via a camera head button programmed to capture still images (See the "Programming Head Buttons" section of this manual or the Image1 Camera Head Instruction Card for more information on how to program camera head buttons). Still Images may also be captured by pressing the F3 key on a keyboard or via a keyboard or camera head buttons using the "Capture Still" command in the Image Capture Menu as described in the section on the previous page. Finally, still images may be captured via an optional single-pedal footswitch as described in the "Capturing Still Images or Video with optional footswitch" section on the next pages.

Once the desired image is on screen, press the programmed camera head button or the configured footswitch or use the "Capture Still" command in the Image Capture Menu to capture the image. The captured image will freeze momentarily on the surgical monitor. If "Print During Capture" is set to "On", a graphic showing the status of the printed page/print queue will momentarily be displayed on the bottom left of the monitor.

Still images may be captured while video is being recorded.

## Operating instructions

### 10. Capturing Still Images or Video with optional footswitch

Still images or video may be captured via an optional Karl Storz single-pedal footswitch connected to the Acc 1 port on the CCU back panel. The footswitch must be configured to activate a still capture or start/stop video capture in the CCU Setup Wizard:

1. Go to the **Setup Wizard (CCU)**
2. Use the ↓ to highlight **Next** and press **[ENTER]** to go to the **CCU Defaults** screen.
3. Use the ↓ to highlight **Footswitch Setup** and press **[ENTER]**.
4. **Capture Still** will be highlighted. Use the ↑ or ↓ to scroll through the available choices.
5. **Capture Still** will configure the footswitch for still capture.
6. **Capture Video** will configure the footswitch for video capture start/stop.

Please see the “Customizing the camera – Setup Wizards” section of this manual for more information.

**NOTE:** If the CCU Acc 1 and/or Acc 2 output is connected to a Karl Storz AIDA image and video capture system via an accessory cable, the Capture Still and Capture Video commands will capture stills and video on both the AIDA and the CCU Image Capture system.

### 11. Ending a Capture Session

To end a capture session, power off the CCU, remove the camera head or remove the USB storage device. Disconnecting a USB printer will not end a capture session.

**NOTE:** The print queue is erased when the CCU is powered off. Be sure that all prints have been printed prior to powering off the CCU. It is recommended to always have a USB storage device connected to ensure captured stills are not “lost” in the event of accidental powering off of the CCU prior to the completion of printing.

### 12. Low USB Memory Warnings

Warning messages will be displayed at the bottom of the surgical monitor when a connected USB storage device has remaining memory space for less than 5 minutes of new video or less than 100 new still image captures. Both the video and still warning messages will display a countdown until there is no remaining memory space on the connected USB storage device, displaying the message, “USB Memory Full”. At that time, no additional video or still images can be stored to the USB Storage device.

**NOTE:** If the USB storage device memory is “Full”, and Print During Capture is set to “On”, still images may still be captured, but they will be sent to the connected USB printer only; they will not be stored on the USB storage device.

### 13. Reviewing Video and Still Images on a Computer

To view video or captured images on a computer, insert the USB storage device into the computer’s USB drive. Go to My Computer to access the USB drive. Open the “Karl Storz” folder to access the capture session(s) stored on the USB storage device. Please contact KARL STORZ Technical Support at 800-421-0837 for assistance.

The “Temp” file is stored on the USB storage device at the completion of a capture session. This is used by the system to end one capture session and set the system to begin another capture session. The “Temp” file contains no capture session data and may be safely deleted.

## Operating instructions

### 6. Storing Still Images to a USB Storage Device

To store capture still images, a USB storage device must be connected to one of the USB outputs on the Image1 CCU. A printer is not required to store images to a USB device.

All still images are stored to a USB storage device in .jpeg format. Captured still images may then be viewed on, and saved to, a computer.

**NOTE:** Only one USB storage device may be connected at one time.

### 7. Printing Still Images

To capture and print still images, a USB printer must be connected to one of the USB outputs on the Image1 CCU. A USB storage device is not required to only capture and print (not store) still images.

Still images may be automatically printed as they are captured (See "Print During Capture Feature" below), or manually printed via a programmed head button or via a keyboard or camera head buttons using the "Print Now" command in the Image Capture Menu as described above. Finally, still images may be printed by simultaneously pressing the Shift + F3 keys on a keyboard. The number of prints per page and the 1, 2 or 3 copies of each page can be set in the Image Capture Setup menu as described in the section on the previous page.

**NOTE:** The print queue is erased when the CCU is powered off. Be sure that all prints have been printed prior to powering off the CCU. It is recommended to always have a USB storage device connected to ensure captured stills are not "lost" in the event of accidental powering off of the CCU prior to the completion of printing.

### 8. Print During Capture Feature

If "Print During Capture" is set to "On", all captured images will print immediately once a page is full ("full" is based on the selection of Images per page set in the Prints Per Page option in the Image Capture Setup menu). For example, if Prints Per Page is set to 4, printing will automatically begin after the 4th still capture, after the 8th still capture and so on. Setting "Print During Capture" to "On" also enables still image capture with only a USB printer (no USB storage device) connected.

If "Print During Capture" is set to "On", any pages which are not full when capturing is completed (and therefore have not printed) will print automatically upon removing the USB storage device.

If "Print During Capture" is set to "Off", captured images will not print unless the manual "Print Now" command is used (see earlier Image Capture Menu section). If "Print During Capture" is set to "Off", all previous still images are cleared from the print queue once the page is full and the next still is captured. For example, if Prints Per Page is set to 4, still captures 1 through 4 are cleared from the print queue (and may not be printed) once the 5th still is captured.

**NOTE:** The print queue is erased when the CCU is powered off. Be sure that all prints have been printed prior to powering off the CCU. It is recommended to always have a USB storage device connected to ensure captured stills are not "lost" in the event of accidental powering off of the CCU prior to the completion of printing.

### 9. Capturing Video

The Image Capture system records Standard Definition video in 4:3 aspect ratio when using both High Definition and Standard Definition camera heads. To capture video, a USB storage device must be connected to one of the USB outputs on the Image1 CCU. Long video captures are stored as separate 12 minute video files in mpeg4 format.

Video capturing may be started and stopped via a camera head button programmed to record video (See the "Programming Head Buttons" section of this manual or the image1 Camera Head Instruction Card for more information on how to program camera head buttons). Video capturing may also be activated by pressing the F4 key on a keyboard or via a keyboard or camera head buttons using the "Capture Video" command in the Image Capture Menu as described in the section above. Finally, video capture may be activated via an optional single-pedal footswitch as described in the "Capturing Still Images or Video with optional footswitch" section on the next pages.

When the desired scene is on screen, press the programmed camera head button or the configured footswitch or use the "Capture Video" command in the Image Capture Menu to start and stop video capturing. When video capturing is activated, a green circle icon will display on the bottom right of the screen. The green circle icon will remain on-screen until video capturing is stopped.

When using a High Definition camera head, a "Video Marker" may be set to display to act as a "sight" to show the 4:3 video being captured from the 16:9 surgical image. The Video Marker may be set in the Image Capture Setup menu as described in the section above.

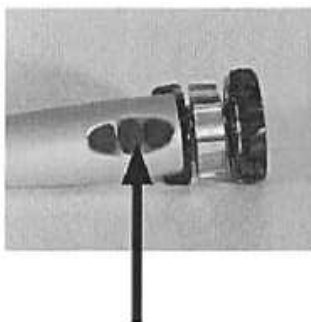




**User Menu**

The *User Menu* allows control of **eight** re-programmable camera functions from the camera head buttons. To access this menu:

- from the camera head, press the bottom button (■)
- or
- from the keyboard, press **ENTER**



The default *User Menu* is:

<pre>User Menu Exit White Balance Enhancement (Low) ▶ Brightness (Medium) ▶ Capture Still Capture Video Light Source Control Insufflator Control Program Head Buttons ▶</pre>	<p>} fixed</p> <p>} 8 re-programmable functions</p>
---	---

This menu can be re-programmed to include eight of the following options:

<pre>Camera Functions White Balance Color Bars Capture Still Capture Video Button Settings Brightness Enhancement Shutter Button Hints Program Head Buttons Light Source Insufflator</pre>	<pre>Patient Information Clear All Pages Patient Information Pages Patient Information Page Select Edit Patient Information SCB SCB Text Configure SCB Display SCB Warning/Status Image Capture Menu Capture Still Capture Video Print Now &lt;None&gt;</pre>	<p>} Only available if a keyboard is plugged into the CCU.</p>
--	---	--

### Modules

The Image 1 CCU can be upgraded with modules to add new features and technologies. The module slots on the back of the CCU labelled "Future Ready" are available for upgrade. For information on available modules, contact your Karl Storz sales representatives.

The Image 1 HD CCU with Image Capture utilizes two of these module slots.



**CAUTION:** Use only Karl Storz approved modules. Maximum power 20W.

## Customizing the camera

### Customizing options

There are four options for customizing the camera:

- **Setup Wizard (CCU) - (keyboard recommended to access)**

The *Setup Wizard (CCU)* leads the user through a series of 3 screens to set the language used, CCU default settings (for text messages) and Date/Time. These settings will remain with the CCU when it is turned off and on again or when a different camera head is used.

- **Setup Wizard (Camera Head) - (keyboard recommended to access)**

The *Setup Wizard (Camera Head)* leads the user through 2 screens to set the camera head defaults (brightness and enhancement) and to program the User Menu. These settings will remain with the camera head when the CCU is turned off and on again or when a different CCU is used.

- **User Menu**

The *User Menu* offers eight programmable options which can be accessed from the head buttons. These buttons are programmed through the *Setup Wizard (Camera Head)*.

- **Options Menu**

The *Options Menu* allows the user to activate or set camera functions for a specific surgical case. If the camera is turned off and on again, the default settings (as determined by user via *Setup Wizards*) will be restored. The *Options Menu* also allows access to the Patient Information sub-menu, the SCB sub-menu. The *Setup Wizard* menus (used to set certain camera defaults), and the HD Text Mode menu



### • Head Buttons

The ▲ and ▼ head buttons can be programmed to perform one function each (via the *User Menu* or the *Options Menu*).

### Setup Wizard access (keyboard recommended to access)

Your sales representative is available to assist in using the CCU and Camera Head *Setup Wizards*. Preferences for specific menu options, camera image settings and other features can be programmed within the *Setup Wizards* and will remain as defaults each time the camera is turned on. In many cases, the *Setup Wizards* will need to be set only once, with individual user adjustments made through the *Options Menu* or the *User Menu*.

To access the *Setup Wizards*, hold down the keyboard **SHIFT** key and press **ENTER** (or, alternatively, hold down the camera head's center button for 7 seconds) to open the *Options Menu* at left:

```
Options Menu
Exit
Camera Functions...
Patient Information...
SCB...
Setup Wizard (CCU) ▶
Setup Wizard (Camera Head) ▶
```

Using the ↑ or ↓ key, highlight **Setup Wizard (CCU)** or **Setup Wizard (Camera Head)** and press **ENTER**. Each *Setup Wizard* will run through a series of screens to re-program the camera defaults.

At the bottom of each screen, options are provided as follows:

**Next:** Holds the new setting and displays the next screen. This option is highlighted when a screen opens so user can quickly scroll through the screens.

**Save and Exit:** Saves what was selected on all screens and exits back to image.

**Quit and Exit:** Exits back to image without saving new settings.

## Setup Wizard (CCU)

The screen diagrams on the left show default settings (i.e. in Language Selection screen, the "Display" default setting is "English").

```
Language Selection
Display          (English)
Keyboard        (English)

Next
Save and Exit
Quit Without Saving 1/3
```

### 1. Language Selection

To change the language of the on-screen display and to identify the keyboard language:

1. Use the ↓ or ↑ key to highlight the word **Display**.
2. Press **ENTER** to select.
3. Cursor will move to the right. Scroll through the list of languages using the ↓ or ↑ key (English, Espanol, Francais, Italiano, Portugues, Deutsch, Русский, Svenska, Polski). When the desired language is on-screen, press **ENTER**. The highlighted area will move back to the menu on the left.
4. To indicate the language of the keyboard being used, highlight the word **Keyboard** and press **ENTER**.
5. Scroll through the list of languages (English, Espanol, Francais, Italiano, Portugues, Deutsch, Русский, Svenska, Polski) using the ↓ or ↑ key. When the appropriate language appears on-screen, press **ENTER**.

To proceed to the next screen, highlight **Next** and press **ENTER**.

## Customizing the camera - Setup Wizards

```
CCU Defaults
Button Hints      (Off)
SCB Text         (On)
Footswitch Setup
  Capture Still
Display Type (Universal)
HD Text Mode    4:3
Next
Save and Exit
Quit Without Saving  2/3
```

```
Date and Time Setup
Program Date/Time
Year      (2008)
Month     (1)
Day       (1)
Hour      (1)
Minute    (00)
Display (None)
Next
Save and Exit
Quit Without Saving  3/3
```

### 2. CCU Defaults

To change a setting:

1. Highlight the option to re-set. Press **ENTER**.
2. A value to the right of the selected option is now highlighted. Scroll through the additional values using the **↓** or **↑** key. The available values for each option include:

**Button Hints:** On, Off.

**SCB Text:** On, Off (NOTE: "SCB Text On/(Off)" function overrides all other SCB displays with the exception of "SCB Warning/Status display.")

**Footswitch Setup:** Capture Still, Capture Video and None.

**Display Type:** Universal, HD 1920 X 1080P DVI-D

**NOTE:** For a complete definition of these options, please see "Definition of Features/Options" section of this manual.

3. When the desired value is on-screen, press **ENTER**. The highlighted area will move back to the menu on the left for additional changes.

To proceed to the next screen, highlight **Next** and press **ENTER**.

### 3. Date and Time Setup

To program the date/time:

1. Select a category (Year, Month, Day, Hour, or Minute) using the **↓** or **↑** keys. Press **ENTER**.
2. The **↓** or **↑** keys will now allow you to scroll through options for each category (i.e. "Month" will have values from 1-12). Once the desired value is on-screen, press **ENTER**. The highlight will now return to the list of categories for further changes.

To change the time/date Display:

1. Highlight "Display" and press **ENTER**. The **↓** or **↑** keys can now be used to scroll through the following options:
  - None
  - Time HH:MM
  - Date YYYY-MM-DD
  - Date MM-DD-YYYY
  - Date DD-MM-YYYY
2. Using the **↓** or **↑** keys, choose the desired display and press **ENTER**.

This is the last screen in the *Setup Wizard (CCU)*. To exit, highlight **Save and Exit** and press **ENTER**. All menus will disappear from the screen and the camera image will be restored. To make additional changes, highlight **Next** and press **ENTER** to scroll through

```
Camera Head Defaults
Brightness (Medium)
Enhancement (Low)
```

```
Next
Save and Exit
Quit Without Saving 1/3
```

```
Program User Menu
1. White Balance
2. Enhancement
3. Brightness
4. Capture Still
5. Capture Video
6. Light Source Control
7. Insufflator Control
8. Program Head Buttons
```

```
Next
Save and Exit
Quit Without Saving 2/3
```

### Setup Wizard (Camera Head)

**NOTE:** The *Setup Wizard (Camera Head)* is only accessible if a camera head is connected to the CCU.

#### 1. Camera Head Defaults

To change a setting:

1. Highlight the option to re-set. Press **ENTER**.
2. A value to the right of the selected option is now highlighted. Scroll through the additional values using the **↓** or **↑** key. The available values for each option include:

**Brightness:** Low, Medium, High, Peak, Small Scope A, Small Scope B

**Enhancement:** Off, Low, High (and special filters if available on camera head).

**NOTE:** For a complete definition of these options, please see "Operating Instructions - Description of Features/Options" section of this manual.

3. When the desired value is on-screen, press **ENTER**. The highlighted area will move back to the menu on the left for additional changes.

To proceed to the next screen, highlight **Next** and press **ENTER**.

#### 2. Program User Menu

To change the *User Menu* (the control of features from the head buttons):

1. Highlight the item number to re-program. Press **ENTER**.
2. The **↓** or **↑** keys can now be used to scroll through the following options:

##### Camera Functions

```
White Balance
Color Bars
Capture Still
Capture Video
Button Settings
Brightness
Enhancement
Shutter
Button Hints
Program Head Buttons
Light Source
Insufflator
```

##### Patient Information

```
Clear All Pages
Patient Information Pages
Patient Information Page Select
Edit Patient Information
SCB
SCB Text
Configure SCB Display
SCB Warning/Status
Image Capture Menu
Capture Still
Capture Video
Print Now
<None>
```

Only available if a keyboard is plugged into the CCU.

**NOTE:** For a complete definition of these options, please see "Operating Instructions - Description of Features/Options" section of this manual.

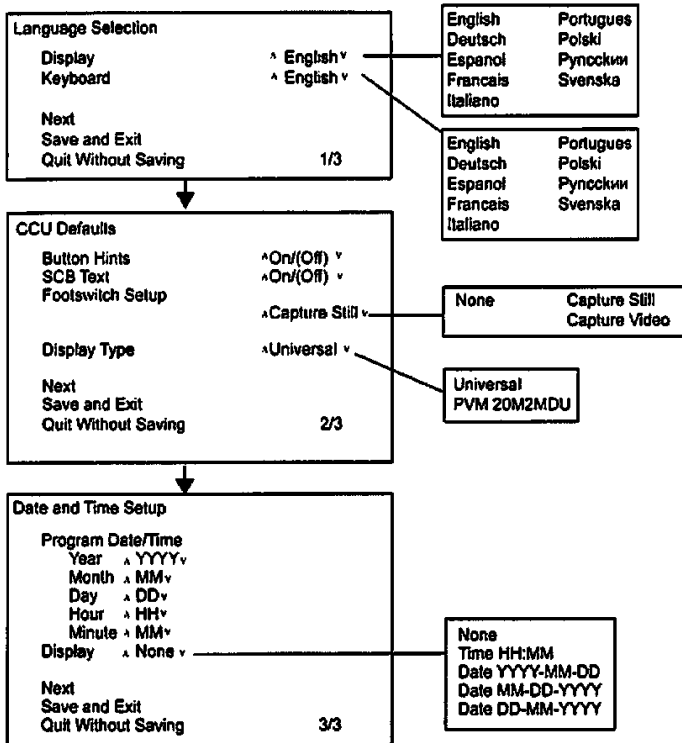
3. Once the desired option appears on-screen, press **ENTER**. Other *User Menu* items can be reset using the same method.

This is the last screen in the *Setup Wizard (Camera Head)*. To exit, highlight **Save and Exit** and press **ENTER**. All menus will disappear from the screen and the camera image will be restored. To make additional changes, highlight **Next** and press **ENTER** to scroll through *Setup Wizard (Camera Head)* screens.

## Customizing the camera - Setup Wizards

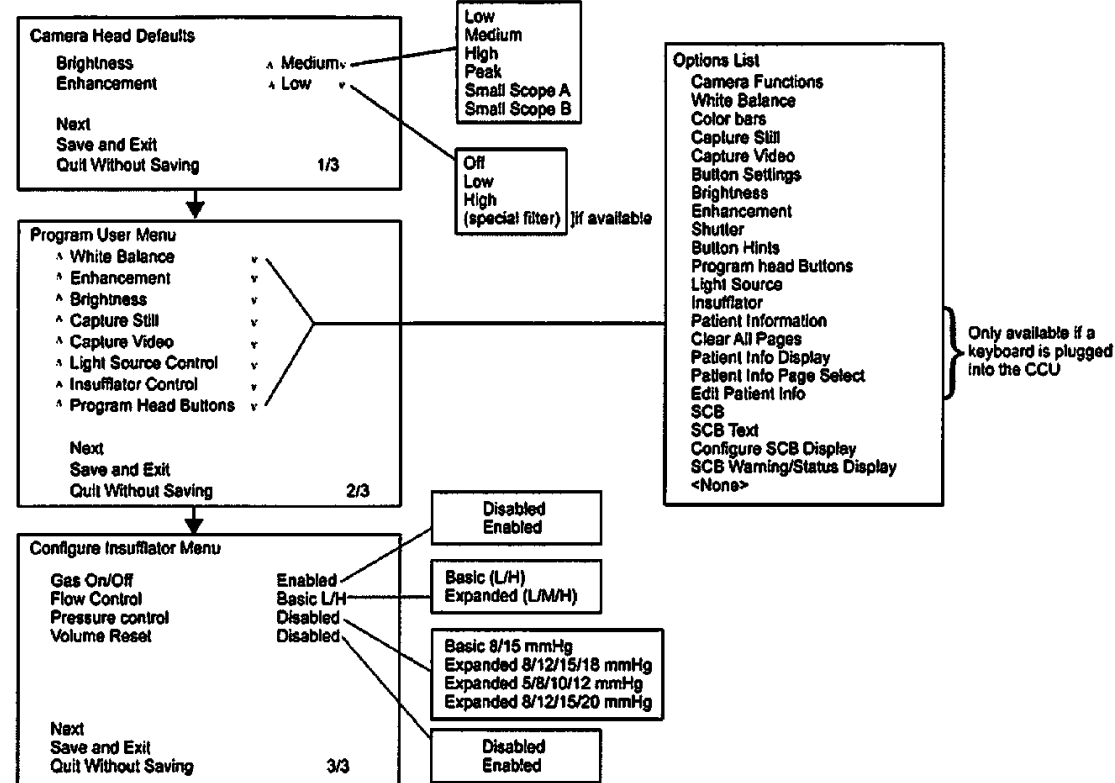
### Setup Wizard (CCU)

To access: Press SHIFT-ENTER on keyboard or hold down center camera head button for 7 seconds



### Setup Wizard (Camera Head)

To access: Press SHIFT-ENTER on keyboard or hold down center camera head button for 7 seconds



## Customizing the camera - Options Menu

```
Options Menu
Exit
Camera Functions...
Patient Information...
SCB...
Setup Wizard (CCU) ▶
Setup Wizard (Camera Head) ▶
```

```
Options Menu
Exit
Camera Functions...
Patient Information...
SCB...
Setup Wizard (CCU) ▶
Setup Wizard (Camera Head) ▶
```

### Options Menu access

Once the *Setup Wizards* functions have been set to the desired defaults, the *Options Menu* can be accessed to easily adjust or activate certain camera functions for a specific surgical case. If the camera is turned off and on again, the selected default settings from the *Setup Wizards* will be restored. The *Options Menu* also allows access to the Patient Information sub-menu and the SCB sub-menu.

To bring up the *Options Menu*, hold down the **[SHIFT]** key and press **[ENTER]** on the keyboard or hold down the camera head's center button for seven seconds. The menu at left will appear.

To select an option, use the **↓** or **↑** keys to highlight this option and press **[ENTER]**.

Below is a description of each option and its operation.

### Options Menu

#### 1. Camera Functions

When selecting **Camera Functions**, the following menu will appear:

```
Camera Functions
Exit
White Balance
Color Bars On/(Off)
Camera Still
Camera Video
Button Settings (Default) ▶
Brightness (Medium) ▶
Enhancement (Low) ▶
Shutter (Auto) ▶
Button Hints On/(Off)
Program Head Buttons ▶
Light Source (x%)
Insufflator
```

1. Highlight a function from the following list:

**White Balance:** Performs White Balance.

**Color Bars:** Turns the color bars On or Off.

**Capture Still:** Captures a still image and for use with a Karl Storz AIDA image and video capture system.

**Capture Video:** Captures video and for use with a Karl Storz AIDA image and video capture system.

**Button Settings:** Sets both **▲** and **▼** head buttons simultaneously as follows:

Default: **▲** (value) **▼** (value)

Dual White Balance: **▲** (light mode) **▼** (White Balance)

**Brightness:** Selects Low, Medium, High, or Peak, Small Scope A or Small Scope B setting. Peak, Small Scope A and Small Scope B may be used to reduce glare of small, bright objects in an otherwise dark endoscopic view.

**Enhancement:** Selects Off, Low, High, or special filters (if available on head) setting.

**Shutter:** Selects auto exposure or speeds from 1/60 - 1/17,000 second.

**Button Hints:** Turns head button labels On or Off. (To select labels for accessory devices, please see "Setup Wizard (CCU) - CCU Defaults" section of this manual.)



## Customizing the camera - Options Menu

**Program Head Buttons:** Sets the ▲ (Up button) and ▼ (Down button) on the camera head to control the following functions:

Camera Functions  
White Balance  
Color Bars  
Camera Still  
Capture Video  
Button Settings  
Brightness  
Enhancement  
Shutter  
Button Hints  
Program Head Buttons  
Light Source  
Insufflator

Patient Information  
Clear All Pages  
Patient Information Pages  
Patient Information Page Select  
Edit Patient Information  
SCB  
SCB Text  
Configure SCB Display  
SCB Warning/Status  
Image Capture Menu  
Capture Still  
Capture Video  
Print Now  
<None>

Only available if a keyboard is plugged into the CCU.

**Light Source:** Allows selection of light source intensity of 25%, 50%, 75%, 100% or Standby (0%). **NOTE:** When scrolling through available options quickly, there may be a slight delay in light source response.

**Insufflator Control:** Allows control of Karl Storz electronic insufflators

**Split Screen Enhancement:** Allows image to be split horizontally to display Low or High Enhancement settings on top and no Enhancement on bottom.

- Press **ENTER** to select. For functions followed by a ▶, use the ↓ or ↑ to scroll through available options. Press **ENTER** when desired option is on-screen. Upon pressing **ENTER**, the menu will disappear and the camera image will re-appear on the monitor.

```
Options Menu
Exit
Camera Functions...
Patient Information...
SCB...
Setup Wizard (CCU) ▶
Setup Wizard (Camera Head) ▶
```

### 2. Patient Information

**NOTE:** Patient Information option is not available unless a keyboard is plugged into the CCU.

When selecting Patient Information, the following menu will appear:

```
Patient Information
Exit
Patient Information Display On/(Off)
Patient Information Page Select (1) ▶
Clear All Pages
Edit Patient Information
```

- Highlight a function from the following list:

**Patient Information Display:** The Patient Information screens should be On to enter, edit or view patient information. When turned On, two lines of patient information are available at the bottom of the screen. **NOTE:** When Patient Information Display is On and contains text, the lower four Karl Storz SCB parameters will not be visible on the monitor.

**Patient Information Page Select:** To select one of ten pages available for patient information, scroll through the list of pages and select the desired page.

**Clear Patient Information:** Clears all stored text from patient information pages.

**Edit Patient Information:** When inputting or editing patient information, the keyboard becomes completely functional, including the following key assignments:

## Customizing the camera - Options Menu

**INS** key: Toggles between *Overttype* (allows existing text to be typed over. Indicated by a flashing block cursor) and *Insert* (allows text to be inserted. Indicated by a flashing underscore cursor). **NOTE:** When the cursor reaches the last character of the last line, it will remain in the same position. Select "next page" (see below) to insert additional text.

**▲** or **▼** keys: Moves cursor between line 1, line 2, and the menu below.

In the Edit Patient information screen, a menu is available at the bottom with options for:

**Next page:** Goes to next page.

**Previous page:** Returns to previous page.

**Exit:** Saves information and returns to live image.

2. Press **ENTER** to select.

3. For functions followed by a **▶**, use the **↓** or **↑** to scroll through available options. Press **ENTER** when desired option is on-screen. Upon pressing **ENTER**, the menu will disappear and the camera image will re-appear on the monitor.

**NOTE:** **▲** or **▼** buttons on the camera head are not functional for menu operation while inputting or editing text.

**NOTE:** Patient Information pages are stored in the CCU and not the camera head. Therefore, if a new head is plugged into the CCU, the Patient Information text will remain.

```
Options Menu
Exit
Camera Functions...
Patient Information...
SCB...
Setup Wizard (CCU)▶
Setup Wizard (Camera Head)▶
```

### 3. SCB

**NOTE:** SCB information is saved in the CCU and not the camera head.

When selecting SCB, the following sub-menu will appear:

```
SCB
Exit
SCB Text (On)/Off
Configure SCB Display▶
SCB Warning/Status (On)/Off▶
```

1. **SCB Text:** Turns the on-screen text On or Off. This function overrides the "Configure SCB Display" option but not the "SCB Warning/Status Display."

**NOTE:** To set camera default for SCB Text, please see "Setup Wizard (CCU)".

2. **Configure SCB Display:** Allows selection of up to eight SCB devices/settings for display (i.e. Insufflator, gain, etc). To select the device parameters for display:

1. Highlight the **Configure SCB Display** option and select by pressing **ENTER** on the keyboard or the center button on the camera head. The devices connected to the SCB system will be displayed on-screen, for example:

```
SCB
Exit
SCB Text (On)/Off
Configure SCB Display▶
SCB Warning/Status (On)/Off
```

```
SCB Display (Devices)
Image 1
Insufflator
Light Source
(Up to 8 devices specified)
Exit
```

## Customizing the camera - Options Menu

2. Select the device to be displayed. A sub-menu of the device parameters will appear on-screen.

For example, if Image 1 is selected...

```
SCB Display (Devices)
Image 1 .....
Insufflator
Light Source
(up to 8 devices specified)
Exit
```

... the sub-menu below will appear:

```
SCB Display (Image 1)
Shutter Speed (Off, 1-8)
Brightness (Off, 1-8)
Enhancement (Off, 1-8)
Devices...
Exit
```

3. As an example, to display the Brightness setting on the monitor, select **Brightness** by highlighting and then pressing **[ENTER]** on the keyboard or the center button on the camera head. The cursor will move to the options on the right.

```
SCB Display (Image 1)
Brightness (Off, 1-8)
Enhancement (Off, 1-8)
Devices...
Exit
```

```
Off
1      5
2      6
3      7
4      8
```

Use the ↓ or ↑ to scroll through the following list of options: Off, 1, 2, 3, 4, 5, 6, 7, 8. The Off option turns the Brightness display off, and the options 1 – 8 represent the following regions on-screen:

Region 1	Region 2
Region 3	Region 4
Region 5	Region 6
Region 7	Region 8

**NOTE:** If the Patient Information Display was turned On and contains text (see "Patient Information" in "Customizing the Camera – Options Menu" section of this manual for more information), only four SCB regions can be displayed (regions 1, 2, 3 and 4).

4. Use the ↓ or ↑ to scroll through the list and select the desired option/region by pressing **[ENTER]** on the keyboard or the center button on the camera head.

**NOTE:** If a device parameter is already displayed in the selected region, that parameter will be automatically forwarded to a blank region.

5. Once selected, the highlighted area will move back to the sub-menu on the left side to continue configuring the display for that device. After completing the display for that device, select **Devices...** to return to previous screen (**SCB Display – Devices**) to set display for remaining devices or select **Exit** to return to live image.

**NOTE:** "SCB Text On/(Off)" command overrides the text set in this "Configure SCB Display" submenu.

3. **SCB Warning/Status Display:** Turns this on-screen Warning/Status display **On** or **Off**.

```
SCB
Exit
SCB Text (On)/Off
Configure SCB Display ▶
SCB Warning/Status (On)/Off
```

To change this option from its current status (indicated in parenthesis on-screen):

1. Highlight **SCB Warning/Status Display**.
2. Press **[ENTER]** to change status. A message will appear on-screen to confirm your selection. **NOTE:** "SCB Text On/(Off)" command does not override this function.
3. Once confirmed, the image will return to live.

```
Options Menu
Exit
Camera Functions...
Patient Information...
SCB...
Setup Wizard (CCU) ▶
Setup Wizard (Camera Head) ▶
```

4. **Setup Wizards**

**Setup Wizards:** Take the user through a series of screens to set defaults, options, menus, head buttons, etc. For additional information, see "Customizing the Camera - Setup Wizards" section of this manual.

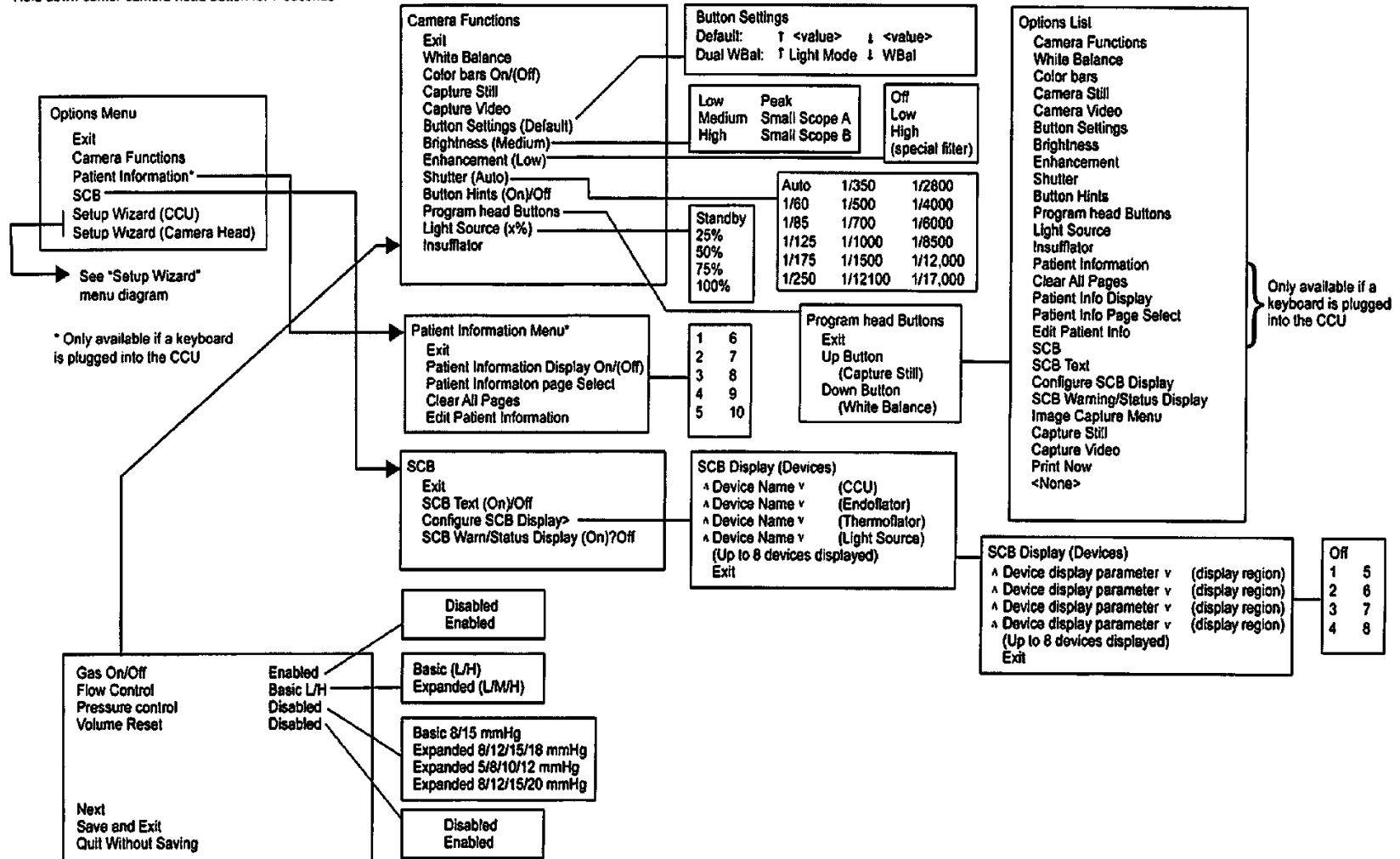
```
Options Menu
Exit
Camera Functions...
Patient Information...
SCB...
Setup Wizard (CCU) ▶
Setup Wizard (Camera Head) ▶
```

5. **Exit**

**Exit:** Removes the menu and restores the camera image to the monitor.

# Options Menu

- Press SHIFT-ENTER on keyboard
- Hold down center camera head button for 7 seconds



## Cleaning and care (all heads except the H3-M HD Microscope camera head)

**NOTE:** Use of the term “camera head assembly” means either a camera head assembly with integrated optical adaptor, a screw mount camera head with or without optical adaptor, or an optical adaptor by itself, as appropriate.

### Care and handling

To maximize the life of your camera, please follow the guidelines given below for proper handling and care of the camera head:



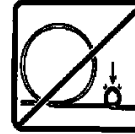
**DO NOT PLUG THE CAMERA HEAD CABLE INTO THE PROCESSOR RECEPTACLE IF IT IS WET.** Always ensure the connector is completely clean and free of debris. If moisture is present, dry thoroughly with sterile towel prior to insertion.



**DO NOT STORE THE CAMERA WITH CABLE COILED TIGHTLY OR GATHERED INTO FOLDS.** Always arrange the cable in loose coils of 6 inches (15 cm) or more in diameter.



**DO NOT PICK UP THE CAMERA HEAD ASSEMBLY BY ITS CABLE.** Always pick up the assembly by the camera head first, then provide secondary support for the cable and connector. The cable contains tiny electronic conductors and should be treated gently and carefully.



**DO NOT RAPIDLY PULL THE CABLE WHEN UNCOILING.** Harmful “kinks” can result. Always allow the cable to uncoil gently and loosely.



**DO NOT STORE CAMERA SYSTEM** in direct sunlight or excessive heat.



**DO NOT AUTOCLAVE THE CAMERA HEAD UNLESS THE DEVICE IS SPECIFICALLY MARKED TO ALLOW STEAM STERILIZATION; IRREPARABLE DAMAGE WILL OCCUR.** Safely sterilize by ETO gas with temperature not exceeding 140° F (60° C) or by the STERIS or STERRAD methods, according to manufacturer's instructions. Alternatively, the camera head may be safely soaked in not greater than 2% Glutaraldehyde disinfection solution for no longer than 45 minutes.



**HANDLE THE SYSTEM WITH CARE,** avoiding extreme impacts to device. When transporting, use the original shipping box to prevent damage to the device.



**WHEN DRYING, DO NOT PULL THE CABLE, AS THIS MAY RESULT IN BUNCHING OF THE CABLE JACKET.**

### Cleaning, disinfection and sterilization guidelines

To ensure optimal reproduction of the endoscopic image, the light entrances and exits of the camera head assembly, light cable and endoscope must always be kept clean. Clean exposed faces with a cotton swab dipped in a neutral soap solution and wipe with a cotton swab soaked in alcohol.

**CAUTION:** Before and after disinfection or sterilization, inspect the camera head cable for breaks or cuts. Camera heads with damaged cables should NOT be disinfected or sterilized. A break or cut in the cable will allow fluid to enter the camera cable and cause damage. Return the damaged camera head to Karl Storz for repair.



**CAUTION:** Allowing buildup of disinfectant or sterilant to occur on the camera head card-edge connector can cause camera failure.

## Cleaning and care



**CAUTION:** The camera head assembly should be thoroughly cleaned and disinfected/sterilized according to validated infection control procedures prior to use and subsequent reuse. Any deviations from the recommended parameters for cleaning, disinfection and sterilization should be validated by the user.



**CAUTION:** Use of sterilization/disinfection methods other than those recommended by Karl Storz may cause adverse effects to the materials of the camera and endoscopic adaptor. Resulting damage will not be covered by the warranty.



**CAUTION:** When handling the cameras and other devices, place water resistant caps as required according to Manufacturer's instructions. Failure to properly place the caps may result in damage to the cameras or other devices.

## Preparation for cleaning and sterilization

Place the camera head assembly in containers and soak with a neutral pH (pH 6.0 – 8.0) enzymatic cleaning solution (e.g., Enzol, Me-trizyme or equivalent diluted to proper concentrations per manufacturer's instructions) immediately after use to prevent blood, protein and other contaminants from drying onto the equipment

## Cleaning instructions



**CAUTION:** Wear protective gloves, clothing and a face mask for cleaning of contaminated equipment.

### Camera control unit (CCU) or other box



**CAUTION:** Always disconnect the power cord before cleaning the camera control unit.

If the camera control unit needs to be cleaned, wipe it down with a damp cloth or sponge. Dry thoroughly with a soft towel or gauze surgical sponge.

### Camera head assembly

1. Thoroughly rinse the camera head assembly to remove all gross debris. Distilled water is recommended for cleaning and rinsing of the camera head assembly.
2. Completely immerse the camera head assembly and camera head cable in a neutral pH enzymatic cleaning solution (e.g., Enzol, Me-trizyme or equivalent per manufacturer's instructions) and distilled water. Karl Storz does not recommend the use of detergents alone, as they contain high concentrations of surfactants which can leave a film on the equipment.
3. Remove any residual debris and contaminants from the camera head assembly with a soft brush. Cleaning accessories are available from Karl Storz.
4. Be sure that the card-edge connector is thoroughly clean.
5. Cleaning brushes should be cleaned and high level disinfected or sterilized daily.
6. Triple-rinse the camera head assembly with distilled water, for a minimum of one minute for each rinse. The rinse water should be discarded at the end of each rinse, as it will be contaminated with the cleaning solution. Thorough rinsing of the camera head assembly is necessary for removing any debris or detergent which could interfere with sterilization.
7. Dry the equipment with a lint-free soft cloth. Wipe the card-edge connector with 70% isopropyl alcohol to remove any residual detergent.
8. Do not allow exposed glass windows to air dry. 70% isopropyl alcohol may be applied to glass surfaces with a soft cotton applicator to prevent streaks and spots. Dry the surfaces thoroughly with a cotton applicator after applying the alcohol.
9. After cleaning, inspect the camera head assembly and camera head cable for cleanliness and damage.  
**CAUTION:** Inspect the camera head cable for breaks and cuts. Camera heads with damaged cables should not be sterilized or disinfected. Return camera heads with damaged cables to Karl Storz for repair.
10. Before sterilization and/or disinfection, coil the camera head cable into loops at least six inches in diameter. Do not kink or twist the cable.

**Note:** To prolong the life of the camera, Karl Storz recommends the use of sterile drapes to cover the camera head assembly during surgical procedures.

Approved Sterilization and Disinfection Methods

CAMERA HEADS	STERILIZATION								HIGH LEVEL DISINFECTION		Sterile Drape
	ETO Gas	STERRAD (Vaporized H <sub>2</sub> O <sub>2</sub> , Plasma)					STERIS		CIDEX (Glutaraldehyde, 2.4%)	Resori XL HLD (2% H <sub>2</sub> O <sub>2</sub> )	
		100S (US) "Short" Cycle (Int'l)	50	200 (US) "Short" Cycle (Int'l)	NX "Standard" Cycle"	100NX "Standard" Cycle"	V-Pro 1 (Vaporized H <sub>2</sub> O <sub>2</sub> ) V-Pro 1 Plus "Non-Luman" Cycle	SYSTEM 1 (Percetic Add Solution)			
<b>Non - Autoclavable</b>											
Image 1 H3-Z (with blue cable nut)	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Image 1 H3 (with blue cable nut)	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Image 1 H3 (with black cable nut)	✓	✓	✓	✓				✓	✓	✓	✓
Image 1 S3 / S1 (with blue cable cylindrical ring)	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Image 1 S3 / S1	✓	✓	✓	✓				✓	✓	✓	✓
Image 1 P3 / P1	✓	✓	✓	✓	✓	✓		✓	✓	✓	✓
Image 1 F3	✓	✓	✓	✓	✓	✓		✓	✓	✓	✓
Image 1 D1	✓	✓	✓	✓	✓	✓		✓	✓	✓	✓
<b>Autoclavable</b>											
Image 1 A3 / A1	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

NOTE: Blue Cable Back Nut (H3/H3Z HD Cameras) or Cylindrical Slide Ring (S3/S1 SD Cameras) indicates validation for STERRAD NX/100NX and/or STERIS Amsco V-PRO 1 Hydrogen Peroxide Sterilizers

NOTE: The sterilization methods referenced in the reprocessing chart above exclude the use of the KARL STORZ Sterilization Trays. For more information, please refer to specific tray's labeling statement and/or consult KSEA Technical Services.



## Sterilization and disinfection

### Sterilization instructions

Routine ethylene oxide (EtO) sterilization is recommended for initial and subsequent sterilization of all non-autoclavable camera head assemblies. They may also be Steris System1<sup>®</sup>, Steris V-PRO 1<sup>™</sup> or STERRAD<sup>®</sup> Sterilization Systems sterilized. To achieve the desired sterility assurance level (SAL) of 1 0-6, Karl Storz recommends the following EtO, Steris System1<sup>®</sup>, Steris V-PRO 1<sup>™</sup> and STERRAD<sup>®</sup> Sterilization Systems sterilization methods.



**CAUTION:** DO NOT steam sterilize (autoclave) any part of the camera head or optical adaptor, unless the device is specifically marked to allow steam sterilization; irreparable damage will occur.



**CAUTION:** Before sterilization, the camera head assembly must be thoroughly cleaned and all organic material, blood and cleaning solution completely removed.



**CAUTION:** The recommended sterilization parameters are only valid with sterilization equipment that is properly maintained and calibrated.

**NOTE:** If the optical adaptor is detachable (i.e. c-mount), remove it from the camera head prior to cleaning, disinfection, or sterilization.

### Steam sterilization [Autoclave] (A1, A3 only)

1. Clean the camera head assembly as described in the cleaning section of this manual. Place the camera head assembly in a sterilization tray. Do not place any instruments on top of the camera.
2. Karl Storz has validated the following steam sterilization methods.

#### Gravity Displacement

Temperature: 250° – 252° F  
Exposure Time: 30 minutes, minimum

#### Gravity Displacement [Flash]

Temperature: 270° – 272° F  
Exposure Time: 10 minutes, minimum

#### Prevacuum [Flash]

Temperature: 270° – 272° F  
Exposure Time: 4 minutes, minimum

3. Trays should be positioned in the sterilizer so that there is an adequate circulation and penetration of steam, air removal and condensate drainage. A loosely loaded sterilizer allows the best penetration of the sterilant.
4. Camera heads may be wrapped or unwrapped
5. At the completion of the steam sterilization cycle, all camera heads should remain untouched until adequately cooled. **CAUTION: DO NOT QUICKLY COOL CAMERA HEAD AFTER REMOVING FROM AUTOCLAVE. THIS MAY DAMAGE THE CAMERA OPTICS AND VOID WARRANTY.**
6. The suggested drying time after sterilization for camera heads is 4 minutes to ensure that the card edge is completely dry before plugging it in.\*

\*For those autoclave units that do not have a built-in dry cycle, the card edge must be dried after cool down using a sterile towel. Prior to insertion all moisture must be removed from the card edge.

### Ethylene Oxide (EtO) gas sterilization

1. Clean the camera head assembly as described in the cleaning section of this manual. Place the camera head assembly in a sterilization tray. Do not place any instruments on top of the camera.
2. All sterilization cycles should include a preconditioning cycle:

Temperature:	130 ± 5°F	Time: 30 minutes, nominal
Humidity	≥70% RH	
Vacuum	1.3 psia	
3. Karl Storz has validated Ethylene Oxide (EtO) sterilization using the following parameters:

Gas mixture:	100% EtO
Temperature:	Set point of 55°C
Relative humidity:	≥70% RH
Humidity Dwell Time:	30-45 minutes
Exposure time:	180 minutes, (full cycle)
EtO concentration:	735 ± 30 mg/L
4. Aeration of the equipment can be accomplished in any aeration chamber at a temperature of 120 – 130°F for 12 hours.  
Maximum acceptable levels of residues following EtO sterilization are as follows (per ANSI/AAMI/ISO 10993-7):

Ethylene oxide:	20 mg
Ethylene chlorohydrin:	12 mg
6. The suggested drying time after sterilization for camera heads is 4 minutes to ensure that the card edge is completely dry before plugging it in.\*

\*For those autoclave units that do not have a built-in dry cycle, the card edge must be dried after cool down using a sterile towel. Prior to insertion all moisture must be removed from the card edge.

## Sterilization and disinfection

### STERRAD® Sterilization Systems (STERRAD 50, 100S, 200, NX, and 100NX)

The STERRAD® Sterilization Systems, manufactured by Advanced Sterilization Products (ASP), utilize a synergism between hydrogen peroxide and low temperature gas plasma to produce a rapid, low temperature, low moisture inactivation of microorganisms. It is intended for terminal sterilization of properly cleaned, rinsed, and dried reusable medical devices.

STERRAD® NX™ is a table top sterilizer with rectangular chamber size of 51 .3L / 26L (usable). It utilizes the same sterilant (hydrogen peroxide) as the other STERRAD® units, the STERRAD® 100S, 200, and 50. The major difference is the vaporization system that renders the hydrogen peroxide sterilant more concentrated and improve diffusion into lumens. This combined vaporization system combined with a shorter cycle time results in a similar exposure to the sterilant.

The STERRAD® 100NX™ System is very similar to the current STERRAD® NX™ System. The STERRAD® 100NX™ System is a large sterilizer with rectangular chamber size of 1 52L / 93.4L (usable).

**CAUTION:** STERRAD® sterilization may cause cosmetic changes to the camera head assembly that does not necessarily impact the camera's functionality.

**CAUTION:** The camera head assembly must be thoroughly dried before loading into the STERRAD® sterilization chamber. Loads containing moisture may cause a cycle cancellation.

**CAUTION:** Use only STERRAD® -compatible instrument trays in the sterilization chamber. These trays are specially designed to allow the plasma to surround the items.

**CAUTION:** Use only FDA – cleared polypropylene sterilization wrap and polyolefin pouches. Do not use paper pouches or sterilization wraps containing wood pulp or cotton.

1. Clean and prepare the camera head assembly as recommended in the cleaning section of this manual. Be sure that the camera head assembly is completely dry.
2. Load the camera head assembly into the STERRAD® sterilizer, arranging it so that the hydrogen peroxide vapor can surround it. Do not allow the camera head assembly to touch the wall of the sterilizer.
3. Please consult the STERRAD® Sterilization System Operator's Manual for detailed instructions for use.
4. Please contact Advanced Sterilization Products [ASP] for the most up to date information regarding sterilization with the STERRAD® Sterilization System.

## Sterilization and disinfection

### Sterilization with Steris System1® processor

The STERIS Process™ is a sterile processing method for immersible surgical and diagnostic devices. The Steris System1® utilizes a liquid chemical process (primarily buffered peracetic acid) for the rapid, low temperature destruction of microorganisms on the surfaces of surgical instruments and devices. Please consult the Steris System1® operator's manual for safe handling instructions for the Steris System1® sterilant.

**WARNING:** Failure to thoroughly clean and properly position devices so that all surfaces will be exposed to the sterilant or overloading the processing container may result in an ineffective sterile process and/or damage to the devices.

**WARNING:** Use only Steris System1® processing containers to ensure proper sterilization of the devices. DO NOT use Steris System1® for devices that cannot be immersed in liquid.

**WARNING:** Always verify that the sterilant container is empty after the cycle is complete. If the sterilant container is not empty, then the load cannot be considered sterile.

**WARNING:** Devices are not sterilized and/or adequately rinsed when a sterile processing cycle is cancelled.

1. Be sure that all devices are completely clean using the methods recommended in the cleaning section of this manual.
2. Visually inspect and test the devices to ensure that it is working properly before processing in the Steris System1® processor.
3. Position the device in the Steris System1® tray to ensure that all surfaces will be exposed to the sterilant. All devices should be disassembled to the smallest components possible.
4. Place the lid on the processing container.
5. Place the processing container in the processing tray. Align the fluid port on the bottom of the processing container over the fluid port of the processing tray.
6. Add the Steris System1® sterilant to the processing tray and insert the aspirator probe into the sterilant container. Be sure the aspirator probe assembly is in the proper position.
7. Close the lid. DO NOT FORCE THE LID TO CLOSE. If the lid does not close easily, open the lid and check the positioning of the processing tray/container and the aspirator assembly.
8. Press the START button. The sterilization cycle will be complete in approximately 30 minutes.
9. At the completion of the sterilization cycle, five short beeps will be sounded and the complete light will be illuminated.
10. Remove the empty sterilant container and discard. Please consult the Steris System1® operator's manual for proper disposal instructions.
11. The equipment is ready to use immediately at the completion of the Steris System1® cycle.
12. Please consult the Steris System1® operator's manual for more detailed instructions for use of the Steris System1® processor.
13. Please consult the STERIS Corporation for the most up to date information regarding processing of cameras in the Steris System1® Processor.

## Sterilization and disinfection

### V-PRO 1™ Sterilization System

The V-PRO 1™ Low Temperature Sterilization System from STERIS® utilizes vaporized hydrogen peroxide (no gas plasma) to inactivate microorganisms. The V-PRO 1™ System is a large sterilizer with rectangular chamber size of 1 36L. It is intended for terminal sterilization of properly cleaned, rinsed, and dried reusable medical devices.

**CAUTION:** V-PRO 1™ sterilization may cause cosmetic changes to the camera head assembly that does not necessarily impact the camera's functionality.

**CAUTION:** The camera head assembly must be thoroughly dried before loading into the V-PRO 1™ sterilization chamber. Loads containing moisture may cause a cycle cancellation.

**CAUTION:** Use only V-PRO 1™ -compatible instrument trays in the sterilization chamber. These trays are specially designed to allow the plasma to surround the items.

**CAUTION:** Use only FDA-cleared polypropylene sterilization wrap and polyolefin pouches. Do not use paper pouches or sterilization wraps containing wood pulp or cotton.

1. Clean and prepare the camera head assembly as recommended in the cleaning section of this manual. Be sure that the camera head assembly is completely dry.
2. Load the camera head assembly into the V-PRO 1™ sterilizer, arranging it so that the hydrogen peroxide vapor can surround it. Do not allow the camera head assembly to touch the wall of the sterilizer.
3. Please consult the V-PRO 1™ Sterilization System Operator's Manual for detailed instructions for use.
4. Please contact STERIS for the most up to date information regarding sterilization with the V-PRO 1™ Sterilization System.

## Sterilization and disinfection

### High Level Disinfection instructions

**WARNING:** High level disinfection is recommended **ONLY** for instruments which come into contact only with intact mucous membranes.

**CAUTION:** Any deviations from the recommended disinfection parameters must be validated by the user.

**CAUTION:** Before disinfection, the instruments must be thoroughly cleaned, rinsed, and dried.

**CAUTION:** To avoid damage to the instruments, do not immerse the devices in disinfectant solution for longer than one hour.

Karl Storz camera head assemblies can be chemically disinfected using high-level disinfectant solutions containing a 2.4% concentration of glutaraldehyde (e.g. CIDEX, a 14-day glutaraldehyde solution) or 2.0% concentration of hydrogen peroxide (e.g. Reser XL HLD). Karl Storz does not recommend the use of CIDEX PLUS or other 28-day glutaraldehyde solutions, as they contain high concentrations of surfactants, which may dry and crystallize on the endoscopes if they are not thoroughly rinsed. The crystalline form of the surfactant can become conductive to electricity providing a pathway for arcing. Glutaraldehyde solutions with concentrations greater than 2.4% should be avoided, as a higher percentage of glutaraldehyde may damage the instruments.

1. Prepare the camera head assembly for disinfection as described in the cleaning section of this manual.
2. Once the camera head assembly has been properly cleaned, prepare the disinfecting solution for use:

#### **CIDEX (2.4% Glutaraldehyde Concentration Solution)**

Activate the glutaraldehyde solution by adding the entire contents of activator vial to the solution in the container. Shake well. Activated solution immediately changes color to green, thereby

indicating the solution is ready to use. Check the pH of the glutaraldehyde solution to be sure that it is between 8.2 and 8.9 for optimal antimicrobial activity. Do not use activated solution beyond stated 14 day reuse life. Record the date of activation and the expiration date on the container.

#### **Reser XL HLD (2.0% Hydrogen Peroxide Concentration Solution)**

No activation is necessary. Use Verify® Chemical Monitoring Strip for Reser XL HLD Solution to confirm hydrogen peroxide concentration before each use. Record the date the solution was poured out of the original container.

3. Pour the desired amount of HLD solution from its original container into a secondary container. Approved plastic containers should be used to avoid scratching of the instruments and to eliminate electrolytic corrosion, which may occur when dissimilar metals are soaked in the same solution.
4. Place the pre-cleaned camera head assembly into approved plastic containers. Do not soak camera head assembly with other instruments to prevent potential damage. Completely immerse the camera head assembly; care must be taken to remove any air bubbles adhered onto the surface of the immersed device.
5. Utilize the following disinfection conditions to achieve manual high-level disinfection:

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## Sterilization and disinfection

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### **CIDEX (2. 4% Glutaraldehyde Concentration Solution))**

Completely immerse the camera head assembly in the undiluted 2.4% glutaraldehyde solution for a minimum of 45 minutes at 25°C (77°F).

**CAUTION: DO NOT** soak the camera head assembly longer than 45 minutes.

### **Resert XL HLD (2. 0% Hydrogen Peroxide Concentration Solution)**

Completely immerse the camera head assembly in the undiluted 2.0% hydrogen peroxide solution for a minimum of 8 minutes at 20°C (68°F).

6. After immersion in the high level disinfection solution, thoroughly rinse the camera head assembly by immersing it completely in a large volume of sterile water. Rinse the camera head assembly three times. Each rinse should be for a minimum of 1 minute in duration. Discard the water after each rinse, as it will be contaminated with the disinfecting solution. Use fresh sterile water for each rinse. Thorough rinsing of the camera head assembly with sterile water is essential for removing any residual disinfection solution.
7. Please refer to the disinfectant manufacturer's Instructions-for-Use for more detailed information regarding the use of the disinfectant solution, including proper rinsing techniques.
8. Dry the camera head assembly with a lint-free sterile cloth.
9. Special care must be taken to thoroughly rinse the card-edge connector and carefully dry it with a sterile lint-free cloth. Be sure that the card-edge connector is completely clean and free of moisture before inserting into the camera processor. Wipe the card-edge connector with isopropyl alcohol to remove any trace of disinfectant.

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## Use of sterile drapes

1. Clean and prepare the head assembly as recommended in the cleaning section of this manual.
  2. Follow the instructions provided by the drape manufacturer when using sterile drapes.
- 

## References for cleaning and sterilization

1. Gruendemann, B.J. and Meeker, M.H. Alexander's Care of the Patient in Surgery, 7th edition. The C.V. Mosby Company, St. Louis, MO 1983.
  2. Association for the Advancement of Medical Instrumentation. Designing, Testing and Labeling Reusable Medical Devices for Reprocessing in Health Care Facilities: A Guide for Device Manufacturers. AAMI TIR No. 12-2004.
  3. The Difficulty of Reprocessing Reusable Rigid Laparoscopic Forceps and other Endoscopic Accessories: Are Disposables the Answer? Health Devices, Vol. 23, Nos. 1-2, pp. 57-58, 1994.
  4. Descoteaux, J-G, Poulin, E.C., Julein, M. and Guidoin, R. Residual Organic Debris on Processed Surgical Instruments. AORN Journal Vol. 62, No. 1 pp. 23-29, 1995.
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### Customizing options

There are four options for customizing the camera:

- **Setup Wizard (CCU) - (keyboard or keypad recommended to access)**

The *Setup Wizard (CCU)* leads the user through a series of 3 screens to set the language used, CCU default settings (for text messages) and Date/Time. These settings will remain with the CCU when it is turned off and on again or when a different camera head is used.

- **Setup Wizard (Camera Head) - (keyboard or keypad recommended to access)**

The *Setup Wizard (Camera Head)* leads the user through 2 screens to set the camera head defaults (brightness and enhancement) and to program the User Menu. These settings will remain with the camera head when the CCU is turned off and on again or when a different CCU is used.

- **User Menu**

The *User Menu* offers eight programmable options which can be accessed from the head buttons. These buttons are programmed through the *Setup Wizard (Camera Head)*.

- **Options Menu**

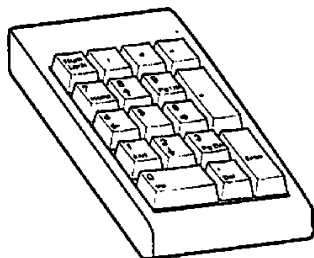
The *Options Menu* allows the user to activate or set camera functions for a specific surgical case. If the camera is turned off and on again, the default settings (as determined by user via *Setup Wizard's*) will be restored. The *Options Menu* also allows access to the Patient Information sub-menu. The Setup Wizard menus (used to set certain camera defaults), and the HD Text Mode menu

- **Head Buttons**

The ▲ and ▼ head buttons can be programmed to perform one function each (via the *User Menu* or the *Options Menu*).



## Customizing the camera - Setup Wizards - H3-M HD Microscope Head



```
Options Menu
Exit
Camera Functions...
Patient Information...

Setup Wizard (CCU) >
Setup Wizard (Camera Head) >
```

```
Language Selection
Display      (English)
Keyboard    (English)

Next
Save and Exit
Quit Without Saving 1/3
```

### Setup Wizard access (keyboard or keypad recommended to access)

Preferences for specific menu options, camera image settings and other features can be programmed within the *Setup Wizards* and will remain as defaults each time the camera is turned on. In many cases, the *Setup Wizards* will need to be set only once, with individual user adjustments made through the *Options Menu* or the *User Menu*.

To access the *Setup Wizards*, hold down the keyboard **[SHIFT]** key and press **[ENTER]** (or, alternatively, hold down the camera head's center button for 7 seconds) to open the *Options Menu* at left:

The *Setup Wizards* may also be accessed on the optional keypad by holding down the keypad **[INS]** key.

Using the **↑** or **↓** key, highlight **Setup Wizard (CCU)** or **Setup Wizard (Camera Head)** and press **[ENTER]**. Each *Setup Wizard* will run through a series of screens to re-program the camera defaults.

At the bottom of each screen, options are provided as follows:

**Next:** Holds the new setting and displays the next screen. This option is highlighted when a screen opens so user can quickly scroll through the screens.

**Save and Exit:** Saves what was selected on all screens and exits back to image.

**Quit and Exit:** Exits back to image without saving new settings.

### Setup Wizard (CCU)

The screen diagrams on the left show default settings (i.e. in Language Selection screen, the "Display" default setting is "English").

#### 1. Language Selection

To change the language of the on-screen display and to identify the keyboard language:

1. Use the **↓** or **↑** key to highlight the word **Display**.
2. Press **[ENTER]** to select.
3. Cursor will move to the right. Scroll through the list of languages using the **↓** or **↑** key (English, Espanol, Francais, Italiano, Portugues, Deutsch, Рунцкий, Svenska, Polski). When the desired language is on-screen, press **[ENTER]**. The highlighted area will move back to the menu on the left.
4. To indicate the language of the keyboard being used, highlight the word **Keyboard** and press **[ENTER]**.
5. Scroll through the list of languages (English, Espanol, Francais, Italiano, Portugues, Deutsch, Рунцкий, Svenska, Polski) using the **↓** or **↑** key. When the appropriate language appears on-screen, press **[ENTER]**.

To proceed to the next screen, highlight **Next** and press **[ENTER]**.

```
CCU Defaults
Button Hints (value)

Footswitch Setup
Capture Still (None)
Display Type (Universal)

HD Text Mode 4:3
Next
Save and Exit
Quit without Saving
```

### 2. CCU Defaults

To change a setting:

1. Highlight the option to re-set. Press **ENTER**.
2. A value to the right of the selected option is now highlighted. Scroll through the additional values using the **↓** or **↑** key. The available values for each option include:

**Button Hints:** On, Off.

**Footswitch Setup:** Capture Still, Capture Video, and None.

**Display Type:** Universal, HD 1920x1080p DVI-D.

**NOTE:** For a complete definition of these options, please see "Definition of Features/Options" section of this manual.

3. When the desired value is on-screen, press **ENTER**. The highlighted area will move back to the menu on the left for additional changes.

To proceed to the next screen, highlight **Next** and press **ENTER**.

```
Date and Time Setup
Program Date/Time
Year (2008)
Month (1)
Day (1)
Hour (1)
Minute (00)
Display (None)

Next
Save and Exit
Quit Without Saving 3/3
```

### 3. Date and Time Setup

To program the date/time:

1. Select a category (Year, Month, Day, Hour, or Minute) using the **↓** or **↑** keys. Press **ENTER**.
2. The **↓** or **↑** keys will now allow you to scroll through options for each category (i.e. "Month" will have values from 1-12). Once the desired value is on-screen, press **ENTER**. The highlight will now return to the list of categories for further changes.

To change the time/date Display:

1. Highlight "Display" and press **ENTER**. The **↓** or **↑** keys can now be used to scroll through the following options:  
None  
Time HH:MM  
Date YYYY-MM-DD  
Date MM-DD-YYYY  
Date DD-MM-YYYY

2. Using the **↓** or **↑** keys, choose the desired display and press **ENTER**.

This is the last screen in the *Setup Wizard (CCU)*. To exit, highlight **Save and Exit** and press **ENTER**. All menus will disappear from the screen and the camera image will be restored. To make additional changes, highlight **Next** and press **ENTER** to scroll through *Setup Wizard (CCU)* screens.

### Program User Menu

1. Auto White Balance
2. Manual White Balance
3. Exposure
4. Enhancement
5. Load User Settings
6. Save User Settings
7. Program Head Buttons
8. Color Bars

### Setup Wizard (Head)

#### 1. Program User Menu

To change the *User Menu* (the control of features from the head buttons):

1. Highlight the item number to re-program. Press **ENTER**.
2. The **↓** or **↑** keys can now be used to scroll through the following options:

Camera Functions  
Auto White Balance  
Manual White Balance  
Color Bars  
Capture Still  
Capture Video  
Exposure  
Enhancement  
Button Hints  
Program Head Buttons  
Program Keypad Hot Buttons  
Load User Settings  
Save User Settings

Reset User Settings  
Patient Information  
Clear All Pages  
Patient Information Display  
Patient Information Page Select  
Edit Patient Information  
Image Capture Menu  
Capture Still  
Capture Video  
Print Now  
<None>

Only available if a keyboard is plugged into the CCU.

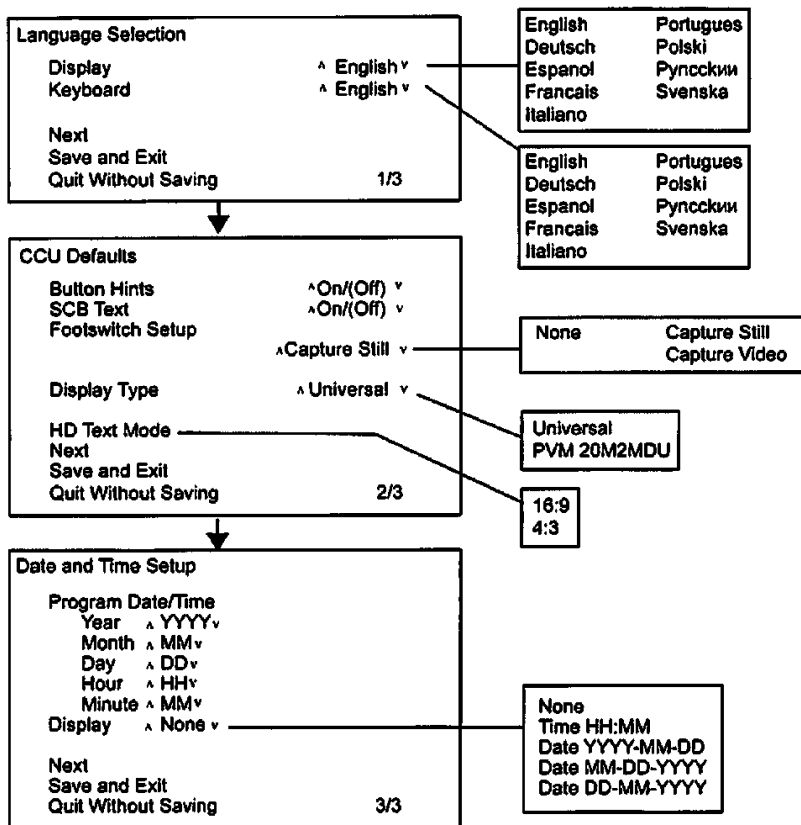
**NOTE:** For a complete definition of these options, please see "Operating Instructions - Description of Features/Options" section of this manual.

3. Once the desired option appears on-screen, press **ENTER**. Other *User Menu* items can be reset using the same method.

This is the last screen in the *Setup Wizard (Camera Head)*. To exit, highlight **Save and Exit** and press **ENTER**. All menus will disappear from the screen and the camera image will be restored. To make additional changes, highlight **Next** and press **ENTER** to scroll through *Setup Wizard (Camera Head)* screens.

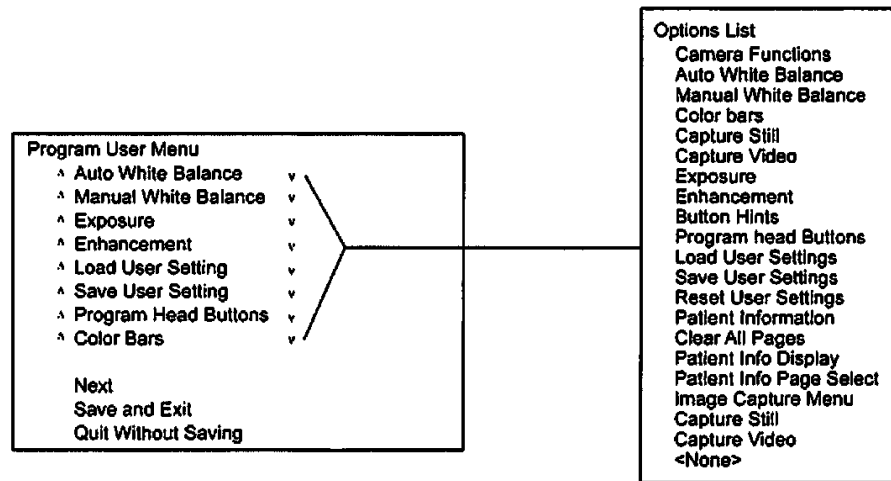
## Setup Wizard (CCU)

To access: Press **[INS]** on keypad **[SHIFT] - [ENTER]** on keyboard or hold down center camera head button for 7 seconds.



## Setup Wizard (Camera Head)

To access: Press **[INS]** on keypad **[SHIFT] - [ENTER]** on keyboard or hold down center camera head button for 7 seconds.



## Customizing the camera - Options Menu - H3-M HD Microscope Head

```
Options Menu
Exit
Camera Functions...
Patient Information...

Setup Wizard (CCU) ▶
Setup Wizard (Camera Head) ▶
```

```
Options Menu
Exit
Camera Functions...
Patient Information...

Setup Wizard (CCU) ▶
Setup Wizard (Camera Head) ▶
```

### Options Menu access

Once the *Setup Wizards* functions have been set to the desired defaults, the *Options Menu* can be accessed to easily adjust or activate certain camera functions for a specific surgical case. If the camera is turned off and on again, the selected default settings from the *Setup Wizards* will be restored. The *Options Menu* also allows access to the Patient Information sub-menu.

To bring up the *Options Menu*, hold down the **[SHIFT]** key and press **[ENTER]** on the keyboard or hold down the camera head's center button for seven seconds or press the **[INS]** key on the keypad. The menu at left will appear.

To select an option, use the **↓** or **↑** keys to highlight this option and press **[ENTER]**.

Below is a description of each option and its operation.

### Options Menu

#### 1. Camera Functions

When selecting **Camera Functions**, the following menu will appear:

```
Camera Functions
Exit
Auto White Balance
Manual White Balance
Color Bars On/(Off)
Capture Still
Capture Video
Exposure ▶
Enhancement (Low) ▶
Button Hints On/(Off) ▶
Program Head Buttons ▶
Program Keypad Hot Buttons ▶
Load User Settings ▶
Save User Settings ▶
Reset User Settings ▶
Factory Default Reset ▶
```

1. Highlight a function from the following list:

**Auto White Balance:** Performs White Balance automatically.

**Manual White Balance:** Allows user adjustable White Balance.

**Color Bars:** Turns the color bars **On** or **Off**.

**Accessory 1:** Captures a still image and for use with a Karl Storz AIDA digital image and video capture device.

**Accessory 2:** Captures a video and for use with a Karl Storz AIDA digital image and video capture device.

**Exposure:** Selects mode, level, Brightness, save canned Mode =Auto, Auto + Peak, Manual Level = Min,1-15 , Max Brightness = 1-5

**Enhancement:** Off,Low, 1-5, High

**Button Hints:** On/Off

**Program Head Buttons:** Sets value of ▲ and ▼ buttons.

**Program Keypad Hot Buttons:** Sets value of /, \*, -, + as Hot Buttons.

**Load User Settings:** 1-8

**Save User Settings:** 1-8

**Reset User Settings:** 1-8

**Factory Defaults:** Yes/No, restores to original factory settings.

**Button Settings:** Sets both ▲ and ▼ head buttons simultaneously as follows:

**Default:** ▲ (value) ▼ (value)

**Program Head Buttons:** Sets the ▲ (Up button) and ▼ (Down button) on the camera head to control the following functions:

Camera Functions  
Auto White Balance  
Manual White Balance  
Color Bars  
Capture Still  
Capture Video  
Exposure  
Enhancement  
Button Hints  
Program Head Buttons  
Program Keypad Hot Buttons

Load User Settings  
Save User Settings  
Reset User Settings  
Patient Information  
Clear All Pages  
Patient Information Display  
Patient Information Page Select  
Edit Patient Information  
Image Capture Menu  
Capture Still  
Capture Video  
Print Now  
< none >

Only available if a keyboard is plugged into the CCU.

2. Press **ENTER** to select. For functions followed by a ▶, use the ↓ or ↑ to scroll through available options. Press **ENTER** when desired option is on-screen. Upon pressing **ENTER**, the menu will disappear and the camera image will re-appear on the monitor.

```
Options Menu
Exit
Camera Functions...
Patient Information...
Setup Wizard (CCU) ▶
Setup Wizard (Camera Head) ▶
```

### 2. Patient Information

**NOTE:** Patient Information option is not available unless an optional keyboard is plugged into the CCU.

When selecting Patient Information, the following menu will appear:

```
Patient Information
Exit
Patient Information Display On/(Off)
Patient Information Page Select (1) ▶
Clear All Pages
Edit Patient Information
```

1. Highlight a function from the following list:

**Patient Information Display:** The Patient Information screens should be On to enter, edit or view patient information. When turned On, two lines of patient information are available at the bottom of the screen.

**Patient Information Page Select:** To select one of ten pages available for patient information, scroll through the list of pages and select the desired page.

**Clear Patient Information:** Clears all stored text from patient information pages.

**Edit Patient Information:** When inputting or editing patient information, the keyboard becomes completely functional, including the following key assignments:

**INS key:** Toggles between *Overtyp*e (allows existing text to be typed over. Indicated by a flashing block cursor) and *Insert* (allows text to be inserted. Indicated by a flashing underscore cursor). **NOTE:** When the cursor reaches the last character of the last line, it will remain in the same position. Select "next page" (see below) to insert additional text.

**▲ or ▼ keys:** Moves cursor between line 1, line 2, and the menu below.

In the Edit Patient information screen, a menu is available at the bottom with options for:

**Next page:** Goes to next page.

**Previous page:** Returns to previous page.

**Exit:** Saves information and returns to live image.

2. Press **ENTER** to select.

3. For functions followed by a ▶, use the ↓ or ↑ to scroll through available options. Press **ENTER** when desired option is on-screen. Upon pressing **ENTER**, the menu will disappear and the camera image will re-appear on the monitor.

**NOTE:** ▲ or ▼ buttons on the camera head are not functional for menu operation while inputting or editing text.

**NOTE:** Patient Information pages are stored in the CCU and not the camera head. Therefore, if a new head is plugged into the CCU, the Patient Information text will remain.

```
Options Menu
Exit
Camera Functions...
Patient Information...
```

```
Setup Wizard (CCU) ▶
Setup Wizard (Camera Head) ▶
```

**4. Setup Wizards**

**Setup Wizards:** Take the user through a series of screens to set defaults, options, menus, head buttons, etc.  
For additional information, see "Customizing the Camera - Setup Wizards" section of this manual.

```
Options Menu
Exit .....
Camera Functions...
Patient Information...
```

```
Setup Wizard (CCU) ▶
Setup Wizard (Camera Head) ▶
```

**5. Exit**

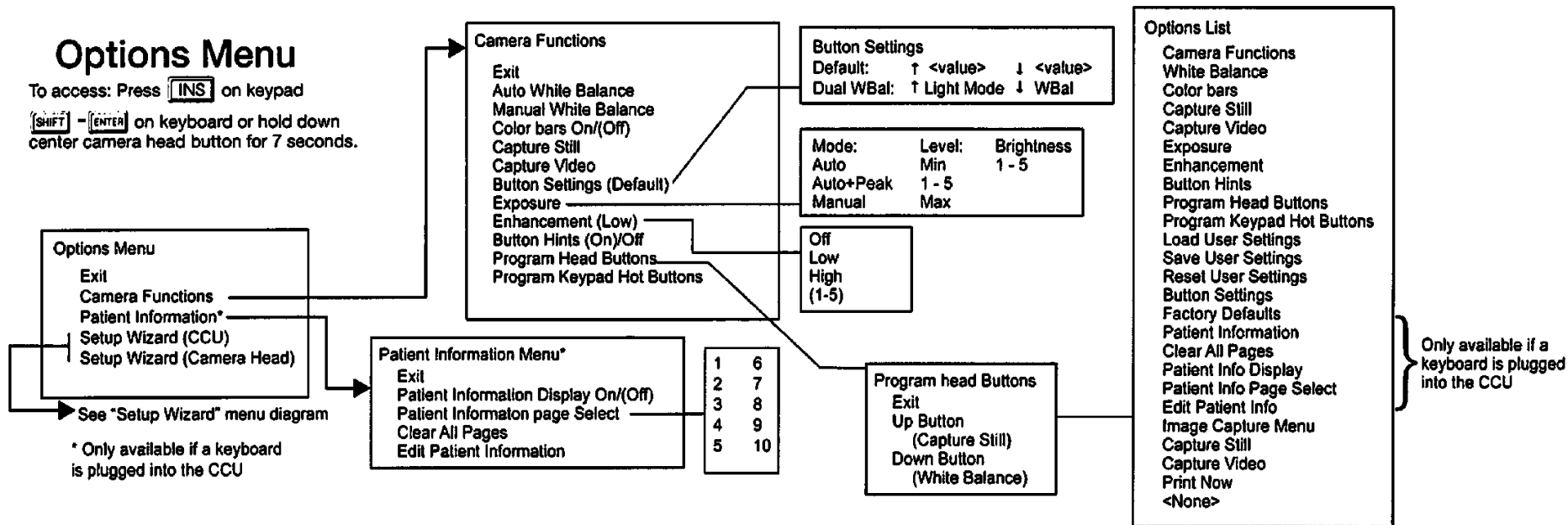
**Exit:** Removes the menu and restores the camera image to the monitor.



## Options Menu

To access: Press **[INS]** on keypad

**[SHIFT]** - **[ENTER]** on keyboard or hold down center camera head button for 7 seconds.



## Cleaning and Care - H3-M HD Microscope Head

**NOTE:** Use of the term "camera head assembly" means either a camera head assembly with integrated optical adaptor, a screw mount camera head with or without optical adaptor, or an optical adaptor by itself, as appropriate.

### Care and handling

To maximize the life of your camera, please follow the guidelines given below for proper handling and care of the camera head:



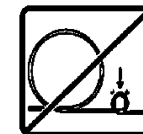
**DO NOT PLUG THE CAMERA HEAD CABLE INTO THE PROCESSOR RECEPTACLE IF IT IS WET.** Always ensure the connector is completely clean and free of debris. If moisture is present, dry thoroughly with sterile towel prior to insertion.



**DO NOT STORE THE CAMERA WITH CABLE COILED TIGHTLY OR GATHERED INTO FOLDS.** Always arrange the cable in loose coils of 6 inches (15 cm) or more in diameter.



**DO NOT PICK UP THE CAMERA HEAD ASSEMBLY BY ITS CABLE.** Always pick up the assembly by the camera head first, then provide secondary support for the cable and connector. The cable contains tiny electronic conductors and should be treated gently and carefully.



**DO NOT RAPIDLY PULL THE CABLE WHEN UNCOILING.** Harmful "kinks" can result. Always allow the cable to uncoil gently and loosely.



**DO NOT STORE CAMERA SYSTEM** in direct sunlight or excessive heat.



**DO NOT STEAM STERILIZE (AUTOCLAVE) ANY PART OF THE CAMERA HEAD OR ORIGINAL ADAPTER, UNLESS THE DEVICE IS SPECIFICALLY MARKED TO ALLOW STEAM STERILIZATION; IRREPERABLE DAMAGE WILL OCCUR.** Safely sterilize by ETO gas with temperature not exceeding 140° F (60° C) or by the STERIS or STERRAD methods, according to manufacturer's instructions. Alternatively, the camera head may be safely soaked in not greater than 2% Glutaraldehyde disinfection solution for no longer than 45 minutes.



**HANDLE THE SYSTEM WITH CARE,** avoiding extreme impacts to device. When transporting, use the original shipping box to prevent damage to the device.



**WHEN DRYING, DO NOT PULL THE CABLE, AS THIS MAY RESULT IN BUNCHING OF THE CABLE JACKET.**

### Cleaning, disinfection and sterilization guidelines

To ensure optimal reproduction of the endoscopic image, the light entrances and exits of the camera head assembly, light cable and endoscope must always be kept clean. Clean exposed faces with a cotton swab dipped in a neutral soap solution and wipe with a cotton swab soaked in alcohol.

**CAUTION:** Before and after disinfection or sterilization, inspect the camera head cable for breaks or cuts. Camera heads with damaged cables should NOT be disinfected or sterilized. A break or cut in the cable will allow fluid to enter the camera cable and cause damage. Return the damaged camera head to Karl Storz for repair.



**CAUTION:** Allowing buildup of disinfectant or sterilant to occur on the camera head card-edge connector can cause camera failure.



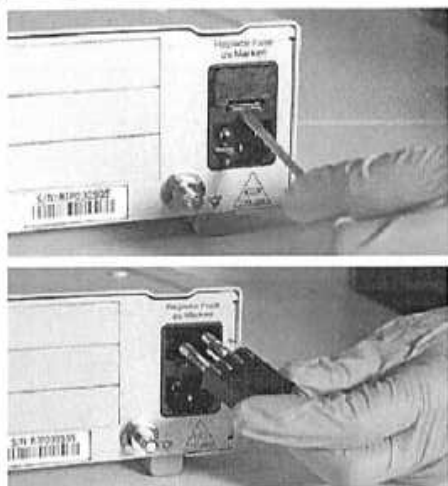
### Maintenance operations

Performance of preventive maintenance is not essential. Regular maintenance can, however, contribute to identifying potential problems before they become serious, thus enhancing the camera's reliability and extending its useful operating life. Maintenance services and information on maintenance contracts can be obtained from your local representative or from the manufacturer.



**WARNING:** To ensure safe operation of the video camera, you should perform the following procedures every 12 months:

1. Check leakage current from chassis <math>< 100\mu\text{A}</math>, single fault condition.
2. Check ground impedance <math>< 0.1</math> ohms.
3. Check power consumption  $\leq$  rated power.



### Fuse replacement

1. Switch off the CCU and remove the power plug from the electrical outlet.



**CAUTION:** Use only fuses approved to IEC 127 Sheet III, Type T for replacement.

2. Remove the power fuse holder with a screwdriver or other tool.
3. Insert new fuses of the appropriate rating.

**CAUTION:** Only use fuses of the correct rating.

	22200020/22201020 100-240 VAC
Power fuses	2 x T1.6 A

4. Replace the fuse holder.
5. Reconnect the power cord.
6. Test the camera system for proper operation.

## Returns, repairs, and warranty

### Return policy

A return merchandise authorization, in the form of a Sales Order number ("SO #"), or a Return Delivery number ("RD #") or a Return Merchandise Authorization number (RMA #) must be obtained from Karl Storz Endoscopy America's (KSEA) Customer Service Department prior to returning any products. When phoning or writing for such a return merchandise authorization, the Customer Service Representative must be provided with: (1) Customer name and number, as it appears on the invoice; (2) the telephone number and the person to contact; (3) the applicable P.O. number; (4) the Karl Storz catalog number and, if applicable, the serial number for each product; and, (5) the reason for the return. KSEA reserves the right to refuse or return (collect) any products sent back to KSEA without prior authorization of its Customer Service Department. Returns must be shipped pre-paid to KSEA, ATTN: SO number, RD number, or RMA number. KSEA's Customer Service Department will provide the return address and a SO#, RD#, or RMA#. Shipping charges will be reimbursed if the return was due to an error on the part of KSEA. When returning products, Customer should include a copy of the original invoice or packing slip to ensure prompt issuing of credit. Full credit will only be issued for products that are returned within 30 days of invoice date, and so long as such items are unused, in resaleable condition, and in the original, as well as undamaged, packaging. All products returned after 30 days from the date of invoice are subject to a 15% restocking fee. If the returned product requires refurbishing or repacking, and is accepted for credit, a service charge will be deducted from the amount of credit. The following products may not be returned for credit or exchanged: (1) products held longer than 90 days from invoice date; (2) sterile packaged products; (3) discontinued products; (4) instruments that are etched or engraved by Customer; (5) used instruments not in their original packaging; (6) products damaged by the Customer; and, (7) products purchased "as is" or as demo products.



**WARNING:** In order to prevent the transmission of disease to both hospital and Karl Storz personnel, when returning product for repair, the user must ensure the equipment being returned is clean and free from biohazards, including, but not limited to: human or animal blood, tissue or tissue fluids, or components thereof. Product must be disinfected/sterilized when appropriate.

KSEA reserves the right to return contaminated products to the Customer or to charge a "cleaning fee" to handle such products. Additionally, if any product becomes damaged and is not immediately returned, KSEA assumes no responsibility or liability for Customer's continued use of that damaged product. KSEA does not guarantee the performance, and may decline to repair or accept for repair/exchange, any product that has been repaired, modified and/or altered by any person or entity other than KSEA or an authorized repair facility of KSEA.

### Repairs

If repairs become necessary, for other than damages incurred during initial shipment (see "Shipping Damage" below), Customer must contact Karl Storz Endoscopy America (KSEA) to identify the reason for returning the product, and then carefully repack and ship the damaged product (freight prepaid) to KSEA, in accordance with KSEA's Return Policy, set forth above. Customer should describe, in writing, the damage and the apparent problem, along with the name of the person(s), who KSEA should contact to discuss the problem, and the address and telephone number of the facility. Warranty repairs will be made without charge (see "Warranty Policy" for covered repairs). All other repairs are subject to KSEA's standard repair charges. If requested, Customer will be advised of the estimated cost of the repair work before it is undertaken.

*Karl Storz reserves the right to make engineering modifications in the interest of promoting technological progress and generating performance improvements without obligation on our part to submit prior notice thereof. Please contact your Karl Storz sales representative for information on engineering modifications performed.*

### Shipping damage

Although all Karl Storz products are carefully packed to minimize in-transit damage, all shipments should be carefully examined upon receipt. If a product is damaged, Customer must promptly document the nature and extent of the damage and contact the carrier. If concealed loss or damage is discovered, Customer must retain all packing materials and immediately notify the carrier, requesting an inspection. This is essential and must be done within seven (7) days of delivery. If shipments are received short, Customer must contact the carrier and Karl Storz Endoscopy America's (KSEA) Customer Service Department at once. KSEA reserves the right to make partial shipments on any Order. Invoice(s) for partial shipments are payable upon receipt.

## Returns, repairs, and warranty

### Warranty policy

The Image 1 CCU is warranted to be free from defects in workmanship and materials for two (2) years from date of sale. With regard to other Image 1 system components, except as otherwise provided herein and/or by the applicable warranty information for a specific product or type of product, all Karl Storz branded products are generally warranted to be free from defects in workmanship and materials for one (1) year from date of sale. However, since some products carry a longer or shorter warranty period, Customer should check all product specific literature for the exact warranty period. Any such products with a defect, occurring during the applicable warranty period, will be promptly replaced, or at the discretion of Karl Storz Endoscopy America (KSEA), repaired, at no charge to the Customer. KSEA is not liable, directly or by way of indemnity, either expressly or impliedly, for (1) any damages which might arise or be caused, whether by the Customer or by any users of the products, as a result of, connected with, to the extent of or otherwise attributable to: (a) misuse, mishandling and/or improper operation; (b) repairs, servicing, modifications or alterations performed by any person or entity, other than KSEA or an authorized repair facility of KSEA; (c) use in combination with adaptors and/or equipment from other manufacturers or, (d) use in any manner or in a medical procedure, other than those for which such product is labeled, designed and is otherwise intended to be used; and, (2) any special, incidental, consequential, punitive, exemplary or other damages, including but not limited to alleged damages for delayed shipment, product failure, product design or production, loss of future business, or from any other cause, whatsoever, whether based on breach of contract, warranty, tort, strict or products liability, infringement of patents, trade secrets, trademarks, copyrights, or other proprietary rights or legal theory, in connection with or arising from the purchase, sale, lease, rental, installation or use of such Karl Storz products or with respect to the within terms and conditions. **THIS WARRANTY IS IN LIEU OF ALL OTHER WARRANTIES, EXPRESS, IMPLIED AND/OR STATUTORY, INCLUDING, BUT NOT LIMITED TO WARRANTIES OF MERCHANTABILITY, FITNESS AND/OR OF SUITABILITY FOR A PARTICULAR PURPOSE, WITH RESPECT TO ALL KARL STORZ PRODUCTS OR SERVICES, INCLUDING ANY PATENTS OR TECHNOLOGY RELATIVE THERETO. ANY AND ALL OTHER WARRANTIES, REPRESENTATIONS AND/OR GUARANTEES, OF ANY TYPE, NATURE OR EXTENT, BE IT IMPLIED, EXPRESS AND/OR WHETHER ARISING UNDER OR AS A RESULT OF ANY STATUTE, LAW, COMMERCIAL USAGE, CUSTOM, TRADE OR OTHERWISE, ARE HEREBY EXPRESSLY EXCLUDED AND DISCLAIMED.** KSEA neither assumes, nor authorizes any person to assume for it, any other liabilities in conjunction with and/or related to the sale and/or use of its products. To ensure proper use, handling and care of Karl Storz products, Customer should consult the applicable catalog, brochure, instruction manual, teaching [demonstration] film and other product literature which is included with the product or otherwise available from KSEA at no charge, upon request. Repairs, modifications or alterations of Karl Storz products, performed by any person or entity other than by KSEA or an authorized repair facility of KSEA, nullifies and otherwise voids all applicable Karl Storz warranties. This "Warranty Policy" is only for the benefit of the original Customer and is not transferable or assignable by Customer.

## Technical assistance

### Technical phone assistance

For Karl Storz Technical Assistance, call 1-800-421-0837 in the U.S., or contact your Karl Storz Sales Representative.

### Troubleshooting

**NOTE:** The picture quality of the camera is dependent upon optimal light conduction. To guarantee the best possible light conduction, make sure that the light entrances and exits of the endoscope, light cable, and camera head assembly are always kept clean.

Symptom	Possible causes	Remedy
Camera system will not switch on	No power from power line. Defective power fuse. Power cord is not properly connected to power cord connector.	Check that there is electricity to the wall outlet. Exchange fuses. Push power cord firmly into power cord connector.
No picture	No connection between video-out of CCU and monitor. Camera head cable connector is not inserted completely into receptacle. Defect in camera electronics. Defective monitor.	Check video cable connection, and if necessary, change cables. Reinsert camera head cable connector into receptacle. Send camera/CCU in for repair. Check monitor.
Dark picture	Too little light due to: - soiled lens - defective light cable - defective light conductor of the telescope (Signal amplifier of the camera also amplified HF interference signal when there is too little light).	Clean the endoscope. Exchange light cable or endoscope.
Blurred picture, streaks, smears, etc.	Optics or lens of the endoscope or camera soiled.	Clean with cotton swab and alcohol solution.
Inaccurate color reproduction	White balance adjustment faulty. Color adjuster on monitor is not adjusted properly. Defective monitor or camera.	Repeat white balance adjustment. Inspect monitor using instruction manual. Send equipment in for repair.
Color reproduction changes	Camera head cable is broken.	Send equipment in for repair to have camera head cable replaced.
Interference of the video image when activating electrosurgical unit (ESU) during procedure	The camera head cable and ESU cable are too close together or wrapped around one another. The camera control box and the ESU are too close together. The camera control box and the ESU are plugged into the same power circuit.	Separate the camera head cable and ESU cable. If it is desired to minimize cable "clutter" in the sterile field, clip the camera head cable and the ESU cable together at one single point versus wrapping around each other. Separate the camera control box and the ESU. Plug the camera control box and the ESU into different power circuits.

## Technical description

### Technical specifications

Technical Data for Image 1 CCU in use with	Single CCD Head, Zoom, NTSC, CE for MDD	Single CCD Head, Zoom, PAL, CE for MDD	Three CCD Head, Zoom, NTSC, CE for MDD	Three CCD Head, Zoom, PAL, CE for MDD	H3-Z HD Head Zoom, CE for MDD 50Hz & 60Hz
Karl Storz Image 1 Head Part #	22210130-X	22210030-X	22220130-X	22220030-X	22220055-X
CCU, Image 1, CE for MDD	22200020-1XX CCU, Image 1, NTSC and PAL				22201020-1XX CCU, Image 1, HD
Image Sensor	1/4"				1/3"
Picture Format	NTSC	PAL	NTSC	PAL	50Hz & 60Hz
HD Video Output					1920 x 1080p
Picture Elements	380 k	440 k	380 k	440 k	
Horizontal Resolution	≥ 500		≥ 700		
Signal to Noise Ratio	≥ 54dB		≥ 60dB		
Auto Exposure	microprocessor controlled				
White Balance Range	1900-6900K		1900-8700K		
Dynamic Range	10 bits				
Minimum Sensitivity	3 lux		1.3 lux		
Internal Lens	Parfocal 2:1 optical zoom				
Focal Length	14.5 – 28 mm				14.0 – 29.6 mm
Instrument Coupling	Per DIN 58105 (standard)				
Video Outputs	Composite Video Output (BNC) S-Video Outputs (2x Y/C connectors, 4 pin mini DIN) RGB Output (15 pin high density D connector)				HD-DVI (2)
CCU Inputs	Keyboard Input (5 pin DIN)				
Serial Port I/O	RJ-11				
Data Port I/O	RJ-45				
USB/USB-A (2)					
SCB I/O	6 pin Mini DIN (2X)				
Storage Conditions	Ambient Temperature: 14° to 140° F (-10° to 60° C) Humidity: 20 to 80% (non-condensing) Atmospheric Pressure: 50 kPa to 106 kPa				
Operating Temperature	41° – 95° F (5° – 35° C)				
Fuse	2 x T1.6A 250V				
Power Supply Requirements	100–240 Vac				
Power Frequency Requirements	50/60 Hz				
Dimensions, CCU	12" x 12.5" x 3.5" (w x d x h) [30.5 x 31.8 x 8.9 cm]				
Weight, CCU	Approximately 6.8 lb. (3.1 Kg)				Approximately 8.2 lb. (3.7 Kg)
Dimensions, Head			Length: 4.4" (11.2cm) Height: 1.3" (3.3cm)	Length: 3.97" (11.4 cm) Height: 1.72" (4.4 cm) Width: 1.25" (3.2cm)	
Weight, Head (w/ 6" of cable)	6.5 oz (184g)		6.6 oz (189g)		9.2 oz (261g)
Aspect Ratio	4:3				16:9

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## Technical description

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### Equipment classification

Type of protection against moisture: Ordinary

Type of protection against electric shocks: Protection Class 1

Degree of protection against electric shocks: CF-type instrument  , defibrillation proof

Mode of operation: Continuous

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### Equipment test certificates

Type 22200020-1XX and 22201020-1XX equipment is certified and manufactured in accordance with EN 60601-1, EN 60601-2-18, UL 2601-1, CSA 22.2 No. 601.

CE marked equipment has been tested and found to comply with the EMC limits for Medical Devices for the Medical Device Directive 93/42/EEC (EN 60601-1-2: 2001).

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### Technical documentation

On request, the manufacturer will provide those circuit diagrams, itemized parts listings, descriptions, sets of adjustment instructions, and other items of available documentation to suitably qualified user personnel duly authorized by the manufacturer for their use in repairing those components of the equipment that have been designated by their respective manufacturers as repairable.

Supply of such technical documentation relating to the CCU shall not be construed as constituting manufacturer's authorization of user's personnel, regardless of their levels of technical training, to open or repair the CCU. Explicitly exempted herefrom are those maintenance and repair operations described in this manual.

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### Software ownership and licensing

With respect to Karl Storz products containing software components, Customer has a non-exclusive, limited, non-transferable license to use the programmed logic, computer programs and/or software supplied by Karl Storz, in connection with, and incorporated into, Karl Storz Products System ("Software") internally, only in the form in which delivered to Customer and for the sole purpose of operating in accordance with Karl Storz's written instructions for such products sold to Customer (and for no other product). The Software, and all modifications, enhancements and upgrades thereto, will, at all times, remain the property of KSEA. Customer may not duplicate, copy, reverse-engineer, de-compile, or disassemble the Software or in any way modify the Software. Customer has no right to, and may not, create derivatives of the software, and Customer may not attempt to copy, create or re-create the source code of the Software. Any and all such modifications or enhancements to the Software by Customer, in contravention of this license, will immediately become the sole property of KSEA. Customer hereby acknowledges and agrees (i) that the purchase of Karl Storz products does not constitute a sale of the Software, (ii) that the Software is the property of Karl Storz, (iii) that Customer neither owns nor acquires any claim or intellectual property right in or to the Software, and (iv) Karl Storz retains all right, title, and interest in and to the Software, at all times, regardless of the form or media in or on which the original or other copies of the Software may exist. In the event of a failure of Customer, or its agents, employees or representatives, to comply with any terms and conditions of the License herein granted, the License will, without any further action by Karl Storz or any other party, immediately terminate.

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## Technical description

### Electromagnetic compatibility user information for Image 1 models 22200020-xxx and 22201020-xxx

**WARNING:** Medical Electrical Equipment needs special precautions regarding EMC and needs to be installed and put into service according to the Electromagnetic Compatibility [EMC] information provided in this Instruction Manual.

**WARNING:** It is prudent to separate all electrical equipment that is very close in distance to the Image 1 models 22200020-xxx and 22201020-xxx. If it is essential to use the Image 1 models 22200020-xxx and 22201020-xxx very close to other electrical equipment, it is prudent to determine, by observation, if the performance of either product is affected by unintended electromagnetic coupling.

**WARNING:** The Image 1 models 22200020-xxx and 22201020-xxx are intended for use by healthcare professionals only. This is a CISPR Class A medical [equipment / system]. In a domestic environment the Image 1 models 22200020-xxx and 22201020-xxx may cause radio interference, in which case it may be necessary to take adequate mitigation measures, such as re-orienting, relocating, or shielding the Image 1 models 22200020-xxx and 22201020-xxx or filtering the connection to the public mains network.

**NOTE:** The EMC tables and other guidelines that are included in the Instruction Manual provide information to the customer or user that is essential in determining the suitability of the Equipment or System for the Electromagnetic Environment of use, and in managing the Electromagnetic Environment of use to permit the Equipment or System to perform its intended use without disturbing other Equipment and Systems or non-medical electrical equipment.

**NOTE:** CE marked equipment has been tested and found to comply with the EMC limits for the Medical Device Directive 93/32/EEC [EN 55011 Class A and EN 60601-1-2:2001].

These limits are designed to provide reasonable protection against harmful interference in a typical medical installation. The 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 other devices in the vicinity. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference with other devices, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving device
- Increase the separation between the equipment
- Connect the equipment into an outlet on a circuit different from that to which the other device(s) is connected
- Consult the manufacturer or field service technician for help.

**WARNING:** The use of portable and mobile RF equipment may have impact on this and other pieces of medical equipment.

**WARNING:** The use of an accessory or cable with the Image 1 models 22200020-xxx and 22201020-xxx other than those specified in this manual may result in increased emissions or decreased immunity of the Image 1 models 22200020-xxx and 22201020-xxx. Also, by using an accessory or cable with Image 1 models 22200020-xxx and 22201020-xxx other than those specified in this manual it becomes the responsibility of the user of the Image 1 models 22200020-xxx and 22201020-xxx to determine compliance with EN 60601-1-2:2001 when using this item.

Table 200				
System cables and maximum lengths used for EMC compliance				
Cable type	Shielded	Max length [m]	Ferrite	Used for
Y/C [S-video]	Yes	1.8	No	Interconnection of S-video signals
BNC to BNC	Yes	1.8	No	Interconnection of Composite or SDI video signals
BNC to RGB Video	Yes	1.8	No	Interconnection of RGB signals
4 Pin Mini DIN	Yes	1.8	No	Interconnection of SCB signals
1394 Firewire	Yes	4.5	No	Interconnection of DV signals
AC Power Cord	No	3	No	Connection of Device to AC mains
USB	No	1.8	No	Connection to USB printer or storage device

Table 201		
Guidance and manufacturer's declaration – electromagnetic emissions		
<p>The Image 1 models 22200020-xxx and 22201020-xxx are intended for use in the electromagnetic environment specified below. The customer or user of the Image 1 models 22200020-xxx and 22201020-xxx should assure that they are used in such an environment.</p>		
Emissions test	Compliance	Electromagnetic enforcement – guidance
RF Emissions CISPR 11	Group 1	<p>The Image 1 models 22200020-xxx and 22201020-xxx use RF energy only for its internal function. Therefore, its RF emissions are very low and are not likely to cause interference in nearby electronic equipment.</p> <p>The Image 1 models 22200020-xxx and 22201020-xxx are suitable for use in all establishments other than domestic and those directly connected to the public low voltage power supply network that supplies buildings used for domestic purposes.</p>
RF Emissions CISPR 11	Class A	
Harmonic emissions IEC 61000-3-2	Class A	
Voltage fluctuations/ flicker emissions IEC 61000-3-3	Complies	

**Technical description**

**Table 202**

**Guidance and manufacturer's declaration—electromagnetic immunity**

The Image 1 models 22200020-xxx and 22201020-xxx are intended for use in the electromagnetic environment specified below. The customer or user of the Image 1 models 22200020-xxx and 22201020-xxx should assure that they are used in such an environment.


Immunity test	IEC 60601 test level	Compliance level	Electromagnetic environment - guidance
Electrostatic Discharge (ESD) IEC 61000-4-2	±6kV contact ±8kV air	±6kV contact ±8kV air	Floors should be wood, concrete or ceramic tile. If floors are covered with synthetic material, the relative humidity should be at least 30%.
Electrical Fast Transient/burst IEC 61000-4-4	±2kV for power supply lines ±1kV for input/output lines	±2kV for power supply lines ±1kV for input/output lines	Mains power quality should be that of a typical commercial or hospital environment.
Surge IEC 61000-4-5	±1kV differential mode ±2kV common mode	±1kV differential mode ±2kV common mode	Mains power quality should be that of a typical commercial or hospital environment.
Voltage dips, short interruptions and voltage variations on power supply input lines IEC 61000-4-11	<5% <i>UT</i> (>95% dip in <i>UT</i> ) for 0.5 cycle  40% <i>UT</i> (60% dip in <i>UT</i> ) for 5 cycles  70% <i>UT</i> (30% dip in <i>UT</i> ) for 25 cycles  5% <i>UT</i> (>95% dip in <i>UT</i> ) for 5 sec	<5% <i>UT</i> (>95% dip in <i>UT</i> ) for 0.5 cycle  40% <i>UT</i> (60% dip in <i>UT</i> ) for 5 cycles  70% <i>UT</i> (30% dip in <i>UT</i> ) for 25 cycles  5% <i>UT</i> (>95% dip in <i>UT</i> ) for 5 sec	Mains power quality should be that of a typical commercial or hospital environment. If the user of the Image 1 models 22200020-xxx and 22201020-xxx require continued operation during power mains interruptions, it is recommended that the Image 1 models 22200020-xxx and 22201020-xxx be powered from an uninterruptible power supply or a battery.
Power Frequency (50/60Hz) magnetic field IEC 61000-4-8	3A/m	3A/m	Power frequency magnetic fields should be at levels characteristic of a typical location in a typical commercial or hospital environment.

**NOTE:** *UT* is the a.c. mains voltage prior to application of the test level.

**Table 204**

**Guidance and manufacturer's declaration – electromagnetic immunity**

The Image 1 models 22200020-xxx and 22201020-xxx are intended for use in the electromagnetic environment specified below. The customer or user of the Image 1 models 22200020-xxx and 22201020-xxx should assure that they are used in such an environment.

Immunity test	IEC 60601 test level	Compliance level	Electromagnetic environment – guidance
<p>Conducted RF IEC 61000-4-6</p> <p>Radiated RF IEC 61000-4-3</p>	<p>3 Vrms 150 kHz to 80 MHz</p> <p>3 V/m 80 MHz to 2.5 GHz</p>	<p>3 Volt</p> <p>3 V/m</p>	<p>Portable and mobile RF communications equipment should be used no closer to any part of the Image 1 models 22200020-xxx and 22201020-xxx, including cables, than the recommended separation distance calculated from the equation applicable to the frequency of the transmitter.</p> <p>Recommended separation distance</p> $d = 1.17 \sqrt{P}$ <p><math>d = 1.17 \sqrt{P}</math> 80 MHz to 800 MHz</p> <p><math>d = 2.33 \sqrt{P}</math> 800 MHz to 2.5GHz</p> <p>Where <math>P</math> is the maximum output power rating of the transmitter in watts [W] according to the transmitter manufacturer and <math>d</math> is the recommended separation in meters [m].</p> <p>Field strengths from fixed RF transmitters, as determined by an electromagnetic site survey,<sup>a</sup> should be less than the compliance level in each frequency range.<sup>b</sup></p> <p>Interference may occur in the vicinity of equipment marked with the following symbol:</p> 

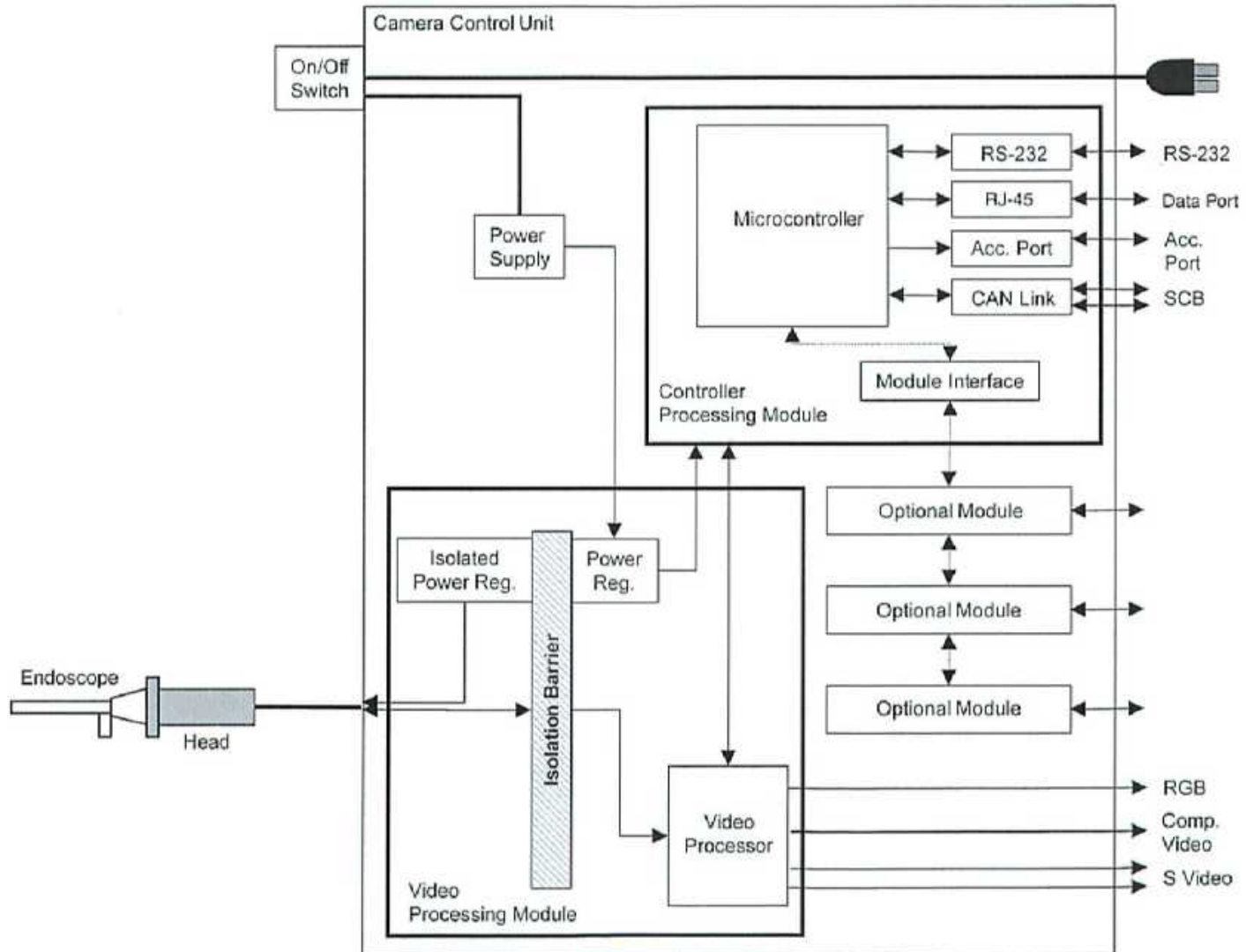
**NOTE 1:** At 80 MHz and 800 MHz, the higher frequency range applies.

**NOTE 2:** These guidelines may not apply in all situations. Electromagnetic propagation is affected by absorption and reflection by structures, objects and people.

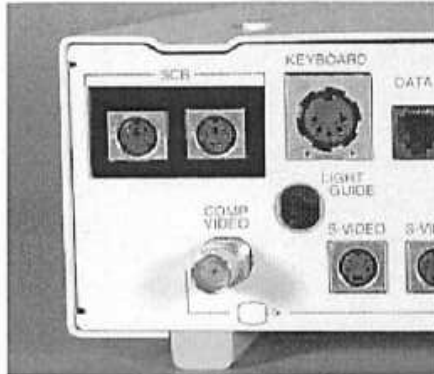
<sup>a</sup> Field strengths from fixed transmitters, such as base stations for radio [cellular/cordless] telephones and land mobile radios, amateur radio, AM and FM radio broadcast and TV broadcast cannot be predicted theoretically with accuracy. To access the electromagnetic environment due to fixed RF transmitters, an electromagnetic site survey should be considered. If the measured field strength in the location in which the Image 1 Video System is used exceeds the applicable RF compliance level, above, the Image 1 Video System should be observed to verify normal operation. If abnormal performance is observed, additional measures may be necessary, such as reorienting or relocating the Image 1 Video System.

<sup>b</sup> Over the frequency range 150 kHz to 80 MHz, field strengths should be less than 3 V/m.

General circuit diagram



## Karl Storz Communication Bus (SCB)



### General information

The Image 1 CCU has been designed to incorporate a Karl Storz Communication Bus (SCB) system. This SCB system is based on a serial communication interface between the Karl Storz devices. This SCB interface, in conjunction with SCB input/output devices, permits the parameters of the SCB devices connected to be displayed centrally and remotely controlled, even from the sterile area.

Image 1 CCUs are shipped with a 2', 6 pin mini DIN cable, and a "Karl Storz Communication Bus (SCB) - System Manual" (IM-SCB-XX).

### Warnings and cautions

In addition to the Warnings and Cautions in this manual, refer also to all Warnings and Cautions in the "Karl Storz Communication Bus (SCB) - System Manual" (IM-SCB-XX). In order to assure the safest, most effective use of this Karl Storz product, it is essential that you read the entire "Karl Storz Communication Bus (SCB) - System Manual" before attempting to utilize the SCB.

### Installation and operating instructions

Refer to the "Karl Storz Communication Bus (SCB) - System Manual" (IM-SCB-XX) for installation and operation of your Image 1 camera with the Karl Storz Communication Bus.

