

HAYDEN MEDICAL

Standard Endoscopic Camera System

405-463CS

User Manual & Troubleshooting Guide



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1. Introduction

Thank you for choosing the Hayden Medical Standard Endoscopic Camera System (405-463CS). This manual provides the information necessary to safely set up, operate, maintain, and troubleshoot the system. It includes an overview of system components and controls, installation and operating instructions, video recording, cleaning and care, and operator-level troubleshooting procedures.

Please read this manual carefully before operating the system and retain it for future reference. For issues that cannot be resolved using the procedures provided, contact Hayden Medical or an authorized service provider.

IMPORTANT: Internal repairs, electrical testing, circuit-board inspection, component replacement, software programming, and other service procedures must only be performed by qualified and authorized service personnel. Do not open the system enclosure or attempt to access internal components.

2. Important Safety Information

2.1 General Safety

- Ensure the system is placed on a stable, flat, dry surface.
- Make sure the power cord is properly connected.
- Ensure the ventilation openings are not blocked.
- Keep the system away from excessive moisture and liquids.
- Inspect cables and connectors for visible damage before use.
- Do not operate the equipment if the power cord, camera cable, or other critical components appear damaged.
- Do not attempt to open the equipment enclosure.
- Do not attempt to repair or modify internal components.
- Do not perform electrical measurements inside the equipment.

2.2 Service and Repairs

If troubleshooting does not resolve a problem, contact your authorized Hayden Medical service provider. Do not remove the housing or attempt to access internal circuit boards, power supplies, wiring, or other internal components.

2.3 Patient Heat Considerations

For smaller patients, particularly those weighing less than **5 kg (11 lb)**, heat transmitted through the endoscope may be more noticeable and may potentially cause discomfort or thermal injury.

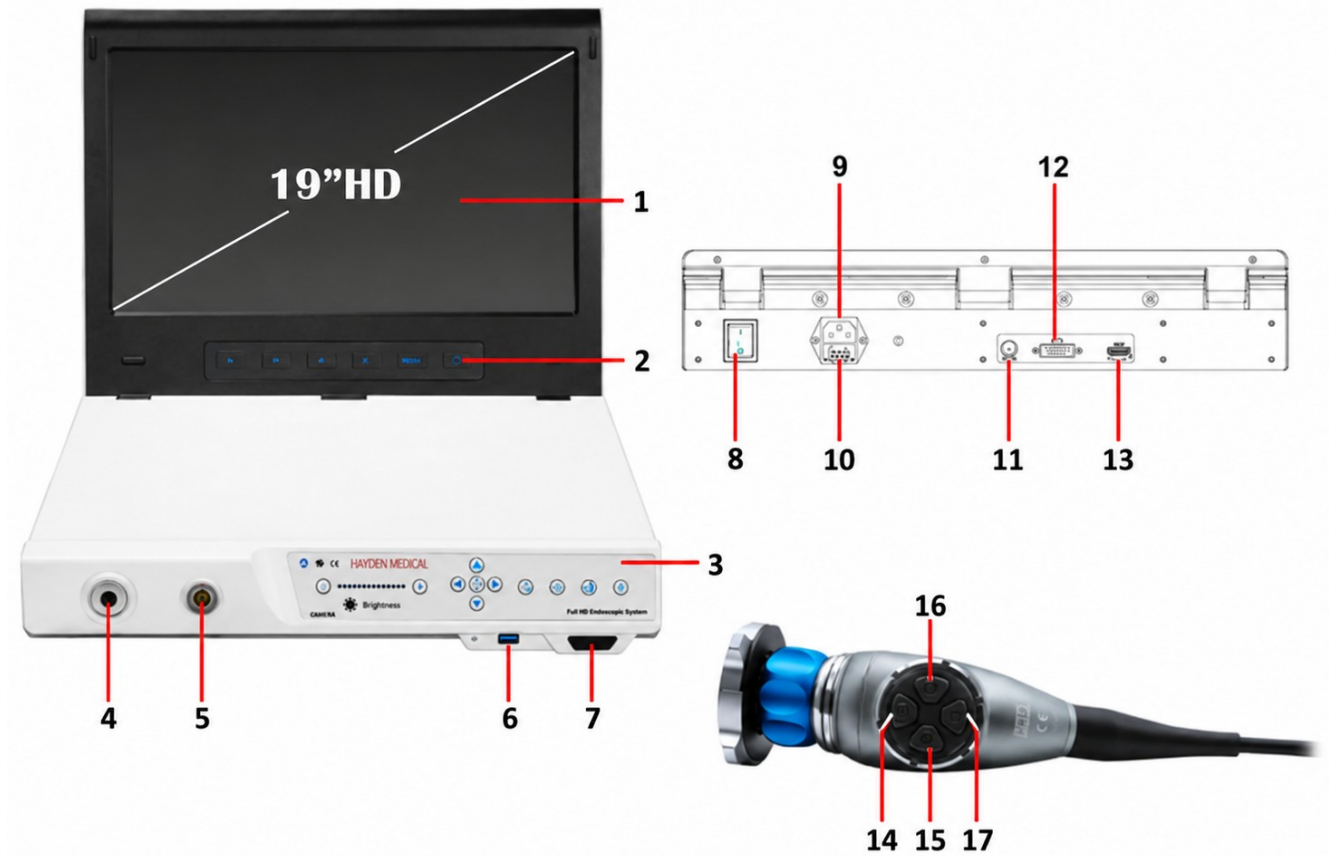
Reduce light-source intensity when appropriate and periodically monitor the temperature of the endoscope tip during prolonged procedures.

WARNING: If the endoscope tip temperature exceeds **41°C (105.8°F)**, immediately reduce the light-source intensity or suspend use and allow the endoscope to cool before continuing.

3. System Overview

The Endoscopic Camera System consists of the main imaging unit, camera, light source connection, display, video outputs, and associated accessories.

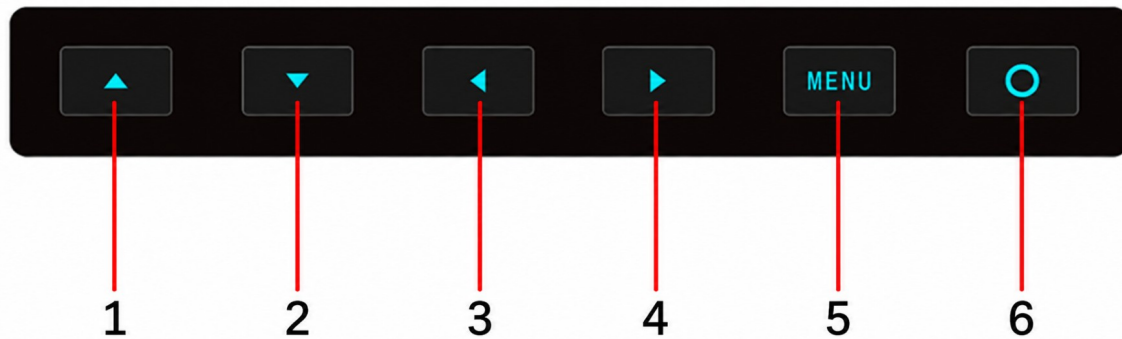
3.1 System Interface Functions



1. 19-inch HD Medical Monitor
2. Screen Operation Panel
3. Camera Operation Panel
4. LED Light Interface
5. Camera Interface
6. USB Interface
7. Power Switch
8. Power Supply Switch
9. Power Input (AC 100–240 V)

10. Fuse
11. CVBS
12. DVI
13. HDMI
14. Image Capture
15. Zoom In
16. Zoom Out
17. White Balance

3.2 Monitor Button Functions



- | | |
|----------------------|---|
| 1. Up | 4. Right (adjust monitor color pattern) |
| 2. Down | 5. Menu / Confirmation |
| 3. Left (not in use) | 6. Return |

3.3 Included Accessories

- | | |
|--------------------------|--------------|
| • Camera Unit | • HDMI Cable |
| • HD Camera Head | • USB Drive |
| • Fiberoptic Light Cable | • Spare Fuse |
| • Power Cable | |

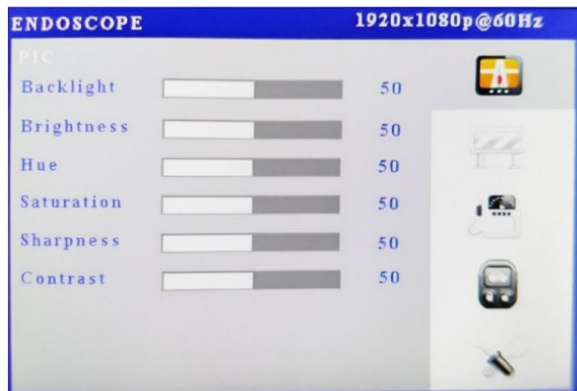
3.4 System Settings

The monitor interface provides controls for adjusting the displayed image and system settings. Available parameters include:

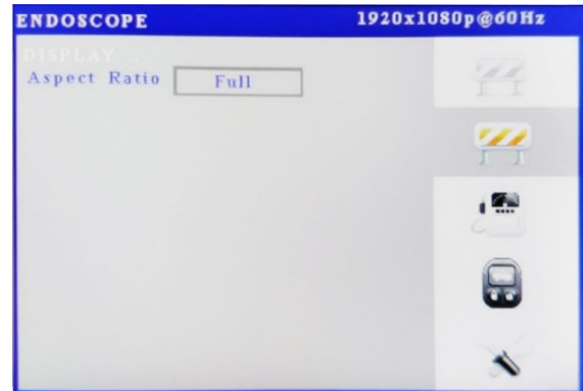
- | | |
|--------------|-----------------------|
| • Backlight | • Color Temperature |
| • Brightness | • Aspect Ratio |
| • Hue | • Language |
| • Saturation | • Update |
| • Sharpness | • Reset |
| • Contrast | • RGB/YPBPR selection |

Adjust these settings as required to obtain an appropriate image. Device parameters can be accessed at any time through the “Menu” button below the monitor screen.

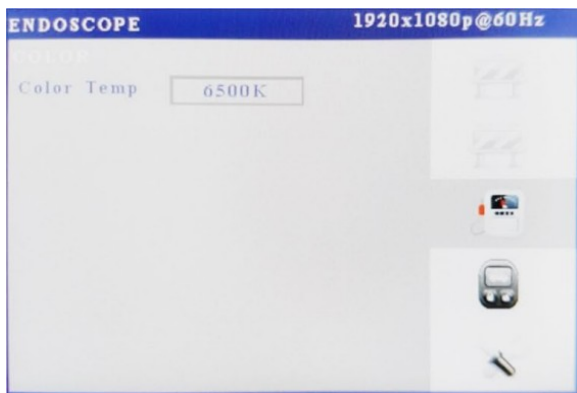
On-Screen Settings



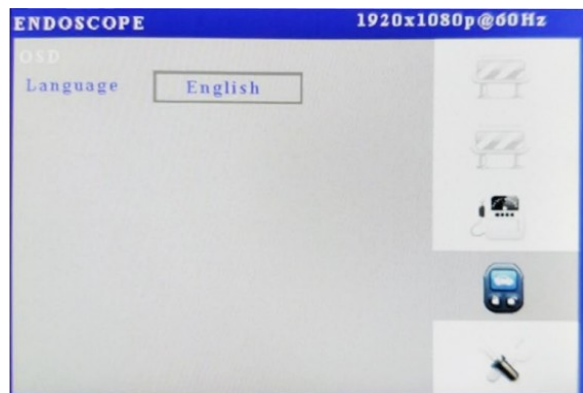
PIC menu



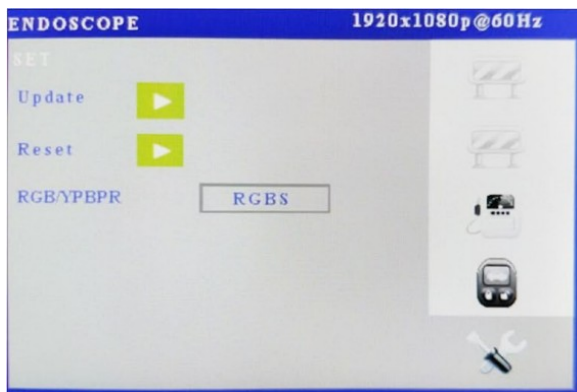
DISPLAY menu



COLOR menu



OSD menu



SET menu

4. Before Using the System

4.1 Check the System

- Make sure the power cable is connected.
- Verify that the camera is properly connected.
- Verify that the light guide is connected.
- Check the camera/light cable for visible damage.

4.2 Check the Camera and Endoscope

Inspect the camera and endoscope for:

- Dirt
- Mechanical damage
- Kinks
- Breaks
- Damaged connector pins
- Loose connection

If damage is found, discontinue use and contact your Hayden Medical service provider.

5. Installation and Setup

Before installation, verify that the main unit and all required accessories are present and undamaged.

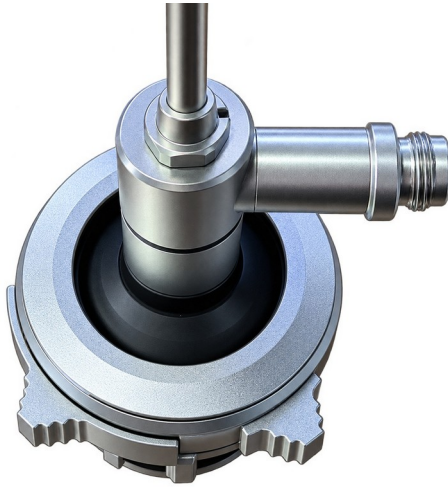
5.1 Component Connections



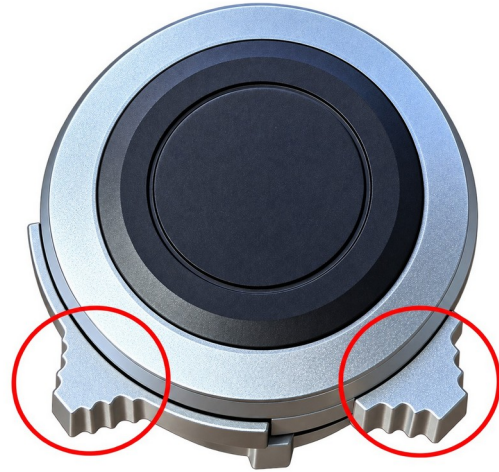
1. Place the main unit on a stable, level surface with adequate ventilation.
2. Remove the protective cap from the camera head cable.
3. When connecting the camera to the processor, align the corresponding red alignment marks before inserting the connector.
4. Connect the fiber-optic cable in the light source port.
5. Verify that all connections are secure.
6. Adjust the optical coupler focus until a clear image is obtained.

CAUTION: Do not twist, kink, crush, or subject the fiber-optic cable (or camera head cable) to heavy loads.

5.2 Attaching the Endoscope to the Camera Coupler



Endoscope inserted into the coupler



Textured release tabs (circled)

1. Locate the two textured release tabs on opposite sides of the camera coupler.
2. Pinch both tabs together to open the coupler's locking mechanism.
3. While holding the tabs, insert the endoscope eyepiece into the center of the coupler.
4. Release the tabs to secure the endoscope in place.

To prevent the endoscope from rotating:

5. Push both tabs outwards simultaneously. Although no visible movement may occur, this action helps tighten the connection.
6. Gently check that the endoscope is securely attached and does not rotate or move freely.

NOTE: Ensure the endoscope is properly secured before beginning a procedure. Do not force the connection.

6. Video Recording



1. Insert a compatible USB storage device into the USB port on the front panel. (Red rectangle)
2. Press the Record button to begin recording. (Red circle)
3. Verify that the indicator light turns green, confirming that recording is in progress.

4. Press the Record button again to stop recording.
5. Wait for the indicator light to flash three times, indicating that the video has been saved successfully.
6. Remove the USB storage device and connect it to a computer to access the recorded video.

7. Storage

When the system is not in use:

1. Turn off the system.
2. Disconnect the external power supply.
3. Cover the equipment with a protective cloth or dust cover, or store it in appropriate packaging.
4. Keep the equipment in a clean, dry location protected from excessive humidity and dust.
5. Protect the equipment from vibration, impact, rain, moisture, and mechanical shock.
6. For long-term storage, clean the equipment and store it in its original or other appropriate protective packaging.
7. During long-term storage, power on the system periodically, approximately once every two months.

8. Transportation

Handle the system carefully during transportation. Protect the equipment from:

- Moisture and rain
- Vibration
- Impact
- Compression
- Other mechanical damage

The equipment may be transported by air, road, or rail when appropriately packaged and protected.

9. Operator Level Troubleshooting

The following troubleshooting procedures may be performed by the system operator. Do not open the equipment enclosure while troubleshooting. If a problem cannot be resolved using the procedures below, contact your authorized Hayden Medical service provider.

9.1 System Will Not Turn On

Possible Causes

- Power cable is not properly connected.
- Incorrect power cable is being used.
- Power switch is not turned on.
- Fuse may require replacement.

Troubleshooting

1. Verify that the power cord is securely connected to the system.
2. Verify that the other end of the power cord is securely connected to the appropriate power outlet.
3. Make sure the main power switch is turned on.
4. Check whether the power indicator is illuminated.
5. If the power indicator remains off, disconnect the system from power and contact your authorized Hayden Medical service provider regarding the fuse.

9.2 Black Screen / No Image

If the system powers on but the display does not show an image, perform the following checks.

Step-by-Step

1. Verify that the camera is properly connected to the main unit.
2. Verify that the camera cable is fully inserted and does not appear damaged.
3. Confirm that the endoscope is properly connected to the camera.
4. Confirm that the light guide is properly connected.
5. Confirm that the display is receiving power and is set to the appropriate input, if applicable.
6. If the built-in display remains black, connect the system's video output to a known-good external medical monitor or compatible display.
7. If an image appears on the external monitor, the camera system is producing a video signal and the problem may be isolated to the built-in display or display path. Do not open the system; contact your authorized Hayden Medical service provider.
8. If there is no image on the external monitor, confirm the external monitor, video cable, camera, and camera cable are functioning and connected properly. If no image is produced, contact your authorized Hayden Medical service provider.

9.3 No Image From the Camera

Troubleshooting

1. Check the camera connection at the main unit.
2. Check the camera cable for visible damage.
3. Confirm that the camera is fully connected.
4. Confirm that the endoscope is properly connected.
5. Confirm that the light guide is properly connected.
6. Reconnect the appropriate external connections and restart the system.
7. If available, test the system with a known-good compatible camera.
8. If the system still does not display an image, contact your authorized Hayden Medical service provider.

9.4 Poor or Blurry Image

Possible Causes

- Focus has not been properly adjusted.
- The endoscope tip or optical connection is dirty.

Troubleshooting

1. Check the endoscope tip and optical surfaces for visible contamination.
2. Clean the appropriate external optical surface using clean gauze or the cleaning method specified for your endoscope.
3. Adjust the focus using the focus adjustment on the camera.
4. Verify the image again.
5. If the image remains blurry after cleaning and focusing, contact your Hayden Medical service provider.

9.5 Image Is Too Dark

Possible Causes

- Light guide is not properly connected.
- Light intensity is too low.
- Image parameters may need adjustment.

Troubleshooting

1. Verify that the light guide is properly connected to the endoscope.
2. Verify that the light source is turned on.
3. Increase the light-source brightness.
4. Check the image brightness settings.
5. Confirm that the endoscope is properly connected.
6. If the image remains unusually dark, contact your Hayden Medical service provider.

9.6 Image Is Too Bright

Troubleshooting

1. Reduce the light-source brightness.
2. Adjust the image brightness to an appropriate level.
3. If necessary, adjust the available image settings.
4. If the image remains excessively bright despite adjustment, contact your Hayden Medical service provider.

9.7 Incorrect Image Color

White Balance Procedure

1. Prepare a clean white surface or clean gauze appropriate for performing white balance.
2. Position the endoscope so that the image field is filled appropriately with the white reference surface.
3. Ensure that the endoscope tip is clean and free from colored substances.
4. Activate the camera's white-balance function.
5. Allow the system to complete the white-balance adjustment.
6. Verify the resulting image.
7. If the color remains incorrect after performing white balance, contact your Hayden Medical service provider.

9.8 Image Contains Noise or Interference

Possible Causes

- Cable wear or aging.
- Poor cable connection.
- Noise-reduction settings.
- Camera or system aging.

Troubleshooting

1. Check all externally accessible video and camera connections.
2. Make sure the cables are fully connected.
3. Inspect the cables for visible damage.
4. If available, try a known-good compatible cable.
5. Check the image/noise-reduction settings.
6. Restart the system.
7. If interference remains, contact your Hayden Medical service provider.

9.9 Video Recording or Image Capture Does Not Work

Troubleshooting

1. Verify that the live image displays normally.
2. Check the USB storage device.
3. Confirm that the storage device is functioning properly.
4. Confirm that the storage device is formatted as FAT32.
5. If possible, try another compatible USB storage device.
6. Reconnect the storage device and test image capture or recording.
7. If recording or image capture remains unavailable, contact your authorized Hayden Medical service provider.
8. Do not open the system or attempt to inspect or replace the internal video board.

9.10 System Is Running Hot

Troubleshooting

1. Turn off the system if necessary.
 2. Check the ventilation openings.
 3. Remove any objects blocking the ventilation openings.
 4. Make sure there is adequate space around the system for air circulation.
 5. Do not place the system directly against a wall or other object that blocks airflow.
 6. Allow the system to cool before continued operation if necessary.
 7. If the system continues to become unusually hot, discontinue use and contact your Hayden Medical service provider.
-

9.11 Power Indicator Is Not Illuminated

Troubleshooting

1. Verify that the power cord is connected.
 2. Verify that the power switch is turned on.
 3. Verify that the electrical outlet is functioning.
 4. If the fuse requires replacement, use only the specified fuse.
 5. If the power indicator remains off after these checks, contact your authorized Hayden Medical service provider.
 6. Do not open the system or inspect internal electrical components.
-

9.12 Factory Reset / System Freeze

Troubleshooting

1. If the system becomes unresponsive or displays an unrecognized fault condition, a factory reset may be available through the system controls.
2. Before performing a factory reset, save any required images or recordings.
3. Understand that system settings may return to their factory defaults.
4. Follow the operating instructions provided with your specific system.
5. If you do not want operators performing factory resets, contact your authorized Hayden Medical service provider instead.
6. If the system repeatedly freezes or displays an unrecognized fault code, contact your authorized Hayden Medical service provider.

10. External Monitor Troubleshooting Procedure

Use this procedure when the built-in screen is black or does not display an image.

10.1 What You Will Need

- A known-good compatible external monitor
 - Compatible video cable
 - Endoscopic camera system
 - Camera and associated accessories
-

10.2 Procedure

1. Turn on the endoscopic camera system and allow normal startup.
 2. Verify the camera connection.
 3. Verify that the external monitor is powered on and functioning properly.
 4. Connect the appropriate video output from the endoscopic camera system to the external monitor.
 5. Set the external monitor to the input corresponding to the connected video cable.
 6. Check whether the camera image appears on the external monitor.
-

10.3 Result A — Image Appears on External Monitor

The camera system is producing a video image. The problem may be isolated to the built-in display or display path. Do not open the system. Contact your authorized Hayden Medical service provider.

10.4 Result B — No Image Appears on External Monitor

1. Confirm that the external monitor is working.
 2. Confirm that the video cable is working.
 3. Confirm that the correct monitor input is selected.
 4. Confirm that the camera is connected.
 5. Confirm that the camera cable is properly connected.
 6. If available, test with another known-good compatible camera or cable.
 7. Restart the system.
 8. If no image is still produced, contact your authorized Hayden Medical service provider.
-

11. Camera and Cable Inspection

11.1 Camera Cable

Inspect the camera cable for:

- Cuts
- Cracks
- Kinks
- Broken insulation
- Loose connections
- Bent or damaged connector pins
- Dirt or contamination

11.2 Power Cable

Inspect the power cable for:

- Cuts
- Cracks
- Damaged insulation
- Kinks
- Breakage
- Loose connections

If damage is found, discontinue use and replace with an appropriate compatible replacement.

12. Cleaning and Basic Care

Clean the exterior surfaces of the main unit and camera using a degreased cotton pad dipped in 75% medical alcohol, with each wipe remaining on the surface for approximately 3 minutes.

1. Turn off the system.
 2. Disconnect the power supply when appropriate.
 3. Allow the equipment to cool if necessary.
 4. Use the cleaning/disinfection procedure specified for the applicable equipment and accessories.
 5. Prevent liquid from entering the equipment.
 6. Do not open the equipment during cleaning.
-

12.1 Equipment Care and Maintenance

Inspect the equipment regularly to ensure it remains in proper working condition.

- Inspect the power cord regularly. If damage or wear is identified, discontinue use and replace the damaged cord with an appropriate replacement.
 - Ensure the system is properly grounded.
 - Keep the equipment away from humid, dusty, or corrosive environments and protect it from corrosive gases and liquids.
 - After transporting or relocating the equipment, verify that all connections are secure before use.
 - Routine maintenance is recommended approximately once per month.
 - Do not direct the camera toward intense light sources, including direct sunlight or surgical lights operating at maximum intensity, because intense light may damage the imaging sensor.
-

13. Operating Environment

- Ambient temperature: 5°C to 35°C (41°F to 95°F)
 - Relative humidity: 20–95%, non-condensing
 - Atmospheric pressure: 86–106 kPa (25.4–31.3 inHg)
 - Power supply: AC 100–240 V, 50/60 Hz (USA: 120 V, 60 Hz; Europe: 230 V, 50 Hz)
 - Input power: ≤250 VA
 - Storage and transport: -10°C to 60°C (14°F to 140°F), 20–95% relative humidity
-

14. When to Contact Service

Contact your authorized Hayden Medical service provider if:

- The system will not power on after checking the power connection.
 - The built-in display remains black.
 - The external monitor produces no image.
 - The camera does not produce an image.
 - The image remains blurry after cleaning and focusing.
 - Image color remains incorrect after white balancing.
 - Image interference remains after checking cables and settings.
 - Recording or image capture does not work after checking the USB storage device.
 - The system becomes unusually hot.
 - The system repeatedly freezes.
 - A fault code repeatedly appears.
 - A cable or connector is damaged.
 - Any unusual behavior is observed.
-

15. Do Not Perform These Procedures

Do not:

- | | |
|---------------------------------------|---|
| • Open the system enclosure. | • Replace internal power supplies. |
| • Remove internal covers. | • Replace internal video boards. |
| • Access circuit boards. | • Modify internal wiring. |
| • Measure internal voltages. | • Reprogram the system's control board. |
| • Test internal power-supply outputs. | • Connect programming equipment to internal circuit boards. |
| • Disconnect internal wiring. | • Modify or bypass safety components. |
| • Short circuit internal terminals. | |

IMPORTANT: Internal diagnostic and repair procedures are reserved for qualified service personnel.

16. Service Information

When contacting service, have the following information available:

- Equipment model
- Serial number
- Description of the problem
- Date the problem was first noticed
- Any displayed error or fault code
- Whether the built-in display shows an image
- Whether an external monitor was tested
- Result of the external-monitor test
- Any relevant accessories or cables being used

17. Troubleshooting Quick Reference

Problem	First Things to Check	If Problem Remains
System will not turn on	Power cord, power switch, outlet, fuse	Contact service
Power indicator is off	Power connection and fuse	Contact service
Built-in screen is black	Camera connection, video connection, external monitor	Contact service
External monitor has image but built-in screen does not	Built-in display issue suspected	Contact service
No image on built-in or external monitor	Camera, camera cable, video cable, monitor	Contact service
Image is blurry	Clean endoscope tip, adjust focus	Contact service
Image is too dark	Light guide, light intensity, brightness setting	Contact service
Image is too bright	Reduce light intensity/brightness	Contact service
Incorrect colors	Perform white balance	Contact service
Image has noise/interference	Check cables and settings	Contact service
Recording doesn't work	Check USB storage/FAT32	Contact service
System gets unusually hot	Clear ventilation openings, maintain clearance	Contact service
System freezes	Factory reset, if authorized	Contact service
Fault code appears	Record the code and contact service	Contact service

18. Important Service Notice

This guide is intended for operator-level troubleshooting only.

The absence of a troubleshooting procedure from this guide does not mean that the equipment cannot be repaired. Internal diagnostic and repair procedures are intentionally excluded from this document and are reserved for qualified service personnel.

IMPORTANT: Do not open the equipment or attempt internal repairs.

If the troubleshooting procedures in this guide do not resolve the problem, discontinue use when appropriate and contact your authorized Hayden Medical service provider.

19. Use With Other Medical Equipment

- When the Endoscopic Camera System is used in combination with other medical electrical equipment, verify that all connected equipment meets applicable safety requirements, particularly requirements concerning leakage current.
 - Users must be familiar with the operation, performance, and safety precautions of all associated surgical instruments and equipment.
 - Appropriate contingency measures should be available in the event of equipment failure, including backup equipment or alternative procedures when necessary to maintain patient safety.
-

20. Electromagnetic Compatibility (EMC)

- This equipment requires appropriate electromagnetic compatibility precautions.
 - Portable and mobile RF communication equipment may interfere with system operation.
 - Use manufacturer-specified accessories, cables, and components. Use of non-approved components may increase electromagnetic emissions or reduce the electromagnetic immunity of the system.
 - Maintain appropriate separation from strong radio-frequency sources and other equipment capable of causing electromagnetic interference.
-

Contact & Support

For questions regarding the operation, maintenance, or troubleshooting of your camera system, please contact Hayden Medical. Our team is available to assist with product inquiries and technical support.

HAYDEN MEDICAL

Website: www.haydenmedical.com

Email: info@haydenmedical.com

Phone: (661) 296-7200

For additional product information and resources, please visit our website.