AMD-400s Camera & Illumination System
Table of Contents

AMD-400s Image & Illumination Source Overview.................................3
  System Components ........................................................................3
  Platform Box Front Panel .................................................................3
  Platform Box Rear Panel ................................................................4
  Light Guide Connections................................................................5
  Camera Cable ..................................................................................6
  Intended Use and Operation ..............................................................7

Installation .....................................................................................8
  Using the Camera ..........................................................................8
  Getting an Image ..........................................................................11
  Important Hints and Safety Notes ....................................................11

AMD-400s Trouble Shooting .............................................................13
  No Video ...................................................................................13
  No Illumination: ..........................................................................13
  If light is not bright enough: ..........................................................13
  Poor video quality .......................................................................14

Servicing the AMD-400s .................................................................15
  Cleaning/Sterilization .................................................................16
  Warranty, Service and Repair .......................................................17
  Spare Parts ................................................................................18
  Changing the camera’s light bulb ...................................................19
  Replacing the Camera’s Fuses ......................................................22

Amd-400s Product Specifications .....................................................25
  Power Supply Safety Ratings .......................................................25
AMD-400s Image & Illumination Source Overview

The AMD-400s Image and Illumination Source is a combination of a light source and a compact camera. It consists of the base unit with exchangeable light guide connections and a camera head. It drives a wide variety of diagnostic scopes and produces the superior quality images you need for accurate diagnosis. Examination scopes supported by the AMD-400s unit include: ENT/otoscope, direct ophthalmoscope, dermascope, nasopharyngoscope and laparoscopes.

System Components

Figure 1 shows the four components of the AMD-400s system

Platform Box Front Panel

1. **Light Guide:** Sets the White Balance for the viewing scene. It is very important to reset the White Balance anytime there is a change in the Imaging and Illumination System set up, especially after a lamp change and/or scope change.

2. **Diaphragm:** This controls the brightness of the image and it can be adjusted by turning the control.

3. **Camera Cable:** Video signals are transmitted by the camera cable. The video signal then is available at the camera outputs for monitor, video recorder, video printer or PC connection.

4. **Power Switch:** Controls Power to the Platform Box and integrated light source as well as the camera head. When the switch is in the ON position, the metal halide lamp will ignite. (See Trouble Shooting Guide for further information).
1. **Label:** Schoelly label and CE mark
2. **Remote:** Connector for remote to control video printer
3. **S-Video:** Plug for video out (Y/C)
4. **Bonding Connector:** Equipment ground
5. **Mains Connection:** Power cord plug
6. **USB 2.0:** Digital Output
7. **Connection Video Out:** FBAS
Light Guide Connections

1. **Locking for Scope Ocular** - Locks Scope securely into place
2. **Focusing Ring** - Used in focusing the scope for clarity of the image
3. **White Balance/Window Function** - Press the white balance function to whiten image
4. **Remote Function** - Controls an image on a video printer.

Light guide connection for Storz-compatible light guide is part of the base equipment.
**Camera Cable**

1. **Camera Head:** Its plastic construction is designed to be lightweight and durable to meet the broad spectrum of endoscopic applications, from general surgery to ENT to orthopedic to office diagnostics.

2. **Cable:** The cable assembly consists of illumination fibers and electronic wires housed within a stainless steel monocoil and covered with a durable neoprene outer sheathing to resist crushing.

3. **Camera Connector:** Simply align the connector with the port, and insert the connector firmly into the AMD-400s. To uncouple, grasp the knurled ring on the connector, pull it back away from the platform box and withdraw the cable from the port.
**Intended Use and Operation**

The light source and camera unit provides illumination and visualization for medical and industrial applications such as endoscopy, laboratory diagnosis, non-destructive material testing. Preferably to be used with rigid or flexible endoscopes.

The AMD-400s is a combination of a light source and a compact camera. The light source and compact camera are turned on by the power switch. The brightness of the light can be adjusted by using the diaphragm.

The image of operation field is optically realized by the endoscope and projected to the CCD sensor through the endo objective and then is turned into electrical signals and amplified. The image brightness is adjusted automatically depending on the light intensity.

The video signals are transmitted by camera cable. The video signal is available at the camera outputs for monitor, video recorder, video printer or PC connection.

**Accessories**

The light source is able to be used with light guides of different manufacturers respectively with light guides which are compatible to other brands.

- Storz-compatible AMD-408
- Wolf-compatible AMD-410
- ACMI-compatible AMD-309

**Endoscopes**

All endoscopes with ACMI-compatible eyepieces can be adapted to the camera head. Depending on the type of your compact camera it is especially applicable with image bundle endoscopes by the use of an anti-moiree-filter.

**Video Accessories**

Peripherals (monitor, printer, recorder, PC, video still storage) which corresponds to the video standards PAL or NTSC (depending on the camera module) and which can analyze the signals video (FBAS) or s-video (Y/C) can be connected.
Installation

The Installation of the AMD-400s consists of 7 simple steps shown

Using the Camera

Step 1 – Plug in power cable to the AMD-400s

Connect the power cable to the AMD-400s but do NOT connect it to the power source yet.

Step 2 – Plug in video cable to the AMD-400s

Use the video output socket on the back of the AMD-400s to connect your video cable. The S-Video USB 2.0 connector can be used as well. You may connect a video device to the video output.
**Step 3 – Plug in video cable to your video system**

Connect the video cable coming from the AMD-400s to your video input socket in your system. Make sure you select the right video input source in your video system or video monitor.

![Image of video cable connection](image1.jpg)

**Step 4 – Connect camera cable to AMD-400s**

Simply connect the camera cable into the Platform Box firmly.

![Image of camera cable connection](image2.jpg)

To uncouple, grasp the connector; pull back and withdraw the cable from the port.
**Step 5 – Connect Light cable to AMD-400s**

The fiber optic bundles are specifically designed to maximize the light provided by the AMD-400s Imaging and Illumination System. They feature a precisely fitted ACMI termination on the Platform Box end, and a Universal light post on the scope end which can be coupled with various adapters to fit a wide variety of scopes. Do no kink or crush this cable. Uniform light quality will be diminished.

**Step 6 – Plug power cable to 115-230, 50-60Hz outlet**

**Step 7 – Connect camera cable and light cable to the desired Video**

For instructions on how to connect camera cable and light cable to a specific video scope refer to the scope instruction manual.

**Step 8 – Turn the AMD-400s on.  (Refer to “Getting an Image,” p.11)**
Getting an Image

Before getting any image from the AMD-400s you should connect the desired scope to it. For ENT images use the AMD-2015-ENT Scope. For dermatology images use the AMD-2030 Dermoscope. For Ophthalmology images use the AMD-2020 Ophthalmoscope. Refer to the Scope Operation manual for its own specific operation and connection to the AMD-400s. Other scopes can be connected to the AMD-400s camera for more medical applications. Call AMD for further assistance on other medical applications at 1-800-742-1674 or 1-978-937-9021.

Once the appropriate scope is connected follow the Start-Up and operation procedures.

Important Hints

Set-up the unit in such a way that sufficient air flow is guaranteed. All ventilation slits on the back side of the AMD-400s have to be free. Be sure to take care that a minimum space of 30 cm is given between the back panel and other objects. The average ambient temperature should not exceed 40 °C. Never use the unit with dismantled housing and only operate the unit in a horizontal position. The operating performance of the unit is dependent on electromagnetic harmonization of the peripheral units such as monitor, printer and recorder. If electromagnetic disharmony occurs it could cause stripes or color changes on the monitor.

Make sure that all devices operated in the vicinity comply with the relevant EMC requirements. Radio systems, cellular telephones, etc. are possible sources of interference as they may emit higher levels of electromagnetic radiation. All additional and/or peripheral systems or units which are connected to the camera system units have to correspond to EN specifications (e.g. EN 60950 or EN 60601; The International Electro technical Commission (IEC) Standards. Furthermore they have to cover the EN 60601-1-1 norming.

Safety Notes

It is in no case allowed that the AMD-400s is used in explosive environment. Please make sure that the unit is only used in water proofed areas. Never dip the AMD-400s in liquids. Routinely inspect all electrical connections, defects like loose plugs, defective cables or others are interfering safety and image quality and have to be eliminated immediately. The unit is not allowed to be used in technical unobjectionable condition for the defined purpose according to this instruction manual.
Start-up Procedure

a) Turn POWER switch to “ON”

b) Turn the diaphragm control and the brightness can be adjusted.

c) Focus the image by turning the optical focusing ring on the camera head. To white balance the camera system aim the scope at a white object

d) White Balance

Operation Procedure

a) Press the white balance button and focus on white image for a few seconds. The image will change to an accurate white.

b) Press the White Balance/Window Function button to toggle between enhanced and standard image. Select as desired.

c) During the exam, adjust the illumination by turning the Intensity Ring until best results.
**AMD-400s Trouble Shooting**

**No Video**

a) Check that unit is connected to power supply and mains.

b) Check that camera is connected correctly with monitor.

c) Check that camera head is connected to the AMD-400s.

d) Check that light guide is connected to the light source.

**No Illumination:**

A few seconds after the camera is turned “ON” you should be able to see the glow of the light.

a) Turn the AMD-400s power switch off.

b) Wait for 25 seconds.

c) Turn the AMD-400s power switch on.

d) Make sure fan is running – listen to it.

e) Without the light cable plugged into the AMD-400s, check that the light bulb is on.

f) If light and fan are not on, replace fuse.

g) If light bulb is not on, replace bulb.

h) If light bulb is on plug the light cable (see installation in this same manual) in.

i) If light is not coming out the other end of the light cable, replace light cable.

**If light is not bright enough:**

a) Check light source and repeat white balance if necessary.

b) Check window function.
Poor video quality

a) Turn the focusing of the camera head until the image is brought into focus.

b) Try cleaning the endoscope tip. The front window of the camera head should also be kept free of debris and can be cleaned with 70% isopropyl alcohol if necessary.
Servicing the AMD-400s

Carefully review the instructions for cleaning and sterilization found in this manual. The first section highlights compatibility of the AMD-400s with various cleaning methods, and the next section highlights instructions for cleaning of each of the components of the AMD-400s.

Compatible Cleaning Methods

BE SURE TO FOLLOW YOUR INSTRUCTIONS SPECIFIC CLEANING AND STERILIZATION PROCEDURES IN CONSULTATION WITH THIS OPERATING MANUAL. Disinfection or Sterilization is always recommended for devices coming in contact with the patient; always sterilize rigid and flexible scopes before use.

1. Platform Box (Illustrated in Figure 1)

   The Platform Box should not be sterilized. To clean, turn power OFF, and disconnect the power cord from the Platform Box. The surfaces may be cleaned by wiping with a damp cloth.

2. Camera Head and Camera Cable need to be unplugged and can not be steeped in liquids.

   The Camera Head and Camera Cable are compatible using the following cleaning methods:

   - Moisten with water and soft suds, rinse with tap water

WARNING:

The Camera Head and Camera Cable should never be autoclaved.

The Camera Head Assembly and Fiber Optic Assembly may also be draped.
Instructions for Cleaning

System Disassembly

a) Turn Platform Box OFF.

b) Disconnect Fiber Optic Bundle from the Platform Box. Pull fiber bundle straight out.

c) Disconnect the Camera Head Cable from the Platform Box. Release the fuse connector. Continue pulling the connector straight back so it disconnects from the Platform Box.

Cleaning/Sterilization

a) Rinse the Camera Head and Cable, Optical Coupler, Fiber Optic Bundle, and Scope Adapters in tap water. Use mild soap suds to remove any resistant debris.

b) Follow your institution’s specific cleaning procedures at all times. Specific sterilization instructions for the AMD-400s appear below. To ensure compatibility and prevent damage to the AMD-400s, consult the previous section on Compatible Cleaning Methods.

ETO Sterilization (for Camera Head and coupler Assembly and Fiber Optic Bundle)

The camera head is not allowed to be sterilized by ETO (Ethylene Oxide). Steam autoclaving will destroy the camera head.

c) The Camera Head, Camera Cable, and Fiber Optic Bundle should be dried with a lint-free, sterile cloth. The glass window on the Camera Head and Optical coupler should not be allowed to air dry as this may lead to fogging or smeared image.
Warranty, Service and Repair

AMD commits a 12 month guarantee on the functioning of the light source/camera unit. This guarantee is restricted to claims presented within the guarantee period starting from the date of the purchase of the light source/camera unit giving details about repairs along with the invoice number.

This guarantee is only applicable to defects that cannot be attributed to normal wear and tear, misuse or wrong handling, and lack of proper care.

For maintenance and repairs, please contact AMD Telemedicine:

AMD Telemedicine
73 Princeton Street
North Chelmsford, MA 01863
1-800-742-1674
1-978-937-9021
service@amdtelemedicine.com

For a fast processing of your service requests, please return the product indicating the following dates:

- Return Material Authorization (RMA)
- Serial number (SN)
- Detailed description of defects

Guarantee and warranty claims will not be accepted if the user or non authorized repair center effects maintenance or repair on its own.
**Spare Parts:**

Spare Lamp: AMD-407
Camera Cable: AMD-406
Light Cable: AMD-404


**System Reassembly**

Be sure to follow your institution’s sterility procedures while reassembling the AMD-400s.

a) Ensure Platform Box is turned OFF

b) Connect power cord to the Platform box. Connect the appropriate scope adapter to the universal light post at the end of the Fiber Optic Bundle.

c) If applicable, connect and secure the Optical Coupler and endoscope to the Camera Head. Connect Fiber Optic Bundle to the endoscope.

d) Turn Platform Box ON and verify that the AMD-400s functions properly. If picture does not appear, turn OFF power and verify that camera cable is plugged in. If problems persist, see section on Troubleshooting.

**Changing the camera’s light bulb**

The camera light bulb can be replaced following a simple 8 step procedure. Make sure the camera is turned off and disconnected, wear appropriate eye protection and gloves while changing lamps before staring the bulb replacement procedure described as follows:

**Caution: Be sure the bulb has cooled down for at least 10 minutes before handling.**

**Step 1 – Locating the light bulb**

The light bulb (AMD-407) is located under the housing cover right behind the Light Guide Connection.
Step 2 – Open the light bulb compartment
With a flat screwdriver unscrew the safety screw and detach the grounding cable.

Step 3 – Removing the lamp
Turn lamp to the left approximately 20 degrees until the stop position.

Step 4 – Remove the light bulb
Pull the lamp forward carefully to remove.
Step 5 – Reinsert new light bulb

Insert the new light bulb in between the bulb base and the holding clips.

Step 6 – Reinsert new light bulb

Turn lamp to the right approximately 20 degrees until the stop position.

Step 7 – Reconnect the grounding cable.

Plug grounding cable back into place

Step 8 – Close the Housing cover and screw it on.
Replacing the Camera’s Fuses

The camera’s fuses can easily be replaced following a simple 5-step procedure. Make sure the camera is turned off and the power cable disconnected before starting the fuse replacement procedure described as follows:

**Step 1 – Locate the fuses’ compartment**

The fuses are located right below the power cable connector.

**Step 2 – Open the fuses’ compartment**

Using two fingers open the compartment as illustrated.
**Step 3 – Take out the fuses’ holding box**

Using your fingers remove the fuses' box out as illustrated.

![Image of fuses' holding box]

**Step 4 - Replace fuses**

Replace both fuses with same size same power (3.15A, 230V) fuses.

![Image of replacing fuses]
Step 5- Reinsert fuses’ holding box

Using your fingers reinsert the fuses’ box back in as illustrated and push until it clicks in.
## Amd-400s Product Specifications

There are no user serviceable or repairable parts inside the unit. The unit must be returned to AMD for repair. The unit does not have to be maintained regularly. The only wear part at the light source is the lamp which can be easily replaced by the user.

<table>
<thead>
<tr>
<th><strong>Power Supply:</strong></th>
<th>Worldwide Automatic Switching 115/230 VAC</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Main fuse:</strong></td>
<td>115V-T 6.3A or 230V- T 3.15A</td>
</tr>
<tr>
<td><strong>Dimensions:</strong></td>
<td>10.35&quot; (263mm) W x 3.93&quot; (100mm) D x 12.40&quot; (315mm) H</td>
</tr>
<tr>
<td><strong>Weight:</strong></td>
<td>8.818 lbs. (4kg)</td>
</tr>
<tr>
<td><strong>Video Outputs:</strong></td>
<td>Video/S-Video, USB 2.0</td>
</tr>
<tr>
<td><strong>TV System:</strong></td>
<td>PAL or NTSC Sensor; size- 1/3&quot; CCD Detection 2:1 line interlacing</td>
</tr>
<tr>
<td><strong>Signal/Noise Ratio:</strong></td>
<td>44 db</td>
</tr>
<tr>
<td><strong>Average lamp life:</strong></td>
<td>2,500 hours</td>
</tr>
<tr>
<td><strong>Ambient Temp:</strong></td>
<td>+10° C up to + 40° C</td>
</tr>
<tr>
<td><strong>Approx. air humidity:</strong></td>
<td>up to 70%</td>
</tr>
<tr>
<td><strong>Horizontal Resolution:</strong></td>
<td>525 lines (NTSC), 625 lines (PAL), Brightness-automatically</td>
</tr>
</tbody>
</table>

**Approvals:**
The CE-label certifies that the product corresponds to the EMC regulations 89/336/EEC respectively EMC law and the directive 73/23/EEC. With regard to medical devices the CE-label certifies, that the product corresponds to the Medical Device Directive 93/42/EEC respectively to the Medical Device Law.

*Local rules may require that these contaminated tip covers be treated as hazardous waste.*

### Power Supply Safety Ratings

- **Type BF equipment (according EN 60601-1)**
- **CE-mark guideline 93/42/EWG**
- **Warning/ Caution:** indicating a potential hazard/actual hazard. If not avoided, this may result in personal or serious injury and product or property damage.
- **Equipotential bonding connector**
- **High Voltage**
- **Please observe instruction for use**
- **High Temperature**