

HD COLOR VIDEO CAMERA

GLOBAL
SURGICAL™ CORPORATION

OWNER'S MANUAL



M 517HD AND M A517HD Series

When contacting Global Surgical Corporation for either Customer Service or Technical Service, it will be helpful if you have your **Customer Identification Number** and your **Customer Order Number** available. Please take a moment to record these numbers (printed on invoice) in the spaces below.

Customer Identification Number: _____

Customer Order Number: _____



S U R G I C A L TM C O R P O R A T I O N

3610 TREE COURT INDUSTRIAL BLVD.

ST. LOUIS, MO 63122, USA

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**Congratulations on your purchase of the
HD Color Video Camera.**

**We truly appreciate your business,
and we're grateful for the trust you've placed in us.**

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THE SAFETY AND SATISFACTION OF OUR CUSTOMERS AND THEIR PATIENTS ARE THE HIGHEST PRIORITIES OF GLOBAL SURGICAL CORPORATION. THIS MANUAL CONTAINS IMPORTANT INFORMATION REGARDING THE SAFE AND PROPER USE OF THIS EQUIPMENT AND SHOULD BE READ THOROUGHLY BY ALL OPERATORS PRIOR TO THEIR FIRST USE OF THE EQUIPMENT. FAILURE TO READ AND UNDERSTAND THIS MATERIAL COULD RESULT IN INJURY TO PATIENTS OR PERSONNEL OR IN DAMAGE TO THE EQUIPMENT.

1.1 Symbol Definitions



This symbol on the product is an attention symbol, alerting the user to read the Owner's Manual for important installation, operating instructions or safety information.



This symbol on the product indicates a potential electrical shock hazard and alerts the user to read the Owner's Manual for important safety information.



Symbol indicating do not expose to wetness or high moisture conditions



Interference may occur in the vicinity of equipment marked with the following symbol:



Symbol indicating "not for general waste." Recycle per the EUROPEAN WASTE ELECTRICAL AND ELECTRONIC EQUIPMENT (WEEE) DIRECTIVE.



For Professional Use Only.



This symbol indicates a situation in which incorrect handling through disregard of a warning might result in death or serious personal injury.



This symbol indicates a situation in which incorrect handling through disregard of a caution might result in personal injury or may result in damage to property.



This symbol indicates a message to avoid property damage or additional information to help complete a procedure.

1.2 Warnings and Cautions

**WARNING**

ELECTRIC SHOCK HAZARD. DO NOT EXPOSE THE CAMERA TO WETNESS OR HIGH MOISTURE CONDITIONS. DO NOT USE NEAR WATER. DO NOT HANDLE PLUGS OR CAMERA WITH WET HANDS

**WARNING**

ELECTRIC SHOCK HAZARD. DO NOT DISASSEMBLE OR MODIFY THE CAMERA OR ACCESSORIES. REFER ALL REPAIRS TO QUALIFIED SERVICE PERSONNEL.

**WARNING**

DISCONNECT ALL ELECTRICAL POWER PRIOR TO CLEANING AND DISINFECTING. RISK OF ELECTRIC SHOCK RESULTING IN DEATH OR INJURY IS POSSIBLE IF THE ELECTRICAL POWER IS NOT DISCONNECTED PRIOR TO CLEANING THE UNIT.

**WARNING**

NO MODIFICATION OF THE EQUIPMENT IS ALLOWED.

**WARNING**

FAILURE TO FOLLOW THESE INSTRUCTIONS WILL RESULT IN DAMAGE TO THIS SYSTEM OR POSSIBLE INJURY (RECEIVER'S RESPONSIBILITY).

**CAUTION**

USE ONLY THE PROVIDED POWER SUPPLY TO ENERGIZE THE CAMERA, OTHER POWER SUPPLIES MAY CAUSE DAMAGE TO THE CAMERA.

**CAUTION**

BRIGHT LIGHT SHINING DIRECTLY INTO THE CAMERA LENS CAN CAUSE DAMAGE TO THE CCD.

**CAUTION**

DO NOT PULL OR MOVE SYSTEM BY CORDS OR PULL CORDS AROUND SHARP EDGES. KEEP CORDS AWAY FROM HEATED SURFACES.

**CAUTION**

THIS EQUIPMENT GENERATES AND USES FREQUENCY ENERGY AND IS NOT INSTALLED AND USED PROPERLY, I.E. IN STRICT ACCORDANCE WITH THE INSTRUCTION MANUAL, MAY CAUSE HARMFUL INTERFERENCE TO RADIO COMMUNICATIONS. IT HAS BEEN TESTED AND FOUND TO COMPLY WITH THE LIMITS FOR A CLASS A COMPUTING DEVICE PURSUANT TO SUBPART J OF PART 15 OF FCC RULES, WHICH ARE DESIGNED TO PROVIDE REASONABLE PROTECTION AGAINST SUCH INTERFERENCE WHEN OPERATED IN A COMMERCIAL ENVIRONMENT.

**CAUTION**

TO REDUCE THE RISK OF ELECTRICAL SHOCK, DO NOT REMOVE COVER (OR BACK) NO USER SERVICEABLE PARTS INSIDE. REFER SERVICING TO QUALIFIED SERVICE PERSONNEL.

1.3 Product Precautions

- Handle the camera with care. Do not abuse the camera. Avoid striking or shaking it. Improper handling or storage could damage the camera.
- Do not pull or damage the camera cable.
- During camera use, do not wrap the unit in any material. This will cause the internal temperature of the unit to increase.
- Do not expose the camera to moisture, or do not try to operate it in wet areas.
- Do not operate the camera beyond its temperature, humidity and power source ratings.
- While the camera is not being used, keep the lens or lens cap on the camera to prevent dust or contamination from getting in the CCD or filter area and scratching or damaging this area.
- Do not keep the camera under the following conditions:

In wet, moist, and high humidity areas

Under hot direct sunlight

In high temperature areas

Near an object that releases a strong magnetic or electric field

Areas with strong vibrations

2 Product Information

The M 517HD and M A517HD Series high definition camera allows for the documentation of medical procedures and examinations. It outputs HDMI video at true HD 1080p resolution. The 1/3" C-mount design offers a compact and lightweight HD video solution. The on-camera push-button is used for one-push white balance and push-hold for image flip.

2.1 Included Components

Table 1-1 (below) identifies the items packaged with the M 517HD Series HD color video camera.

Table 2-1 Included Components

Model Number	M 517HD1080	M 517HD1080-725	M 517HD1080-I	M 517HD1080-725I	M A517HD1080
HD Video Camera Head, 1080p (028-008-046)	●	●	●	●	●
HDMI Cable, 30' (039-004-047)	●	●	●	●	●
U.S. Power Supply, 100-240V~50/60 Hz input (031-005-015)	●	●	┃	┃	●
International Power Supply, 100-240V~47-63Hz input (031-005-010)	┃	┃	●	●	┃
12VDC Extension Cable, 30' (102-007-064)	●	┃	●	┃	┃
12VDC Extension Cable, 11' (102-007-066)	┃	●	┃	●	┃
12VDC Extension Cable, 6.5' (102-007-066)	┃	┃	┃	┃	●
Cable Ties 4" Black, Qty 6 (018-006-037)	●	●	●	●	●
Flexible Braided Sleeving (123-006-208 - 6") (123-006-209 - 2')	●	●	●	●	●
HDMI Right Angle Adapter (039-004-048)	●	●	●	●	●

● | Included

┃ | Not Included

2.2 Specifications

Table 1-2 (below) lists the general specifications for the M 517HD Series HD color video camera.

Table 2-2 Specifications

Model Number	<p>M 517HD1080</p> <p>M 517HD1080-725</p> <p>M 517HD1080-I</p> <p>M 517HD1080-725I</p> <p>M A517HD1080</p>
Image Sensor	1/2.8" 230 Megapixel CMOS
Resolution	1920 (H) X 1080 (V), 16:9 Format 1080p
S/N Ratio	0 to 45 dB
Video Output	DVI 1.0 compliant HDMI connector, RGB
Lens Mount	C-mount
Dimensions (W x H x D)	40 x 40 x 51.1mm (1.6" x 1.6" x 2.01")
Weight Approximately	116 g (4.09 oz)
Storage temperature	-30°C ~ 65°C (-22°F ~ +149°F)
Operating temperature	0°C ~ 45°C (32°F ~ 113°F)
U.S. Power Supply	Input: 100-240V~ 50/60 Hz Output: 12VDC, 800 mA
International Power Supply	Input: 90-264V~ 47 to 63 Hz 0.6A Output: 12VDC 3.75A
Complies With Standards	EN61000-6-2 EMI: EN55022 (Class B)
RoHS	RoHS Compliant

2.3 Features and Controls

Figure 1-1 (below) identifies the location of important camera features and controls.

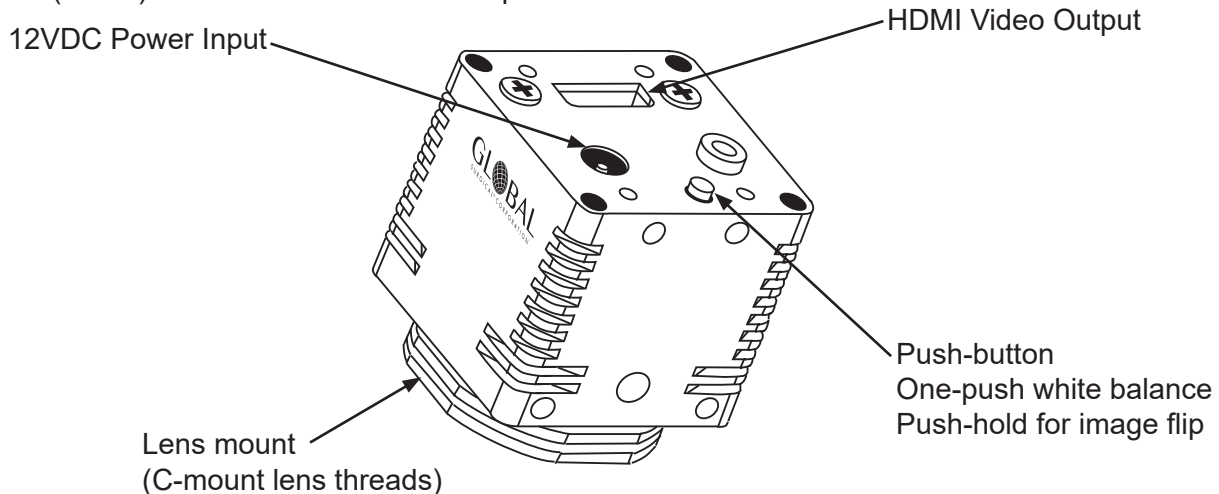


Figure 2-1. Features and Controls

3 Preparation For Use And Operation

3.1 Installation

Installing the M 517HD Series camera to the microscope requires a C-mount camera adapter and beamsplitter. These items are sold separately. Global's patented virtual beamsplitter is the beamsplitter of choice as it will provide excellent video depth of field with minimal light loss to the user.

1. If the beamsplitter and/or the C-mount camera adapter have not been attached to the microscope, install them now.
2. Thread the M 517HD camera onto the C-mount camera adapter until it is secure.
3. Route and connect power and video cables. Typical wire configuration is illustrated in Figure 3-1. Route cables through arms in such a way that they are not likely to be pinched or stretched or otherwise damaged. Microscope arm covers may have to be removed to route cables.
4. Neatly bundle external cables by using the supplied cable ties and sleeving as needed for cable management.
5. Plug the camera power supply into an AC outlet.

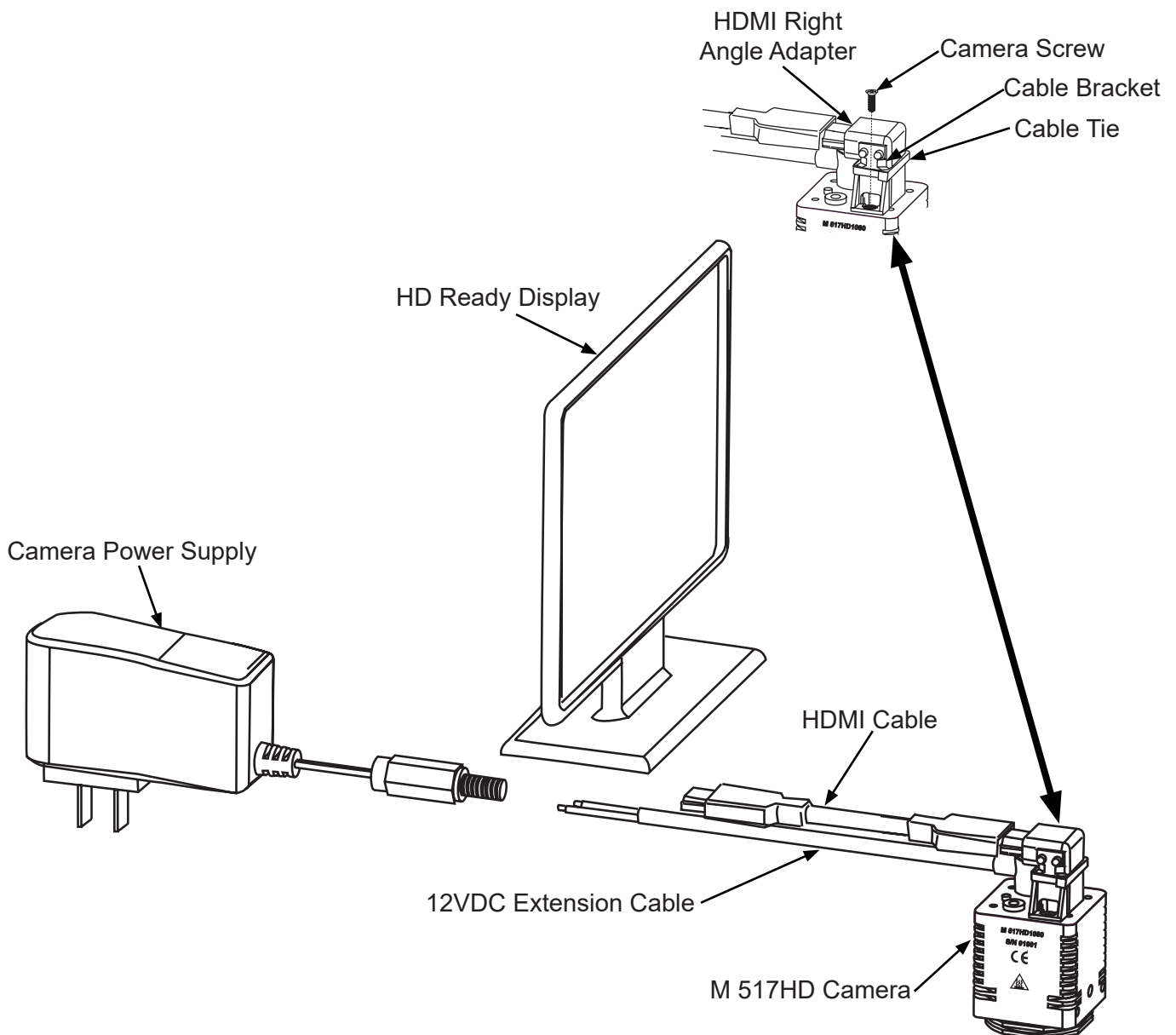


Figure 3-1. Typical Wire Configuration

1. Turn the HD-ready display on and select the proper HDMI source input for display.
2. Turn the microscope light source on.
3. Position and focus the microscope over an object. The object should be displayed on the monitor. If the image is not displayed, refer to “Troubleshooting” in Section 6.
4. If the image is not oriented properly on the monitor (straight up), slightly loosen either the C- mount coupler or the C-mount camera adapter and then rotate the camera for proper orientation. Once the image orientation is correct, tighten the C-mount coupler until secure. See Figure 3-2 for rotation adjustment locations.
5. **Important!** Do not skip this step. Perform the “Par-Focal Procedure” per the microscope owner’s manual to ensure the video image and binocular image have the same focus.
6. Refer to “Operation” paragraph 4.1 for use. The camera power supply should be disconnected from the AC outlet if the M 517HD camera is not going to be used for extended periods of time.

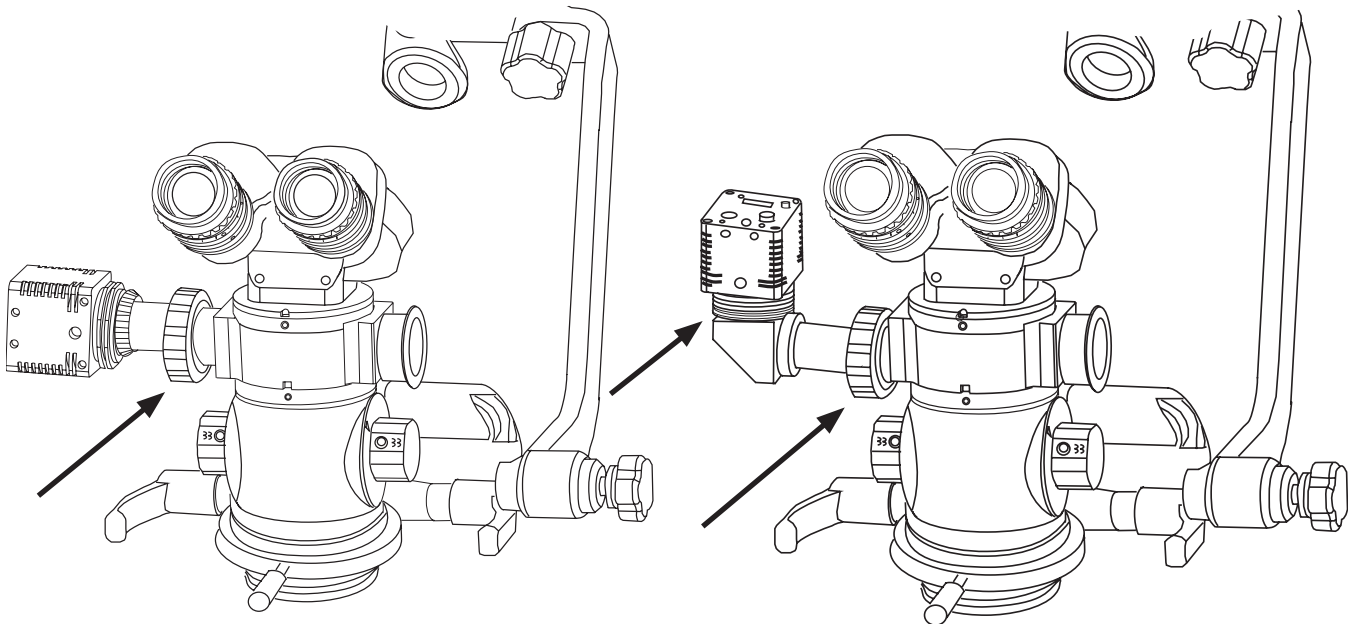


Figure 3-2. Rotation Adjustment Locations

4.1 Operation

Follow the steps below after installation of the M 517HD camera. It is recommended to inspect cable condition and routing before each use of the microscope.

1. Turn on the HD-ready display and microscope light source.
2. Apply power to the M 517HD camera by plugging the power supply into an AC outlet.

**NOTE**

This camera does not have a power “On / Off” switch. The camera will be “On” when the power supply is plugged in and all power cables are attached to the camera.

3. Perform WHITE BALANCE (paragraph 4.1.1) if the video image color does not seem accurate.
4. Perform IMAGE FLIP (paragraph 4.2.1) if the video image is reversed.
5. The camera power supply should be disconnected from the AC outlet if the M 517HD camera is not going to be used for an extended period of time.

4.1.1 White Balance

Color accuracy is an important property of image quality. Cameras interpret the color of an object by measuring the amount of red, green and blue light from the object. A white object will have equal amounts of red, green and blue light. However, each light source emits different amounts of each color creating a specific color temperature. The WHITE BALANCE procedure allows the camera to measure and adjust for the color temperature of the light source.

1. Ensure the microscope light source is on.
2. Place a white sheet of paper under the objective lens to fill the M 517HD camera field of view.
3. Press and release the on-camera push-button to set the white balance. If necessary, adjust the color settings of the HD-ready display.

4.2.1 Image Flip

Different camera adapters may or may not optically flip (reverse) an image. This feature allows the M 517HD camera to be used on a variety of adapters.

1. Press and hold the on-camera push-button until the image flips, then release the button. The hold time is approximately 3 to 5 seconds.

**WARNING**

DISCONNECT ALL ELECTRICAL POWER PRIOR TO CLEANING AND DISINFECTING. RISK OF ELECTRIC SHOCK RESULTING IN DEATH OR INJURY IS POSSIBLE IF THE ELECTRICAL POWER IS NOT DISCONNECTED PRIOR TO CLEANING THE UNIT.

**NOTE**

Clean and disinfect after every patient according to CDC and OSHA requirements for non-critical devices.

5 Maintenance

The M 517HD Series has no consumable parts (i.e. fuses, filters, etc.) to replace. The only necessary maintenance includes cleaning (paragraph 5.1) and cable management (paragraph 5.2.) Any other maintenance or service should be performed by qualified service personnel (see section 7 for service.) Cleaning should be performed as needed. Cable management should be performed before each use of the microscope.

5.1 Cleaning**WARNING**

DO NOT USE AN AEROSOL SPRAY DIRECTLY ON THE M 517HD CAMERA. SPRAY MAY CAUSE ELECTRICAL SHOCK AND/OR DAMAGE TO INTERNAL CIRCUITS

See M A730 Series Surgical Operating Microscope System Owner's Manual (110-013-079) Section 6 for cleaning and disinfecting instructions.

5.2 Cable Management

1. Ensure all cables are free from defects. Replace damaged cables immediately.
2. Route all cables in such a way that they are not likely to be pinched or stretched or otherwise damage
3. Neatly bundle cables by using the supplied cable ties and sleeving as needed.
4. Ensure all cable connections are secure.

6 Troubleshooting

Table 6-1 (below) lists some symptoms, possible causes, and solutions.

Table 6-1 Troubleshooting

Symptoms	Possible Causes	Solutions
No Video Display	The HDMI cable is loose or defective.	Check all cable connections or replace cable.
	The camera power supply is not plugged in or is defective.	Plug the camera power supply into an AC outlet or replace the camera power supply.
	The 12VDC extension cable is not connected to either to the M 517HD camera or the camera power supply.	Check all cable connections.
	The 12VDC extension cable is defective.	Replace the 12VDC extension cable.
	The HD-ready display is “off” or not set to the correct video input.	Ensure the HD-ready display power is on and that the video source is set to the correct HDMI video input.
	The microscope light source is off or is defective.	Ensure the microscope light source power is on and working.
	The microscope magnification changer is set between magnification levels.	Turn the microscope magnification changer until it stops at a magnification level. Verify by looking through the microscope binoculars.
	The M 517HD camera is defective.	Replace the M 517HD camera.
Dim Video Display	Faulty camera power supply.	Ensure camera power supply is supplying 12VDC.
	The microscope light source is off or brightness setting is too low.	Ensure light source power is on and lamp is working. Also, check the brightness control on the light source.
	12VDC extension cable is defective.	Replace 12VDC extension cable.
Poor Focus	The HD-ready display requires settings adjustments.	Ensure HD-ready display settings are set to optimal viewing levels.
	The M 517HD camera is out of focus	Perform the “Par-Focal Procedure” per the microscope owner’s manual.

7.1 Warranty Information

Global Surgical Corporation warranty information is located at:

<http://www.globalsurgical.com/warranty.html>

90-Day Money-back Guarantee on Microscopes and Accessories.

The microscope and microscope accessories you purchase will be unconditionally guaranteed and risk-free. You may return a product to Global in good condition for any reason within 90 days of invoice and receive a full product refund. Custom microscope parts are excluded from this policy. This money-back guarantee applies to the U.S. and Canada only.

Microscope Limited Lifetime Warranty

Your microscope will include an unprecedented lifetime warranty, including parts and labor, for all optical and support components. Please refer to detailed Limited Lifetime Warranty below.

Upgradeable

We will continue to do our best to design our microscopes to be modular and upgradeable, thus greatly minimizing the possibility of obsolescence.

Microscope Limited Lifetime Warranty

Except as set forth in this Limited Lifetime Warranty, Global Surgical Corporation (the "Company") hereby warrants that each microscope product manufactured and sold by the company ("Product") shall be free from defects in materials and workmanship under normal use and service for the life of the product. This warranty is non-transferable and is valid only with respect to the original purchase of the product. The Company's obligation under this warranty shall be limited to repairing or replacing at the Company's facility and at the Company's expense, any parts of components that are demonstrated to be defective. The purchaser shall be responsible for shipment of the product to and from the Company's facility at 3610 Tree Court Industrial Boulevard, St. Louis, Missouri, 63122, Attention: Technical Service, or such other facility as the Company may otherwise designate. Under certain circumstances which are pre-approved by the Company, necessary repairs may be made at the purchaser's facility.

A return authorization is required before returning any product for warranty service by calling 1-800-861-3610. The customer is responsible for all shipping expenses. Global Surgical suggests using a method that will allow you to track the package in the event it does not arrive. Global also recommends you insure the package.

This warranty shall not be applicable to: (I) any electrically-driven products sold by the Company, (II) any products which are not manufactured by the Company which may be attached to the product, such as video equipment, camera equipment, recording devices, monitors, printers (III) any components which are consumable or are required to be replaced or disposed of in connection with normal use of the product, such as lamps, fiber optic cables, rubber eyecups and drapes, or (IV) any product which was purchased prior to April 27, 1994.

This warranty shall be void and of no effect: (I) if the product is damaged due to misuse, use in a manner other than pursuant to the instructions for the use of Product, abuse, physical mishandling or natural causes such as flood, fire, earthquake, or other perils, as determined by the Company, or (II) if any repairs or replacements are made by persons not authorized by the Company to perform such services.

The warranties set forth herein are in lieu of any and all other warranties, expressed or implied, including, without limitation, warranties of merchantability and fitness for a particular purpose. Purchaser's rights thereunder are granted in lieu of any other rights purchaser may have and purchaser hereby waives all other rights, warranties, remedies or guarantees whatsoever with respect to the product. The Company shall not be liable for any third parties with respect to the product or its performance. Further, the Company shall not be liable for, and purchaser hereby releases the Company from any direct, or indirect, consequential, special, and incidental or punitive damages with respect to the product. In no event shall the Company be liable for any breach of warranty or other claim in an amount exceeding the purchase price of the product.

Warranty for Microscope products not included in the Limited Lifetime Warranty:

Electrical and electronic components, except for the LED lightsource, have a one-year warranty. The LED lightsource has a three-year warranty.

Consumables such as fiber optic cables, eyecups etc., have a one-year warranty. Light bulbs have a warranty equal to that given by the manufacturer.

This warranty applies to the U.S. and Canada only.

For international warranty information: Email: international@globalsurgical.com

Phone: 1-636-861-3388, Fax: 1-636-861-2969

7.2 Technical Services Department

When contacting our Technical Services Department, you will be served by highly knowledgeable representatives in an efficient manner. If service is required at your location, a skilled technician or sales representative will be dispatched within 24 hours.

If you have questions that are not covered in this manual, please call the Global Surgical Technical Services Department as listed below:

Toll Free Number:	1-800-861-3610
Technical Services Representatives:	1-636-861-3388
Fax Number:	1-636-861-5284
Email:	techservice@globalsurgical.com

The staffing hours for the Global Surgical Technical Services Department are Monday through Friday from 8:00 a.m. to 5:00 p.m. Central Standard Time.

Internet Access

The Global Surgical Technical Services website has information about additional products and services and can be reached online at: <http://www.globalsurgical.com>.

Service Information

In the event of any malfunction, you should immediately contact the Global Surgical Technical Services Department for assistance. A **Customer Identification Number and Customer Order Number** will be needed when contacting the Technical Services Department. These numbers are printed on your invoice. To save time in the event service is needed, record these numbers in the spaces provided in the front of this manual.

A **Return Material Authorization (RMA) number** must be obtained from the Global Surgical Technical Services Department prior to returning a product for repair. The following information must accompany all returned units:

1. Your name, address, and telephone number
2. The RMA number
3. A description of the problem

Ship or return the product to:

Global Surgical Corporation
3610 Tree Court Industrial Blvd.
St. Louis, MO 63122
Attention: Technical Services Department



**Global Surgical Corporation
3610 Tree Court Industrial Blvd.
St. Louis, MO 63122, USA**



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