



HIGH DEFINITION CAMERA SYSTEM

SUPPLEMENT SETUP AND USE MANUAL

MEDICAL ILLUMINATION INTERNATIONAL, INC.

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DEFINITION OF TERMS

I.E.C.

International Electrotechnical Commission

UL

Underwriter's Laboratories

Medical Electrical Equipment

Electrical equipment intended to diagnose or treat the patient under medical supervision.

Total Irradiance

The total amount of energy imparted to the patient by the lighting system expressed in Watts/meter squared.

Handle Sterilizable

Device when properly sterilized maintains a sterile area in order to handle it under aseptic conditions when attached to the equipment.

Light Head/Articulating Arm Assembly

That part of the device which includes the light source, heat removal system, light focusing system and light head vertical positioning arm.

Extension Arm

Horizontal section of the positioning arm with pivots on both ends that is used to increase the area covered by the light head and articulating arm

Light Mounting

Support apparatus used to connect light head/articulating arm assembly to a fixed surface, consisting of either a single, double or triple ceiling mount.

Neutral Conductor

In an AC circuit, the return line for current.

Protective Earth Ground

The conductor used to connect the non-current-carrying metal parts of equipment, raceways, and other enclosures to the system grounded conductor, the grounding electrode conductor, or both, of the circuit at the service equipment or at the source of a separately derived system.

Ft-Lbs

Foot-pounds: The unit of measurement of torque which is caused by an off-center load.

SYSTEM TWO CAMERA SPECIFICATIONS

MECHANICAL

| Parameter | Value |
|--|---|
| Weight Camera head assembly (all models) Controller (Eight-channels) Controller (Single-channel) | Approximately 5.7 lbs. (2.58 Kg). Approximately 4.8 lbs. (2.18 Kg). Approximately 2.5 lbs (1.13 Kg). |
| Dimensions Camera head Controller (Eight-channels) Controller (Single-channel) | 5" (127 mm) diameter x 10" (254 mm) deep 2.50" (63.5 mm) diameter X 2.75 (70 mm) height 7.25" (184 mm) long X 2.75 (70 mm) height |
| Rotations Articulating arm/Yoke interface Yoke/ Camera head interface | Approximately +/-540 Degrees Approximately +/-340 Degrees |

ELECTRICAL

| Parameter | Value |
|---|--|
| Input Voltage Operating Voltage Fuses Power Supply (eight channel models only) Fuse Remote Controllers | 100 - 240 VAC, 50/60 Hz 12 VDC Slow blow, 5mm X 20mm, 1.25A, 250VAC Slow blow, 5mm X 20mm, 0.5A, 250VAC |
| Power All models | 40 Watts |

VIDEO

| Parameter | Value |
|----------------------------|---|
| Image sensor | 1/2.8-type Exmor CMOS |
| Effective number of pixels | Approx. 3.27 Megapixels |
| Image size (H x V) | 1920 x 1080, 1280 x 720, 720 x 480, 720 x 576 |
| Lens | 20x optical zoom, f=4.7 mm (wide) to 94.0 mm (tele) , F1.6 to F3.5 |
| Digital zoom | 12x (240x with optical zoom) |
| Angle of view (H) | 1080p mode - 55.4°(wide end) to 2.9°(tele end) 720p mode - 37.6°(wide end) to 2.0°(tele end) |
| Minimum object distance | 10 mm (wide end) to 1,000 mm (tele end) (Default: 300 mm) |
| Sync system | Internal |
| Minimum illumination | High sensitivity mode - 0.5 lx (F1.6, ICR off) 0.095 lx (F1.6, ICR on) Normal mode - 1.7 lx (F1.6, ICR off) 0.3 lx (F1.6, ICR on) |

SECTION 1

SYSTEM TWO CAMERA SPECIFICATIONS (continued)

| | |
|--------------------------|---|
| Recommended illumination | 100 LUX to 100,000 LUX |
| S/N ratio | More than 50 dB |
| Signal system | <u>HD</u> 1080p/29.97, 1080p/25, 1080i/59.94 (Frame out: 29.97 PsF), 1080i/50 (Frame out: 25 PsF) 720p/59.94, 720p/50, 720p/29.97, 720p/25 <u>SD</u> NTSC, PAL |
| Video output | <u>HD</u> Analog: Component (Y/Pb/Pr) Digital: Y/Cb/Cr 4:2:2 via LVDS (Signal format conforms to SMPTE274/SMPTE296.) <u>SD</u> VBS |
| Camera control interface | VISCA (CMOS 5 V level) Baud rate: 9.6 Kbps, 19.2 Kbps, 38.4 Kbps Stop bit: 1 bit |
| Electronic shutter | 1/1 to 1/10,000 s, total 22 steps |
| White balance | Auto, ATW, Indoor, Outdoor, Outdoor Auto, Sodium Vapor Lamp (Fix/Auto), One-push, Manual |
| Gain | Auto/Manual (-3 dB to +28 dB, +2 dB step/total 16 steps) Max. Gain Limit (+6 dB to +28 dB, +2 dB step/total 12 steps) |
| AE control | Auto, Manual, Priority mode (shutter priority & iris priority), Bright, EV Compensation, Slow AE |
| Focusing system | Auto (Sensitivity: normal, low), One-push AF, Manual, Infinity, Interval AF, Zoom Trigger AF, Focus Compensation in ICR On |

ENVIRONMENTAL

| Parameter | Value |
|---------------------------|-----------------------------|
| Operating temperature | 41 - 104 °F (5-40 °Celsius) |
| Storage temperature range | 41 - 104 °F (5-40 °Celsius) |
| Humidity | 10 - 75% relative humidity |

Medical Illumination International, Inc.

Accessory Equipment

LIMITED WARRANTY

Medical Illumination International, Inc. Accessory Equipment is warranted against defective material and/or workmanship, excluding normal replacement parts (e.g. bulbs or glass items), for a period of three (3) years from the date of shipment. This warranty applies exclusively to the repair or replacement of parts recognized as defective by Medical Illumination International, Inc., that are in normal use, and have not been modified or repaired by unauthorized personnel. This warranty supersedes all other guarantees or warranties, expressed or implied.

In the event of a failure covered under this warranty, please take the following action:

1. Call the Medical Illumination Customer Service Department at (818) 838-3025.
 - A. Be prepared to give the model number, serial number, and full description of the failure.
 - B. Customer Service will attempt to solve the problem over the phone. If it becomes necessary to send the product to the factory for repair, Customer Service will provide a Return Authorization number. No product should be returned without a Return Authorization number.
2. Carefully package the light component (light head, arm assembly, or mount assembly) and return it, freight prepaid and insured, with the Return Authorization number clearly marked on the box, to:

Medical Illumination International, Inc.
547 Library Street
San Fernando, CA 91340
RA#

Damage resulting from inadequate packing is not covered by this warranty and shipping insurance does not cover damage from inadequate packing.

We recommend that the package be insured against loss or in-transit damage. Medical Illumination can not be responsible for in-transit loss or damage.

3. **DAMAGE TO THE PRODUCT RESULTING FROM TAMPERING, ACCIDENT, ABUSE, NEGLIGENCE, OR OTHER CAUSES UNRELATED TO PROBLEMS WITH MATERIAL AND/OR WORKMANSHIP, ARE NOT COVERED BY THIS WARRANTY.**
4. Warranty may be voided if equipment is found to have been installed incorrectly, resulting in equipment failure.
5. This warranty does not cover any labor costs associated with removing, re-packaging for shipment or reinstalling this product. Such costs are the responsibility of the purchaser.
6. Medical Illumination International, Inc. will evaluate the returned product, repair as appropriate, and ship the product back to you freight paid.

In the event non-warranty damage or failure is discovered, you will be contacted before repairs are performed.

CAMERA PRE-INSTALLATION GUIDELINES

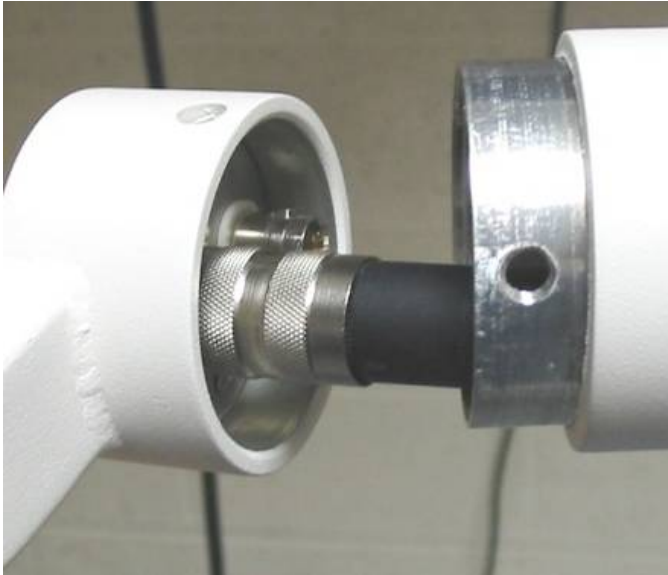
SPECIAL NOTE: Installation and repair of this equipment should be performed by qualified persons only. Medical Illumination International, Inc. does not warranty any damage occurring as a result of improper installation.



Before installation, refer to the System Two Surgical Lighting System Service Manual for installation instructions.

CAMERA HEAD INSTALLATION

⚠ Do not remove the locking pin on the arm until the camera head has been installed onto the arm assembly. Failure to do so can result in serious injury and/or property damage.



Install the arm cable (six-pinned connector) on the receptacle on the yoke as shown. NOTE: Both the connector and receptacle are keyed. Slide the connector in and then fasten to secure.

Install the coaxial cable exiting the arm on the receptacle on the yoke.



Slide the camera head assembly over the shaft protruding from the arm. NOTE: Pull any cable slack from the wheel-casting end if necessary.

SECTION 3

CAMERA HEAD INSTALLATION



While holding the arm, rotate the yoke adapter until the opening on it is aligned with the threaded hole on the shaft. Secure the camera head assembly to the arm with the provided knob as shown.



⚠ Failure to install or tighten the provided knob can cause the camera head to fall causing serious injury and/or property damage.

Position Adjustment: To move the camera head and arm over the work area, firmly grasp the sterilizable handle or the yoke located opposite the handle and bring the camera head to the required height. Adjust the angle of the camera head by holding the handle and either pulling forward or pushing backward to change the tilt. Rotating the camera head can be done by grasping the yoke or handle and moving it on its axis in a circular motion.

CAMERA CONTROLLER

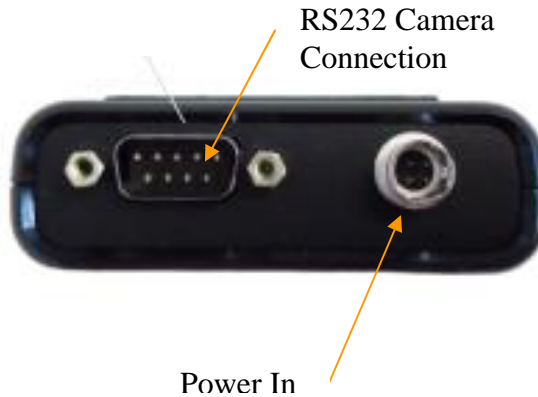
The High Definition In-Arm camera is designed to provide a high resolution video to Medical Professionals. It utilizes the most current HD technology in an easy to use format.



THE CONTROLLER

The supplied controller is a stand-alone unit that provides control functions to the camera. The various functions include On/Off, Focus, Zooming In/Out and Freezing the picture.

CONTROLLER CONNECTIONS


















CONTROLLER KEYPAD



CONTROLLER SPECIFICATIONS

| | |
|---------------------------|--|
| On /Off | Powers the camera on and off |
| Iris | Opens and closes the lens iris which controls amount of light that comes in and out. Use up and down keys to increase or decrease iris. |
| Zoom | Activates up and down arrows for controlling the lens, press zoom button the zoom by pressing the up arrow (tele end) and down arrow for (wide end). |
| Up and Down Arrows | These buttons are activated by Iris, Zoom, EXP, Gain, Focus & Bright. The up arrow will increase (+) while the down arrow decreases (-). |
| E-Flip | (Not all FCB cameras have this feature) This function turns the video output from the camera upside down. |
| EXP | Sets the camera in Manual Exposure mode 21 steps ranging from 1/2 shutter to 1/10000 . Use up and down keys to increase or decrease shutter speed. |
| AEXP | Auto exposure will allow video signal to output the optimum image for subjects from low light conditions to bright light conditions. |
| Gain | Changes the db of the camera, typically 8 manual steps. Use up and down keys to increase or decrease gain. |
| Auto Focus | Sets the camera in auto focus mode. |
| Focus | Sets the camera in manual focus mode, Use up and down keys adjust focus. |
| ICR | (Not all FCB cameras have this feature) An infrared cut filter can be disengaged from the image path for increased sensitivity in low light environments. Please note, when image is in ICR mode the image becomes black and white. |
| Freeze | (Not all FCB cameras have this feature) This function captures an image in the field memory and displays image on screen. |
| BLC | When the background of the subject is to bright, back light compensation will automatically adjust and make the subject bright and the background darker. |
| Dimensions | H x W x L (mm) 20 x 148 x 85 |
| Power | 12v dc via the 4pin jack or 9v dc battery |

SAFETY INSTRUCTIONS

-  Only facility authorized maintenance personnel should troubleshoot the System Two Camera. Troubleshooting by unauthorized personnel could result in personal injury and/or property damage.
-  Only facility authorized personnel should repair the System Two Camera. Repair by unauthorized personnel could result in personal injury and/or property damage and could void warranty.
-  After completing a repair of the System Two Camera make sure the unit is in proper working order. Failure to do so could result in personal injury and/or property damage.
-  The articulating arm is spring loaded. When removing the camera head ensure that the arm locking pin has been installed. Failure to do so could result in personal injury and/or property damage.
-  The articulating arm is spring loaded. Never remove the arm locking pin until the head/yoke has been installed. Failure to do so could result in personal injury and/or property damage.
-  The System Two Camera comes with a heat-resistant borosilicate glass diffuser. If the diffuser appears to be damaged in any way repair immediately before use on any patient. Failure to do so could result in personal or patient injury.
-  Follow the product manufacturer's instructions. Failure to do so could result in personal injury and/or property damage.
-  If the unit fails any part of the preventive maintenance functional checks, repair the unit before use on any patient. Failure to do so could result in personal injury and/or property damage.
-  Do not use harsh cleaners, solvents, or detergents. Failure to do so could result in equipment damage.
-  Do not use silicone based lubricants. Equipment damage could occur.
-  Turn off main power before any repairs are started. Failure to do so could result in personal injury and/or property damage.
-  Do not pinch any wires during installation. Pinched wires can cause an electrical shock hazard, resulting in personal injury and/or property damage.
-  Use only Medical Illumination fuses P/N 0003082 if replacement is necessary. Failure to do so could result in personal injury and/or property damage.
-  Do not expose the unit to excessive moisture. Failure to do so could result in personal injury and/or property damage.
-  Do not rest articles or liquids on top of the System Two Camera. Spilled liquids will damage the light head and arm assemblies causing an electric shock hazard.

GENERAL MAINTENANCE

FUSE REPLACEMENT:



Turn off main power before fuses are replaced. Failure to do so could result in personal injury and/or property damage.

Refer to System Two Surgical Lighting System Service Manual for detailed instructions on how to replace fuses.



Use only Medical Illumination fuses P/N 0003082 if replacement is necessary. Failure to do so could result in personal injury and/or property damage.

HANDLE STERILIZATION:

Remove sterilizable handle by pressing the button near the base of the handle and pulling the handle off the handle post.

Sterilize the handle utilizing steam sterilization of minimum 250° Fahrenheit for a minimum of 30 minutes in compliance with AAMI-SSSa-1998 Good Hospital Practices, Steam Sterilization and Sterile Assurance, or equivalent method.

CLEANING INSTRUCTIONS:

Clean the front lens using glass/plastic cleaner or mild soap and water mix. Use a clean, soft cloth to avoid any scratching of the diffuser. Never spray the cleaning fluid directly onto the lens surface, but instead spray into clean cloth and then wipe the lens.

Clean the camera housing and arm using mild soap and water mixture. Apply this mixture to a clean cloth and wipe down the light head and arm. Never spray the cleaning fluid directly onto the light head or arm, but instead spray onto clean cloth and then wipe the light head and arm.



Do not use harsh cleaners, solvents, or detergents. Failure to do so could result in equipment damage.



Do not expose the unit to excessive moisture. Failure to do so could result in personal injury and/or property damage.

HEAD/YOKE ADJUSTMENT:



The head/yoke has been pre-adjusted by the factory. Should further adjustment be necessary, utilize the following procedure.

Unfasten the knob securing the head to the arm. Slide off the head and place it over a working-bench or flat-surface.

Find the yoke cap for the camera head. Cradle the sides of the cap with your thumb and index finger. Squeeze and then pull out the yoke cap to expose the nut, or gently pry off with a flat bladed screwdriver.

Use a flat bladed screwdriver to unfasten the bolt. Add thread-locking liquid (e.g. Loctite) over the bolt threads and reinstall the bolt. Let the adhesive cure for 24 hours.

Push the yoke cap back into its original position.

MAINTENANCE SCHEDULE

| Function | Procedure |
|---------------------------|--|
| Knob | Check to see that the knob securing the camera head to the mounting arm is in place and securely tightened. |
| Glassware | Inspect the front lens for chips, cracks, deep scratches or other defects that could affect the safety or performance of the camera head. Replace these items as required. |
| Moving joints/Adjustments | Check to make sure all moving joints function properly along the camera head and arm system. |
| Overall appearance | Check the general aesthetics of the System Two Camera Head. The unit should be kept clean and dust free. Clean and dust as necessary. |

Note: Maintenance schedules vary depending on usage and operating instructions. An annual inspection of the equipment is recommended.

Note: Medical Illumination International Inc., recommends that the maintenance records for this equipment be kept on file at the health care facility.

SECTION 8

TROUBLESHOOTING THE CAMERA

| Problem | Cause | Remedy |
|---|--|---|
| Camera will not turn on | No power to camera Fuse is blown Video switch is not turned on | Check circuit breaker Replace fuse/fuses Turn switch on |
| Camera malfunctions when rotated | Faulty or damaged connection | Contact customer service as the unit may require factory repair |
| Camera head does not maintain its position horizontally | Pivot bolt is loose. | Refer to maintenance section for adjustment instructions. If problem persists, contact customer service as the unit may require factory repair |
| Camera head will not rotate 340 degrees | Camera head is against internal stop | Contact customer service as the unit may require factory repair |
| Camera will not zoom or focus | No power to remote controller Remote controller is turned off Remote controller cable is unplugged | Plug unit to power outlet. Plug power-cord to remote controller Turn remote controller on Plug remote controller cable. Refer to Operation section |
| Laser will not turn on (laser models only) | No power to lasers Fuse is blown Laser switch is not turned on | Check circuit breaker Replace fuse/fuses Turn switch on |

SECTION 9

ELECTRICAL SCHEMATIC OF WIRING HARNESS

