LUXTEC

MicroLux® DLX Camera System NTSC & PAL

Operation and Service Manual

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Table of Symbols

CE	CE Mark of Conformity		Y/C	S-Video chromaticity & illuminance
(On-Off symbol)	On-Off button		Video	Composite video
IPX0	Ordinary protection against ingress of fluids		∼	Alternating current
CSA	Indicates this product is listed by CSA International as certified		⚠	Warning / Caution Read Operation and Service Manual before use
WB	White Balance		(Type BF symbol)	Type BF Equipment

General Warnings

- The user should carefully study this Operation and Service Manual before using this equipment in the clinical environment. Instructions should be followed explicitly, with special attention given to warnings, controls and user specifications. The Manual should be available to the appropriate personnel.
- The user of this product should be thoroughly familiar and trained in the assembly, use and care of this product.
- **Follow the instructions and restrictions in the operating manuals of other manufacturer's equipment when they are used in conjunction with this product.**
- Before every procedure, carefully inspect the Camera to ensure it has been properly maintained and cleaned, and that it is fully functional. DO NOT use if inspection reveals any damage such as cable cuts or loose connectors.
- To reduce the risk of fire and electric shock, do not expose electrical equipment to moisture. When cleaning, do not immerse the camera head or any other electrical device in liquid. Do not use or store liquids on or above the Camera.
- All electrical equipment must be used with approved hospital grade power cords and power plugs inserted properly into grounded AC power outlets.
- Electric shock hazard. If unit is not functioning properly, DO NOT OPEN.
  Please refer to the Repair and Return Section of this Manual for instructions.
- **Do not use in the presence of flammable anesthetics, liquids, vapors, gases or dusts.**
- Use care not to point any light guide directly at the eye while operating this system.

MicroLux® DLX Camera Control Unit Assembly
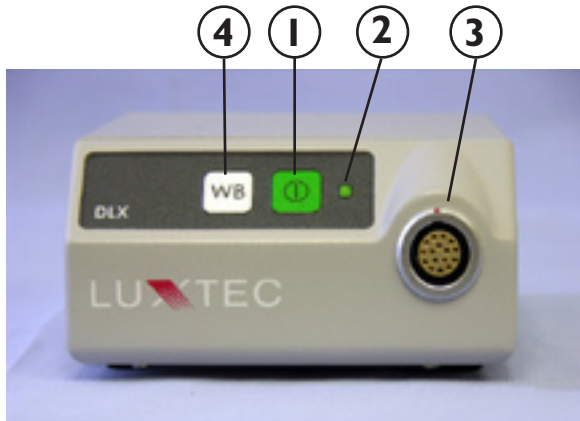
Front View
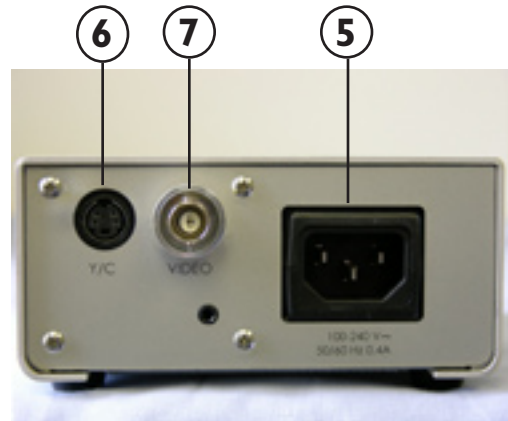
Rear View

①	**POWER switch**	Turns the camera control unit (CCU) on and off.
②	**POWER indicator**	Illuminates when the power is turned on.
③	**CAMERA head connector**	Connects the camera head to the CCU.
④	**WB switch**	Activates the white balance function.
⑤	**AC power**	Accepts a standard AC power cord.
⑥	**S-Video connector**	Connects CCU to S-Video input of a monitor, recording device, printer, etc...
⑦	**BNC VIDEO connector**	Connects to video input of a monitor, recording device, printer, etc... Can be used at the same time as the S-Video connector.

MicroLux® DLX Camera Overview

Indication for Use

The Luxtec video camera is mounted on a headlight to provide visualization of a wound or surgical site. See Figure 1.

Inspection Before Use

The MicroLux® DLX Camera system includes a camera head mounted on the headlight module, a headlight cable, a headband or sweatband, video connecting cables and adapters, and a camera control unit (CCU) (Figure 2). Check to make sure you have all cables, adapters and camera parts. Please verify that all components have been received undamaged.

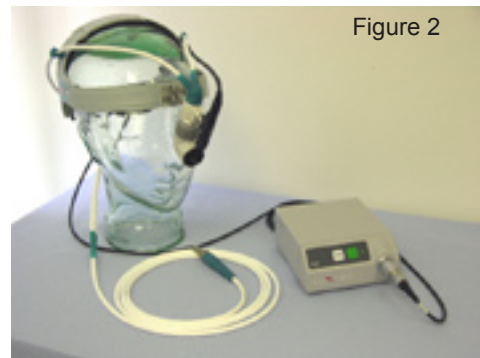
Figure 1

Figure 2

Installation to Floor Stand (Optional)

1. Using a 5/64" Allen or Phillips screwdriver, remove cable bracket on left side of the floorstand and keep the screws handy. See Figure 3.
2. Mount the bracket to the floorstand using the existing screws. See Figure 4.
3. Mount CCU to the bracket using a Phillips screwdriver. See Figure 5.
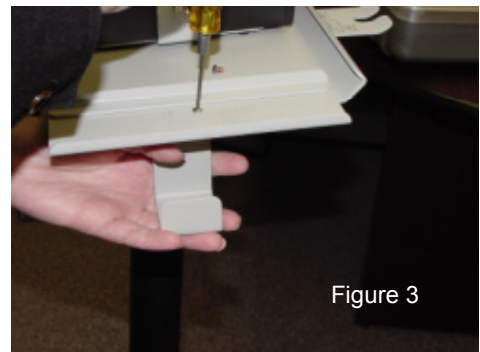
Figure 3

Figure 4
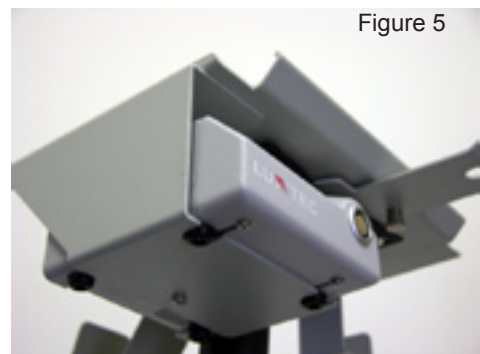
Figure 5

Set-up Sequence

• Power must be off.

• Align the red dot on the camera head connector with the red dot shown on the front of the CCU.

• Push the camera head connector fully into the CCU.

• Plug the AC power cord into the back of the CCU.

• Connect the video cables from the back of the CCU to a monitor, printer, recording device, etc.
  (See Connection Instructions).

• Push on ⏻ button to activate the camera (green light on the front of CCU should be on).

CAUTION:
Carefully align the red dot on the camera head connector with the red dot shown on the front of the CCU.
See Figure 6.

Figure 6
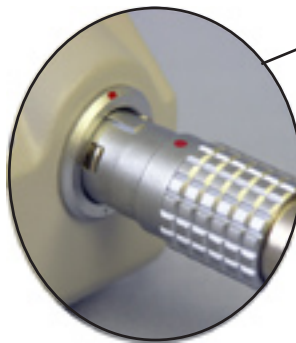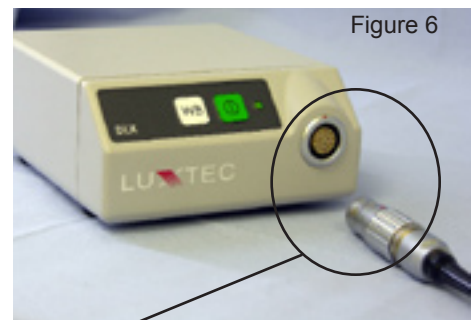
Connection Instructions

Back View

CCU
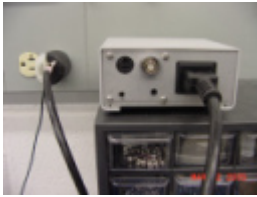
Step 1:
AC Power Connection

Recording Device

Step 2:
Video Connection
CCU to Recording Device

Monitor

Step 3:
Recording Device to
Monitor Connection

Front View

Step 4:
Camera head connection
via camera cable

Step 5:
Power "on"

Step 1: AC Power Connection to the Camera Control Unit (CCU).

CAUTION: ⚠ **DO NOT plug in the power supply to the wall outlet yet.**
DO NOT TURN THE POWER ON YET!

Step 2: Camera Control Unit connection to a Recording Device.
The CCU has both S-video and BNC video connections. Connect the video cable(s) from the CCU to the VIDEO IN of the recording device. If both S-video and BNC video cables are used, make sure they do not connect to the VIDEO IN of the same recording device.

Step 3: Recording Device connection to a monitor.
It is only necessary to connect one video cable to the monitor. If both the S-Video and BNC cables are connected to a single monitor, please ensure that one is connected to line A and the other to line B. If using more than one monitor or recording device, you can use both S-Video and BNC cables.

If the recording device is not used:
BNC Connection from the camera to the monitor:
If you used the BNC cable at the rear of the camera, connect using the **BNC cable** to the rear of the monitor, and lock the BNC connector as shown:
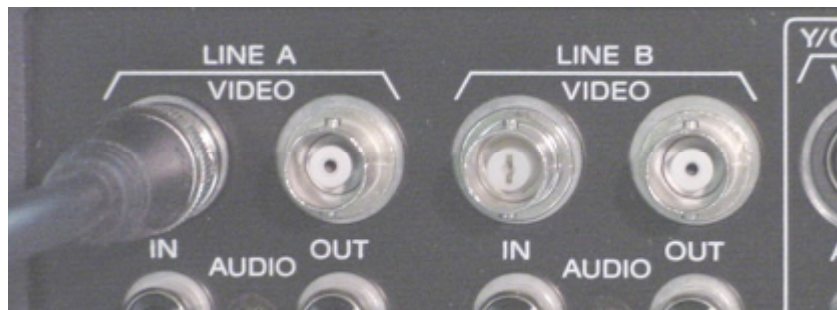
BNC connection to **Line A VIDEO IN**

OR

If the recording device is not used:
S-Video Connection from the camera to the monitor:
To connect using the **S-Video** cable to rear of the monitor, line up the pins and select the **Y/C INPUT**

S-Video cable connector pin orientation

S-Video cable connected to the **Y/C INPUT**
(S-video connection)

Infrequently, you will need to use the **RCA** plug to connect to a monitor or recording device. In order to do this, connect the **RCA** plug adapter to the end of the **BNC** cable as shown below.

Step 4: Camera head connection to the CCU:
**Carefully align the red dot on the camera head connector with the red dot shown on the front of the CCU.**

Step 5: Power ON.
1. Turn on the monitor, recording device and/or printer.
2. Select Line A or Line B on the monitor.
3. Put on the headlight with the camera..
4. Connect the headlight cable to your Luxtec light source.
5. Turn on the lightsource and the camera power. The camera power switch is located on the front panel of the CCU.
6. Look at the front of the monitor. A picture should be visible on the monitor.

CAUTION: ⚠️ **The camera head MUST be connected to the CCU PRIOR to turning on the CCU.**
Connecting the camera head to the CCU while the power is on will damage or destroy the video chip.

If you still do not have a picture, make sure you have selected the same Line A or B that you have selected to in the rear of the monitor.

If you still do not have a picture, turn OFF the camera power and check all of your connections on the camera, recording device, printer and monitor. Turn the camera power back on. If you still do not have a picture, please contact your local distributor.

White Balance

White balance optimizes the color definition at different illumination levels.

White Balance before each procedure is strongly recommended.

1. Fully open the iris of the headlight module.
2. Point the camera and headlight at a white object. Make sure the image fills the monitor entirely.
3. Press the "WB" button on the front of the CCU and hold for 5 seconds. The camera will white balance automatically.

Troubleshooting

Problem	Cause	Action
No image on monitor	Camera not turned on	Turn power on
	Camera head not connected to controller	Connect camera head cable to front of CCU with power OFF
	CCU not plugged into AC outlet	Plug CCU power cord into outlet
	Monitor not turned on	Turn monitor on
	Monitor settings not correct	Consult monitor manufacturer's guide
	Intermediate component (recording device/printer) connection not correct	Consult connection diagram in this manual
Poor image quality	Components not connected properly	Consult connection diagram in this manual
	Dirty Camera lens / obstruction	Refer to cleaning instructions
	Bad / damaged camera	Contact your Luxtec distributor
	Video standard incompatibility (NTSC/PAL)	Consult components' manufacturers' guides
Image not centered on monitor	Illumination spot not vertically centered on video image	Contact your Luxtec distributor
Colors not correct	White balance is not correct	Follow white balance instructions in this manual to reset
Black and white image	S-video cable connection is loose	Secure S-Video cable connections
Dim image	Insufficient light at surgical site	Increase light output per light source user instructions

Cleaning

The Camera can be wiped down using 70% isopropyl alcohol. Be sure to unplug the power cord before cleaning. Allow 5 minutes for alcohol to evaporate before reconnecting to power.

Specifications

Dimensions camera head only .... 0.43" W (10.9mm) x 3.34" H (84.8mm) x 1.03" D (26.2mm)
Weight: camera head only .... 28 grams
Weight: complete headlight assembly,
      includes: camera head, headband,
      headlight and two feet of cable .... 230 grams (8 oz)
Dimensions control unit .... 4.6" W (117mm) x 2.33" H (59mm) x 5.77" D (147mm)
Weight of control unit .... 700 grams (25 oz)
Power to CCU .... 100 - 240VAC ± 10%
Power consumption .... 25W (max) 5w nominal
Image Sensor .... ¼ Inch CCD
Output .... composite video and S-Video in either NTSC or PAL
Resolution .... NTSC: 768 lines (H) x 494 pixels (V)
                                     PAL: 752 lines (H) x 582 pixels (V)
Classification .... Type BF, Class II
Electrical Safety .... IEC 60601-1, UL 60601-1, CAN/CSA C22.2 NO. 601.1-M90,
                                     IEC 60601-2-18.
Water Ingress Rating .... IEC 60529, IPX0
Electromagnetic Compatibility .... IEC 60601-1-2: Class A, IEC 61000-3-2, IEC 61000-3-3
Recommended Conditions .... Operating: Temperature 5 to 40°C and
                                     10 to 85% relative humidity, non-condensing
                                     Storage: Temperature 0 to 50°C and
                                     10 to 85% relative humidity, non-condensing

Ordering Equipment

To place an order, contact your local Luxtec distributor or call Luxtec customer service at 1-800-325-8966 (USA) or +1-508-835-9700 to identify your local distributor.

MicroLux® DLX Camera System:

003085NTSC   Includes NTSC Camera Control Unit (CCU) and Camera head mounted on the
                    UltraLite® Plus Headlight System
003085PAL   Includes PAL Camera Control Unit (CCU) and Camera head mounted on the
                    UltraLite® Plus Headlight System

Reordering parts:

001270BIF   Headband for UltraLite 2 bifurcated cable
001290BIF   Sweatband for UltraLite 2 bifurcated cable
0029009   UltraLite 2 cable, bifurcated, 9' (275cm)
005331LX   Cable clip kit (package of 4)

Recommended Light Sources:

9300XDPTT   300 Watt Xenon Dual Port Light Source
9300XSPT   300 Watt Xenon Single Port Light Source
00LX300T   300 Watt Xenon Light Source with turret

Limited Warranty

Luxtec warrants that the equipment manufactured by Luxtec shall be free from defects in material and workmanship under normal use and service for a period of one (1) year from the date of purchase from Luxtec. Luxtec's sole and exclusive liability under the warranty shall be, at Luxtec's option, either to repair any component which fails during the warranty period due to any defect in workmanship or material F.O.B. factory if:

1. Customer promptly reports such defect to Luxtec in writing,
2. If requested by Luxtec, customer returns equipment to Luxtec with shipping charges and,
3. Upon inspection, Luxtec finds the equipment to be defective.

This warranty is contingent upon normal and proper use of the equipment. It does not cover equipment modified without the written approval of Luxtec, subjected to unusual physical or electrical stress, or damaged during shipment. This warranty is non-transferable unless authorized in writing by Luxtec.

Luxtec reserves the right to make design changes on its products without liability to incorporate said change in Luxtec products previously designed or sold.

Upon receipt of the product, it should be carefully inspected. If any defect is discovered, notification must immediately be given to the manufacturer and distributor.

Limited Warranty

Contact your local Luxtec distributor for Return Authorization. **This device must be clean when returned**. Luxtec reserves the right to return un-repaired any equipment that is contaminated with blood or other organic material.

Warranty Service and Repair:
To obtain service under warranty or return product for repair, the customer should contact your local Luxtec distributor or call Luxtec Customer Service at 1-800-325-8966 (USA) or +1-508-835-9700.

99 Hartwell Street • West Boylston • MA, 01583 • USA
Telephone: (800) 325-8966 (USA & Canada) or +1-508-835-9700 •
Fax: +1-508-835-9976 • email: CustSvcLuxtec@integra-LS.com
www.integra-surgical.com