OmniCure®
UV Curing • In Control

LED Light Meter System

User Guide

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EXCELITAS TECHNOLOGIES®

USER GUIDE

035-00434R

Trademarks:

Made in Canada. Doc. No. 035-00434R

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1 Introduction

The main purpose of this LED Light Meter System is to provide accurate absolute power/irradiance measurements for various lens options and wavelengths of an Excelitas LX series UV LED spot curing system or any other commercially available UV LED spot curing system.

This product will complement the Excelitas LX series and will also cater to commercially available LED UV spot curing systems.

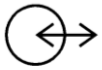
We recommend that you read this manual to discover all its features, and how to use them

2 Safety

2.1 Glossary of Symbols

CAUTION - Risk of danger: consult accompanying documents

WARNING -Eye damage may result from directly viewing ultraviolet light – protective eye shielding and clothing must be used at all times.



Input/Output Signals

Battery

D.C. Current

Caution, Hot Surface

2.2 Safety Precautions

DIN Multi Pin Connection Port For External Sensors
(for use only with sensors supplied by Excelitas Technologies)

- For using the Sensor, connect cable to this port.

WARNING
When using LED Heads do not stare directly at the LED Aperture(s). This may be harmful, resulting in eye injury. Always use the protective eyewear provided with this device. Additionally, protect any exposed skin with appropriate clothing or shielding as required.

WARNING
To prevent accidental exposure to hazardous optical/ UV radiation, always ensure that the LED Heads are properly secured in a mounting fixture. Hand-held use of the LED Heads is not recommended and may expose the user to dangerous optical radiation.

Caution, Hot Surface
Due to elevated operating temperatures; avoid contact of the LED Head(s) when energized The LED Heads are designed to be mounted in a suitable fixture prior to use. Clamp type heat sink assemblies are provided with each LED Head to provide user safety and optimum thermal management. Prior to handling of the UV LED Head(s), allow a cool down for a period of approximately 5 minutes after system power has been removed.

Warning
The LED Light Meter is supplied with two lithium batteries. Lithium batteries present a potential fire, explosion or severe burn hazard. **DO NOT** attempt to re-charge, disassemble, incinerate, short circuit or expose battery to temperatures above 100° C or expose contents to water.

WARNING!
Used batteries are not to be discarded. Return to the nearest authorized Excelitas Technologies service center for disposal/ recycling.

Lithium batteries must have terminals taped with non-conductive material prior to returning for disposal/re-cycling to prevent short-circuiting. External packaging material must provide adequate protection to contents.

The lithium battery supplied in this system DOES NOT contain: mercury, lead, manganese or cadmium. Substitution of any other type of battery is not recommended and may void warranty.

Caution
The detection window operational life can be significantly shortened if it is handled incorrectly. Do not touch the window surface. Skin oils and scratches can cause the window to fail prematurely.

Cleaning:
Clean the exterior of the Light Meter with a slightly dampened cloth and simple water/ detergent solution only. Refer to section 9.2 for detailed cleaning instructions.

3 System

- LED Light Meter (model# LM2011, LM2011-xx)
- LED Light Sensor with removable Aperture (model# LS100, LS200)

Component	Part Number
LED Light Meter System	010-00281R, 019-00427R
Lithium Battery (qty. 2)	055-00007R

4 LED Light Meter Features

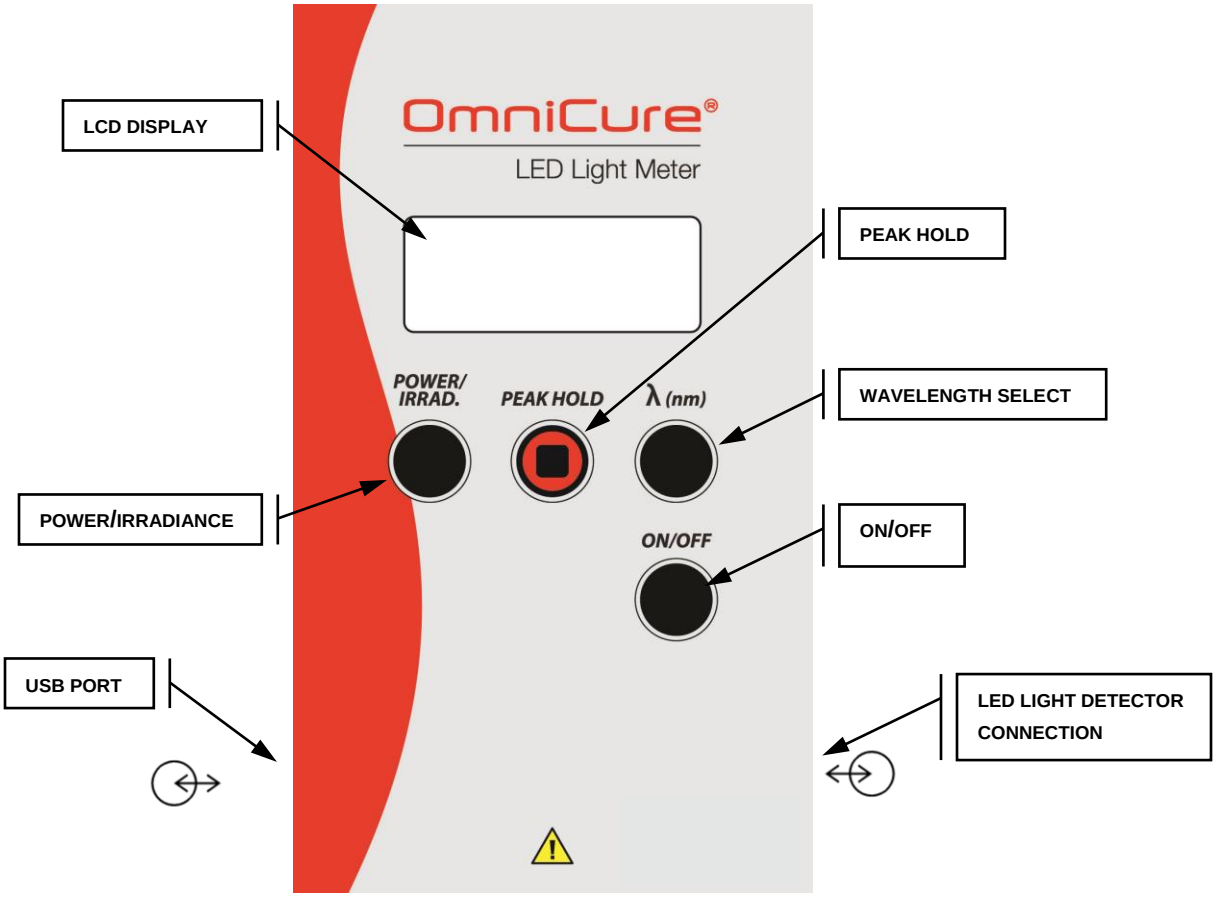


Figure 1 LED Light Meter

Figure 2 LED Light Sensor Connection

Figure 3 USB Connection

4.1 Power ON/OFF

4.1.1 Press ‘ON/OFF’ button to switch on the unit. The power on sequence will flash full screen information for 5 seconds and then display current wavelength.

4.1.2 The Meter will auto power off after 5 minutes (system will remember the last mode and wavelength on power up).

4.1.3 Hold ‘ON/OFF’ for 4 seconds to turn power off.

4.2 Peak Hold

4.2.1 ‘Peak Hold’ button (Irradiance or Power Mode): in either modes the meter latches on to the peak value and refreshes the display when the value is higher than the current displayed value.

4.2.2 Upon pressing the button once, the meter will activate the ‘Peak Hold’ mode and the system will display “peak hold” (displays “peak’ over top of ‘hold’) to indicate the peak hold mode. Pressing ‘Peak Hold’ again the meter will revert back to the normal default mode which displays the current value.

4.3 Wavelength nm:

Default Wavelength Selections (LM2011);

- 365nm
- 385nm
- 400nm
- 460nm

Default Wavelength Selections (LM2011-xx);

- 365nm
- 385nm
- 395nm
- 405nm

4.3.1 Pressing the ‘Wavelength’ button once will display the current set wavelength. Pressing the ‘Wavelength’ button repeatedly will cycle through the 4 preset wavelengths. (if you have increased or decreased the number of wavelengths using the control panel, the unit will cycle through the list provided)

4.4 Power/Irradiance

4.4.1 This button will toggle between the Power and Irradiance mode.

	Sensor Aperture	Light Meter Select
Power	Removed	Power
Irradiance	Installed	Irradiance

4.4.2 The display will show "0L" if the output power exceeds 500mW or 25W/cm² (when used with a LS100)

4.4.3 The display will show "0L" if the output power exceeds 2000mW or 40W/cm² (when used with a LS200)

4.5 LED Light Sensor Connection

4.5.1 Connect the LED Light Sensor via DIN multi-pin connection.

4.5.2 If the sensor is not connected the display will show "LS"

4.6 USB Connection

4.6.1 Connect to a computer to access the GUI.

5 LED Light Sensor:

Note: Ensure the supplied aperture is used with the sensor, exchanging other apertures invalidates the irradiance calibration.

5.1.1 Removable threaded aperture will allow a choice of Power or Irradiance to be measured.

5.1.2 To remove the aperture, twist and rotate the aperture in a counter-clock wise direction. (do not use mechanical tooling). Refer to Figure 5.

5.1.3 To install the aperture, engage threads and hand tighten the aperture in a clock wise direction until a positive force is felt. (do not over tighten or use mechanical tooling). Refer to Figure 5.

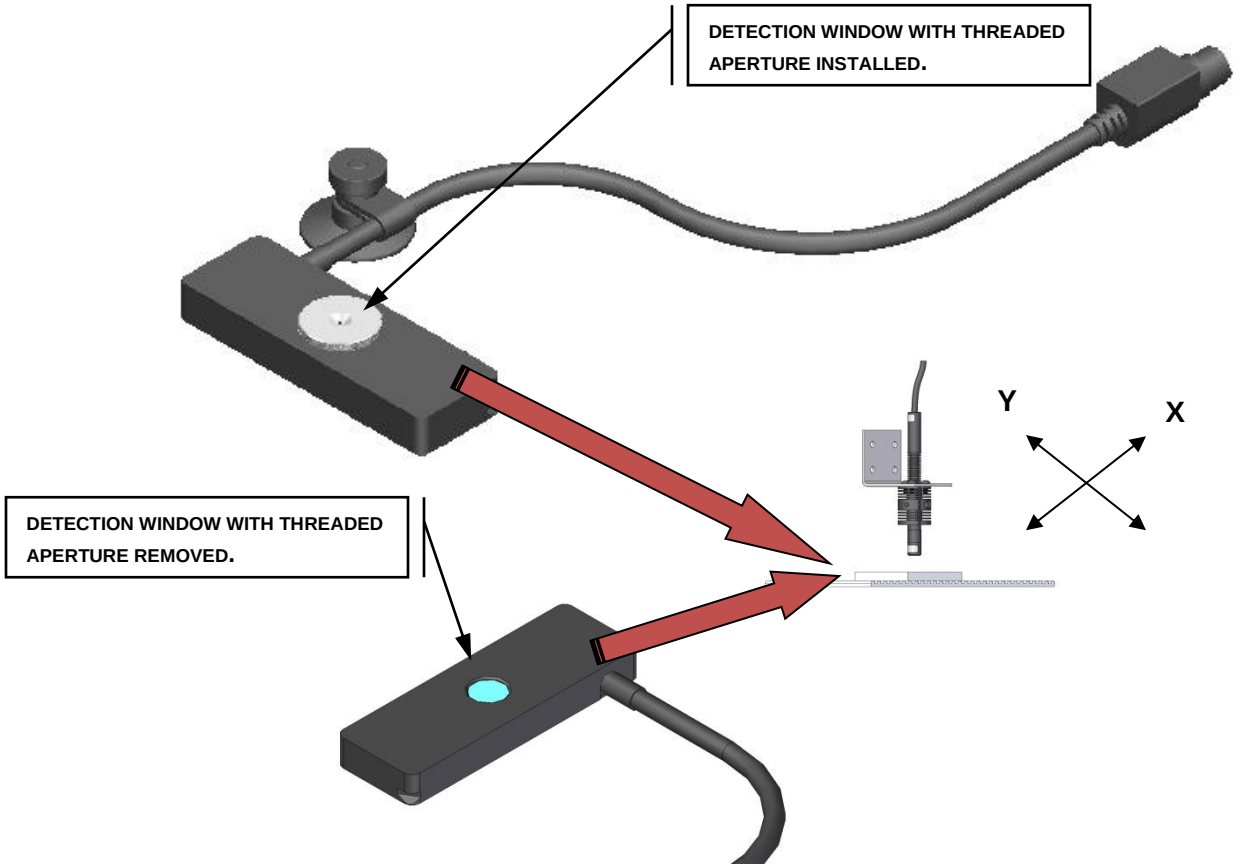


Figure 4 LED Light Sensor

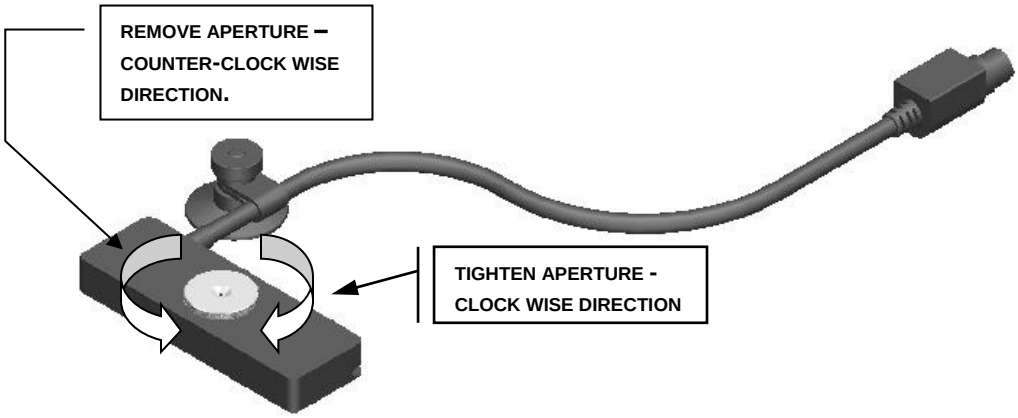


Figure 5 LED Light Sensor Aperture

6 Calibration

6.1.1 It is recommended that the LED Light Meter system be calibrated every 12 months to ensure valid measurements. The calibration is traceable to NRC and a calibration certificate is included at each calibration cycle.

6.1.2 Irradiance calibration is only valid with the correct aperture supplied, Exchanging other apertures invalidates the calibration.

6.1.3 Calibration is authorized only by a certified Excelitas service center. When calibration is due contact Excelitas for a return authorization number. Refer to Section 0.

7 Installation and Basic Operation:

XY Alignment Tool:
Provisions for an alignment tool/fixture is recommended to eliminate the alignment challenges which may be encountered to capture accurate peak power or irradiance measurement.

7.1.1 Connect the LED Light Sensor to the LED Light Meter via the DIN Multi-pin Connection.

7.1.2 Place LED Light Sensor into production position

7.1.3 Select wavelength to match the LED Head wavelength, ref. section 4.3.

7.1.4 If measuring Irradiance, install Aperture and ensure “Irradiance” is selected on the meter.

7.1.5 If measuring Power remove Aperture and ensure “Power” is selected on meter.

	Sensor Aperture	Light Meter Select
Power	Removed	Power
Irradiance	Installed	Irradiance

7.1.6 If utilizing an XY alignment tool/fixture adjust XY positions over the detection window/aperture to achieve maximum Power/Irradiance level. Secure LED Head into desired position.

7.1.7 If not using an alignment tool/fixture manually move LED Head over the detection window until maximum Power/Irradiance level is achieved and secure LED Head into desired position.

Note; Do not use mechanical device to remove or install Aperture. Carefully install by hand until snug. Ensure the Aperture and the detector optical window are clean before each use.

8 GUI Operation

8.1 Driver Installation

Minimum Computer Specifications.

- 600+ MHz Intel Compatible processor.
- Windows XP, Windows Vista, Windows 7.
- 256 Mb for RAM.
- 10 Mb for software installation.
- 20 Mb for data storage.
- SVGA video 1024x768 resolution, 16 bit color.
- USB port (1 port), USB 1.1 or 2.0 format.

Download the GUI installation file from Excelitas website.

8.1.1 Connect a USB cable to the LED Light Meter and the Computer USB port. Refer to Figure 3 for connecting cable locations.

8.2 GUI Control Panel Operation

8.2.1 The GUI allows the user to change the wavelengths that may be accessed by the radiometer. The radiometer by default has 4 wavelengths, this may be increased to 5 wavelengths, customized using the GUI.

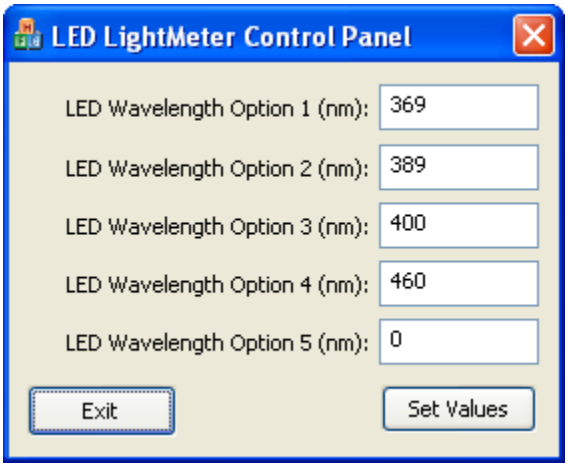


Figure 6 LED Light Meter GUI Control Panel

8.2.2 Allowable wavelength values are between 320nm and 750nm. Click Set Values to update the selectable wavelengths in the power meter.

8.2.3 Enter 0 if you wish to use less than 5 wavelengths.

8.2.4 Click Exit to exit out of the program.

9 Care and Maintenance

9.1 General

9.1.1 The LED Light Sensor can be stored in its original individual packaging, or in the plastic case with the LED Light Meter – there is a special cut-out in the foam insert for this purpose.

9.1.2 Do not touch the LED Light Sensor's optical window with fingers or any abrasive object. Large measurement errors may result from be generated through scratches, digs and other coating damage on the Sensor optical window surface. Refrain from touching the optical surface with any foreign object which could scratch the optical window.

9.2 Cleaning

9.2.1 Cleaning of the Sensor is not generally required. However, if any visible contamination or finger prints appear in the optical window, the contaminants may cause inaccurate measurement. If required, gently clean the Sensor optical window and the aluminum housing with reagent grade alcohol and soft cotton swab, a minimum amount alcohol is preferred to avoid alcohol contamination in the detector.

Warning:
Seals are not 100% water tight. Use of excessive liquid will flood and damage the electronics.

9.2.2 Large measurement errors may result from be generated through scratches, digs and other coating damage on the detector optical window surface. Refrain from touching the optical surface with any foreign object which could scratch the optical window.

9.3 Lithium Batteries

9.3.1 The lithium batteries (qty.2) in the LED Light Meter are expected to last for 1 year under normal operating conditions. Do not remove the batteries from the Meter until the low battery code 'BAT' appears on the LCD screen.

9.3.2 The batteries are accessible through a cover located on the underside of the LED Meter. When replacing the batteries ensure that both batteries are replaced at the same time.

9.3.3 Use the batteries supplied by Excelitas Technologies, do not substitute with another brand. The batteries in the Meter are not standard AA batteries. The voltage of the standard AA batteries will not supply enough power to operate the LED Light Meter.

9.3.4 To replace the Excelitas Technologies supplied lithium batteries:

- Remove the protective rubber boot.
- Remove qty.2 Philips Screws.
- Open battery cover.
- Remove and discard old batteries
- Insert new batteries (refer to the + / - placement decal inside the battery cavity).

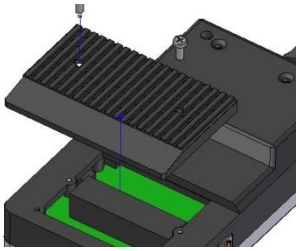


Figure 7 Lithium Battery Compartment

10 Technical Specifications

Wavelength Range:	5 wavelengths are user-selectable within the range of 320nm - 750nm
Irradiance (LS100):	50mW/cm² - 25W/cm²
Power Range (LS100):	1mW –500mW
Irradiance (LS200):	50mW/cm² - 40W/cm²
Power Range (LS200):	1mW –2000mW

Measurement Resolution: 1% of displayed reading (worst case)

Sensor Uncertainty:
The uncertainty is claimed to be ±10.0%. This means there is a 95% probability the reported power measurement from the detector falls within ±10.0% of the NRC (National Research Council of Canada) reference detector standard

11 Electrical Specifications (LED Light Meter)

Battery Type: 3.6-volt Lithium, non-rechargeable 2.2 Ah

I/O Ports:

External Detector Port: DIN Connector, only use with Excelitas external LED Light Meter Sensor.
USB 2.0.

Electrical Specifications (Sensor)

DIN Multi-Pinned Connection Cable: use only connect to LED Light Meter.

General

LED Light Meter
Dimensions (L x W x H): 6.39 x 3.93 x 1.70 inches (163mm x 100mm x 44mm)
Weight: 1lb (450g).
LED Light Sensor
Dimensions: 3 x 1 x 0.35 inches (75mm x 25mm x 9mm) (without aperture).
Weight: 2.9oz (82g) without protective cover.

12 Regulatory Compliance

12.1 Safety and Electromagnetic Compatibility:

The LED Light Meter system (model # LM-2011/LM-2011-xx/LS100/LS200), has been tested and found to comply with product safety and electromagnetic compatibility requirements. For a complete list of tests and for certification details, please contact your OmniCure representative or visit: https://www.excelitas.com/product/omnicure-lx500-led-uv-radiometer-and-calibration-kit

CE Marking

Council Directive 2014/35/EU	Low Voltage Directive	CE
Council Directive 2014/30/EU	EMC Directive	
Council Directive 2012/19/EU	WEEE Directive	
Council Directive 2011/65/EU as amended by (EU) 2015/863	RoHS	

Information to User

FCC Class B Digital Device or Peripheral

NOTE: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and then the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

WARNING
Changes or modifications not expressly approved by Excelitas Canada Inc. could void the user's authority to operate the equipment.

12.2 China RoHS

The symbol above indicates that this product is in compliance with China RoHS requirements.

Part Name	Hazardous Substances					
	Lead (Pb)	Mercury (Hg)	Cadmium (Cd)	Hexavalent Chromium (Cr (VI))	Polybrominated biphenyls (PBB)	Polybrominated diphenyl ethers (PBDE)
Printed circuit board assemblies	X	O	O	O	O	O

This table is compiled according to SJ/T 11364.
O : Indicates that the content of the hazardous substance in all homogeneous materials of the part is below the limit requirement of GB/T 26572.
X : Indicates that the content of the hazardous substance in at least one of the homogeneous materials of the part exceeds the limit requirement specified by GB/T 26572.

12.3 WEEE Directive

The symbol above indicates that this product should not be disposed of along with municipal waste, that the product should be collected separately, and that a separate collection system exists for all products that contain this symbol within member states of the European Union.

The equipment that you bought requires the extraction and use of natural resources for its production. It may contain hazardous substances that could impact health and the environment.

To avoid the dissemination of those substances in our environment and to diminish the pressure on the natural resources, we encourage you to use the appropriate take-back systems. Those systems will reuse or recycle most of the materials of your end life equipment in a sound way.

The crossed-out wheeled bin symbol indicated above invites you to use those systems.

If you need more information on the collection, reuse and recycling systems, please contact your local or regional waste administration.

13 Warranty

Excelitas Technologies warrants, to the original purchaser for a period of one (1) full year, calculated from the date of purchase, that the equipment sold is free from defects in material and workmanship.

In the event of a claim under this warranty, the equipment is to be sent postage and carriage paid, including a description of the fault, to the Excelitas Technologies Service Centre. Returned equipment will not be received without a Return Authorization (RA) Number, issued by the appropriate Service Centre. Alternatively you can fill out a request for Return Authorization (RA#) on our website https://www.excelitas.com/ox_service_request_form.

Any claims for units received with defects in material or workmanship must be reported to an authorized Excelitas Technologies Service Centre within 30 days from the original date of receipt. Excelitas Technologies will repair or replace these reported defects free of charge for a period of up to 2 years from the original date of receipt. The equipment must be sent postage and carriage paid.

In order for us to serve you better, include a written description of the fault and the name and telephone number of a contact person who may be contacted for additional service related questions.

Package the LED Light Meter System in its original shipping case or as appropriate to prevent damage during transport.

In the case of damage caused by wear and tear, careless handling, neglect, by the use of force or in the case of interventions and repairs not carried out by an Excelitas Technologies Authorized Service Center, the warranty ceases to be valid.

This warranty may not form the basis for any claims for damages, in particular not for compensation of consequential damages.

Warning

There are no user serviceable parts within the LED Light Meter System. Opening the main LED Light Meter enclosure will void the warranty.

14 Returning Equipment to Excelitas Technologies for Service

1. Original packaging should be kept for future use. Please use this packaging when sending equipment to Excelitas Technologies for servicing or calibration to protect the sensitive optical and electronic components. It is safe to ship the LED Light Detector in the plastic carrying case with the LED Light Meter provided it is placed in its foam cut-out.

2. Please make a note of the problem encountered, the steps followed to isolate the problem and the result of any trouble shooting steps taken.

3. Contact the nearest Excelitas Technologies Service Centre to obtain a Return Authorization Number. For your convenience, RA numbers can also be requested on-line at: https://www.excelitas.com/ox_service_request_form

4. Follow shipping instructions provided by the service technician. The unit should be returned in its original packaging if possible.

15 Contact Information

Excelitas Canada Inc.
2260 Argentia Road
Mississauga, Ontario
L5N 6H7 CANADA

Tel.: +1 905 821-2600

Toll: +1 800 668-8752 (USA and Canada)

Fax: +1 905 821-2055

https://www.excelitas.com/product/omnicure-lx500-led-uv-radiometer-and-calibration-kit

https://www.excelitas.com/ox_service_request_form

https://www.excelitas.com/omnicure-x-cite-inquiries

Technical Assistance:

techsupport@excelitas.com

https://www.excelitas.com/ox_service_request_form

For a complete listing of Authorized OmniCure Distributors and Service Centres, please go to https://www.excelitas.com/dealer-search

16 Replacement Parts and Accessories

Replacement components can be purchased directly from Excelitas Technologies. For ordering and pricing information, contact the Inside Sales Department at:

Tel.: +1 905 821-2600

Toll: +1 800 668-8752 (USA and Canada)

https://www.excelitas.com/contact

Part Number	Description
010-00281R	LED Light Meter System (LM2011/ LSM2011-xx, LS100)
019-00427R	LED Light Meter System (LM2011-xx LS200)
055-00007R	Replacement Battery (qty.2)