RETRA III (N) Light Engine®
Instruction Manual
Regulatory Models
Lumencor utilizes regulatory model names for all certified and CE marked products. The regulatory model names are traceable to all regulatory documentation, third party reports and certifications.

"Regulatory Model: Retra III" is used as a representative model for all certified and CE marked Retra III Products.

Emissions
This equipment has been tested and found to comply with the limits of EMC directive 2014/30/EU. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. 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.

Safety Certifications
TÜV SÜD America, CB Certification (IEC 61010-1:2010)
TÜV SÜD America, NRTLus Certification (UL 61010-1:2012)
TÜV SÜD America, cNRTL Certification (CAN/CSA-C22.2 No. 61010-1:2012)
TÜV SÜD America, EN Certification (EN 61010-1:2010)

CE Marking
Low Voltage Directive (2014/35/EU)
EMC Directive (2014/30/EU)
RoHS Directive (2011/65/EU+2015/865/EU)
REACH Regulation (EC) No. (1907/2006/EC)

EU Declarations of Conformity can be found at http://lumencor.com/company/regulatory-compliance/

If you wish to discard electrical and electronic equipment (EEE), please contact your dealer or supplier for further information.

For disposal in countries outside of the European Union: This symbol is only valid in the European Union (EU). If you wish to discard this product, please contact your local authorities of dealer and ask for the correct method of disposal.

This product is FOR RESEARCH USE ONLY.

Lumencor, Inc.
14940 NW Greenbrier Parkway
Beaverton, OR 97006
T 503.213.4269
www.lumencor.com

Document Number 52-10025
Revision A
010820
Table of Contents

1. Introduction
2. Precautions and Warnings
3. Installation and Operating Instructions
4. Light Output Characteristics
5. Operational Specifications
6. Routine Maintenance and Trouble Shooting
7. Customer Support
8. Warranty
1. Introduction

The RETRA III light engine consists of 1 or 2 individually addressable solid-state light sources with integrated electronic control systems. The constituent light sources may be LEDs or luminescent light pipes. The outputs of the constituent light sources are refined by bandpass filters and merged into a common optical train directed to the light output port on the front panel. The light output port has a built-in adapter for connection to an SMA-terminated optical fiber or a liquid light guide (LLG). An onboard photodiode continuously monitors the light output and generates reference signals that can be applied to the constituent sources in a feedback loop to maintain constant light output over time. The light sources within the RETRA III light engine® are controlled by an on-board microprocessor operating Lumencor firmware accessed via one of two serial interfaces, USB/RS-232 or TCP. The user can enable or disable each source independently by serial commands as well as change the intensity of each source independently. The RETRA III light engine can either be controlled by third party microscopy data acquisition software or by a GUI resident on the on-board microprocessor. Alternatively, the light sources may be turned on and off by TTL inputs from a trigger device such as a camera or a real-time controller. The only manual control is the master power switch on the front panel. Optimal internal operating temperature is maintained by negative pressure air cooling with the air intake at the front of the light engine and the exhaust fan at the the rear.
2. Precautions and Warnings {Précautions et mises en garde}

A few simple practices will ensure trouble-free operation for the life of the light engine.

Les quelques règles simples suivantes permettront d’assurer un fonctionnement fiable pendant toute la durée de service de la source lumineuse.

Safety Instructions:
Please read and follow all safety instructions provided BEFORE using the RETRA III light engine®. Failure to comply with the safety instructions may result in fire, electrical shock, or personal injury and may damage or impair protection provided by equipment. Please save all safety instructions.

Instructions de sécurité:
Veiller à lire et à respecter toutes les instructions de sécurité fournies AVANT d’utiliser le RETRA III light engine® afin d’écarter les risques d’incendie, de décharge électrique, de blessure corporelle et de possibles dommages ou défaillance de la protection offerte par l’appareil. Conserver toutes les instructions de sécurité.

Safety Definitions (Définitions relatives à la sécurité):

Warning: Statements identify conditions or practices that could result in personal injury.

Avertissement: déclarations qui identifient des situations ou des pratiques susceptibles d’entraîner des blessures corporelles.

Caution: Statements identify conditions or practices that could result in damage to your equipment.

Attention: déclarations qui identifient des situations ou des pratiques susceptibles d’endommager le matériel.

Safety Items (Mesures de sécurité):

Warning: DO NOT use an unapproved power supply. The Lumencor supplied external power supply (see Section 3.1) is recommended for the use with the RETRA III light engine. The equipment is required to be supplied by a properly approved/certified DC power source meeting the minimum electrical ratings of the product. Connect the AC power cord to a receptacle with a protective safety (earth) ground terminal.

Avertissement: NE PAS utiliser une alimentation non approuvée. L'alimentation externe fournie par Lumencor (voir section 3.1) est recommandée pour une utilisation avec le moteur léger RETRA III. L’équipement doit obligatoirement être alimenté par une source d'alimentation CC dûment approuvée / certifiée respectant les caractéristiques électriques minimales du produit. Branchez le cordon d'alimentation secteur sur une prise avec une borne de terre de protection.

Warning: DO NOT look into the output of the light engine. The brightness of this light source is higher than most commercial lighting fixtures and is intended to couple directly into a microscope or other bioanalytical instrument.

Avertissement: NE PAS regarde directement la sortie de la source lumineuse. L’intensité lumineuse de cette source est supérieure à celle de la majorité des appareils d’éclairage disponibles dans le commerce et est conçue pour un raccordement direct à un microscope ou autre appareil de bioanalyse.
Warning: DO NOT turn on the light without the output end of the light guide safely directed into an enclosed optical path. DO NOT point the light output directly onto any flammable or burn-susceptible material. This includes all animal or vegetable tissues, plastics, fabrics, paper and liquids.

Avertissement: NE PAS allumer la lumière sans l’extrémité de sortie du guide de lumière dirigée en toute sécurité dans un chemin optique fermé. NE PAS pointer la sortie de lumière directement sur un matériau susceptible d’être inflammable ou susceptible de brûler. Cela comprend tous les tissus, les plastiques, les tissus, le papier et les liquides animaux ou végétaux.

RISK GROUP 3

Warning: Possibly hazardous optical radiation emitted from this product. Do not look at operating lamp. Eye injury may result.

Warning: Infrared (IR) emitted from this product. Do not look at operating lamp.

Warning: UV emitted from this product. Avoid eye and skin exposure to unshielded product.

GROUPE DE RISQUE 3

Avertissement: Infrarouge (IR) émise par ce produit. Ne regardez pas la lampe d’exploitation.

Avertissement: Rayonnement optique Peut-être dangereux émis par ce produit . Ne regardez pas la lampe d’exploitation. Une blessure oculaire peut entraîner.

Avertissement: UV émis par ce produit . Évitez les yeux et la peau exposition au produit non blindé.

Caution: DO NOT open the unit. There are no serviceable parts inside and opening the light engine enclosure will void the manufacturer’s warranty.

Attention: NE PAS ouvrir l’appareil. Il ne contient aucune pièce réparable et l’ouverture de son boîtier a pour effet d’annuler la garantie.

Caution: DO NOT set liquids on the light engine. Spilled liquids may damage your light engine.

Attention: NE PAS placer de liquide sur la source lumineuse. Les liquides renversés peuvent endommager la source lumineuse.
3. Installation and Operating Instructions

3.1 Contents

The RETRA III light engine ships with the following list of standard components:

1. The RETRA III light engine® engine, configured with 1 to 2 output channels (colors) and an output adapter for connection to an SMA-terminated optical fiber or a liquid light guide (LLG) as documented on the certificate of conformance (Figure 1).
3. A region-specific AC power cord for the power supply (see adjacent table).
4. RJ45 ethernet cable.
5. Control key, external gate jumper, and remote interlock jumper (Figure 2).
6. Quickstart Guide instruction document (85-10049)

The model name, unique 4- or 5- digit serial number and certification markings of the light engine are carried on a label affixed to the rear panel. Performance specifications for individual light engines are listed on the certificate of conformance included with the shipping documents e-mailed to the customer (Figure 1).

### AC Power Cords

<table>
<thead>
<tr>
<th>Region</th>
<th>Part Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>North America</td>
<td>29-10002</td>
</tr>
<tr>
<td>Europe</td>
<td>29-10005</td>
</tr>
<tr>
<td>United Kingdom</td>
<td>29-10004</td>
</tr>
<tr>
<td>Israel</td>
<td>29-10008</td>
</tr>
<tr>
<td>Australia/New Zealand</td>
<td>29-10024</td>
</tr>
</tbody>
</table>

3.2 Installation

When setting the RETRA III light engine up for use, place the unit on a hard surface and avoid blocking or restricting airflow at the air inlet (front panel; Figure 3) or exhaust ports (rear panel) on the enclosure. Restricting the airflow will cause the unit to operate at elevated temperatures and will result in decreased product life and/or premature failure. Thermal overload protection is provided by the on-board computer in conjunction with an on-board temperature sensor. If the internal temperature registered by the sensor exceeds 50°C or the fan rotor is stopped, all light output channels automatically turn OFF and are locked in this state until the internal temperature is below 50°C and/or the fan restarts. The current reading of the on-board temperature sensor is displayed on the front panel status display (Figure 3) and in the GUI (Figure 4, right).
The RETRA III light engine® may be configured for light delivery via a liquid light guide (Figure 3) or an SMA-terminated optical fiber. The output couplers are built into the light engine front panel and are not field-exchangeable. The liquid light guide output coupler incorporates an electrical power interlock switch in the back of the receptacle. The liquid light guide must be fully inserted in the receptacle to activate the interlock. Electrical power supply to the light engine cannot be turned on via front panel power switch until the interlock is activated. After fully inserting the liquid light guide, lock it in position using the set screw on the side of the receptacle to prevent inadvertent disconnection of the light guide during use.

Figure 1. Specimen certificate of conformance (C of C) for RETRA III Light Engine. The C of C identifies the color channels installed in the light engine and the bandpass filters associated with each channel. Full (100%) power outputs measured at the terminus of the liquid light guide (LLG) or optical fiber are recorded in the third column.

The RETRA III light engine® may be configured for light delivery via a liquid light guide (Figure 3) or an SMA-terminated optical fiber. The output couplers are built into the light engine front panel and are not field-exchangeable. The liquid light guide output coupler incorporates an electrical power interlock switch in the back of the receptacle. The liquid light guide must be fully inserted in the receptacle to activate the interlock. Electrical power supply to the light engine cannot be turned on via front panel power switch until the interlock is activated. After fully inserting the liquid light guide, lock it in position using the set screw on the side of the receptacle to prevent inadvertent disconnection of the light guide during use.
3.3 Operating Instructions

3.3.1 Control and Interlock Keys

The Master Power Switch button on the front panel (Figure 3) turns the electrical power to the unit on or off. A green power indicator embedded in the button is lit when the power supply is connected to the light engine and the power button is in the on position. Initialization of the onboard computer takes about 30 seconds after the master power switch is turned on. When initialization is complete, the status indicator display (Figure 3) will activate.

The Key Control (Figure 3) must be in the on position before light output can be turned on. The key must be removed and stored in a secure location when the product is not in use. ONLY trained individuals should use and have access to the key. The Master Power Switch button, Key control and Remote interlock can be used to shut off light output.

The Source Enabled indicator LED (below the status indicator display; Figure 3) provides a warning indication that one or more light sources are active and emitting invisible and/or visible radiation.

The Remote Interlock Connector: (rear panel, lower left) is provided to allow for connection of a remote interlock. When this interlock is open it will shut off light output. After the interlock has been opened, the Manual Interlock Reset button will need to be pushed to resume light output.

Note: In the event of ANY normal or abnormal interlock fault condition (including high ESD/EMP/EFT conditions ~2kV) you MUST clear the latch fault condition by depressing the manual reset button.

3.3.2 Start Up

1. Insert the light guide and secure it with the set screw. 
2. Insert the external gate jumper (Figure 2) in the labeled socket on the front panel (Figure 3). Insert the interlock jumper in the labeled socket in the lower left corner of the rear panel.
3. Insert the control key, turn it to the ON position.
4. Connect the isolated DC power supply to the light engine.
5. Connect the AC power cord to the DC power supply.
6. As soon the DC power supply is energized, the master power button (top right) will automatically light up. The light engine automatically starts when the power is connected; there is no need to push the master power button. 
7. Wait 30–45 seconds for the initiation sequence (onboard microprocessor boot-up) to complete. Do not press any buttons or insert any plugs during this time.
8. When the initiation sequence completes, “LUMENCOR” will flash on front display panel and then be replaced by a display showing the current light engine IP address, the internal temperature and the fan status. At the same time, the fan will come on at HI for about 2 seconds and then shut off automatically. The light engine is now ready for use.
Prior to turning the light output on, be sure the output end of the liquid light guide or optical fiber is safely directed into an enclosed optical path (e.g. a beam dump).

Notes:
1  Ensure that the distal end of the light guide or optical fiber is safely directed into an enclosed optical path (e.g. microscope epilluminator or a beam dump) before turning the light output on. If the light engine is equipped with an output adapter for an SMA-terminated optical fiber, connect the fiber to the output adapter using the integral threaded sleeve.
2  To enable light output of the RETRA III Light Engine the external gate jumper, control key, remote interlock jumper, and Liquid light guide must be inserted.
3  For subsequent start ups, use the master power button to start or shut down the light engine. Shut down can also be accomplished using the “Shut Down” button in the GUI (Figure 4, left).

3.3.3 Ethernet Connection and Control GUI

The Web GUI provides a quick and easy way to control the light engine, providing the ability to turn each source on/off, adjust the power of each source independently from off to full power (Figure 4, left). The GUI also tracks the total on time and the power sensor readings. To set up the Web GUI, follow the follow protocol below:
1. Go to Start menu > Control Panel > Network & Internet and/ or Network & Sharing Center
2. Click Change Adapter Settings
3. Right-click on Local Area Connection
4. Click on Properties (in pop-up)
5. Select Internet Protocol Version 4 (TCP/IPv4)
6. Click Properties button
7. Use the following IP addresses:
   - IP Address: 192.168.201.201
   - Subnet Mask: 255.255.255.0
   - Default gate way and DNS Server are OK to leave blank

Figure 4. RETRA III Web GUI: Control Tab (left) and Settings Tab (right).
8. Connect the RJ45 cable (supplied with the light engine) between the LAN port on the light engine and an Ethernet port on the computer.

9. Type the Light Engine IP address (Figure 3) into any web browser address bar to access the resident control GUI. The factory default IP address is 192.168.201.200.

3.3.4 Control via Serial ports

RETRA III light engines have two serial ports, labeled USB and RS-232 (Figure 3), which can be set to receive either LEGACY or STANDARD mode commands. Connection to the computer requires a USB-A-to-USB B cable (29-10058) or USB-to-RS-232 cable (29-10011). LEGACY commands are limited to controlling on/off switching and intensity adjustment of individual color channels. Only one of the two ports can be set to LEGACY mode at one time. The STANDARD mode command set gives access to an extensive panel of operating status reports and configuration settings in addition to the the basic control functions of the LEGACY command set. A complete listing of STANDARD mode commands is provided in Lumencor Light Engine Command Reference (Document number 57-10018). Note that LEGACY and STANDARD mode communications use different serial protocols (9600,8,N,1 and 115200,8,N,1 respectively). Changes to the command mode setting for a serial port can be made via the Settings screen of Web GUI (Figure 4, right). Changes are applied instantaneously and are retained between power cycles.

Select the command mode setting for the serial port that is compatible with the light engine device driver in the control software. This selection is typically found under the “Devices” tab. The COM port address assigned by the computer to the light engine USB serial port must be correctly registered in control software.

3.3.5 Control Light Engine Control Pod

2. Open the Web GUI control interface as described in Section 3.3.2.
3. Go to the SETTINGS page (Figure 4, right) in the Web GUI. Make sure that the USB port configuration is set to LEGACY mode and USB 5V is set to ENABLED.
4. The pod must be set in the RETRA III light engine control mode. The light engine control mode setting is shown in green letters at the bottom of the pod display screen. If the pod is not in the RETRA III light engine control mode, change the setting by holding down the MODE button on the pod until the light engine selection menu appears. Move the cursor to “AURA” in the selection menu by turning the pod control knob. Press the MODE button again to select the RETRA III light engine control mode and return to the main control screen.
5. Follow instructions on Lumencor’s Light Engine Control Pod Operation sheet (54-10036). In brief, press the COLOR button to select output light output channel, press the MODE button to toggle light output on and off, turn the control knob to adjust intensity for the current light output channel selection.

3.3.6 TTL Control

The TTL Interface provides users with a faster method of switching color channel outputs on and off. These can be conveniently addressed using an accessory BNC breakout cable (Lumencor part no. 29-10156, Figure 5) or an accessory SMB breakout cable (Lumencor part no. 29-10216) connected to the front panel TTL port (Figure 3). As a safeguard against unintended light output when the inputs are initially connected, the TTL port is disabled. To enable the TTL input, click the Enabled button next to “TTL inputs” in the web GUI under the Settings tab (Figure 5). BNC breakout cable to enable TTL triggering.
4, right). The response polarity of the TTL input can be set to positive or negative in the GUI settings tab (Figure 4, right). Changes are applied instantaneously and are retained between power cycles. The breakout cable also provides a global shutter input (labeled “shutter”). TTL signals input to the global shutter will synchronously toggle all currently enabled source channels on and off.

4. Light Output Characteristics

RETRA III light engines may incorporate different numbers and types of solid state light sources. Constituent light sources may include LEDs and luminescent light pipes. The number of light sources installed and the bandpass filters associated with each are shown on the Certificate of Conformance (Figure 1) included with the shipping documents e-mailed by Lumencor to the customer. The certificate of conformance also shows full (100%) power outputs for each source measured at the terminus of the liquid light guide (LLG) or optical fiber. Not all sources may be turned on simultaneously. To prevent exceeding the capacity of the DC power supply, power consumption is tracked by the onboard computer. If a set limit (see Governor, Figure 5) is exceeded, either by increasing intensity settings for sources that are already on, or by turning on additional sources, commands will be rejected. To clear the error condition, reduce intensities of sources that are on or turn off additional sources.

![Spectral output plot for a representative RETRA III Light engine showing 2 color channels: TRITC (green) and Cy5 (red)](image)

**Figure 6.** Spectral output plot for a representative RETRA III Light engine showing 2 color channels: TRITC (green) and Cy5 (red)
Light source outputs are refined by bandpass filters, see Figure 6 for a representative spectral output plot for an RETRA III Light Engine. The specifications of these bandpass filters are recorded on the certificate of conformance (Figure 1) as CWL/FWHM where CWL = center wavelength and FWHM = full width at half-maximum transmission, both measure in nanometers (nm). Bandpass filters are not user-exchangeable and changes require return of the light engine to Lumencor’s factory for service (see Section 7). Since changing bandpass filters will result in source output power changes, a new certificate of conformance will be provided as part of this service.

5. Operational Specifications

The RETRA III light engine® must be operated and stored within the environmental conditions specified in the table below. Performance specifications for individual light engines are listed on the certificate of conformance included with the shipping documents e-mailed to the customer (see example shown in Figure 1). It is important to retain the certificate of conformance for reference. In the event that the light engine is sold, the certificate of conformance should be transferred to the new owner. Certificates of conformance are also recorded in Lumencor’s database and copies can be requested by e-mail to techsupport@lumencor.com. The request message must include the 4- or 5-digit serial number of the light engine.

<table>
<thead>
<tr>
<th>Specification</th>
<th>Detail</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Temperature</strong></td>
<td></td>
</tr>
<tr>
<td>Operating</td>
<td>32 to 95° F (0 to 35° C)</td>
</tr>
<tr>
<td>Non-operating</td>
<td>-4 to 158° F (-20 to 70° C)</td>
</tr>
<tr>
<td><strong>Humidity</strong></td>
<td></td>
</tr>
<tr>
<td>Operating and non-operating</td>
<td>0 to 80% relative humidity, non-condensing</td>
</tr>
<tr>
<td><strong>Altitude</strong></td>
<td></td>
</tr>
<tr>
<td>Operating</td>
<td>0 to 10,000 feet (3,048 meters)</td>
</tr>
<tr>
<td>Non-operating</td>
<td>0 to 45,000 feet (13,176 meters)</td>
</tr>
<tr>
<td><strong>Dimensions</strong></td>
<td></td>
</tr>
<tr>
<td>Size (W x L x H)</td>
<td>145 mm x 190 mm x 203 mm (5.7 in x 7.5 in x 8.0 in)</td>
</tr>
<tr>
<td>Weight</td>
<td>4.3 kg / 7.4 lbs</td>
</tr>
<tr>
<td>Lifetime</td>
<td>Time for light engine output to decrease to 70% of the values recorded on the original certificate of conformance #</td>
</tr>
<tr>
<td>Power supply</td>
<td>24VDC / 9.2A</td>
</tr>
<tr>
<td>Warm-up Period</td>
<td>1 s</td>
</tr>
<tr>
<td>Protection</td>
<td>Thermal overload (Section 3.2). Power overdraw (Section 4)</td>
</tr>
<tr>
<td>Sound Level</td>
<td>Sound level at 1 meter &lt; 65db(A)</td>
</tr>
<tr>
<td>Control Interfaces</td>
<td>USB, RS-232, TCP, TTL</td>
</tr>
<tr>
<td>Warranty</td>
<td>18 months parts and labor</td>
</tr>
</tbody>
</table>

# The corresponding number of days/months/years may vary considerably depending on the duty cycle implemented by the user and the prevailing environmental conditions during operation.

6. Routine Maintenance and Trouble Shooting

No routine maintenance is required. There are no user-serviceable components or sub-assemblies in the RETRA III light engine. Opening the light engine enclosure will void the manufacturer’s warranty. In the event that the light engine fails to
perform in accordance with the specifications listed on the certificate of conformance, please contact Lumencor Technical Support for assistance, as directed in Section 7.

### Troubleshooting Procedures

<table>
<thead>
<tr>
<th>Problem</th>
<th>Check the following</th>
</tr>
</thead>
<tbody>
<tr>
<td>No response to serial (USB or RS-232) commands</td>
<td>Check that the LEGACY or STANDARD command mode selection (GUI Settings; Figure 5) is compatible with the software driver.</td>
</tr>
<tr>
<td>No response to TTL trigger commands</td>
<td>Check that <strong>TTL inputs</strong> are ENABLED (GUI Settings; Figure 5) and that the <strong>TTL polarity</strong> setting is consistent with the trigger inputs. Also check that all serial ON/OFF controls are in the OFF state.</td>
</tr>
<tr>
<td>No light output in response to source ON command (serial or TTL)</td>
<td>There are 4 interlocks that need to be closed, check all of these: 1. Control key must be inserted in front panel and turned to “on” position¶. 2. Liquid light guide must be inserted in light output receptacle¶. 3. Remote interlock jumper must be inserted in rear panel¶. 4. External gate jumper must be inserted in front panel (Figure 3).</td>
</tr>
<tr>
<td>Unusually weak fluorescence signals across all detection channels</td>
<td>Weak fluorescence in all detection channels (DAPI, FITC, TRITC, Cy5 etc) is likely to be due to poor light transmission by the liquid light guide, the collimating adaptor or another distal component of the microscope optical path and not to abnormally low light output from the light engine.</td>
</tr>
<tr>
<td>Unusually weak fluorescence signals in a single detection channel (e.g. DAPI)</td>
<td>1. Check that the light engine power output reading in the Web GUI (Figure 4) is normal. 2. Check that the dichroic beamsplitter and emission bandpass filter in the microscope are compatible with light engine excitation filter specifications shown on the certificate of conformance (Figure 1).</td>
</tr>
<tr>
<td>High, spatially uniform fluorescence background</td>
<td>Check that the dichroic beamsplitter and emission bandpass filter in the microscope are compatible with light engine excitation filter specifications shown on the certificate of conformance (Figure 1).</td>
</tr>
</tbody>
</table>

¶ Open interlocks for these conditions will be indicated by a red status indicator in the lower right corner of the GUI control screen (Figure 4)

### 7. Customer Support

For technical support of the RETRA III light engine, please contact Lumencor by phone at 503-213-4269 or through e-mail at techsupport@lumencor.com. Please be prepared to provide the 4- or 5-digit serial number of the light engine. Any light engine returned to Lumencor for repairs or upgrades requires a pre-issued return material authorization (RMA) number. To obtain a RMA number, submit the online request form at [http://lumencor.com/support/lumencor-rma-request-form](http://lumencor.com/support/lumencor-rma-request-form). It is the customer’s responsibility to properly package and safely ship products to Lumencor. Instructions for shipping will be provided in the e-mail giving notification of the RMA number.
8. Warranty

The RETRA III® family of light engines is backed by a 18 month warranty to end users. Warranty coverage starts on the original date of shipment from Lumencor. Light Engines qualifying for warranty service must be verifiably delivering performance that is substantially at variance with the levels documented in the certificate of conformance. The light engine must also have been used and maintained under operating conditions consistent with the specifications given in Section 5, and observing all the Precautions and Warnings notified in Section 2. This warranty does not extend to light engines that have been subject to misuse, accident, tampering or improper installation. Accessories including (but not limited to) liquid light guides, optical fibers, collimators, cables and control consoles are not covered by the warranties attached to light engines. Please fill out and submit the online warranty registration form. This will facilitate provision of warranty service should it be required.