

## PL PORTABLE FORENSIC BLUE LASER SYSTEM OPERATING INSTRUCTIONS

- PL-2-445 PL Portable Forensic Blue Laser System, 2W, 445nm
- PL-5-445 PL Portable Forensic Blue Laser System, 5W, 445nm
- PL-9-445 PL Portable Forensic Blue Laser System, 9W, 445nm



Please read the below before using your PL Portable Forensic Blue Laser System as it relays CRITICAL Safety and Operational information.

### PHYSICAL CHARACTERISTICS:

	PL-2-445 & PL-5-445	PL-9-445
<b>Length</b>	11.1" / 282mm	
<b>Head Size</b>	3.9" / 99mm	4.13" x 4.13" (105mm x 105mm)
<b>Handle Diameter</b>	1.9" / 48mm	
<b>Weight</b>	4.1 lbs (1.9 kg)	4.7lbs (2.13kg)

### BATTERIES:

#### Lithium Ion Rechargeable Battery System (included)

Consists of Lithium Ion Rechargeable Batteries, LiCoO<sub>2</sub> (12 - RCR123, 4s3p), Battery Cap, and AC Adaptor.

### BATTERY LIFE

Battery Life is expected as follows:

P/N	POWER	PL SERIES
PL-2-445	<b>FULL POWER</b>	120-150 minutes*
PL-5-445	<b>FULL POWER</b>	60-75 minutes*
PL-9-445	<b>FULL POWER</b>	40-45 minutes*

\*Battery life will be dependent on the capacity of the charged battery pack, history (total number of cycles), storage temperature, and the ambient temperature.

### RECHARGING BATTERIES:

#### BATTERY RECHARGE TIME

Lithium Ion Battery System takes approximately 4 hours to be charged fully.

Photo of replaceable Battery Pack Module (P/N 600-900)



Charge unit using provided charger:  
Input: 100-240VAC, 50/60 Hz, 250mA  
Output: 16.7VDC, 600mA



- While connected to the AC Adaptor, the GREEN light on the rear of the MF is ON (pictured top right) while connected to the AC adaptor. Its function is only to advise that you are attempting to charge.



- The AC adaptor also has a light which is GREEN when plugged into the wall. As soon as you connect it to the MF for charging, it turns RED. Full Charge is shown by non-blinking GREEN LED on the AC adaptor.

### SAFETY INTERLOCK PLUG-KEY:

Note that a Safety Interlock plug-key must be installed for the Laser to operate.



**Safe Mode**  
Safety plug-key removed



**Operational Mode**  
Safety plug-key installed

### Usage Ranges

#### For PL-2-445 and PL-5-445:

The typical usage range to the surface being investigated is 4 to 12" (100 – 305mm), but is useful for general search at up to 5-8ft (1.5 – 2.5m), or pattern photos at up to 25ft (7.5m) (with fluorescent reactant aid).

#### For PL-9-445:

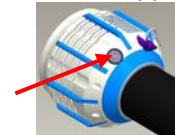
The typical usage range to the surface being investigated is 10 to 15" (254 – 381mm), but is useful for general search at up to 5-15ft (1.5 – 4.6m), or pattern photos at up to 30ft (9.0m) (with fluorescent reactant aid).

### OPERATIONAL MODES:

To activate:

1. Insert the safety plug-key.
2. Press the power switch located at the base of the flashlight.
3. Press the Mode Switch according to desired Mode.

### MODE SWITCH: (adjacent to the Safety plug-key)



When the Power Switch in the rear is activated, and the safety plug-key is on, the laser comes on at:

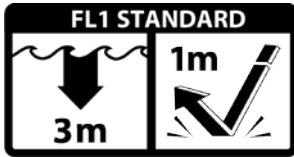
Mode	PL-2-445	PL-5-445	PL-9-445
1	1 Watt	1 Watt	1 Watt
2	2 Watt	2 Watt	3 Watt
3	n/a	3 Watt	5 Watt
4	n/a	5 Watt	9 Watt

NOTE: After the switch is powered off, it will not retain the mode in memory and will start again at Mode 1 when powered back on; this ensures additional safety from accidental over exposure, as well as lower power to be used at short distances.

### ACCESSORIES INCLUDED:

- **AC Charger:** Wall Adaptor
- **Carry Strap:** Shoulder strap
- **Case:** Mil-Spec molded black case with fold down handle. Custom foam interior with cutouts for PL, goggle and charger.
- **Laser Goggles OD 7+ Orange**, P/N 600-1050
- **Yellow Laser Goggle (190-450nm OD5+)**, P/N 600-1060
  - Yellow Goggle included only with P/N PL-9-445

**PRODUCT DURABILITY, ENVIRONMENTAL CONSTRAINTS & CERTIFICATIONS:**



CE-EMC  
IPX-7

- Meets NFPA 1971-2007 Fire Resistant Requirements: 500°F / 260°C for 30 minutes
- Temperature range of use: -10° to 40°C (14°-104°F)
- 

**CARE/CLEANING:**

Your PL Laser Flashlight is a professional tool, but regular maintenance and care will maximize its performance for you. As needed, wash your flashlight using a soft damp washcloth, clean water and a mild soap. Be sure that the battery pack is SEALED before washing. When done, pat dry with a soft cloth. Storage and charging should be in a cool location not exposed to direct sunlight.

**WARNINGS:**

**IMPORTANT**

FoxFury, LLC is not responsible for the incorrect use of any FoxFury Lighting product.

- Always operate the PL Laser Flashlight with appropriate Goggles.
- Lights are strong enough to cause damage to the human eye.
- Do not stare into Laser for long periods of time or from a close range shorter than the NOHD defined.
- Do not look directly into the Laser light during operation, even for a brief period. This can be harmful to the eyes due to the intensity of the Laser light and short range.
- The user should operate the laser without wearing any reflective jewelry, like watches, rings, or bracelets, etc. on their fingers, hands, or wrists that could send reflections back to the users eye.
- Do not expose your skin at close ranges for longer than 3 seconds. Exposure at very short ranges will cause a fast pain reaction.
- FoxFury, LLC is not responsible for any injury or damage caused during the use of this product.
- Do not use under the influence of drugs or alcohol.

**Head of the PL Laser Flashlight will get very warm or hot.**

- Rubber Insulators have been strategically installed to protect the user, and to protect the surfaces where the flashlight will be placed.

**CAUTION:** Avoid touching laser-head surface to prevent burns.

**Laser Flashlight is heavy.**

- If the flashlight falls to the ground, it may cause an injury to a user's foot or ankle, or damage to a nearby surface. Footwear that covers the toes should be worn in the area where this tool is used.

**Eye & Skin Safety Ranges:**

Per IEC 60825 calculations -

**For PL-2-445 and PL-5-445:**

**Nominal Ocular Hazard Distance (NOHD)**

**NOHD = 1.1 meters (3.6' = 3' 7.3")**

Unaided viewing

**Nominal Ocular Hazard Area \*\***

**3.8013 square meters, circular area (41 sq Ft)**

**Nominal Skin Hazard Distance (NSHD)\***

**NHSD = 50.8 mm (2.0")** (up to 3 seconds)

\*\* **Nominal Ocular Hazard Area**, persons in this region should be wearing laser safety eyewear. This region is where the specular reflections from mirrors, chrome & stainless steel surfaces (at any angle), and glossy plastic or laminate surfaces at low angles can reflect the laser beam with little diffusion.

\* **Skin exposure at 1.0" down to ¼"** will feel painful in about ½ to ¼ of a second. Expect a quick pain reaction, of swift withdrawal from the beam if close to the lens.

**For PL-9-445:**

**Nominal Ocular Hazard Distance (NOHD)**

**NOHD = 1.41 meters (4.63')**

Unaided viewing

**Nominal Ocular Hazard Area \*\***

**6.25 square meters, circular area (67.3 sq Ft)**

**Nominal Skin Hazard Distance (NSHD)\***

**NHSD = 76.73mm (3.0")** (up to 1 second)

\*\* **Nominal Ocular Hazard Area**, persons in this region should be wearing laser safety eyewear. This region is where the specular reflections from mirrors, chrome & stainless steel surfaces (at any angle), and glossy plastic or laminate surfaces at low angles can reflect the laser beam with little diffusion.

\* **Skin exposure at 1.0" down to ¼"** will feel painful in about ½ to ¼ of a second. Expect a quick pain reaction, of swift withdrawal from the beam if close to the lens.

**Laser Beam Output:**

	PL-2-445 & PL-5-445	PL-9-445
Beam diameter at lens	30mm	54mm
Beam divergence	9.44° (164.76 mRad) – full angle	9.3° (162.3156mRad) – full angle
Beam diameter at 6ft	13" (approx. 331mm at 1.8 meters)	11.25" (approx. 286mm at 1.8 meters)
Beam power density at lens	15.7 mW/cm <sup>2</sup>	15.7mW/cm <sup>2</sup>

**Tripod / ¼"-20 Mount**

A camera tripod mounting insert can be found on the laser head, near the safety plug-key, to allow ¼-20 screw attachment to a tripod.

1/4-20 insert for mounting is circled in yellow



## Laser Safety



Class 3B – Output beam is classified as Class 3B



**LASER RADIATION  
AVOID EXPOSURE TO BEAM  
CLASS 3B LASER PRODUCT**

A Class 3B laser is hazardous if the eye is exposed directly, but diffuse reflections such as those from paper or other matte surfaces are not harmful. The AEL for continuous lasers in the wavelength range from 315 nm to far infrared is 0.5 W. For pulsed lasers between 400 and 700 nm, the limit is 30 mJ. Other limits apply to other wavelengths and to ultra-short pulsed lasers. Protective eyewear is typically required where direct viewing of a class 3B laser beam may occur.

As an example, Class 3B lasers are used inside CD and DVD writers, although the writer unit itself is Class 1 because the laser light cannot leave the unit. But technicians that work on the inside of the units, must wear laser safety eyeglasses.

Five Class-4 lasers are used to create the homogeneous output beam, free of the normal interference patterns and speckle that direct laser beams (like laser pointers) can create upon reflection or backscatter. The beam diffusers greatly attenuate the output beam power and allow them to be mixed on target.

**The Class-4 lasers are equipped with a safety plug-key and a set of tamper-proof screws.** The safety key must be removed to disconnect power if unit is opened for inspection, cleaning, or maintenance, by factory certified technicians.

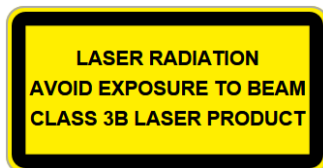
**The typical user should have no reason to open the front section of the laser-light, please leave that to experienced technicians with the proper tools and protections available.**

**It is recommended that the safety plug-key have a removable clasp feature added (like for your car keys) so that the safety plug-key can be easily separated from the laser.**

**The safety plug-key, allows the operator to “safe” the laser, if they need to leave the unit on-scene and take a break, or use the restroom; by taking the key with them – to protect the curious from themselves.**

**Eye protection is strongly recommended when using this product.**

**The user should operate the laser without wearing any reflective jewelry, like watches, rings, or bracelets, etc. that could send reflections back to the users eye.**



### AREA WARNING:

**Fig. 1 - A sign similar to the one shown above should be posted in the entry area were the laser will be in use.**



### AVAILABLE ACCESSORIES:

- Battery Pack Module, P/N 600-900
- Carry Strap, P/N 600-100
- Case, P/N 80-001
- Laser Goggles OD 7+ Orange, P/N 600-1050
- Yellow Goggle OD5+, P/N 600-1060

### LIMITED WARRANTY:

#### FoxFury Limited Warranty & Customer Care Information

FoxFury, LLC (“FoxFury”) warrants to the purchaser of this product (“Buyer”) that for a period of two years following purchase, this product will be free from defects in material and workmanship and will function in substantial compliance with FoxFury’s written specifications for this product as specified in the instruction manual or on FoxFury’s website located at [www.foxfury.com](http://www.foxfury.com). Buyer’s exclusive remedy shall, in any case, be limited, at FoxFury’s election, to: A) repair or replacement of the defective product; or B) refund of the purchase price for this product.

THE FOREGOING WARRANTY IS THE ONLY WARRANTY MADE BY FOXFURY WITH RESPECT TO THIS PRODUCT. TO THE EXTENT ALLOWED BY APPLICABLE LAW, THERE ARE NO REPRESENTATIONS OR WARRANTIES OF ANY KIND BY THE FOXFURY, EXPRESS OR IMPLIED, WITH RESPECT TO THE CONDITION OR PERFORMANCE OF THIS PRODUCT, INCLUDING, BUT NOT LIMITED TO, MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE.

**This limited warranty shall not apply if this product is not stored, handled, installed or used in strict accordance with manufacturer’s specifications and instruction manuals, or which has been subject to misuse, alteration, negligence or accident.**

1. The damaged part or product must be returned to FoxFury **PRIOR TO** any repair or replacement. Shipping costs are the responsibility of the claimant.
2. You must obtain a return authorization (RMA) number from FoxFury prior to returning products. FoxFury is not responsible for any damage incurred while in transit.
3. Buyer will be required to show proof of purchase – No Exceptions.
4. Any modifications to light, cable or battery pack automatically voids all warranties on this product.

All warranty inquiries should be directed to FoxFury’s Customer Service Department to handle all warranty & repair- related inquiries.

**TO THE EXTENT ALLOWED BY APPLICABLE LAW: (A) IN NO EVENT, WHETHER DUE TO BREACH OF WARRANTY HEREUNDER OR ANY OTHER CAUSE WHATSOEVER, SHALL FOXFURY BE LIABLE FOR OR OBLIGATED IN ANY MANNER TO PAY CONSEQUENTIAL, INCIDENTAL OR INDIRECT DAMAGES, INCLUDING, BUT NOT LIMITED TO, LOSS OF PROFITS, COST OF SUBSTITUTE PRODUCTS AND PERSONAL INJURY OR PROPERTY DAMAGE, WHETHER SUCH CLAIM IS BASED ON CONTRACT OR TORT OR ANY OTHER THEORY OF LAW, AND (B) FOXFURY’S ONLY DUTIES IN CONNECTION WITH THE SALE OF THIS PRODUCT SHALL BE TO HONOR THE LIMITED WARRANTY SET FORTH HEREIN. TO THE EXTENT THAT THIS LIMITED WARRANTY IS INCONSISTENT WITH APPLICABLE LAW, THIS STATEMENT SHALL BE DEEMED MODIFIED TO BE CONSISTENT WITH SUCH APPLICABLE LAW.**

Distributed by:



FoxFury, LLC  
Oceanside, CA 92056 USA  
Toll-Free: 844-FOXFURY  
Tel: 760.945.4231  
Fax: 760.758.6283

Email: [custserv@foxfury.com](mailto:custserv@foxfury.com)  
[www.FoxFury.com](http://www.FoxFury.com)

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