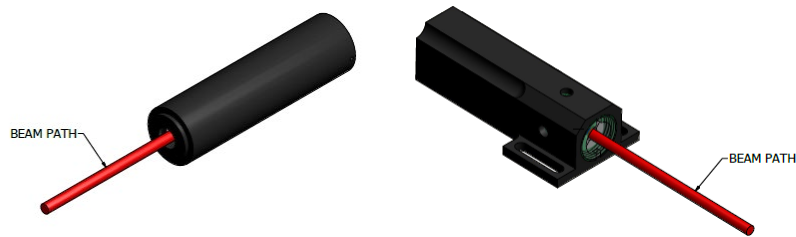


Operating instructions for USB-L laser diode module

General operating instructions

Introduction

The USB-L laser module connects to most standard USB ports and is both powered and controlled via the USB interface. Modules in a wide range of wavelengths produce either both a round and elliptical beam shape. Connecting via USB Micro Type B, the USB-L is designed to work with modern USB 2.0 connections (or later standards). Operators using legacy USB 1.0 connections will potentially see limited output from green, blue and violet lasers (USBL-405-5-X, USBL-450-5-X, USBL-515-X, USBL-515-25-X). All models produce stable optical power, and a custom graphical user interface to control the power level and on/off state. Visible units with less than 5mW of output power are CDRH certified as laser systems.



The module operates in constant optical output power mode only. This means that if there is a change in temperature, focus, or any other dynamic that changes the output of the laser, the laser will automatically adjust the optical power to compensate. This process maintains a constant and stable output power.

Installation

Do not mount the laser in a thermal insulating material, such as foam plastic. Heat can have adverse effect on laser diodes including decreased output power and large shifts in wavelengths. The lifetime of the laser can also be shortened. Lasers below 5mW may not need a heat sink. For best heat dissipation, use a metal mounting fixture. A heat sink is always recommended for operating temperatures above 25° C. Mounting brackets are available for USB-L laser modules. Simply ask your salesperson for more information.

If the label attached to the laser module reads “This product complies with 21CFR 1040.10 and 1040.11, IEC60825-1 AM2:2001,” a permanently installed switch or connector at the power source will be required to retain the modules certification as a laser system. This certification is void if the unit is enclosed, or otherwise inaccessible, if the labels are modified or removed, or the system is permanently connected (i.e. soldered, etc.) directly to the power source without the required switch. Modifying the laser will void the CDRH certification. If the distance between the laser head and the power source switch exceeds two meters, an emissions indicator must be mounted near the switch or connector. PTI does not recommend the use of USB extension cables for this reason.

Operating Procedures & Control Description

The USB-L laser module features two user adjustments. The optical output power can be adjusted incrementally from zero up to 100% via the custom graphical user interface.



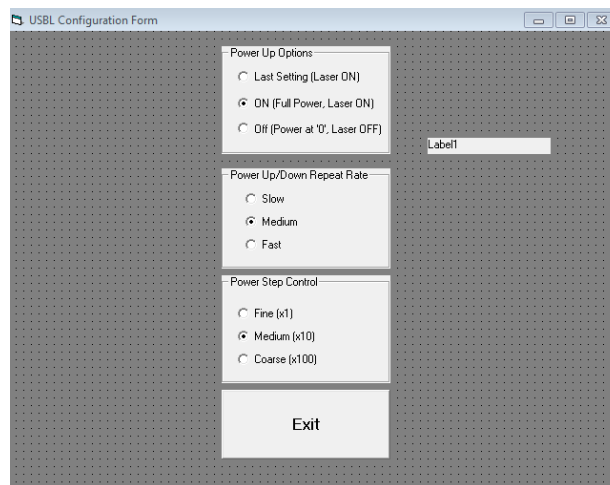
Mailing: P. O. Box 191117, Little Rock, AR 72219-1117 • Shipping: 16302 Alexander Road, Alexander, AR 72002
Tel: 501.407.0712 • Fax: 501.407.0036 • Email: sales@powertechnology.com • Web: www.powertechnology.com

Copyright 2004 Power Technology Inc.



USB-L Graphical User Interface

On the main screen, the ON/OFF button turns the laser on or off. The Power Up and Power Down buttons increase or decrease the amount of light produced by the module. The user cannot damage the laser with these controls. The Configuration button allows users to configure the USBL's settings. Once the Configuration button is pressed, the configuration screen appears and displays options for Power Up, Power Up/Down Repeat Rate, and Power Step Control. Power Up options include Last Setting, On, and Off; which allow the user to determine if the laser will power up to the same level that it was last configured, or to full power and no power. Power Up/Down Repeat rate options include Slow, Medium, and Fast choices, which allow users to determine the response rate of repeated clicks. Power Step Control options include Fine (x1), Medium (x10), and Coarse (x100), which allow the user to determine the amount of power that will be queued for each step. The Exit button returns the user to the main screen.



Configuration Screen

Additionally, the laser can be manually collimated or focused to a spot at various distances using the spanner wrench included with the unit. Care should be taken when focusing or cleaning the optics to prevent damage.



Reflections onto the internal photodiode from the lens are a vital part of the feedback loop. This photodiode is very sensitive to these reflections. Any adjustment of the lens outside the normal focusing range (beam divergence to beam convergence) will change the amount of reflections, thereby changing feedback characteristics. Therefore, adjusting the focus with the module at full power will destroy the laser diode. Also, reducing the amount of reflections (i.e., removing the lens) may result in destruction of the laser diode due to excessive drive current. Avoid placing reflective surfaces in the path of the laser beam, as they may cause the laser to fail.

Maintenance & Service

This laser module contains no user serviceable parts. Depending on environmental conditions, the optics may require occasional cleaning. Use of clean, compressed air is recommended to blow the optics clean. If compressed air fails, clean lens carefully with PGA alcohol or high purity acetone and a lint free rag or cotton swab.

Warranty and Repair Return Policy

For systems that incorporate a centering option, adjustment of the centering setscrews will void the diode warranty and possibly the warranty on the entire laser system since damage to the diode is easily achievable.

No return of merchandise will be accepted by PTI without an RMA (Return Material Authorization) number, issued by the factory and prominently displayed on the return package.

No return shipments will be accepted "Collect" or "COD". On warranty returns, PTI will pay for shipping charges on return of merchandise to the customer.

When contacting the factory for an RMA number, please have the following information available: model number, serial number, and a description of the problem.

Laser Safety

Caution: Use of controls or adjustments or performance of procedures other than those specified herein may result in hazardous radiation exposure.

Caution: The use of optical instruments with this product will increase eye hazard.

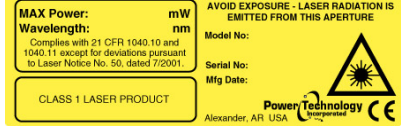
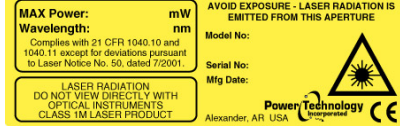
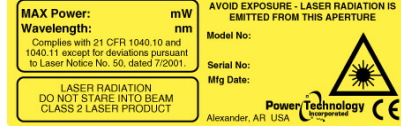
Do not shine laser in the direction of other people or at reflective surfaces that might cause exposure to the human eye. Do not mount the laser at eye level.

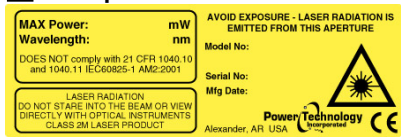
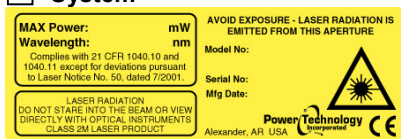
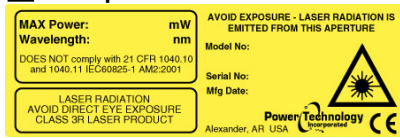
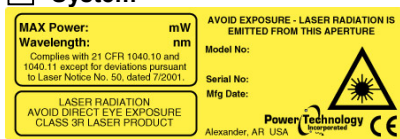
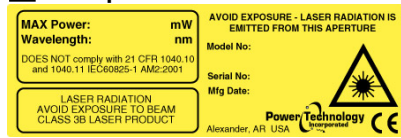
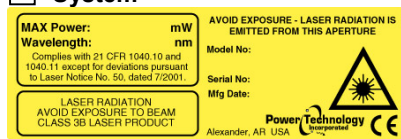
Modifications that affect any aspect of the product's performance or intended functions will require re-certification and re-identification of the product in accordance with the provisions of 21CFR 1040.10 and 1040.11. A copy of 21CFR 1040.10 and 1040.11 can be downloaded from www.powertechnology.com.

The product labels shown below can typically be found near the output optics.

<p style="text-align: center;">Class 1 Laser: Class 1 Laser Product</p> <p><input type="checkbox"/> Component</p> <div style="border: 1px solid black; padding: 5px;"> <p>MAX Power: mW Wavelength: nm</p> <p>AVOID EXPOSURE - LASER RADIATION IS EMITTED FROM THIS APERTURE</p> <p>Model No: Serial No: Mfg Date:</p> <p>DOES NOT comply with 21 CFR 1040.10 and 1040.11 IEC60825-1 AM2:2001.</p> <p style="text-align: center;">LASER RADIATION DO NOT STARE INTO BEAM CLASS 1 LASER PRODUCT</p> <p style="text-align: right;">Power Technology Incorporated Alexander, AR USA</p> </div> <p><input type="checkbox"/> System</p>	<p style="text-align: center;">Class 1M Laser: Laser Radiation, Do not view directly with optical instruments</p> <p><input type="checkbox"/> Component</p> <div style="border: 1px solid black; padding: 5px;"> <p>MAX Power: mW Wavelength: nm</p> <p>AVOID EXPOSURE - LASER RADIATION IS EMITTED FROM THIS APERTURE</p> <p>Model No: Serial No: Mfg Date:</p> <p>DOES NOT comply with 21 CFR 1040.10 and 1040.11 IEC60825-1 AM2:2001.</p> <p style="text-align: center;">LASER RADIATION DO NOT VIEW DIRECTLY WITH OPTICAL INSTRUMENTS CLASS 1M LASER PRODUCT</p> <p style="text-align: right;">Power Technology Incorporated Alexander, AR USA</p> </div> <p><input type="checkbox"/> System</p>	<p style="text-align: center;">Class 2 Laser: Laser Radiation, Do not stare into beam</p> <p><input type="checkbox"/> Component</p> <div style="border: 1px solid black; padding: 5px;"> <p>MAX Power: mW Wavelength: nm</p> <p>AVOID EXPOSURE - LASER RADIATION IS EMITTED FROM THIS APERTURE</p> <p>Model No: Serial No: Mfg Date:</p> <p>DOES NOT comply with 21 CFR 1040.10 and 1040.11 IEC60825-1 AM2:2001.</p> <p style="text-align: center;">LASER RADIATION DO NOT STARE INTO BEAM CLASS 2 LASER PRODUCT</p> <p style="text-align: right;">Power Technology Incorporated Alexander, AR USA</p> </div> <p><input type="checkbox"/> System</p>
---	---	---



 <p>MAX Power: mW Wavelength: nm Complies with 21 CFR 1040.10 and 1040.11 except for deviations pursuant to Laser Notice No. 50, dated 7/2001.</p> <p>CLASS 1 LASER PRODUCT</p>	 <p>MAX Power: mW Wavelength: nm Complies with 21 CFR 1040.10 and 1040.11 except for deviations pursuant to Laser Notice No. 50, dated 7/2001.</p> <p>LASER RADIATION DO NOT VIEW DIRECTLY WITH OPTICAL INSTRUMENTS CLASS 2 LASER PRODUCT</p>	 <p>MAX Power: mW Wavelength: nm Complies with 21 CFR 1040.10 and 1040.11 except for deviations pursuant to Laser Notice No. 50, dated 7/2001.</p> <p>LASER RADIATION DO NOT STARE INTO BEAM CLASS 3 LASER PRODUCT</p>
<p>One of the above labels is attached to the laser head.</p>	<p>One of the above labels is attached to the laser head.</p>	<p>One of the above labels is attached to the laser head.</p>

<p style="text-align: center;">Class 2M Laser: Laser Radiation, Do not stare into the beam or view directly with optical instruments</p> <p><input type="checkbox"/> Component</p>  <p>MAX Power: mW Wavelength: nm DOES NOT comply with 21 CFR 1040.10 and 1040.11 IEC60825-1 AM2:2001.</p> <p>LASER RADIATION DO NOT STARE INTO THE BEAM OR VIEW DIRECTLY WITH OPTICAL INSTRUMENTS CLASS 2M LASER PRODUCT</p> <p><input type="checkbox"/> System</p>  <p>MAX Power: mW Wavelength: nm Complies with 21 CFR 1040.10 and 1040.11 except for deviations pursuant to Laser Notice No. 50, dated 7/2001.</p> <p>LASER RADIATION DO NOT STARE INTO THE BEAM OR VIEW DIRECTLY WITH OPTICAL INSTRUMENTS CLASS 2M LASER PRODUCT</p> <p style="text-align: center; padding: 10px;">One of the above labels is attached to the laser head.</p>	<p style="text-align: center;">Class 3R Laser: Laser Radiation, Avoid direct eye exposure</p> <p><input type="checkbox"/> Component</p>  <p>MAX Power: mW Wavelength: nm DOES NOT comply with 21 CFR 1040.10 and 1040.11 IEC60825-1 AM2:2001.</p> <p>LASER RADIATION AVOID DIRECT EYE EXPOSURE CLASS 3R LASER PRODUCT</p> <p><input type="checkbox"/> System</p>  <p>MAX Power: mW Wavelength: nm Complies with 21 CFR 1040.10 and 1040.11 except for deviations pursuant to Laser Notice No. 50, dated 7/2001.</p> <p>LASER RADIATION AVOID DIRECT EYE EXPOSURE CLASS 3R LASER PRODUCT</p> <p style="text-align: center; padding: 10px;">One of the above labels is attached to the laser head.</p>	<p style="text-align: center;">Class 3B Laser: Laser Radiation, Avoid exposure to beam</p> <p><input type="checkbox"/> Component</p>  <p>MAX Power: mW Wavelength: nm DOES NOT comply with 21 CFR 1040.10 and 1040.11 IEC60825-1 AM2:2001.</p> <p>LASER RADIATION AVOID EXPOSURE TO BEAM CLASS 3B LASER PRODUCT</p> <p><input type="checkbox"/> System</p>  <p>MAX Power: mW Wavelength: nm Complies with 21 CFR 1040.10 and 1040.11 except for deviations pursuant to Laser Notice No. 50, dated 7/2001.</p> <p>LASER RADIATION AVOID EXPOSURE TO BEAM CLASS 3B LASER PRODUCT</p> <p style="text-align: center; padding: 10px;">One of the above labels is attached to the laser head.</p>
---	--	---

