

Operating Instruction for SPM-234

SPM laser head with LDP234 driver

Introduction

The SPM is a separated geometry laser. Instead of being encased in a single unit, the diode and lens are housed together in their own head assembly, separate from the driver. Users have a choice of three drivers (LDP201, LDP214, and LDP234), and this unit incorporates the LDP234 driver. Users also have a choice of three heads: the SPM, SPMB, and SPMC. The separated geometry configuration not only allows for a wide variety of laser head and driver combinations, but it enables flexible mounting in tight spaces. Instructions follow for the SPM-234.

Installation

Do not mount the laser in a thermal insulating material, such as foam plastic. For best heat dissipation use a metal mounting fixture. If the laser is to be run at or near the maximum rated input voltage, the use of a heat sink is recommended. A heat sink is always recommended for operating temperatures above 25°C.

Heat generation can have adverse effects on systems that have an output power greater than 5mW or that have more than 70mA of current drawn by the laser. *If either of these conditions exist for your system, then a heat sink is recommended to prevent damage to the laser diode.*

The operating voltage for this laser is from 3.3VDC to 9VDC. Positive power should be applied to the module's red wire, and ground should be applied to the black wire. An input voltage of 4 to 5VDC will allow the highest ambient operating temperature.

For modulated units, there is a BNC connector that will need to be connected to a modulation source or shorted for CW operation.

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 power switch 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.

Operation

Laser modules that feature the LDP234 driver will operate in either constant current mode or in automatic power control mode. The LDP234 features two power adjustment potentiometers that provide adjustment control for each mode. The calibration pot can be found on the bottom of the unit. If the driver has been previously adjusted, it will ramp up to the set value when power is applied.

One of the adjustment pots will be factory sealed. The pot that is free will be the dominant operating mode, as chosen by the customer. See section on modes for details of adjustment. The sealed pot should not be adjusted. (See Warranty section concerning this sealed pot.)

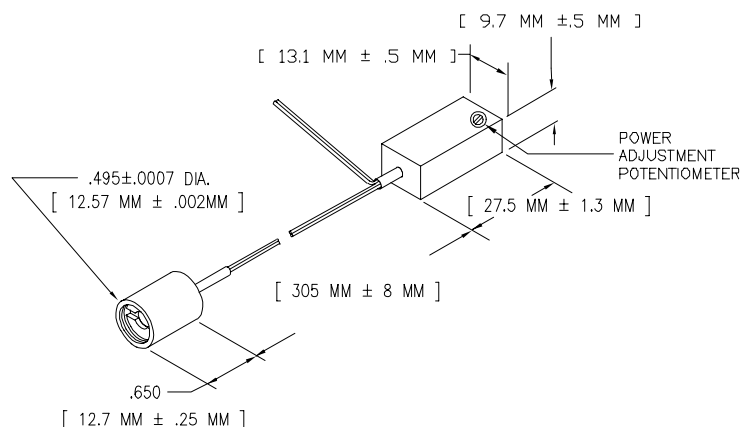


Figure 1: SPM with LDP234 driver



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Automatic power control mode: While operating in automatic power control mode, the driver regulates the drive current to the laser based on current feedback from the laser's built-in photodiode. In this manner, the laser maintains a constant output power regardless of changes in temperature, focus adjustment, or other factors that affect laser output.

The laser current pot will be factory set and sealed at the value where the system will operate at its maximum optical output power value. Clockwise adjustment of the optical power pot increases the laser's optical output power up to the maximum specified for the system.

When the optical power pot reaches this maximum setting (which may not be the full adjustment range of the potentiometer), the system will switch to constant current mode and will operate at the preset current value. Thus, the system is protected from exceeding the laser tolerance values. To return to automatic power control mode, you must decrease (turn counterclockwise) the optical power pot until something less than the constant current mode value is required. Use of the monitor pins will enable this procedure.

Constant current mode: While operating in constant current mode, the driver feeds the laser a constant current as adjusted with the laser current pot. Unlike with automatic power control mode, the laser power will fluctuate with temperature changes and with adjustments in focus, etc., given that the laser current pot remains stationary.

The optical power pot will be factory set and sealed at the system's maximum optical output power value. Clockwise adjustment of the laser current pot increases the laser drive current, thus increasing the laser's optical output power until it reaches the preset maximum.

When the laser current pot reaches this maximum setting (which may not be the full adjustment range of the potentiometer), the system will switch to automatic power control mode and will operate at the preset optical power value. Again, this ensures the system is protected from exceeding the laser tolerance values. To return to constant current mode, you must decrease (turn counterclockwise) the laser current pot until something less than the automatic power control mode value is required. As before, the use of the monitor pins will enable this procedure.

When monitoring both parameters, the value that is stable is the mode in operation. The other will be fluctuating.

The optical power monitor does not directly measure the laser diode optical power. Instead, it measures the current from the photodiode. The optical power monitor has an output of 1 millivolt per microamp of photodiode current. Each system will state the photodiode current at the maximum power. With this information, you can correlate the laser power at any given reading.

The laser current monitor on the system has an output of 1 millivolt per milliamp of laser diode current.

Maintenance & Service

This laser contains no user servicable parts. Depending on environmental conditions, the optics may require occasional cleaning. Clean with alcohol and a lint free rag or cotton swab.

Warranty and Repair Return Policy

Breaking the seal on the sealed potentiometer voids the warranty.

The laser diode is held in place with a locking ring. This locking ring is factory sealed. It is necessary to remove the lens in order to gain access to this ring. Therefore, accidental breaking of this seal is unlikely. Breaking the seal on this locking ring voids the warranty.

For systems that incorporate a centering option, adjustment of the centering set screws will void the diode warranty and possibly the warranty on the entire laser system.

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

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.



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 unintentionally 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 on the laser head near the output optics.

<p align="center">Class 1 Laser: Class 1 Laser Product</p> <p><input type="checkbox"/> Component</p>  <p><input type="checkbox"/> System</p>  <p align="center">One of the above labels is attached to the laser head.</p>	<p align="center">Class 1M Laser: Laser Radiation, Do not view directly with optical instruments</p> <p><input type="checkbox"/> Component</p>  <p><input type="checkbox"/> System</p>  <p align="center">One of the above labels is attached to the laser head.</p>	<p align="center">Class 2 Laser: Laser Radiation, Do not stare into beam</p> <p><input type="checkbox"/> Component</p>  <p><input type="checkbox"/> System</p>  <p align="center">One of the above labels is attached to the laser head.</p>
<p 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><input type="checkbox"/> System</p>  <p align="center">One of the above labels is attached to the laser head.</p>	<p align="center">Class 3R Laser: Laser Radiation, Avoid direct eye exposure</p> <p><input type="checkbox"/> Component</p>  <p><input type="checkbox"/> System</p>  <p align="center">One of the above labels is attached to the laser head.</p>	<p align="center">Class 3B Laser: Laser Radiation, Avoid exposure to beam</p> <p><input type="checkbox"/> Component</p>  <p><input type="checkbox"/> System</p>  <p align="center">One of the above labels is attached to the laser head.</p>

