Operating instructions for PMi diode module

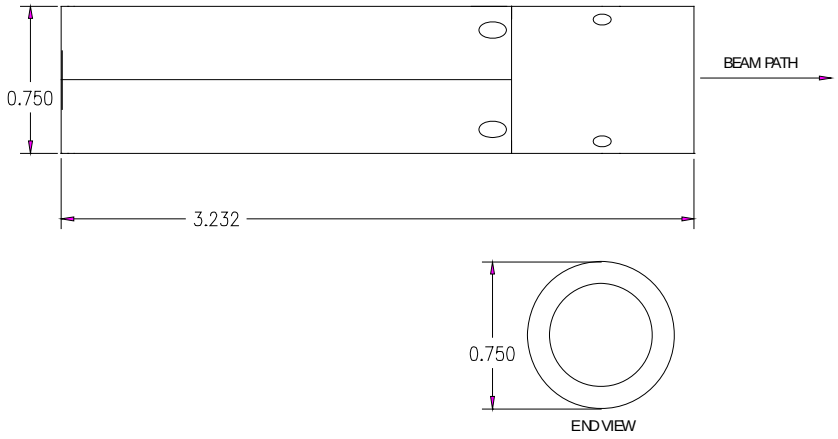
General operating instructions

Introduction

The PM*i* is a higher-powered version of Power Technology, Inc.'s rugged PM laser module. This product can be configured with a variety of laser diodes at various output powers and operating wavelengths. Products with IR output or with more than 5mW of output power are not intended for surveying, leveling, and alignment applications. Visible units with less than 5mW of output power are CDRH certified as laser systems.

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

Dimensions of this Laser Module are .75" diameter and 3.2" long, with Input Voltage of 3.3v to 9.0v. The Maximum Operating Current is 500mA. Output of the PM*i* is CW. The operating environment is 10ºC to 30ºC. Output regulation is ±7% in Constant Current mode (varies from diode to diode) and±1.5% in Constant Power mode (varies from diode to diode).



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. If the system 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. Mounting brackets are available for PM*i* laser modules. Simply ask your salesperson for more information.

The operating voltage for this laser module is from 3.3 VDC to 9 VDC. Positive power should be applied to the module's red wire, and the black wire should be connected to ground

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 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.

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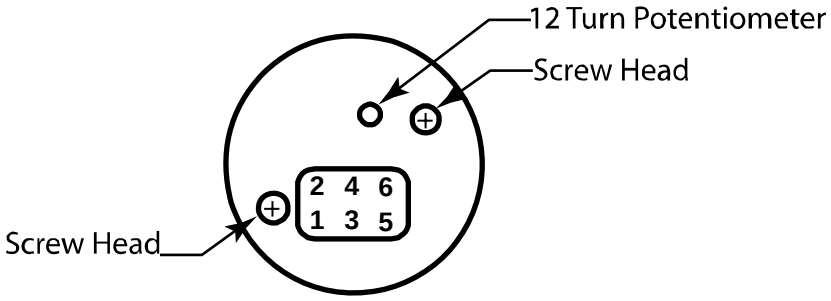
Operating Procedures & Control Description

The PMi, 0.5Amp PM (when properly heat sinked) is capable of operating with 3.3V to 9V input and delivering a controlled 50mA to 500mA maximum current to the Laser Diode. Note that the PMi has a minimum current of 50mA, which differs from most Power Technology, Inc. modules with a minimum current of 0mA.

The PMi can be configured to run in Constant Current or Constant Power mode depending customer requirements. In Constant Current mode, the output power may vary widely with temperature, dependant on the Laser Diode.

The cable that is used for the input has 5 wires:

Pin Number	Wire Color	Description
1	Red	Positive input voltage
2	Black	Return (ground) wire
3	Blue	Monitors Laser Diode current with 1% accuracy (1mv/ma)
4	Gray	Monitors the Photo-Diode current
5	Green	Return lead, Laser Diode current and Photo-Diode
6	NC	No connection, internal use only



The input connector is inserted with the large Red and Black wires to the left (with the adjustment hole above). If inserted reversed, no damage will result, but the unit will not operate.

A potentiometer is supplied for the customer to adjust the Laser Power. With this pot the laser output may be adjusted from maximum to zero output.

External heatsinking is recommended to prevent overheating. High current applications and/or operating unit above 5VDC may require a finned heatsink and fan (Pmi-ACS-HS). An internal temperature shutoff is designed in to disable the driver when the Laser temperature rises above 34 degrees Centigrade. Cycling of the laser output power is an indication of over-temperature condition. Laser diode temperature above 34ºC will force the laser driver output to remain at zero until the unit cools to below 33ºC.

It is possible to toggle the driver output by switching the input voltage on and off. The customer will see a minimum fall time of 100 microseconds and minimum rise time of 20 milliseconds in Constant Current mode.

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.

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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.

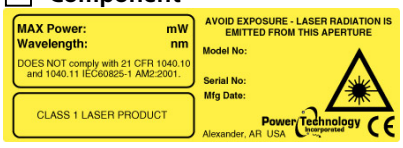
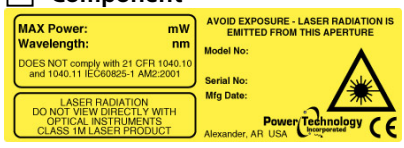
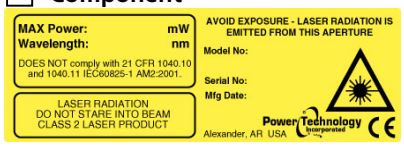
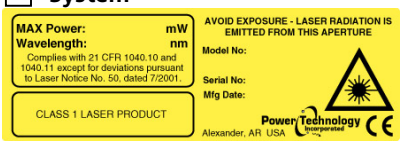
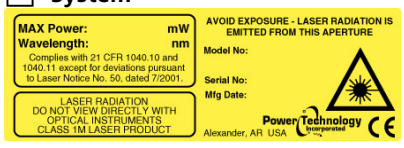
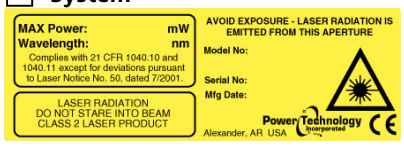
Laser Safety

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.

Class 1 Laser: Class 1 Laser Product	**Class 1M Laser:** Laser Radiation, Do not view directly with optical instruments	**Class 2 Laser:** Laser Radiation, Do not stare into beam
☐ **Component** 	☐ **Component** 	☐ **Component** 
☐ **System** 	☐ **System** 	☐ **System** 
One of the above labels is attached to the laser head.	One of the above labels is attached to the laser head.	One of the above labels is attached to the laser head.

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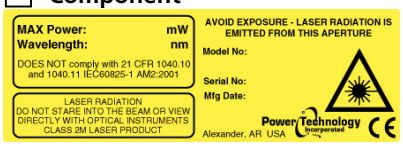
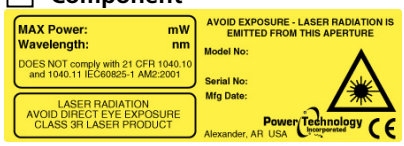
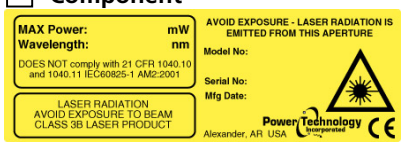
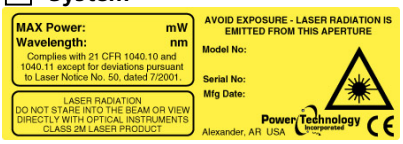
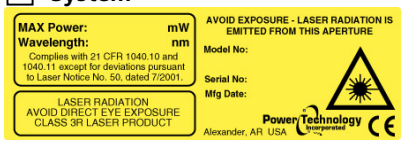
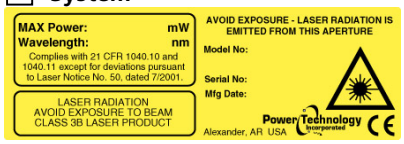
Class 2M Laser: Laser Radiation, Do not stare into the beam or view directly with optical instruments	**Class 3R Laser:** Laser Radiation, Avoid direct eye exposure	**Class 3B Laser:** Laser Radiation, Avoid exposure to beam
☐ **Component** 	☐ **Component** 	☐ **Component** 
☐ **System** 	☐ **System** 	☐ **System** 
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