"SPM-201" Series LASER DIODE OEM SYSTEM INSTRUCTIONS

GENERAL OPERATION

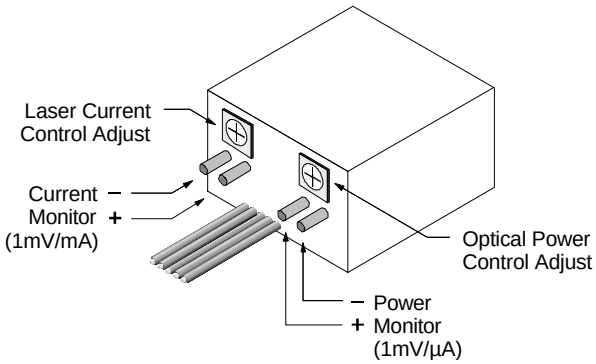
Installation: Do not mount the system in a thermal insulating material, such as foam plastic. For best heat dissipation use a metal mounting fixture. If the system will operate at the maximum 12VDC input (actual maximum will depend on the particular system you have purchased) the use of a heatsink for the laser head is recommended for operating temperatures above 25°C.

Heat generation can also be a problem on the system if it has an output power of 5mW or greater or, that has 70mA or more of current drawn by the laser. *If either of these conditions exist for your system then a heat sink for the laser head is recommended to prevent damage to the laser diode*.

An input voltage of 4 to 5VDC will allow the highest ambient operating temperature.

Operation: The system will operate in either a Constant Laser Current Mode or in a Constant Optical Output Power Mode. Potentiometers provide adjustment control for each mode and DVM compatible pins allow the monitoring of these parameters.

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



Focusing: The system is focus adjustable. A spanner wrench is provided for making this adjustment. Care should be taken when focusing or cleaning the optics to prevent damage. Cleaning methods should follow those customary for glass optics.

<u>Caution</u>: Do not adjust the focus with the module at full power or operate the laser with the lens removed.

Reflections onto the internal photocell from the lens are a vital part of the feedback loop. This photocell 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) will result in destruction of the laser diode due to excessive drive current.*

Modes: <u>Constant Optical Output Power Mode</u>: Operating in this mode, the power supply regulates the drive current to the laser based on current feedback from the laser's built-in photodiode. In this manner, the laser is maintained at a constant 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 it's maximum optical output power value. The clockwise adjustment on 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 the Constant Current Mode and operate at the preset current value. Thus, the system is protected from exceeding the laser tolerance values. In order to return to the Constant Optical Power Mode you must decrease (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: Operating in this mode, the power supply feeds the laser a constant current as adjusted with the Laser Current Pot. Unlike the Constant Optical Power 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. The clockwise adjustment on 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 the Constant Optical Output Power Mode and operate at the preset optical power value. Again, this ensures the system is protected from exceeding the laser tolerance values. In order to return to the Constant Current Mode you must decrease (counterclockwise) the Laser Current Pot until something less than the Constant Optical Output Power Mode value is required. As before, the use of the monitor pins will enable this procedure.

Monitoring: 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.

Warranty Notes:

Sealed Potentiometer: **Breaking the seal on the sealed potentiometer voids the warranty.**

Sealed Locking Ring: 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. So, accidental breaking of this seal is unlikely.

Breaking the seal on this locking ring voids the warranty.

Connecting Wires: The laser head and power supply are connected by the maximum recommended length of cable.

Cutting these wires voids the warranty.

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