Re: Screwy laser diode with monitor photodiode

Source: http://sci.tech−archive.net/Archive/sci.electronics.design/2006−04/msg04140.html

- *From*: "redbelly" <redbelly98@xxxxxxxxx>
- *Date*: 27 Apr 2006 15:40:19 −0700

Ethan wrote:

> So it sounds like using the monitor diode is not going to work for me. Does anybody have suggestions for how to get a tightly controlled output from a laser?
>
> I am using this to measure optical density of a fluid. I shine a laser into the fluid and measure how much light comes out. I am modulating the laser at a couple kHz, just to make the detection easier, and to make it easier to cancel out external light sources.
>
> This is pretty simple and for the most part this works pretty well. The problem is the light source is drifting with temperature.
>
> I have a few bad ideas, they are all physically cumbersome, such as a beam splitter and an external monitor diode. Or a heater/thermister to maintain a constant temperature just above ambient.
>
> Ideas anyone?
>
> Thanks
>
> Ethan
>
> P.S. I am realizing I don't know as much about VCSELs and other lasers as I thought. Any suggestions on good books, or other references?

It's fairly common to control the temperature of a diode laser. Usually a TEC (thermoelectric cooler) is used to cool it. A heater would be easier to set up, but you may be shortening the lifetime; if I did that I'd run the diode at reduced (half?) power (if your application can still work with less power). Of course, you'll need a thermistor or other temperature sensor, plus additional circuitry. PID or PI controllers are available from Wavelength Electronics, http://www.wavelengthelectronics.com −− their site seems to be down right now or I'd hunt down the temp controller part # I used to use at my previous job.

HTH,

Mark

.