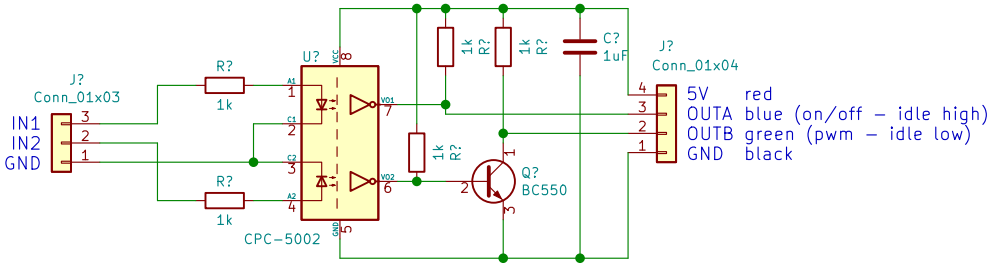
Laser PSU control signal isolator

The 1uF value for the decoupling capacitor is simply what we had lying around, a 100nF would be more typical. Without it, the enable channel would not quite work and measurements were erratic and unpredictable.



The CPC5002 is inverting and open-collector, so it needs output pullups and output is high when no current flows on the input side. This is problematic for the PWM pin, which should be low when idle for a double safety, which is why a transistor is added to invert the signal again.

It also has low input requirements and (unlike most digital isolators) needs no VCC on the input side, which makes it suitable for smoothieboard (which has no vcc on the pin header that has the PWM pins).

Input LED has Vf = 1.2V (max 1.41V). Recommended current is 1.5mA, (min 1.4mA) so: (3.3V - 1.41V) / 1.4mA = 1350Ω
Using 1kΩ gives (3.3V - 1.41V) / 1kΩ= 1.89mA which has plenty of headroom over the minimal 1.4mA.

If a new version is ever needed, the HCPL-2232 optocoupler should be considered. It has low input current, two channel, push-pull outputs that are also non-inverting, reducing the component count to just two external resistors.

Used for the "medium" laser with smoothieboard

Matthijs Kooijman

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File: LaserIsolator.sch

Title: Isolator for laser PSU control

Size: A4	Date:	**Rev:**
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