Excelsior OEM

Diode-Pumped, Visible CW Lasers

User's Manual

Spectra-Physics

A Division of Newport Corporation

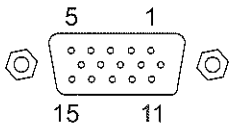

Figure 4-6: External Control Connector Pin Numbering

The function of each of these pins is listed below.

Table 4-1: External Control Connector Pin Functions

Pin	Type	Description	Function
1	Output	Laser OK	This pin is internally shorted to ground when the laser is in stable operation, i.e., laser output power is at the specified level and the laser head temperature is within the proper operating range. Pin 1 can be used as a switch for a laser emission indicator as shown in Figure 4-8.
2	Input	Laser ON/OFF	When this pin is shorted to ground, the laser will turn on immediately (if +5 Vdc power is available to the laser head through the controller). Refer to "Turning the Laser On and Off" on page 4-7 for instructions on using this input.
3	N/A	Reserved	Must be open
4	Output	Current Monitor	Pin 4 provides an output signal proportional to the current of the diode pump laser. The scale is 100 mV/Amp, the maximum signal is 160 mV (corresponding to 1.6 A).
5	Output	Laser Power Monitor	Pin 5 provides an output signal that is approximately proportional to the power output of the laser. At full output power, the signal is 95–100 mV. Example: a Pin 5 signal of 50 mV for the *Excelsior-473-10* indicates that laser power has fallen to about 5 mW.
6	Ground		
7	Ground		
8	Input	External Power Control	This pin is used to vary the output power of the *Excelsior-532-100* and the *Excelsior-532-150*. This pin works only for these two models. Refer to "Changing the Laser Output Power" on page 4-9 for directions on using this input.
9	N/A	Reserved	Must be open.
10	Output	Diode Laser Alarm	Indicates the diode pump laser in the laser head is nearing its end of life. To employ this "open collector" alarm, refer to Figure 4-9 for an example of this circuit.
11	Ground		
12	Ground		
13	N/A	Reserved	Must be open.
14	N/A	Reserved	Must be open.
15	N/A	Reserved	Must be open.

Operation

Please read this entire chapter and Chapter 2, "Laser Safety," before turning on the *Excelsior* laser for the first time.

Danger! Laser Radiation

The Spectra-Physics *Excelsior* laser is a *Class IIIb—High Power Laser* whose beam is, by definition, a safety hazard. Take precautions to prevent accidental exposure to both direct and reflected beams. Diffuse as well as specular beam reflections can cause severe eye damage.

Turning the Laser On and Off

Starting and stopping the laser is straightforward: once +5 Vdc power is connected to the laser head, use a switching circuit similar to that shown in Figure 4-7 below to turn the laser on or off. The laser will be ready to perform according to specifications after a 5-minute warm-up.

Danger! Laser Radiation

Note that the *Excelsior* emits laser radiation immediately after Pin 2 of the EXTERNAL CONTROL connector receives the ON signal. Take care to protect against unexpected exposure.

A simple circuit to turn the laser on and off is shown below. If a suitable drive current is supplied from a +5 Vdc source to Pin 2 of the EXTERNAL CONTROL connector, the diode pump laser will turn on and the *Excelsior* will emit laser light.

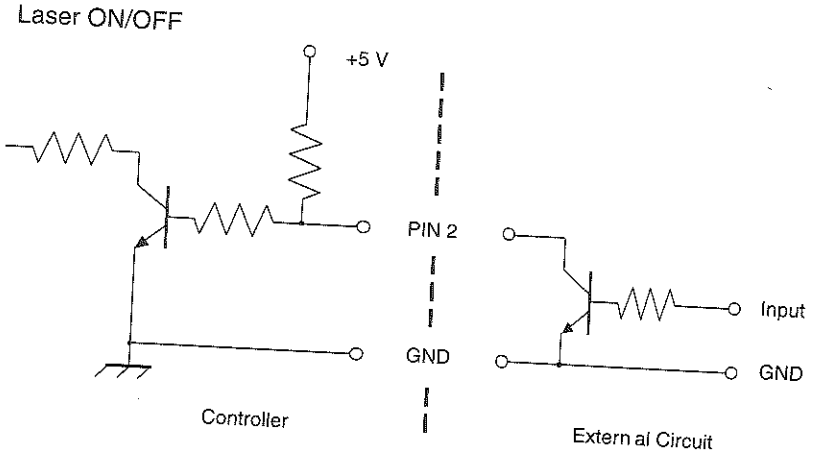

Figure 4-7: Laser On/Off Control Example

Note that the ground pins of the EXTERNAL CONTROL connector are Pins 6 and 7, and Pins 10 and 11.

Using the Emission Indicator

An example of a simple circuit used to turn an emission indicator on and off is shown in Figure 4-8 below.

When the laser output is at its specified level and the laser head temperature is within operating range, the internal transistor connected to Pin 1 in the circuit shown in Figure 4-8 will turn on. The LED shown in the figure will then turn on, indicating that the laser is emitting laser light.

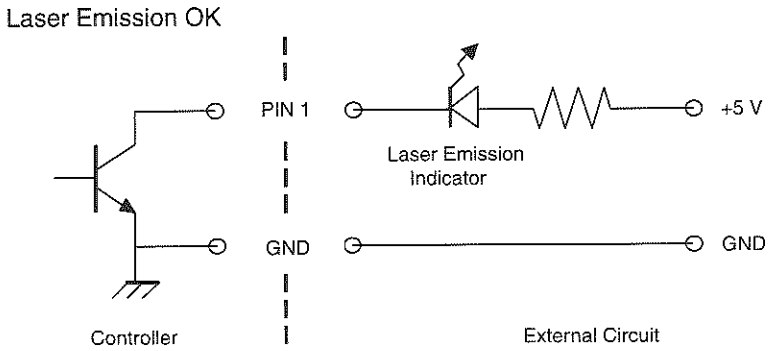

Figure 4-8: Laser Emission Indicator Example

Note that the ground pins of the EXTERNAL CONTROL connector are Pins 6 and 7, and Pins 10 and 11.

Using the Diode Laser Alarm

A circuit to monitor the diode laser alarm is shown in Figure 4-9 below. The diode laser alarm is activated on Pin 10 when the drive current reaches 95% of the factory-set maximum limit. Note that the Pin 10 signal is disabled for the first 5 minutes after the diode pump laser is turned on while the diode current stabilizes.

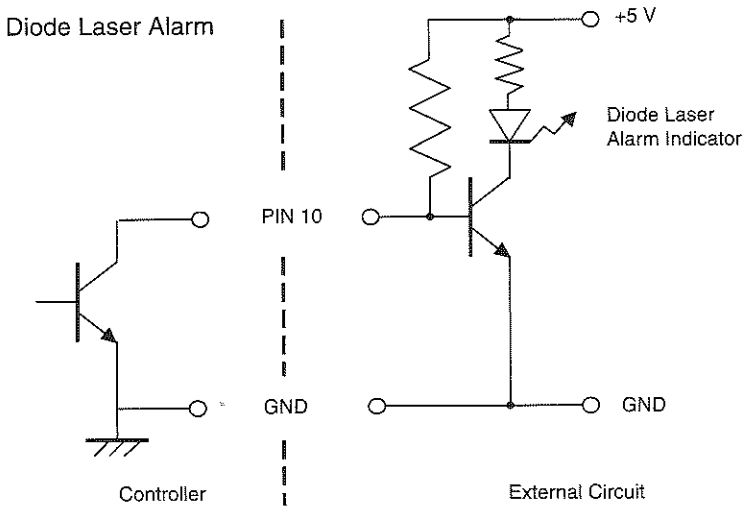

Figure 4-9: Diode Laser Alarm Example