



ANALOG MODULES, INC.

Specialists in Analog and Laser Electronics

MODEL 779A LASER DIODE DRIVER OPERATING INSTRUCTIONS

The Model 779A Laser Diode Driver is a pulsed high current source used to excite high power laser diode emitters. The unit should be mounted as close to the diode as possible and mounted to a heat sink to control unit heat dissipation.

SET UP

Use a 0.1 to 0.05Ω non-inductive load across the output of the supplied cable.
Preset all pots to minimum (CCW)
Preset INT/EXT to INT and CW/PULSE to PULSE.

DC POWER INPUT

The high power DC input should be connected to the terminal as -HV and GND. The most positive potential is connected to GND. The high power input voltage should be 5 to 150 volts DC. A separate 11 to 16VDC at 30mA is connected to +15V and GND.

NOTE: The high power input voltage required is the laser diode compliance voltage at its operating current plus the voltage across the 779A at that operating current from Figure 1. For best efficiency and reliability, the input voltage should be kept as low as possible while still meeting the output current requirements. Also note that the chassis is connected to the GND binding post.

CAUTION: +15VDC must be applied before -HV is applied, and -HV must be removed before +15VDC is removed.

OUTPUT CURRENT ADJUSTMENT (Internal)

Apply power to the unit (see above note for power sequence). Set the current limit adjustment (Pulse I Limit) fully clockwise (maximum). Measure the output current at the Current Monitor output with an oscilloscope, 50mV/Amp. Adjust the Current (I) clockwise to increase output current to desired level. When adjusting the current, start with low -HV and advance as the load voltage increases to prevent excessive instantaneous power dissipation in the driver.

PULSEWIDTH

Adjust the Pulsewidth control to the desired width (100μS to 1mS) while monitoring the output signal on an oscilloscope connected to the current monitor output.

PULSE REPETITION FREQUENCY

Adjust the internal Pulse Rate control to the required repetition frequency as monitored by an oscilloscope connected to the Current Monitor output. The -A has an adjustment range of 10Hz to 100Hz. The -B has an adjustment range of 100Hz to 1kHz.

OUTPUT CURRENT LIMIT ADJUSTMENT

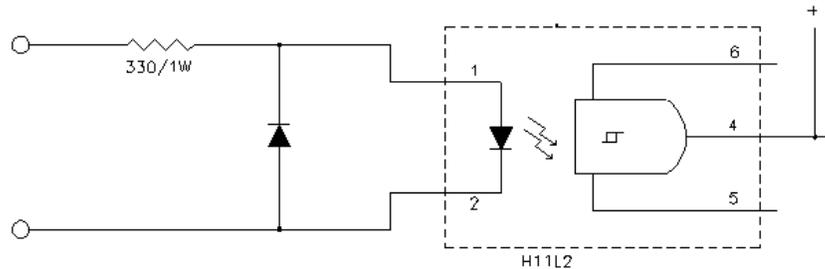
With the output current adjustment, Current (I), set to a level slightly higher than the required setting of the current limit desired, set the Pulse I Limit adjustment counter clockwise by observing the limit action at the Current Monitor output. Set to desired limit current, then reset the Current adjust to the desired level. Note that two limiting pots are provided, one for pulse and one CW.

DIODE INTERCONNECTION

Remove power from the driver before connecting loads. The top row of Pins in the output connector is connected to the cathode of the laser diode. The bottom row (closest to the mounting plate) is connected to the anode. Use the supplied low inductance cable for these connections if at all possible. If longer cable is required, care must be taken to protect against reverse voltage reflections across the laser diode by placing a fast (IN4938) diode in reverse polarity directly across the laser diode.

EXTERNAL CONTROL

The input Pulse Enable is an isolated opto-coupler requiring 10mA of current thus:



The current control is a DC Voltage, 0 to 6V. Set this input to 0 volts initially.

Set the internal/external (INT/EXT) switch in the external (EXT) position and connect a pulse generator to the BNC Pulse Enable input. Set to 5V pulse amplitude. The pulsewidth of the output pulse is determined by the pulsewidth of the Pulse Enable signal. For CW mode, apply +5V to the Pulse Enable BNC. The Current Control BNC input is the external control of the output current, both pulse and CW. This input is a DC Voltage ranging from 0 to 6V with a sensitivity of 20A/V. The pulsewidth limit control limits the maximum of the externally applied signal. Adjust as required.

Note: When using the External Current Control, the Internal Current Control trimpot must be set to zero.

DIODE DRIVER HEAT DISSIPATION

Care must be taken to limit the dissipation of the 779A in both CW and Pulse Mode by controlling the PRF, pulsewidth, the voltage across the driver, and output current as follows:

779A Dissipation from
Figure 1 times duty cycle

Heat Sinking

0 to 20 Watts

No heat sink required

> 0 to 80 Watts

Heatsink with 50 CFM

> 80 to 180 Watts

Heatsink with water @ 30°C

Example: 6 volts (across driver) x 70 Amps x $100\mu\text{S}$ = 42 Watts dissipated in 779A driver.
1mS

Must use at least air heatsink with 50 CFM.

MAINTENANCE

There are no user maintainable parts in the 779A. The 779A should be returned to Analog Modules, Inc. for maintenance and repair.

