



## Laser Diode Controller - 70 A, 5 Volt Laser Output 336 Watt Thermoelectric Temperature Controller



### 70 Amp, 5 Volt Laser Diode Driver 336 Watt TEC Controller

- o Laser Current to 70 A, Voltage up to 5 V
- o Bipolar Temperature Controller up to 336 W
- o Optimized for High Power Laser Diodes Bars and Arrays from Coherent/DILAS,
- o CW Mode and Integrated Quasi-CW Pulse Generator, External Modulation Source
- o Full Complement of Protection Features



**LASER  
DIODE  
CONTROLLERS**





## LDC-296 Laser Diode Controller

The LDC-296 can drive full CW power up to 70 Amps, and the integrated function generator can be programmed to generate QCW pulses from 25 microseconds to CW. The QCW pulse mode feature is capable of delivering continuous pulses, single pulses, and pulse bursts which are internally or externally triggered.

## Internal Function Generator & QCW Pulse Modes

In addition to CW (continuous wave) mode of operation, the LDC-296 laser diode controller offers flexible modulation capabilities and a QCW mode. The rear panel of the controller has a BNC input for an analog or TTL digital modulation input with a 10 kΩ input impedance. The controller has an internal function generator which can be used to set the quasi-CW pulses. In QCW mode, the user can also set the 100μs to CW pulses from a remote TTL signal source.

### LDC-296 REAR PANEL CONNECTIONS

**Peltier Connector**

PIN.No	Abbr.	Function
1,2,7,8	PEL+	Peltier TEC positive Output
3	SCND	Supply Ground
4	ILED	Laser ON LED Anode (+) ILED ca.5mA vs. GND
5	PL+	Pilot Laser (+), vs. GND
6	PD-	Photo Diode Cathode (-) Input
11	T1	Temperature Sensor Input, vs. GND (default NTC 10k)
12	CND	Common Ground
13	S1-24V	1-24V adjustable Supply, max. 500mA, vs. CND, for fan etc.
9,10,14,15	PEL-	Peltier TEC negative Output

**Laser Connector**

PIN.No	Abbr.	Function
A3; A4	LD+	Laser Diode Anode (+)
A1; A2	LDC-	Laser Diode Cathode (-)
A5	n.c.	

**RS232 Connector**

SubD-9 female  
Standard RS232 Connector  
(No Null-Modem Cable!)

**AMOD/DMOD-IN Connector**

MODGND  
MODIN  
Impedance: 10kΩ  
Digital Modulation with TTL-Freq! Analog Modulation 0-4V<sub>cc</sub> → 0-max(A)

**MOD-OUT Connector**

GND  
OUT  
BNC-Socket, current monitor  
0-4mA(A) → 0-4V<sub>cc</sub>  
Take care for laser isolation if you connect GND potential to an oscilloscope I.e.

**Interlock Connector**

Jack Connector 3.5mm  
Laser runs only if closed  
(ca. 5V<sub>cc</sub> over 2V → R < 400Ω)  
I2+  
I1-  
\* not connected

### LDC-296 REAR PANEL LAYOUT

The diagram shows the physical layout of the rear panel, including the Peltier connector, Laser connector, RS232 connector, AMOD/DMOD-IN connector, MOD-OUT connector, and Interlock connector. Dimensions are given as 190mm for the main panel width and 110mm for the height of the connector area.



## Bipolar Temperature Controller Features

The full PID loop provides millidegree temperature stability, and can quickly stabilize high heat loads to the temperature set-point to reduce the risk of damage to your laser. User adjustable upper and lower temperature limits protect the laser diode and the Peltier device. Additionally, TEC output current limits are user-configured to protect the Peltier device from over-drive damage.

## Protection Features for Laser Diode Bars and Arrays

These current sources feature multiple levels of built-in laser diode protection which have been optimized for bars and arrays. One of the unique features is a user programmable soft-start ramp of the bias current to the device under test. The factory sets the ramp time to 300 milliseconds as a default, but the user can adjust this time period from 1 millisecond up to 10's of seconds. This current ramp up and down function is designed to protect the laser from thermal shock during power up and down sequences.

### Optimized for High Voltage Multi-Chip Laser Diodes

nLight Element



Lumics LuOcean



Lumentum ST Series



II-VI Multimode Pump



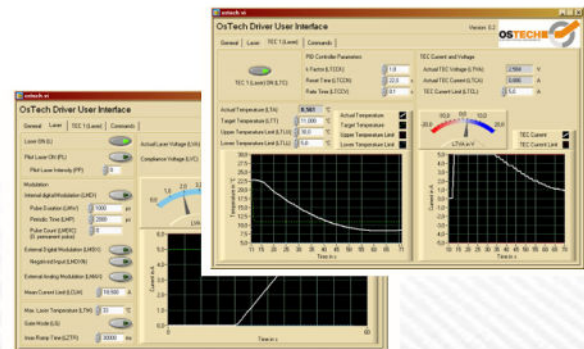
nLight Pearl



Coherent | Dilas Pump



### LABVIEW DRIVERS





## LDC-296 Laser Diode Controller Specifications

### CURRENT & VOLTAGE SUPPLY TO LASER

- Laser Supply Current Range (CW): 0.00 - 70.00 Amps
- Laser Supply Voltage Range: 5 Volts
- Laser Current Noise & Ripple (rms): < 1% full scale
- Laser Current Setpoint Resolution: 18mA
- Laser Current Setpoint Accuracy: +/- 0.5%
- Includes Back Facet Monitor Photodiode bias and Measurement

### INTEGRATED LASER DIODE PROTECTION

- Soft-Start Current Ramp Factory Default Set to 300 Milliseconds; User Adjustable
- User-Programmable Current Limit
- Temperature Limits (Upper and Lower)
- Open Circuit Detection; Short Circuit when Laser Diode Current Turned OFF
- ESD and Power Surge Clamp, AC Line Filter
- Reverse Voltage Transient Clamp
- Rear Panel Keylock Switch and Safety Interlock
- Front Panel e-Stop Button Emergency Shut-Down

### LASER TEC TEMPERATURE CONTROLLER

- Internal TEC Output Power: 336 Watts (7 Amps, 48 Volts)
- TEC Output Current Range (bipolar):  $\pm 7.00$  Amps
- TEC Output Voltage Range (bipolar) :  $\pm 48.00$  Volts
- Temperature Sensor Inputs: 10 k $\Omega$  Thermistor, NTC, PT100, PT1000
- TEC Control Loop Algorithm: Full P.I.D.
- P.I.D. Variables: User Adjustable to Optimize Temp. Settling Speed
- TEC Setpoint Resolution: 0.01 $^{\circ}$ C
- Temperature Range: -25 $^{\circ}$ C to 150 $^{\circ}$ C
- Factory Set Default Lower Temperature Limit: 5 $^{\circ}$ C
- Factory Set Default Upper Temperature Limit: 35 $^{\circ}$ C



## LDC-296 Butterfly Pump Laser Diode Controller Specifications

### MODULATION & QCW PULSING MODE

- Integrated Function Generator
- QCW Trigger: Internal or External
- Rise / Fall Time: < 25 $\mu$ s, 10%-90%
- Pulse Modes: Continuous, Single Pulses, Bursts
- Modulation Input: BNC, Digital (TTL) or Analog, 10k $\Omega$  Impedance
- MODULATION Input Voltage Range: 0 ~ 4 Volts (4V = Max Current)

### AUXILIARY FUNCTIONS

- Temperature Sensor Input: 10k $\Omega$  NTC Thermistor
- External Fan Control Circuit, 1 - 24V, 500mA (max)
- Pilot Laser Anode, vs. Ground: (5V, 150 mA)
- Laser-On External LED Indicator: 5mA Output
- Photodiode Cathode Input, vs. Gnd

### USER INTERFACE AND CONNECTORS

- Front Panel: Alphanumeric LCD
- RS232 Standard
- USB Optional: \$95.00 (Option SVC-USB)
- LabView Drivers Included
- Peltier Connector: SubD-15, Female
- Laser Connector: SubD-5W5, Female
- RS232 Connector: SubD-9, Female
- Safety Interlock: Jack Connector, Stereo 3.5mm

### DIMENSIONS AND POWER INPUT

- Power Input: Universal 100V ~ 240 VAC, 50/60 Hz
- Dimensions: 89 mm (H) x 482 mm (W) x 266 mm (L)
- Chassis Height: 2U (Standard Rack-Mount Units)

### RECOMMENDED ACCESSORIES

- kab-39 Unterminated Connecting Cable -or- kab-231 Terminated Connecting Cable
- kab-141 Power Cable, 80 Amp: Sub-D5W5 (male) - Cable Lugs
- acc-417 USB-RS232 Converter



## Product Sales and Service

Orders for this product are fulfilled by LaserDiodeControl.com, part of the Laser Lab Source group. It is manufactured for Laser Lab Source by OsTech, GmbH.

## Product Warranty

This product is sold with a full one-year warranty. It is warranted to be free from defects in material and/or workmanship for a period of one year from the date of shipment.



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