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DLC-1300 LD&TEC CONTROLLER

Laser Diode Controller

Instruction Manual

Please read this Instruction Manual before using the unit.

WARRANTY

NOLATECH warrants that the Laser Diode Controller shall be free from defects in materials and workmanship for a period of one year from the date of shipment. For the period commencing with the date of shipment of this equipment and ending one year later, NOLATECH will, at its option, either repair or replace any part which is defective in materials or workmanship without charge to the customer.

The customer, before returning any equipment covered by this warranty, which is asserted to be defective by the user, shall make specific written arrangements with respect to the responsibility for shipping the equipment and handling any other incidental charges with NOLATECH.

This warranty does not apply to any equipment that has not been used in accordance with the specifications recommended by NOLATECH in this manual for the proper and normal use

Safety Instructions

Observe the following general safety instructions during all phases of operation of this instrument. Failure to comply with these instructions or with specific warnings elsewhere in this manual violates the safety standards of intended use of the instrument. NOLATECH assumes no liability for the customer's failure to comply with these requirements.

DO NOT SUBSTITUTE PARTS OR MODIFY INSTRUMENT

Do not install substitute parts or perform any unauthorized modification to the instrument. Return the instrument to NOLATECH for service and repair to ensure that all safety features are maintained.

KEEP AWAY FROM LASER BEAM

Semiconductor lasers emit infrared radiation that is invisible to the human eye. When in use, safety precautions should be taken to avoid the possibility of eye damage. Wear certified eye protection. Avoid direct exposure to beam. Do not stare directly at the laser connector or view an operating laser at close range. If viewing is required, the beam should only be observed by reflection from a matte surface utilizing an image converter or a suitable fluorescent screen.

SPECIFICATION
Laser diode driver unit with temperature controller
Operating mode CW
Maximum operating current, mA 1300
Stability of current, better than, % 0.1
Maximum TEC current, A 1.5
Maximum TEC voltage, V 5
PD current range, mA 0.01-5
Supply voltage 110VAC/230VAC
Power consumption, W < 40
Size, mm 225 x 165 x 40
Weight, lb 1.5

1. General Information

The Laser Diode Controller consists of a stabilized laser diode driver, a temperature controller (in one case) and a 14pin DIL or Butterfly zero-force mount. The laser driver allows continuous adjustment of the output power within the operating range 0-1300mA and 0-5V. Laser diode temperature is controlled by a thermoelectric cooler with feedback from a thermistor that is typically incorporated in 14pin DIL or Butterfly packages.

Front Panel

• **Power Switch** – Switches on/off the DC power to the unit.

• **Power LED** – Indicates controller is on.

• **LD ON Button** – Turns the laser output on/off.

• **LD ON LED** – Flashes for several seconds when controller is setting parameters for pumping and glows continuously when laser diode is operating.

• **Control Knob** – For switching between operating parameters and indicators (by pressing it) and for setting operating parameters (by rotating it).

• **Liquid Crystal Display** – Displays operating parameters and settings.

Back Panel

• **Laser Head Port** – For connecting external 14pin DIL mount.

• **12V DC** – Power connector, 12VDC.

• **USB** – microUSB type “B” interface connector.

2. Installation

Caution: Although ESD protection is designed into the Laser Diode Controller, operation in a static-free work area is recommended.

Package Content:

• Laser Diode Controller

• 14pin DIL or Butterfly mount

• 12V AC Adapter and power cable

• Cable for external 14pin DIL mount

• Instruction Manual (this booklet)

14pin DIL Laser Diode Module Installation

• Move the lever on the 14pin DIL mount to the vertical position (open the zero-force connector).

• Put on a grounding wrist strap and insert a 14pin laser diode module (or a superluminescent module) in the zero-force connector in the mount.

• Secure the laser diode module by shifting the lever on the connector from vertical position to horizontal position. Tighten the two screws on the other side of the heat sink in order to press the module against the heatsink for better thermal contact and heat dissipation.

• Connect the mount to the controller with the cable provided.

• Connect the controller to a 120-240 VAC power outlet with the 12V AC adapter provided.

• Remove protective cap from the optical connector at the end of the fiber pigtail (if any).

• Position Laser Controller so that the rear panel and the left panel areas have 2 to 4 inches of clearance for air circulation.

3. Operation

• Turn on Power Switch. After a few seconds, the Thermistor Set screen will come out at the Liquid Crystal Display.

• Set the desired thermistor resistance by rotating Control Knob. Most common thermistors have 10kOhm resistance at 25 degrees C.

• Press Control Knob once to get to Thermistor Real screen. It shows the current thermistor resistance in the laser diode module. Wait till the temperature controller brings this value to the setpoint. Then the laser diode is ready for operation.

• Press Control Knob again to get to Ioperating Real screen. It shows the operating current setpoint. It should read 000 mA.

• Press Pumping button. Pumping LED above the button will flash for 10-20 seconds and then will glow continuously. This indicates that laser diode is on and its operating current is at the setpoint (0mA).

• Rotate Control Knob to adjust operating current to a desired value. The laser diode output will increase respectively and laser radiation will come out through fiber end.

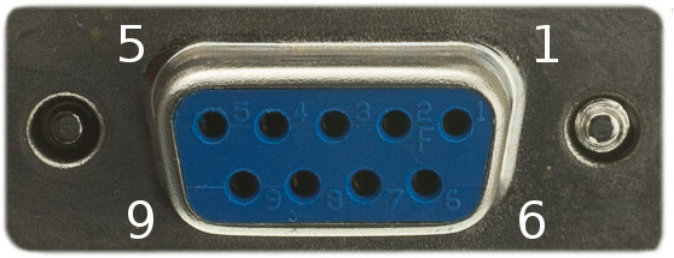
• By further pressing Control Knob the following screens can be viewed in sequence:

    - Photocurrent Real screen shows current through monitor photodiode in the laser diode module.
    - Uoperating Real screen shows voltage provided by the AC adapter (around 12V).

• In order to turn off the module simply turn off Power Switch.

4. Pinout

The included 14-Pin DIL mount is configured to work with laser diodes in standard 14-pin DIL or Butterfly package. The pin layout of the connector is shown below.



Pin	Connection
1	LD Cathode (-)
2	LD Anode (+)
3	TE Cooler (-)
4	TE Cooler (+)
5	Case
6	PD Anode (-)
7	Thermistor
8	Thermistor
9	PD Cathode (+)

Pin layout for DB9 type connector on 14-Pin DIL mount.

14 pin DIL

Pin	Connection
1	TE Cooler (+)
5	LD Anode (+)
7	PD Cathode (+)
8	PD Anode (-)
9	LD Cathode (-)
11	Thermistor
12	Thermistor
14	TE Cooler (-)

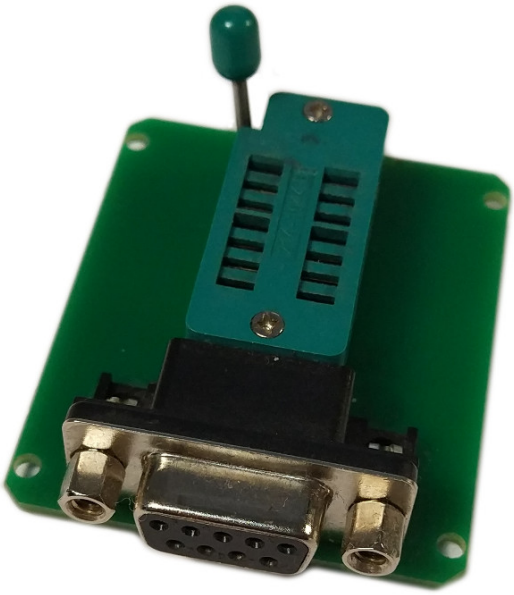
Butterfly

Pin	Connection
1	TE Cooler (+)
2	Thermistor
3	PD Anode (-)
4	PD Cathode (+)
5	Thermistor
10	LD Anode (+)
11	LD Cathode (-)
13	Case
14	TE Cooler (-)

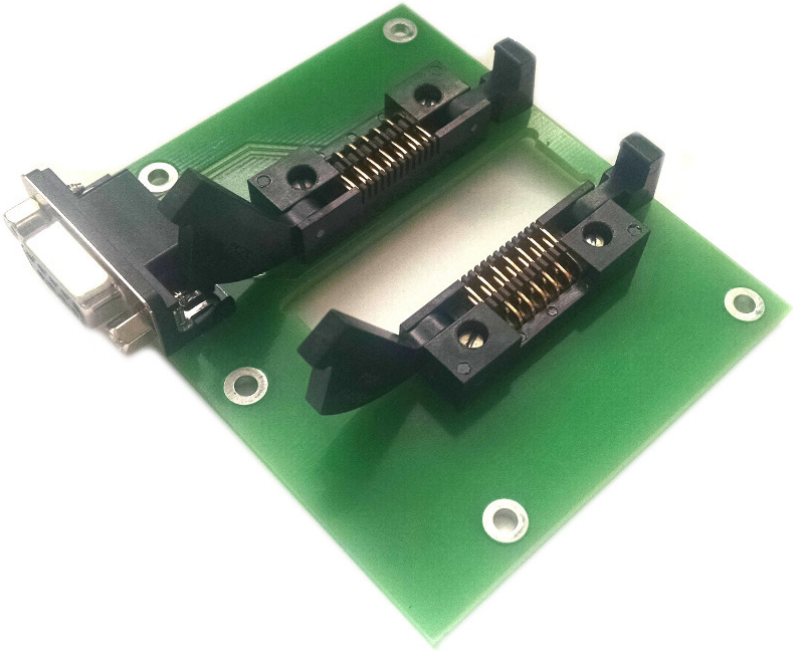
Pin layout for standard 14-pin DIL laser diode or superluminescent diode.

5. Mounts

The kit includes a mount for the 14pinDIL or Butterfly package. Radiator not included.



14 pin DIL mount.



14 pin Butterfly mount.

6. Remote Operation

The Controller has a USB 2.0 interface that allows to send commands from a host computer to the instrument. The connection between PC and Controller is accomplished by a USB cable with a male type ‘A’ connector at the PC side and a type ‘B’ microUSB connector on the instrument side.

Command list:

1. "+" Increase parameter value (equivalent to the rotation of the instrument control knob clockwise)
2. "-" Reduce parameter value (equivalent to the rotation of the instrument control knob counter-clockwise)
3. "=" Request the contents of the display
4. "M" Change menu item (equivalent to pressing the control knob). Returns the menu item number
5. "O" Enable pump (equivalent to pressing the button). Returns the state
6. "F" Shutdown pump (equivalent to pressing the button). Returns the state
7. "I" Increase parameter value (equivalent to the fast rotation of the instrument control knob clockwise)
8. "D" Reduce parameter value (equivalent to the fast rotation of the instrument control knob counter-clockwise)
9. "S" Save parameter values to energy independent memory