

Benchtop Drivers

Platform Drivers

OEM Drivers

Laser Diode Mounts

Laser Diodes

Pigtailed Lasers

Laser Modules

Accessories



Includes Power Cord and Mount
Connection Cable (DB9)

LDC340

Switchable Current Range 1A or 4A of Drive Current

Includes All Cables



Introduction

The LDC340 Laser Diode Current Controller has been designed to provide precise, low-noise current for driving high-power laser diodes with injection currents of up to 4A. It is a stand-alone, laboratory-style instrument with an easy-to-use front panel and an optional IEEE 488.2 interface for remote operation. The LDC340 handles all laser diode and monitor diode pin configurations. When the LDC340 is used in combination with the TED350 temperature controller, a temperature window can be set to switch off the laser drive current if the laser temperature falls outside the prescribed upper/lower limits. This feature also prevents accidental powering of lasers without first enabling the temperature controller.

OPERATION

Current Ranges

This controller can be configured to provide either 1A or 4A of drive current. Both ranges provide a highly stable performance and exceptionally low noise. The laser current is precisely set via a 10-turn front panel control knob or via the optional IEEE-488 interface. Depending on the selected current range, one turn of the front panel current "Adjust" corresponds to 0.1A when operating in the 1A range, or 0.4A for the 4A range.

LDC340 Applications

- Precision Current Source for Laser Diodes
- Safe Operation of Up to 4A Laser Current
- Low-Noise/High-Stability Output
- Analog Modulation Up to 50kHz (3dB Points)

User-Friendly Controls

All operating and displaying elements on the front panel are logically grouped together to provide easy and intuitive operation without being confused by multi-function keys. The 5-digit LED display shows all important parameters.

External Analog Modulation

The analog control input "MOD IN" located on the front panel enables the modulation of the laser diode in constant current mode as well as in constant power mode.

For monitoring purposes, an output voltage proportional to the laser current is provided at the ANALOG OUT jack, also located on the front panel.

FEATURES

Monitor Photodiode Dual Input

The LDC340 provides two independent monitor photodiode inputs. The two separate photodiode inputs allow the system to operate as a complete laser diode test station by implementing a second external calibrated photodiode to replace an optical power meter.

The main photodiode is connected through the rear panel DB9 connector.

The second photodiode can be connected to the auxiliary photodiode BNC input with the readings available through the LDC340. The main photodiode input is switchable to allow for different responsivities of the monitor photodiode. In switch position 1, the maximum photodiode current is 2mA; in switch position 2, the maximum is 10mA. Additionally, the main photodiode input allows for applying a bias voltage to the photodiode to improve the linearity. The auxiliary photodiode provides a fixed input current range of 50 μ A to 2mA.

Monitor Photodiode Calibration

The main photodiode can be calibrated via a front panel trim potentiometer to enable a calibrated front panel display of the laser diode power in milliwatts. Additionally, the potentiometer labeled "CP GAIN" at the rear of the unit may be used to adjust the gain of the constant power mode control loop. This allows the servo circuit that stabilizes the laser power to be adjusted for optimal performance.

Highlights

- Current Ranges for Accurate Control of a Variety of Laser Diodes
- Constant Current and Constant Power Mode
- Supports All Laser Diode Pin Configurations
- Setting of Laser Current and Laser Power With the Output Switched Off (PRESET)
- Analog Modulation Input and Analog Control Output for the Laser Current
- Optional IEEE-488.2 Interface With 18-Bit Hi-Res Mode
- Free Instrument Drivers for LabVIEW™, LabWindows™/CVI
- CSA Approved and CE Certified

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Specifications

- **Laser Diode Current Control:**
0 to ±1A and 0 to ±4A
- **Setting Resolution:** 1mA
(-70µA with IEEE-488)
- **Measurement Resolution:**
1mA (15µA with IEEE-488)
- **Laser Diode Current Accuracy:** ±4mA
- **Noise (10Hz-10MHz, RMS), Typ.:**
<30µA
- **Ripple (50/60Hz, RMS), Typ.:** <6µA
- **Transients, Typ.:** <4mA
- **Drift (24 hrs, 0-10 Hz), Typical:** <300µA
- **Temperature:** <50ppm/°C
- **Compliance Voltage:** >6V

Laser Diode Power Control

- **Photocurrent Control Range:**
50µA to 2mA and 10mA (2 Ranges)
- **Setting Resolution:** 0.1µA and 1µA
(0.03µA and 0.3µA with IEEE-488)
- **Measurement Resolution:** 0.1µA and
1µA (0.01µA and 0.1µA with IEEE-488)
- **Accuracy:** ±2µA and ±20µA
- **Reverse Bias Voltage Photodiode:**
0 to 10V

Laser Diode Current Limit

- **Setting Range:** 0 to ≥4A
- **Resolution:** 1mA
- **Accuracy:** ±10mA

Modulation, Analog Control

- **Input resistance:** 10kΩ
- **Modulation Coefficient, CC:**
400mA/V ±5%
- **Small Signal 3dB-Bandwidth, CC:**
DC to 50kHz
- **Modulation Coefficient, CP:**
0.2mA/V ±5% for 1A Operation
2mA/V ±5% for 4A Operation

Control Output for Laser Current

- **Load Resistance:** 10kΩ
- **Transmission Coefficient:** 2.5V/A ±5%

Laser Voltage Measurement

- **Measurement Principle:** 4-Wire
- **Range:** 0 to 10V
- **Resolution:** 1mV
(100µV With IEEE-488)
- **Accuracy:** ±10mV

Photodiode Current Limit

- **Setting Range:**
0 to ≥2mA and ≥10mA
- **Resolution:** 0.1µA and 1µA
- **Accuracy:** ±20µA and ±200µA

All data valid at 23 ± 5°C and 45 ± 15% relative humidity

General Data

- **Protection Features:** Soft Start, Interlock, Short Circuit When Off, Laser Current Limit, Laser Power Limit, Over Temperature Protection, Temperature Window Protection (With TED350), Open Circuit Detection
- **Displayed Laser Parameters:** Laser Current, Monitor Current (Internal and External), Laser Current Limit, Monitor Current Limit, Output Power, Laser Voltage, Photodiode Bias Voltage
- **IEEE-488.2 Interface:**
16-Bit Setting and 18-Bit Measurement Resolution
- **Weight:** <7kg
- **Dimensions (W x H x D):** 220 x 110 x 351mm
- **Line Voltage:** 100V, 115V, 230V +15%/-10%
- **Line Frequency:** 50 to 60Hz
- **Maximum Power Consumption:** 125VA
- **Operating Temperature:** 0 to +40°C
- **Storage Temperature:** -40 to +70°C

The photodiode signal is also used to limit the maximum output power of the laser. When operating in either mode – constant current or constant power – the front panel PMON trim-pot can be set to limit the control loop to a maximum photocurrent of the monitor diode. This ensures that the output power of the laser stays within safe limits. Operating the controller with the IEEE-488 interface improves the resolution of many of the measurement parameters; the affected parameters are indicated in the specification tables.

PROTECTION FEATURES

Adjustable Current Limit

Independent of the operation mode, a precisely adjustable current limit ensures that the maximum allowed laser current cannot be exceeded. This limit is set via a recessed potentiometer on the front panel to prevent accidental adjustment of the current limit. An attempt to increase the laser drive current above the pre-set limit will result in a visible (LED “LIMIT”) and short audible indicator, even when using the external modulation feature.

Pre-Set Temperature Window

When used with a TED350, the temperature window protection switches off the laser current if the actual laser temperature leaves the pre-set temperature window. If the connection between current source and laser diode is interrupted, the current source automatically switches off the current output and the “LD OPEN” indicator on the front panel illuminates, signifying an open circuit.

Other

The system power is controlled via a front panel key switch. When switched off, an electronic switch within the LDC340 short circuits the laser diode for added protection. After being switched on, a soft-start circuit ensures a slow increase of the laser current without voltage peaks – even in the case of an AC power interruption, the laser current remains transient free. Voltage peaks on the AC line are effectively suppressed by electrical filters, shielding of the transformer, and careful grounding of the chassis. The LDC340 meets the international requirements regarding laser protection (e.g. CDRH US21 & CFR 1040.10). It also includes a key-operated power switch and an interlock.

ITEM	\$	£	€	RMB	DESCRIPTION
LDC340-IEEE	\$ 1,990.00	£ 1,253.70	€ 1.850,70	¥ 19,004.50	Bipolar Laser Diode Controller 1A/4 A With IEEE-488.2