

## ▼ CHAPTERS

Fiber Patch  
Cables

Bare Fiber

Fiber  
OptomechanicsFiber  
ComponentsTest and  
Measurement

## ▼ SECTIONS

PRO8000 Platform

TXP5000 Platform

PMD/PDL System

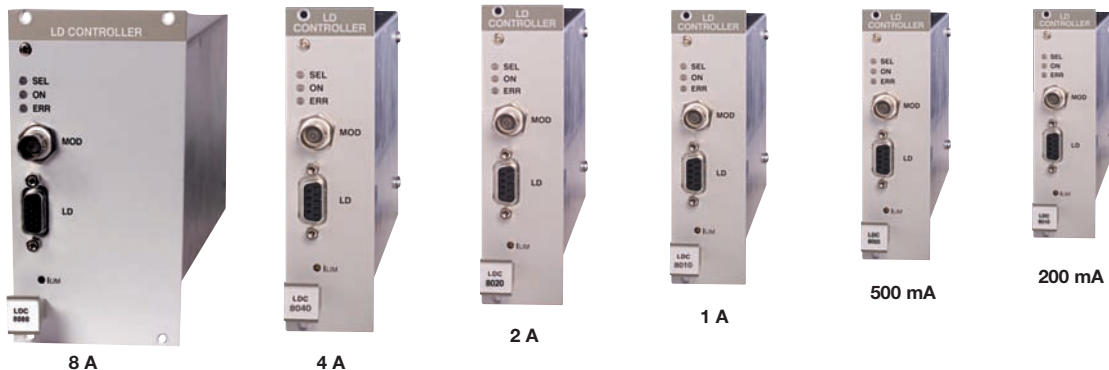
Benchtop Systems

Optical Switches

Optical Modulators

Optical Spectrum  
Analyzers

## PRO8 Laser Controller Modules (Page 1 of 2)



## Introduction

The modular laser diode current controllers of the LDC8 series offer extremely low noise ( $<100 \mu\text{A}$ ) and drift ( $<200 \mu\text{A}$ , 24 hrs), resulting in exceptional laser stability.

## Six Current Ranges

Six different current controller modules are available, with maximum output currents ranging from 200 mA up to 8 A (10 A upon request). The drive current can be set precisely with 16-bit resolution (i.e., one part in 65,536). An analog control input allows all current modules to be operated in either constant current (CC) or constant power (CP) mode. The maximum modulation frequency is dependent on the type of LDC module used and its operating mode.

## User-Friendly Controls

After installing a new module into a PRO8 chassis, the front-panel control screen is used to configure the plug in. The softkeys or the rotary knob can be used to scroll through the slot location to access the basic settings. The operational settings are easily accessed; displayed mnemonic symbols and simple prompts enable user-friendly operation. All settings are retained in memory and automatically recalled upon powering the mainframe.

## Laser Diode Protection Features

The LDC8000 Series current modules incorporate laser protection features to safeguard sensitive laser diodes. An advanced circuit design ensures that AC power line transients, power outages, and RF pickup cannot affect the laser diode.

For each current module, three independent limits can be set to safeguard the laser. Two of the limits are programmable, which prevent the laser current and the laser power from exceeding the user-defined maximum values. The third limit is set via a recessed front panel trim pot that sets a "hardware" current limit and protects against programming errors and accidental adjustment of the front panel knob. Even while externally modulating the laser, it is not possible to exceed the hard or soft limits.

After activating the laser diode, a soft-start function slowly increases the laser current without overshoots.

Even in the case of AC power fluctuation, the laser current remains transient free. Voltage peaks on the AC line are effectively suppressed by electronic filters, shielding of the transformer, and careful grounding of the modules and chassis. The LDC8000 series meets the international requirements regarding laser protection (e.g., CDRH US21, CFR 1040.10). Furthermore, the module's operation is protected by the PRO8 system's key-operated power switch, its interlock, a delay of the output current, and many additional features (see specs table on following page for details).

## Protection Features

- Soft Start Slowly Increases Laser Drive Current
- Programmable Limits for Current and Optical Power
- Hardware Current Limit for Protection Against Errors Through Programming, Modulation, and Wrong Settings
- Extensive AC Power Filtering Eliminates Transients
- Temperature Window Protection in Combination with TED8000 Card
- Meets Applicable CDRH and CE Regulations

## External Modulation of Laser Output

An analog control input enables the modulation of the laser diode in constant current or constant power mode. The maximum modulation frequency depends on the current module used and its operating mode. See the specifications table on the following page for details.

## Features

- 200 mA, 500 mA, 1 A, 2 A, 4 A, and 8 A Modules
- Ultra-Stable Current Control with 16-Bit Resolution
- Extensive Laser Diode Protection Features
- Switchable Photodiode Bias for Improved Sensor Linearity
- Easily Configured Self-Identifying Modules
- External Modulation of Laser Output Current

## Have you seen our...

ITC8000 Combination Laser  
Diode and TEC Controllers



- ◆  $I_{LD} = \pm 200 \text{ mA}, \pm 500 \text{ mA}, \text{ or } \pm 1 \text{ A}$
- ◆  $I_{TEC} = \pm 2 \text{ A}/16 \text{ W}$

See pages 1168 - 1169

## PRO8 Laser Controller Modules (Page 2 of 2)

### LDC8000 Series LD Controllers Specifications

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

ITEM #	LDC8002	LDC8005	LDC8010	LDC8020	LDC8040	LDC8080
Current Control						
Control Range (Continuous)	0 to ±200 mA	0 to ±500 mA	0 to ±1 A	0 to ±2 A	0 to ±4 A	0 to ±8 A <sup>a</sup>
Compliance Voltage	>5 V	>5 V	>5 V	>5 V	>5 V	>5 V
Resolution	3 µA	7.5 µA	15 µA	30 µA	70 µA	130 µA
Accuracy (Full Scale)	±0.05%	±0.05%	±0.1%	±0.1%	±0.1%	±0.3%
Noise Without Ripple (10 Hz to 10 MHz, RMS, Typical)	<3 µA	<5 µA	<10 µA	<20 µA	<50 µA	<100 µA
Ripple (50/60 Hz, RMS, Typical)	<1 µA	<1 µA	<1.5 µA	<3 µA	<4 µA	<8 µA
Transients (Processor, Typical)	<15 µA	<30 µA	<50 µA	<80 µA	<120 µA	<200 µA
Transients (Other, Typical)	<200 µA	<500 µA	<1 mA	<2 mA	<4 mA	<8 mA
Drift 60 min/24 hr (Typical, 0-10 Hz, at Constant Ambient Temperature)	<0.5 µA / <1.5 µA	<2 µA / <4 µA	<5 µA / <20 µA	<15 µA / <100 µA	<25 µA / <150 µA	<100 µA / <200 µA
Temperature Coefficient	<50 ppm/°C					
Power Control						
Control Range of Photocurrent	10 µA to 5 mA (Other Ranges Available upon Request)					
Reverse Bias Voltage	0 V / 5 V (Switchable)					
Resolution	100 nA					
Accuracy (Full Scale)	±0.05%					
Current Limit						
Setting Range (20-Turn Trim Pot)	0 to ≥200 mA	0 to ≥500 mA	0 to ≥1 A	0 to ≥2 A	0 to ≥4 A	0 to ≥8 A
Resolution	6 µA	15 µA	30 µA	60 µA	130 µA	250 µA
Accuracy	±200 µA	±500 µA	±2 mA	±4 mA	±8 mA	±50 mA
Power Limit						
Photocurrent Range	0 to 5 mA					
Resolution	1.25 µA					
Accuracy	±50 µA					
Laser Voltage Measurement						
Measurement Principle	4-Wire (Improves Accuracy by Compensating for Cable Resistance)					
Measurement Range	0 to 5 V					
Resolution	0.2 mV					
Accuracy	±5 mV					
Analog Modulation Input						
Input Resistance	10 kΩ					
3 dB-Bandwidth, CC <sup>b</sup>	DC to 200 kHz	DC to 100 kHz	DC to 50 kHz	DC to 30 kHz	DC to 20 kHz	DC to 10 kHz
Modulation Coefficient, CC	20 mA/V ± 5%	50 mA/V ± 5%	100 mA/V ± 5%	200 mA/V ± 5%	400 mA/V ± 5%	800 mA/V ± 5%
Modulation Coefficient, CP	0.5 mA/V ±5%					
Rise and Fall Time, Typical <sup>c</sup>	<2 µs	<4 µs	<5 µs	<6 µs	<9 µs	<15 µs
General Data						
Card Width	1 PRO8 Slot					2 Slots
Connector	9-Pin D-Sub (f)					15-Pin HD D-Sub (f)
Weight	< 300 g	< 500 g				< 750 g
Operating Temperature	0 to 40 °C					
Storage Temperature	-40 to 70 °C					

<sup>a</sup> 10 A Available upon request

<sup>b</sup> Small Signal Bandwidth

<sup>c</sup> External TTL Modulation, Synchronous for all LDC Modules

## Drive up to 64 Lasers from 1 Chassis – See Next Page

ITEM #	\$	£	€	RMB	DESCRIPTION
LDC8002	\$ 1,050.00	£ 756.00	€ 913.50	¥ 8,368.50	PRO8000 LD Control Module, 200 mA
LDC8005	\$ 1,074.00	£ 773.28	€ 934.38	¥ 8,559.78	PRO8000 LD Control Module, 500 mA
LDC8010	\$ 1,086.00	£ 781.92	€ 944.82	¥ 8,655.42	PRO8000 LD Control Module, 1 A
LDC8020	\$ 1,171.00	£ 843.12	€ 1,018.77	¥ 9,332.87	PRO8000 LD Control Module, 2 A
LDC8040	\$ 1,181.00	£ 850.32	€ 1,027.47	¥ 9,412.57	PRO8000 LD Control Module, 4 A
LDC8080	\$ 1,226.00	£ 882.72	€ 1,066.62	¥ 9,771.22	PRO8000 LD Control Module, 8 A, 2 Slots
CAB400	\$ 66.00	£ 47.52	€ 57.42	¥ 526.02	DB9 Cable, LDC8000 Module to LD Mount*

\*Not for LDC8080