LDX 3200 Series

Precision Laser Diode Drivers

Product Features

- Three models with outputs from 50mA to 4A
- High stability, low noise driver specifically for laser diodes
- Constant current and constant power operating modes
- Multiple laser protection features including adjustable voltage limit
- Analog modulation capability of over 1MHz (LDX-3210/3220 only)
- Precision four-wire forward voltage measurement
- GPIB/IEEE-488 interface

The LDX-3200 Series Precision Laser Diode Drivers are a best-in-class family of high precision microprocessor-based instruments that offer a high stability, low noise current source with integrated laser diode protection circuits, specifically for controlling laser diodes. These laser diode drivers are known throughout the industry for their reliability, precision, and ease-of-use.

The LDX-3200 Series consists of three family members with current ranges of 50/100mA (LDX-3210), 200/500mA (LDX-3220), and 2A/4A (LDX-3232) covering a wide range of laser diode testing and control applications. The LDX-3232 was developed for controlling high compliance voltage devices such as quantum cascade laser diodes with the same low noise, high stability performance of the series. In addition to precision current control, the LDX-3200 Series products are loaded with standard features such as dual current ranges, constant power control, fine/coarse set point control, four-wire forward voltage measurement, and external modulation capability.

All of ILX Lightwave's proven laser diode protection strategies including adjustable current and voltage limits, intermittent contact protection, and output shorting relays are designed into each driver. For automated testing applications in an R&D or production environment, remote operation is easily accomplished through the GPIB-IEEE-488 interface. For virtual instrument programming, LabVIEW® instrument drivers are available on our website.

The Standard in Precision Laser Diode Control

ILX Lightwave
Laser Diode Instrumentation & Test Systems

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PRECISION HIGH STABILITY, LOW NOISE LASER CONTROL

Laser diodes act as a gain medium. Small drive current fluctuations due to noise and drift are amplified optically. Because of this, a controller with a lower noise and stable output is required to ensure precise wavelength and power control.

Each LDX-3200 Current Source offers digital 16-bit control and measurement allowing setpoint accuracies of ±0.05%. Careful attention to design delivers source stability as low as 10ppm with low noise for precise control of laser diodes.

A CHOICE OF LASER CURRENT CONTROL MODES

Each laser diode driver's laser current source can be operated in one of three modes:

1. Constant current, low bandwidth

2. Constant optical power

3. Constant current, high bandwidth

The constant current, low bandwidth mode is optimized for DC operation and offers improved laser protection and lowest noise.

In constant current, high bandwidth mode, the output stage supports up to 1MHz modulation frequency for dithering the laser current in power and wavelength tuning applications. For laser protection, the modulation signal is implemented as a differential input, allowing the modulation control voltage and laser outputs to use different grounds.

The constant power mode provides constant optical power operation of your laser diode by measuring the photocurrent from the laser diode's rear-facet photodiode or an external photodiode in a feedback control loop to the current source.

SETTING THE STANDARD IN LASER DIODE PROTECTION

ILX Lightwave's internal testing and protection standards ensure protection for your laser diode under abnormal operating conditions such as intermittent contact or severe power spikes. These standards have led to advanced protection features like clamping current limits, even under modulated conditions. In addition, exclusive braid-shielded cables have been specifically designed to suppress radiated noise and transients commonly found in laboratory or production environments.

During AC power-up, careful turn-on sequencing and redundant output shorting circuits protect the laser from current transients. when the output is enabled, the slow-start circuit gradually opens the shorting circuits. Current is shunted through the shorting switch until the control circuits are fully active and all circuit transients have died out.

A feature not found in most laser diode drivers - fast output shutoff - provides an additional level of protection from intermittent contacts between the laser diode and the current source.

These protection features all work in conjunction with all instrument modes of operation, providing worry-free, fail-safe control of your laser diode.

EASE OF OPERATION

The front panel of the LDX-3200 Series Laser Diode Driver offers quick, easy operation and information display without confusing multi-layer menus. A bright, 5-digit, green LED display is easy to read from a distance, even with laser safety eyewear. Laser control is directly addressable from the front panel "adjust" section including a "fine adjustment" function for more precise control for sensitive operating parameters. Instrument parameters and modes are easily selected or adjusted through discrete pushbuttons and a rotary digital encoder.

For automated testing or control applications, remote programming and control of the driver is easily accomplished through the GPIB/IEEE-488 interface. All driver functions are accessible through the interface bus, with commands based on a set of easy-to-use mnemonics. Higher resolution measurements of current and voltage are also available through the GPIB interface.

The LDX-3200 Series architecture simplifies routine maintenance. Closed-case calibration can be performed from the front panel or the GPIB interface. The instrument is placed in calibration mode through a unique combination of front panel push button presses or GPIB commands.

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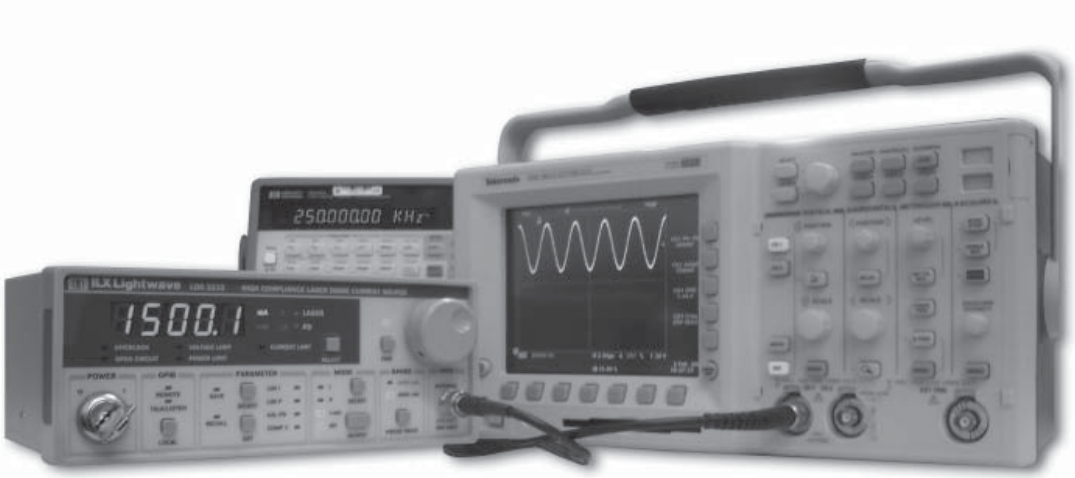

LDX-3200 Series Laser Diode Drivers can be analog modulated with an external input to 1MHz.

PUT OUR EXPERTISE TO WORK

ILX Lightwave is a recognized world leader in Laser Diode Instrumentation and Test Systems. Our products are not only renowned for their reliability, quality, and value, they're backed by industry-leading after sales support. For more information about the LDX-3200 Series Laser Diode Drivers, and our complete family of Laser Diode Instrumentation and Test Systems, call us today or visit our website at www.ilxlightwave.com.

Specifications

	LDX-3210		LDX-3220		LDX-3232	
CURRENT OUTPUT						
Output Current Range:	0 to 50mA	0 to 100mA	0 to 200mA	0 to 500mA	0 to 2000mA	0 to 4000mA
Setpoint						
Resolution:	1µA	2µA	4µA	10µA	40µA	80µA
Accuracy:	±0.05% of FS	±0.05% of FS	±0.05% of FS	±0.05% of FS	±0.15% of SP ±2mA	±0.15% of SP ±2mA
Compliance Voltage:	0-10V, adjustable	0-10V, adjustable	0-10V, adjustable	0-10V, adjustable	0-15V, adjustable	0-15V, adjustable
Temperature Coefficient:	<50ppm/°C	<50ppm/°C	<50ppm/°C	<50ppm/°C	<100ppm/°C	<100ppm/°C
Short Term Stability (one-hour):[2]	<10ppm	<10ppm	<10ppm	<10ppm	<20ppm	<20ppm
Long Term Stability (24-hours):[3]	<20ppm	<20ppm	<20ppm	<20ppm	<40ppm	<40ppm
Noise and Ripple (rms)[4]						
High Bandwidth Mode:	<1.5µA	<1.5µA	<4µA	<4µA	<20µA	<40µA
Low Bandwidth Mode:	<1.5µA	<1.5µA	<2µA	<2µA	<20µA	<20µA
Transients						
Operational:[5]	<1mA	<1mA	<1mA	<1mA	<4mA	<4mA
1kV EFT/Surge:[6]	<5mA/<8mA	<5mA/<8mA	<8mA/<12mA	<8mA/<12mA	<8mA	<8mA
COMPLIANCE VOLTAGE ADJUST						
Range:	0 to 10V	0 to 10V	0 to 10V	0 to 10V	0 to 15V	0 to 15V
Resolution:	50mV	50mV	50mV	50mV	60mV	60mV
Accuracy:	±2.5%	±2.5%	±2.5%	±2.5%	±2.5%	±2.5%
DRIVE CURRENT LIMIT						
Settings						
Range:	1 to 50.5mA	1 to 101mA	1 to 202mA	1 to 505mA	1 to 2020mA	1 to 4040mA
Resolution:	0.25mA	0.5mA	1mA	2.5mA	10mA	20mA
Accuracy:	±0.5mA	±1mA	±2mA	±5mA	±20mA	±40mA

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Current Source	LDX-3210		LDX-3220		LDX-3232	
PHOTODIODE FEEDBACK						
Type:	Differential	Differential	Differential	Differential	Differential	Differential
Photodiode Reverse Bias:	0 to 5V, adjustable	0 to 5V, adjustable	0 to 5V, adjustable	0 to 5V, adjustable	0 to 5V, adjustable	0 to 5V, adjustable
Photodiode Current Range:	5 to 5000µA	5 to 5000µA	5 to 5000µA	5 to 5000µA	5 to 10000µA	5 to 10000µA
Output Stability:[7]	±0.02%	±0.02%	±0.02%	±0.02%	±0.02%	±0.02%
Accuracy, Setpoint (% of FS):	±0.05%	±0.05%	±0.05%	±0.05%	±0.05%	±0.05%
EXTERNAL ANALOG MODULATION						
Input:	0 to 10V, 1kΩ	0 to 10V, 1kΩ	0 to 10V, 1kΩ	0 to 10V, 1kΩ	0 to 10V, 1kΩ	0 to 10V, 1kΩ
Transfer Function:	5mA/V	10mA/V	20mA/V	50mA/V	200mA/V	400mA/V
Bandwidth (3dB)						
High Bandwidth Mode:[8]	DC to 1MHz	DC to 1MHz	DC to 1MHz	DC to 1MHz	DC to 250kHz	DC to 250kHz
Low Bandwidth Mode[9]	DC to 15kHz	DC to 15kHz	DC to 15kHz	DC to 15kHz	DC to 10kHz	DC to 10kHz
TRIGGER INPUT						
Type:	NA	NA	NA	NA	TTL; edge-triggered Active low	TTL; edge-triggered Active low
TRIGGER OUTPUT						
Type:	TTL	TTL	TTL	TTL	TTL	TTL
Pulse Width:	13µs	13µs	13µs	13µs	13µs	13µs
Delay:	12ms	12ms	12ms	12ms	12ms	12ms
MEASUREMENT (DISPLAY)						
Output Current						
Range:	0 to 50.000mA	0 to 100.00mA	0 to 200.00mA	0 to 500.00mA	0 to 2000.0mA	0 to 4000.0mA
Resolution:	0.001mA	0.002mA	0.01mA	0.01mA	0.1mA	0.1mA
Accuracy:	±0.05% of FS	±0.05% of FS	±0.05% of FS	±0.05% of FS	Measurement not displayed	Measurement not displayed
Photodiode Current						
Range:	0 to 5000µA	0 to 5000µA	0 to 5000µA	0 to 5000µA	0 to 100000µA	0 to 100000µA
Resolution:	1µA	1µA	1µA	1µA	1µA	1µA
Accuracy:	±2µA	±2µA	±2µA	±2µA	±4µA	±4µA
Photodiode Responsivity						
Range:[10]	0.00 to 1000.00µA/mW	0.00 to 1000.00µA/mW	0.00 to 1000.00µA/mW	0.00 to 1000.00µA/mW	0.00 to 1000.00µA/mW	0.00 to 1000.00µA/mW
Resolution:	0.01µA/mW	0.01µA/mW	0.01µA/mW	0.01µA/mW	0.01µA/mW	0.01µA/mW
Optical Power						
Range:	0.00 to 101.00mW	0.00 to 101.00mW	0.00 to 505.00mW	0.00 to 505.00mW	0.00 to 5000.00mW	0.00 to 5000.00mW
Resolution:	0.01mW	0.01mW	0.01mW	0.01mW	0.01mW	0.01mW
Forward Voltage						
Range:	0.000 to 10.000V	0.000 to 10.000V	0.000 to 10.000V	0.000 to 10.000V	0.000 to 15.000V	0.000 to 15.000V
Resolution:	1mV	1mV	1mV	1mV	1mV	1mV
Accuracy:[11]	±2mV	±2mV	±2mV	±2mV	±2mV	±2mV

NOTES

1. All values relate to a one-hour warm-up period.
2. Over any one-hour period, half-scale output.
3. Over any 24-hour period, half-scale output.
4. Measured optically, evaluating noise intensity of a laser diode into a 150kHz bandwidth photodetector. LDX-3210 and LDX-3220 only. See the LDX-3232 product brochure for further information.
5. Maximum output current transient resulting from normal operational situations (e.g. power on-off and current on-off) as well as accidental situations (e.g. power line plug removal).
6. Maximum output current transient resulting from a 1000V power-line transient spike. Tested to ILX Lightwave Technical Standard #LDC-00196. Request or download ILX Application Note #3.
7. Maximum monitor photodiode current drift over any 30-minute period. Assumes zero drift in photodiode responsivity.
8. 50% modulation at mid-scale output. Higher bandwidth is possible with smaller magnitude modulation signal.
9. Small signal specification is for typical 10% modulation depth. Large signal specification assumes 50% modulation depth at mid-scale output.
10. The responsivity value is user-defined and is used to calculate the optical power.
11. Four wire voltage measurement at the load. Voltage measurement accuracy while driving calibration load. Accuracy is dependent upon load and cable used.

In keeping with our commitment to continuing improvement, ILX Lightwave reserves the right to change specifications without notice or liability for such changes.

ORDERING INFORMATION

LDX-3210 Laser Diode Driver (50/100mA)
LDX-3220 Laser Diode Driver (200/500mA)
LDX-3232 High Compliance Laser Diode Driver (2000/4000mA)
CC-305S Current Source/Laser Diode Mount Interconnect Cable
CC-306S Current Source/Unterminated Interconnect Cable
LNF-320 Low Noise Filter
LabVIEW® Instrument Driver

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