

## Product Features

Dual range laser diode current source

Low-noise, high-stability output

Constant current and constant power modes

Multiple laser protection features, including adjustable compliance voltage

Analog modulation capability of over 1 MHz

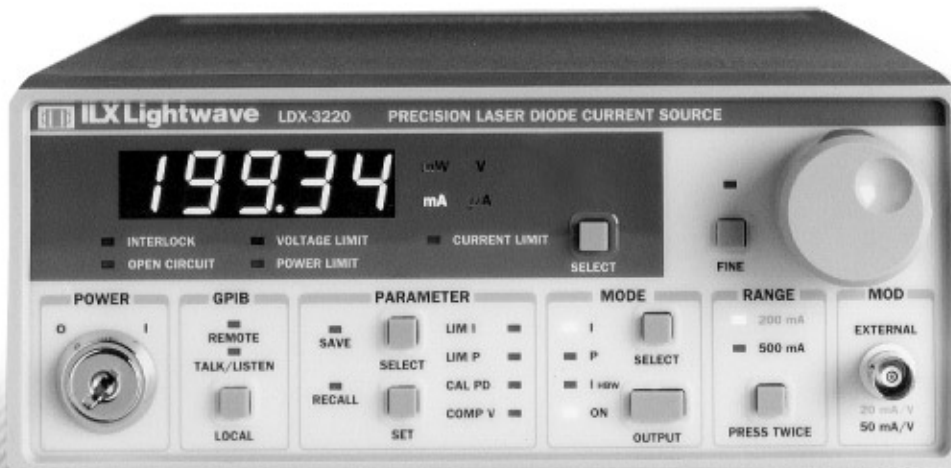
GPIB/IEEE-488.2 interface

The LDX-3200 Series Precision Laser Diode Current Sources are microprocessor-based instruments designed specifically for precise control of low-power laser diodes. The LDX-3200 Series consists of two models, the LDX-3210 with a 50 mA/100 mA dual-range, and the LDX-3220 with dual 200 mA/500 mA current ranges.

The LDX-3200 Series offers a current source topology with unparalleled performance, unbeatable high stability and even lower noise. Dual range output provides greater flexibility to meet application requirements.

# LDX 3200 Series

Precision  
Current Sources



Precision laser diode control  
has never been more affordable.

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Precision  
Current Sources

## Safeguard your investment

ILX Lightwave's rigorous standards ensure uncompromising laser protection. These standards have led to advanced protection features like clamping current limits and exclusive braid-shielded cables, specifically designed to suppress radiated noise and transients commonly found in laboratory environments. The LDX-3200 Series Current Sources, like all of our current sources, feature an output-shorting switch for a safe and worry-free method of switching the output off and on during operation.

During AC power-up, careful turn-on sequencing and redundant output shorting circuits protect the laser from current transients. When the output is turned on, the slow-start circuit gradually opens the shorting circuits, allowing current to be slowly diverted to the laser. Current is withheld from the output until the control circuits are fully active and all circuit transients have died out.

## Fine-tuned laser diode protection

The LDX-3200 Series features a front panel adjustable compliance voltage that prevents damaging voltage spikes, even in the case of intermittent contact. A fast output-shutoff circuit also provides an additional level of protection.

The outputs of the LDX-3200 Series Current Sources are bound by fully independent hardware current limits that cannot be exceeded—even under externally modulated conditions. In power mode, the output is bound by a software optical power limit. Adjustment of any of the limit settings is easy and precise, even while the output is driving a laser at a lower current level.

## Intuitive front panel

Designed for quick and easy operation, the LDX-3200 Series sources feature intuitive front panels. A "Select" button, adjacent to the bright, 5-digit green LED display, toggles the display mode. All of the adjustable parameters and operation modes are logically grouped by function. A digital adjust knob simplifies adjustments, and a useful "Fine Adjustment" mode enables precise control of sensitive operating parameters.

Fast, remote operation is available on both instruments with standard GPIB/IEEE-488.2 interface, powered by National Instruments LabVIEW® TNT 488® chip-set. Instrument drivers are also available for both sources, either by request or by downloading them from our website at [www.ilxlightwave.com](http://www.ilxlightwave.com).

## Closed-case calibration

The LDX-3200 Series architecture simplifies routine maintenance. Calibration can be performed via the front panel or the GPIB interface. The instrument is placed in calibration mode by simply pressing a unique combination of front panel buttons. By adjusting the front panel control knob, the selected display will accurately indicate the values of the appropriate calibration constants. Calibration data is automatically stored in nonvolatile memory.

## Save and Recall

For repeat applications with unique operating parameters, the LDX-3200 Series Current Sources offer a SAVE and RECALL feature. The SAVE feature easily stores all the front panel settings for any given instrument condition. The RECALL button retrieves the settings, which are stored in one of ten memory bins.

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Precision  
Current Sources



## Precision laser diode current control.

### Choice of operation modes

The LDX-3200 Series easily controls the laser diode current in one of three modes:

- 1) constant current, CW
- 2) constant current, high-bandwidth
- 3) constant light

The constant current, CW mode offers improved laser protection and noise performance during CW operation. Optimized for DC operation, this low-bandwidth mode supports external modulation to 15 kHz.

In high-bandwidth mode, the output stage supports higher frequency, external modulation to 1 MHz suitable for dithering the laser current for power and wavelength tuning. For true versatility, the modulation port is implemented as a differential input, allowing the modulation control voltage and laser outputs to use different grounds.

The constant light mode maintains constant optical power by using the photocurrent from the laser diode's rear-facet monitor (or an external photodiode) in a feedback control loop to the laser driver current. Once the proper photodiode responsivity has been entered, the laser's output power can be displayed.

### Put our expertise to work for you

ILX Lightwave is a recognized world leader in photonic instrumentation. Our products are not only renowned for their reliability, quality and value, they're backed by strong after-sales support. For more information about the LDX-3200 Series Current Sources and our family of photonic instrumentation, call us today.

# LDX 3200 Series

Precision  
Current Sources

## Specifications

### Current Source<sup>1</sup>

### LDX-3210

### LDX-3220

#### CURRENT OUTPUT

Output Current Range:	0–50 mA	0–100 mA	0–200 mA	0–500 mA
Setpoint Resolution:	1 $\mu$ A	2 $\mu$ A	4 $\mu$ A	10 $\mu$ A
Setpoint Accuracy:	0.05% of FS	0.05% of FS	0.05% of FS	0.05% of FS
Compliance Voltage:	0–10 V, adjustable	0–10 V, adjustable	0–10 V, adjustable	0–10 V, adjustable
Temperature Coefficient:	$\leq 50$ ppm/ $^{\circ}$ C	$\leq 50$ ppm/ $^{\circ}$ C	$\leq 50$ ppm/ $^{\circ}$ C	$\leq 50$ ppm/ $^{\circ}$ C
Short-Term Stability (1 hr.): <sup>2</sup>	$\leq 10$ ppm	$\leq 10$ ppm	$\leq 10$ ppm	$\leq 10$ ppm
Long-Term Stability (24 hr.): <sup>3</sup>	$\leq 20$ ppm	$\leq 20$ ppm	$\leq 20$ ppm	$\leq 20$ ppm
Noise and Ripple: <sup>4</sup>				
High Bandwidth Mode:	<1.5 $\mu$ A rms	<1.5 $\mu$ A rms	<4 $\mu$ A rms	<4 $\mu$ A rms
Low Bandwidth Mode:	<1.5 $\mu$ A rms	<1.5 $\mu$ A rms	<2 $\mu$ A rms	<2 $\mu$ A rms
Transients:				
Operational: <sup>5</sup>	<1 mA	<1 mA	<1 mA	<1 mA
1kV EFT:	<5 mA	<5 mA	<8 mA	<8 mA
Surge: <sup>6</sup>	<8 mA	<8 mA	<12 mA	<12 mA

#### COMPLIANCE VOLTAGE ADJUST

Range:	0–10 V	0–10 V	0–10 V	0–10 V
Resolution:	50 mV	50 mV	50 mV	50 mV
Accuracy:	$\pm 2.5\%$	$\pm 2.5\%$	$\pm 2.5\%$	$\pm 2.5\%$

#### CURRENT LIMIT SETTINGS

Range:	1–50.5 mA	1–101 mA	1–202 mA	1–505 mA
Resolution:	0.25 mA	0.5 mA	1 mA	2.5 mA
Accuracy:	$\pm 0.5$ mA	$\pm 1$ mA	$\pm 2$ mA	$\pm 5$ mA

#### PHOTODIODE FEEDBACK

Type:	Differential, 0–5 V Adjustable		Differential, 0–5 V Adjustable	
Photodiode Current Range:	5–5000 $\mu$ A	5–5000 $\mu$ A	5–5000 $\mu$ A	5–5000 $\mu$ A
Output Stability: <sup>7</sup>	0.02%	0.02%	0.02%	0.02%
Setpoint Accuracy:	$\pm 0.05\%$ of FS	$\pm 0.05\%$ of FS	$\pm 0.05\%$ of FS	$\pm 0.05\%$ of FS

#### EXTERNAL ANALOG MODULATION

Input:	0–10 V, 10 k $\Omega$	0–10 V, 10 k $\Omega$	0–10 V, 10 k $\Omega$	0–10 V, 10 k $\Omega$
Transfer Function:	5 mA/V	10 mA/V	20 mA/V	50 mA/V
High Bandwidth: <sup>8</sup>	DC to 1 MHz	DC to 1 MHz	DC to 1 MHz	DC to 1 MHz
Low Bandwidth: <sup>9</sup>	DC to 15 kHz	DC to 15 kHz	DC to 15 kHz	DC to 15 kHz

#### TRIGGER OUTPUT

Type:	TTL	TTL	TTL	TTL
Pulse Width:	13 $\mu$ S	13 $\mu$ S	13 $\mu$ S	13 $\mu$ S
Delay:	12 mS	12 mS	12 mS	12 mS

#### MEASUREMENT (DISPLAY)

Output Current Range:	0–50.000 mA	0–100.00 mA	0–200.00 mA	0–500.00 mA
Output Current Resolution:	0.001 mA	0.002 mA	0.01 mA	0.01 mA
Output Current Accuracy (@25 $^{\circ}$ C):	$\pm 0.05\%$ of FS	$\pm 0.05\%$ of FS	$\pm 0.05\%$ of FS	$\pm 0.05\%$ of FS
Photodiode Current Range:	0–5000 $\mu$ A	0–5000 $\mu$ A	0–5000 $\mu$ A	0–5000 $\mu$ A
Photodiode Current Resolution:	1 $\mu$ A	1 $\mu$ A	1 $\mu$ A	1 $\mu$ A
Photodiode Current Accuracy:	$\pm 2$ $\mu$ A	$\pm 2$ $\mu$ A	$\pm 2$ $\mu$ A	$\pm 2$ $\mu$ A
Photodiode Responsivity Range: <sup>10</sup>	0.00–1000.00 $\mu$ A/mW	0.00–1000.00 $\mu$ A/mW	0.00–1000.00 $\mu$ A/mW	0.00–1000.00 $\mu$ A/mW
Photodiode Responsivity Resolution:	0.01 $\mu$ A/mW	0.01 $\mu$ A/mW	0.01 $\mu$ A/mW	0.01 $\mu$ A/mW
Optical Power Range:	0.00–01.00 mW	0.00–01.00 mW	0.00–505.00 mW	0.00–505.00 mW
Optical Power Resolution:	0.01 mW	0.01 mW	0.01 mW	0.01 mW
Forward Voltage Range:	0–10.000 V	0–10.000 V	0–10.000 V	0–10.000 V
Forward Voltage Resolution:	1 mV	1 mV	1 mV	1 mV
Forward Voltage Accuracy: <sup>11</sup>	$\pm 2$ mV	$\pm 2$ mV	$\pm 2$ mV	$\pm 2$ mV

#### NOTES

- All values relate to a one-hour warm-up period.
- Over any 1-hour period, half-scale output.
- Over any 24-hour period, half-scale output.
- Measured optically, evaluating noise intensity of a laser diode into a photodetector with 150 kHz Bandwidth.
- Maximum output current transient resulting from normal operational situations (e.g., power on-off, current on-off), as well as accidental situations (e.g., power line plug removal).
- Maximum output current transient resulting from a 1000 V powerline transient spike. Tested to ILX Lightwave Technical Standard #LDC-00196. Request ILX Application Note #3.
- Maximum monitor photodiode current drift over any 30 minute period. Assumes zero drift in responsivity of photodiode.
- Mid-scale set point, 10% of Full Scale modulation current.
- Small signal specification is for typical 10% modulation depth. Large signal spec. assumes 50% modulation depth at mid-scale output.
- Responsivity value is user-defined and is used to calculate the optical power.

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 Current Source (50/100 mA)
LDX-3220	Laser Diode Current Source (200/500 mA)
CC-305S	Current Source/Laser Diode Mount Interconnect Cable
CC-306S	Current Source/Unterminated Interconnect Cable
LNF-320	Low Noise Filter
LabVIEW <sup>®</sup> Instrument Driver	

  
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