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LDX 32420

High Power Precision Current Source

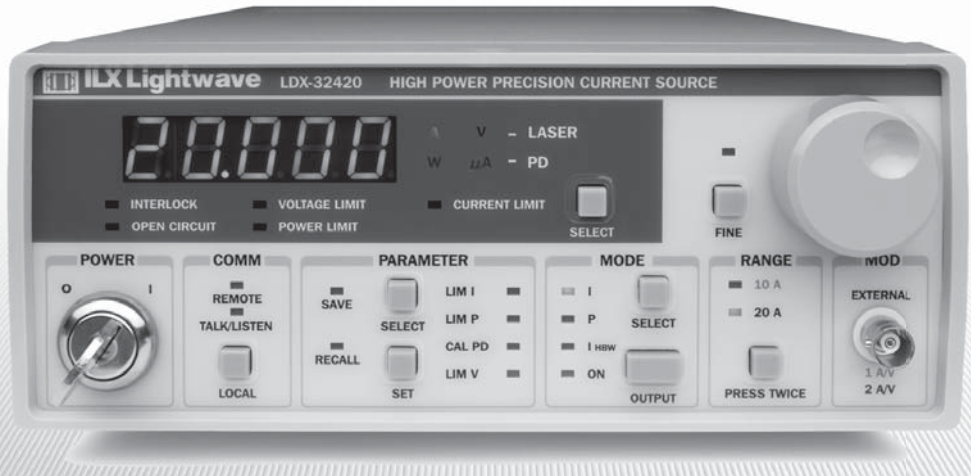
Product Features

- Dual range 10A / 20A output
- Precision current control with 1 mA setpoint resolution
- Constant current and constant power operating modes
- Precision laser forward voltage measurement
- Proven high power laser protection features including independent current limits, adjustable compliance voltage, and intermittent contact protection
- Laser current modulation capability
- GPIB / IEEE488 and USB 2.0 interface

The LDX-32420 High Power Precision Laser Diode Driver is a high performance current source designed specifically for controlling and testing high power laser diodes. It offers maximum current ranges of 10 amps and 20 amps CW with a compliance voltage of four volts. These instruments offer high setpoint accuracy and output current stability, low output noise, and forward voltage and photodiode current measurements making these instruments ideal for precision, high power laser diode testing.

Multiple laser diode protection features include adjustable voltage and hardware current limits, output shorting relays, slow turn on/off circuits, fast error detection circuits, and transient protection during power up and laser operation. In addition, the LDX-32420 accepts a TTL input that can be configured to disable the output to the laser diode in an over temperature condition at the laser.

Designed for automated laser diode testing, these drivers combine precision control and measurement with a GPIB/ IEEE488 and USB interface for high power laser diodes. For virtual instrument programming, LabView® instrument drivers are available free of charge and can be downloaded from the Newport website.



Precision 20A Current Source for High Power Laser Diodes

ILX Lightwave®

A Newport Corporation Brand

LDX 32420

High Power Precision Current Source

HIGH POWER PRECISION LASER DIODE TESTING

The LDX-32420 Laser Diode Driver was designed as a current source specifically for high power laser diodes. Ideal for R&D or manufacturing testing or control applications, precision low noise current control with a set point accuracy of 0.1% along with photodiode current and four-wire voltage measurement provide a cost effective instrument solution by eliminating additional instrumentation. Furthermore, a modulation input accepts a CW or modulated voltage input for precise voltage control or analog modulation of the current output.

A CHOICE OF LASER CURRENT CONTROL MODES

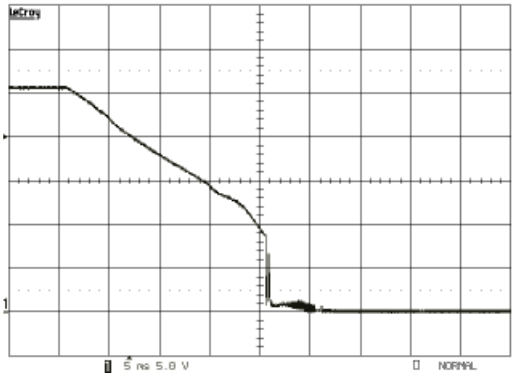
The LDX-32420 can be operated at full-scale current in constant current low bandwidth, constant current high bandwidth or constant optical power mode.

The constant current low bandwidth mode provides stable DC current to the laser diode while offering lowest current noise. In constant current high bandwidth mode, an external control voltage is summed into the output current stage allowing DC or modulated voltage control of the output up to a 100 KHz bandwidth. For laser protection, the modulation port is implemented as a differential input allowing the control voltage and the instrument's laser output to use different grounds.

The constant power mode maintains constant optical power operation of the laser diode by measuring the photocurrent from the diode's rear-facet photodiode, or from an external photodiode in a feedback control loop to the current source. The laser diode's optical power can be displayed if the photodiode responsivity is programmed into the instrument.

DESIGNED TO PROTECT HIGH POWER LASER DIODES

Eliminate problematic current spiking common with voltage sources. The LDX-32420 Laser Diode Driver was designed as a current source specifically for high power laser diodes. 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 transients. The LDX-32420 provides multiple laser diode protection features such as current and voltage limits, slow start turn-on floating outputs, fast error detection, and immunity to operational and power line transients. Transients from normal instrument operation such as output on/off have been thoroughly testing and minimized as well as transients from inadvertent instrument operation (such as mode switching) with the output enabled. These protection features all work in conjunction with all instrument modes of operation, providing worry-free, fail-safe control of the laser diode.



LDX-32420 Response to Loss of Power with Output Enabled

EASE OF OPERATION

Designed for quick and easy operation, the LDX-32420 laser diode driver displays information without confusing multi-layer menus. All of the instrument's parameters and operation modes are logically grouped by function with easy-to-use push buttons and indicating LEDs. A digital potentiometer with a large adjustment knob simplifies current source set point and limit adjustments, and a "Fine Adjustment" mode enables higher precision control of the current source output. A bright 5-digit green LED display displays laser current, voltage, and power for quick easy viewing even with safety goggles.

The LDX-32420 architecture simplifies routing maintenance. Closed-case calibration can be performed through the front panel or the computer interface. The instrument is placed in calibration mode through a unique combination of front panel push button presses or commands. Calibration data is simply entered with the front panel adjust knob or through the interface bus.

LDX 32420

High Power Precision Current Source



The LDX-32420 is compatible with ILX Lightwave temperature controllers, high power laser diode mounts, and power meters.

AUTOMATE HIGH POWER LASER DIODE TESTING

Remote computer controlled instrument operation is available though an IEEE488 / GPIB interface or USB 2.0 computer interface. All instrument controls and functions are accessible through the interfaces for easy remote programming and control in automated test systems where repeatable and accurate test sequencing, measurements, and data handling are required. Whether the application is data intensive LIV testing or control in complex systems, computer controlled operation of the LDX-32420 saves time and ensures systematic data collection and instrument control. For virtual instrument programming, LabView® drivers are available on request or through the ILX website.

REDUCE COST OF TEST

Each LDX-32420 Laser Diode Driver was developed specifically for precision testing of high power laser diodes with 0.1% set point accuracy, low noise and precision forward voltage and photodiode measurement capability. The instrument can perform power measurements calibrated with a user-programmable photodiode responsivity. An adjustable 0 to -5V reverse bias ensures linear measurements and fast conversion speed. Accurate forward voltage measurements even with high current and long cable lengths are accomplished real time through a four-wire measurement system. Reduce total system cost with these high current drivers; there is no need for separate voltage measuring or low current measuring instruments for high power laser diode testing.

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-32420, call us today or visit us at www.newport.com/ilxlightwave.

LDX 32420

High Power Precision Current Source

Specifications

DRIVE CURRENT LIMIT SETTINGS[1]

Output Current Set Point		
Range:	0 to 10A	0 to 20A
Resolution:	1 mA	1 mA
Accuracy (% of reading):	±0.1% + 10 mA	±0.1% + 10 mA
Compliance Voltage:	4V	4V
Temperature Coefficient:	< 50 ppm / °C	< 50 ppm / °C
Stability (1 hour):[2]	±50 ppm	±50 ppm
Noise and Ripple (rms):[3]		
High Bandwidth Mode:	< 5 mA	< 5 mA
Low Bandwidth Mode:	< 5 mA	< 5 mA
Transients:		
Operational:[4]	< 25 mA	< 25 mA
1kV EFT / Surge:[5]	< 80 mA	< 80 mA

COMPLIANCE VOLTAGE ADJUST

Range:	0 - 4 V	0 - 4 V
Resolution:	100 mV	100 mV
Accuracy (% of FS):	±2.5%	±2.5%

DRIVE CURRENT LIMIT SETTINGS

Range:	0.1 to 10.1 A	0.2 to 20.2 A
Resolution:	100 mA	100 mA
Accuracy (% of FS):	±1%	±1%

PHOTODIODE FEEDBACK

Type:	Differential	Differential
PD Current Range:	0 to 5000 µA	0 to 5000 µA
Output Stability:[6]	±0.02%	±0.02%
Accuracy, setpoint (% of FS):	±0.05%	±0.05%
PD Reverse Bias:	0-5V, Adjustable	0-5V, Adjustable

EXTERNAL ANALOG MODULATION

Input:	0-10V, 1 kΩ	0-10V, 1 kΩ
Transfer Function:	1 A/V	2 A/V
Bandwidth (3dB)[7]		
High Bandwidth Mode:	DC to 100 kHz	DC to 100 kHz
Low Bandwidth Mode:	DC to 20 kHz	DC to 20 kHz

TRIGGER OUTPUT

Type:	TTL	TTL
Pulse Width:	14 µs	14 µs
Delay:[8]	12ms	12ms

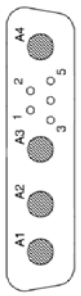
MEASUREMENT (DISPLAY)

Output Current[9]		
Range:	0 to 10.000 A	0 to 20.000 A
Resolution:	0.001 A	0.001 A
Accuracy (% of reading):	0.1% + 10 mA	0.1% + 10 mA
PD Current		
Range:	0 to 5000 µA	0 to 5000 µA
Resolution:	1 µA	1 µA
Accuracy:	±2 µA	±2 µA
PD Responsivity		
Range:[10]	0.00 to 100.00 µA/mW	0.00 to 100.00 µA/mW
Resolution:	0.01 µA/mW	0.01 µA/mW
Optical Power		
Range:	0.00 to 100.00 W	0.00 to 100.00 W
Resolution:	0.01 W	0.01 W
Forward Voltage		
Range:	0.000 to 4.000V	0.000 to 4.000V
Resolution:	1 mV	1 mV
Accuracy:	±5 mV	±5 mV

NOTES

1. All values relate to a one-hour warm-up period.
2. Over any one-hour period, half-scale output.
3. Measured electrically with a 0.5Ω load evaluating AC coupled rms value over a 1 MHz bandwidth.
4. Maximum output current transient resulting from normal operations (e.g., power on-off, current on-off), as well as accidental situations (e.g., power line plug removal).
5. Maximum output current transient resulting from a 1000V power-line transient spike per IEC 1004-4 and 1004-5.
6. Maximum monitor photodiode current drift over any 30-minute period. Assumes zero drift in photodiode responsivity.
7. 5V peak to peak modulation at mid-scale output.
8. From start of output current change to trigger pulse.
9. Measured current through GPIB or USB command; instrument front panel displays setpoint current.
10. The responsivity value is user-defined and is used to calculate the optical power.

OUTPUT CONNECTOR PINOUT



1) PD Anode
2) PD Cathode
3) Voltage Sense (+)
4) Chassis Ground
5) Voltage Sense (-)
A1) Laser Anode
A2) Laser Anode
A3) Laser Cathode
A4) Laser Cathode

LASER DIODE PROTECTION

Output Shorting Relay:	Normally closed
Output Enable Delay:	2s (per CFR 1040.10)
Current Limit:	Adjustable; redundant hardware
Voltage Limit:	Adjustable
Hardware Fault Response Time	
Current Limit:	Continuous Monitoring
Voltage Limit:	5 µs
Open Circuit:	50 µs
Intermittent Contact Protection	
AC Power Failure / Brown Out	
Error Monitoring / Reporting:	Current Limit, Voltage Limit, Open Circuit, Optical Power Limit

INTERLOCKS

Interlock 1:	Normally open; close to enable output
Interlock 2:	Normally high, TTL input; TTL low to disable output

GENERAL

Remote Interface	
GPIB:	IEEE488
USB:	2.0
Power Requirements:	100-120VAC ±10% 220-240VAC ±10%
Maximum Current Draw	
100-120VAC:	1.5A
220-240VAC	0.7A
Size (HxWxD):	4" x 8.5" x 13.4" (102 mm x 216 mm x 340 mm)
Weight:	12.2 lbs. (5.5 kg)
Operating Temperature:	0°C to 40°C
Storage Temperature:	-40°C to 70°C
Humidity:	Up to 85%, non-condensing
Regulatory Compliance:	CE Certified; EN61326-1:2006 Basic Requirements; Immunity EN60950 Low Voltage Directive EN55011:2007 Radiated and Conducted Emissions EN61010-1 Safety Requirements
Connectors	
Laser Output:	D-sub combination 9W4
Modulation Input:	BNC, front panel
Trigger Out:	BNC, rear panel
Interlock 1:	Terminal block; rear panel
Interlock 2:	BNC, rear panel
Ground:	Banana jack

ORDERING INFORMATION

LDX-32420-120V	High Power Precision Laser Diode Driver, 120V
LDX-32420-220V	High Power Precision Laser Diode Driver, 220V
CC-320	20A Interconnect Cable, 9W4 to 7W2
CC-325	20A Interconnect Cable, 9W4 to ring lug
LDM-49840	High Power Butterfly Laser Diode Mount
LDM-49860	High Power 2-Pin Module Laser Diode Mount
RM-139	Single Rack Mounting Kit
RM-140	Dual Rack Mounting Kit

LabView® Instrument Driver

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

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