LDX 3620

Ultra-Low Noise Current Source

Product Features

- Low-noise, battery-based design with 815pA/$\sqrt{Hz}$ noise density
- 10ppm stability over 30 minutes
- Constant current and constant power operating modes
- Dual current ranges: 200mA and 500mA floating output
- 1MHz external modulation bandwidth
- Programmable internal ramp generator
- Built-in battery charger

The LDX-3620 is a battery-powered, ultra-low noise current source, optimized for narrow linewidth or stable wavelength laser diode applications. The instrument provides a dual-current range with a 4.5-digit display. It offers high stability performance, constant current or power operation, internal or external modulation capability, and comes with a built-in battery charger.

High Stability Performance with Flexible Modulation Capability

ILX Lightwave
Laser Diode Instrumentation & Test Systems

LDX 3620

Ultra-Low Noise Current Source

Ultra Low Noise and High Stability

Careful component selection and circuit board layout deliver unprecedented low noise levels. Current noise density is only 815pA/$\sqrt{\text{Hz}}$. Wideband current noise is only 850nA rms. The unique design also delivers stable performance that outperforms conventional current sources. Even over periods of tens of minutes, output is constant to within 10ppm. Such attention to noise and drift figures is critical for applications such as laboratory work in coherent communications or atomic spectroscopy.

Internal or External Modulation

The LDX-3620 offers two ways to modulate the output. One, the built-in programmable ramp generator lets you make an L/I curve or dither the wavelength without introducing noise from an external signal generator. In addition, a trigger signal on the rear of the instrument permits oscilloscope triggering at ramp start-up. Two, an external signal of up to 1MHz-bandwidth, AC- or DC-coupled, and input through the front panel BNC connector modulates the output current. In all modes of operation, the modulation signal is summed with the constant current output.

Laser Diode Protection

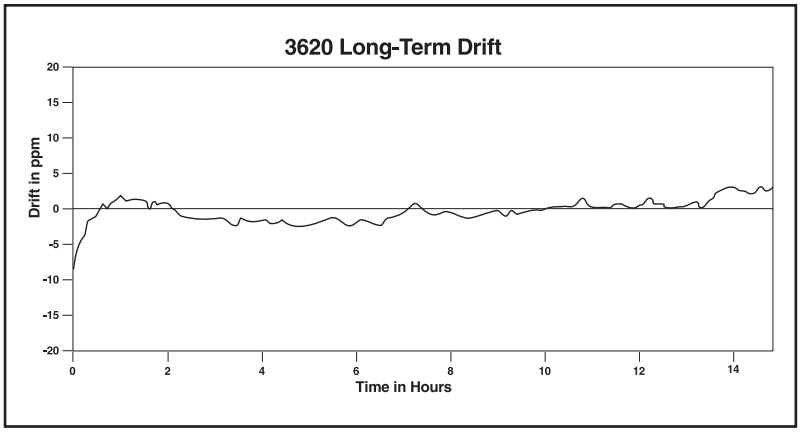
The instrument's slow-start circuit ensures a gentle laser turn-on. For maximum protection, this circuit also keeps the output shorted during power-up and when changing lasers. The LDX-3620 also employs a redundant current limit that may be set using the recessed front panel knob. This safety feature provides extremely fast and effective current limiting under all modes of operation.

Built-In Battery with Charger

The LDX-3620's internal batteries provide the benefits of low noise without the normal drawbacks of battery-powered instruments. The instrument's lead-acid batteries offer high charge retention and long operating times. A battery charger is built into the instrument, permitting instrument operation even while the batteries are being charged.

Low Battery Protection

The 3620 has two low battery circuits. The first simply displays “LO BAT” when the batteries need recharging. The second shuts the instrument down safely if the battery charge gets dangerously low.



The 3620 performs with -10ppm drift (after 30 minutes) and 0.2% constant power stability.

LDX 3620

Ultra-Low Noise Current Source

Ultra-low noise current source that's optimized for your laser diode application.

Constant Current Operation

When operated in constant current mode, all unused circuitry is switched out, allowing measured output noise figures to approach the theoretical limits for the control circuit. The 4.5-digit liquid crystal display, when used in conjunction with the coarse and fine output controls, allows precise control of the current to your laser.

Constant Power Operation

When in constant power mode, the photocurrent from a back facet monitor photodiode or a front facet power monitor may be used to maintain constant output power. Controls on the rear of the instrument allow the gain to be changed depending on the magnitude of the photocurrent.

LDX 3620

Ultra-Low Noise Current Source

Specifications[1]

OUTPUT	0–200mA	0–500mA
Output Current:[2]	0–200mA	0–500mA
Compliance Voltage:	≥5V	≥4V
Noise and Ripple (5Hz to 10MHz bandwidth)		
Battery operation:	≤850nA rms	≤2µA rms
AC line operation:	≤3µA rms	≤8µA rms
(5Hz–10kHz bandwidth)		
Battery operation:	≤100nA rms	≤500nA rms
AC line operation:	≤2µA rms	≤6.5µA rms
Noise Density		
50/60Hz:	5.2nA/$\sqrt{Hz}$	11.5nA/$\sqrt{Hz}$
Battery Operation:		
1kHz:	815pA/$\sqrt{Hz}$	2.6nA/$\sqrt{Hz}$
25kHz:	315pA/$\sqrt{Hz}$	795pA/$\sqrt{Hz}$
Stability		
10–20 seconds:	≤0.1ppm	≤0.1ppm
3–5 minutes:	≤1ppm	≤1ppm
10–30 minutes:	≤10ppm	≤10ppm
Temperature Coefficient:	≤10ppm/°C	≤10ppm/°C
Transients:	≤10µA	≤10µA
Output Connector:	Shielded 9-pin D-sub on panel	Shielded 9-pin D-sub on panel

CURRENT LIMIT		
Range:	10–500mA	10–500mA
Accuracy:	±5mA	±5mA

DISPLAY		
Type:	4.5-digit LCD	4.5-digit LCD
Range	0-199.99	0-500.0
Resolution:	0.01mA	0.1mA
Accuracy:	±0.05mA	±0.6mA
Reads:	LASER diode current in mA MONITOR photodiode current in mA	LASER diode current in mA MONITOR photodiode current in mA

PHOTODIODE FEEDBACK		
Input Type:	Current input from external photodiode	Current input from external photodiode
Range:	20µA to 2mA for full scale output	20µA to 2mA for full scale output
Connectors:	Rear panel isolated BNC jack or 9-pin rear panel D-sub connector	Rear panel isolated BNC jack or 9-pin rear panel D-sub connector

INTERNAL RAMP GENERATOR		
Period:	Adjustable 50ms to 100s	Adjustable 50ms to 100s
Span Adjustment:	0–200/ 0–500mA	0–200/ 0–500mA
Ramp Trigger:	Ramp start trigger output for oscilloscope; optically isolated open collector TTL output	Ramp start trigger output for oscilloscope; optically isolated open collector TTL output
Ramp Flyback Time:	700µs, approximately	700µs, approximately

EXTERNAL MODULATION INPUT		
Bandwidth (3dB point)		
AC Coupled:	100Hz to 1MHz	100Hz to 1MHz
DC Coupled:	DC to 1MHz	DC to 1MHz
Transfer Function:	100mA/V	250mA/V
Connector:	Isolated front panel BNC	Isolated front panel BNC

GENERAL		
AC Power		
Input Voltage		
Range:	100–125 or 210–250VAC	100–125 or 210–250VAC
Line Frequency:	50/60Hz	50/60Hz
Battery		
+12 volt supply:	4.5A-hour sealed lead-acid battery (standard)	4.5A-hour sealed lead-acid battery (standard)
–12 volt supply:	1.2A-hour sealed lead-acid battery	1.2A-hour sealed lead-acid battery
Temperature Range		
Operating:	0°C–40°C	0°C–40°C
Storage:[3]	–40°C to 70°C	–40°C to 70°C
Weight (with extra battery option):	12kg (26.4lbs)	12kg (26.4lbs)
Size (HxWxD):	145mm x 320mm x 346mm 5 5/8" x 12 1/2" x 13 5/8"	145mm x 320mm x 346mm 5 5/8" x 12 1/2" x 13 5/8"

NOTES

1 All values measured after a one-hour warm-up period.
2 Fully floating relative to earth ground.
3 To prevent damage, batteries should be fully charged before subjected to temperature extremes.

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

ORDERING INFORMATION

LDX-3620	Ultra-Low Noise Current Source
LDX-362038	Extra Battery Option
400164	Small Replacement Battery (1.2A-hour)
400165	Large Replacement Battery (4.5A-hour)
CC-305S	Current Source/ Laser Diode Mount Interconnect Cable
CC-306S	Current Source/Unterminated Interconnect Cable
RM-132	Single Rack Mounting Kit

ILX Lightwave
Laser Diode Instrumentation & Test Systems
P.O. Box 6310, Bozeman, MT 59771 • FAX: 406-586-9405
www.ilxlightwave.com

For information call
1-800-459-9459
International Inquiries: 406-556-2481
email: sales@ilxlightwave.com

REV02.070605