Ultra-Low Noise Current Source

**LDX-3620**

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 operating modes, and comes with a built-in battery charger.

### Product Features

- **Low-noise, battery-based design with 815pA/√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**

### Specifications

<table>
<thead>
<tr>
<th>Feature</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>High Stability Performance with Flexible Modulation Capability</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Low-noise, battery-based design with 815pA/√Hz noise density</strong></td>
<td></td>
</tr>
<tr>
<td><strong>10ppm stability over 30 minutes</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Constant current and constant power operating modes</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Dual current ranges: 200mA and 500mA floating output</strong></td>
<td></td>
</tr>
<tr>
<td><strong>1MHz external modulation bandwidth</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Programmable internal ramp generator</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Built-in battery charger</strong></td>
<td></td>
</tr>
</tbody>
</table>

### Product Features

- **Low-noise, battery-based design with 815pA/√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**

### Specifications

<table>
<thead>
<tr>
<th>Feature</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>High Stability Performance with Flexible Modulation Capability</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Low-noise, battery-based design with 815pA/√Hz noise density</strong></td>
<td></td>
</tr>
<tr>
<td><strong>10ppm stability over 30 minutes</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Constant current and constant power operating modes</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Dual current ranges: 200mA and 500mA floating output</strong></td>
<td></td>
</tr>
<tr>
<td><strong>1MHz external modulation bandwidth</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Programmable internal ramp generator</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Built-in battery charger</strong></td>
<td></td>
</tr>
</tbody>
</table>

### Product Features

- **Low-noise, battery-based design with 815pA/√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**

### Specifications

<table>
<thead>
<tr>
<th>Feature</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>High Stability Performance with Flexible Modulation Capability</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Low-noise, battery-based design with 815pA/√Hz noise density</strong></td>
<td></td>
</tr>
<tr>
<td><strong>10ppm stability over 30 minutes</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Constant current and constant power operating modes</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Dual current ranges: 200mA and 500mA floating output</strong></td>
<td></td>
</tr>
<tr>
<td><strong>1MHz external modulation bandwidth</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Programmable internal ramp generator</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Built-in battery charger</strong></td>
<td></td>
</tr>
</tbody>
</table>
Ultra-Low Noise and High Stability

Careful component selection and circuit board layout deliver unprecedented low noise levels. Current noise density is only $815 \text{pA/Hz}$. Wideband current noise is only $850 \text{nA rms}$. The unique design also delivers stable performance that outperforms conventional current sources. Even over periods of tens of minutes, output is constant to within 10 ppm. 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 I/V 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 1 MHz 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.

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.
Ultra-Low Noise and High Stability

Careful component selection and circuit board layout deliver unprecedented low noise levels. Current noise density is only $815 \text{pA/} \sqrt{\text{Hz}}$. Wideband current noise is only $850 \text{nA rms}$. 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.

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.

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.
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 operating modes, and comes with a built-in battery charger.

**Product Features**

- Low-noise, battery-based design with 815pA/√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

**Specifications**

<table>
<thead>
<tr>
<th>Feature</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>OUTPUT</strong> Current ±5mA</td>
<td>0–200mA</td>
</tr>
<tr>
<td><strong>Display</strong> Type</td>
<td>4.5-digit LCD</td>
</tr>
<tr>
<td><strong>AC Power</strong> Voltage (Range)</td>
<td>100–125 or 210–250VAC</td>
</tr>
<tr>
<td><strong>Frequency</strong> (Range)</td>
<td>50/60Hz</td>
</tr>
<tr>
<td><strong>Weight (with extra battery option)</strong></td>
<td>12kg (26.4lbs)</td>
</tr>
<tr>
<td><strong>Internal RAMP Generator</strong></td>
<td>Adjusted</td>
</tr>
<tr>
<td><strong>Size (HxWxD)</strong></td>
<td>145mm x 320mm x 346mm</td>
</tr>
</tbody>
</table>

**Internal RAMP Generator**

- Ramp Trigger: Ramp start trigger output for oscilloscope; optically isolated open collector TTL output 700µs, approximately
- Ramp Flyback Time: 700µs, approximately

**Product Features**

- Low-noise, battery-based design with 815pA/√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

For information call
1-800-459-9459

ILX Lightwave
Laser Diode Instrument & Test Systems
F.O. Box 6310, Bozeman, MT 59771
Fax: 406-586-9405
www.ilxlightwave.com

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-3055 Current Source/Laser Diode Mount
- CC-3065 Current Source/Interminated Interconnect Cable
- RM-132 Single Rack Mounting Kit

www.ilxlightwave.com

Ultra-Low Noise Current Source