The LDC-3900 Modular Laser Diode Controller features four channels with eight isolated outputs for controlling multiple laser diodes. Modules include current sources with maximum outputs from 200mA to 8A, TE (thermoelectric) controller modules with up to 32W of power and voltage measurement, and controller modules with laser current from 200mA to 2A and integrated 12W TE control.

An independent power supply powers each channel, providing protection and stability for your laser diode. Every module incorporates low noise, high stability performance, and ILX Lightwave's unmatched laser diode protection topologies including independent current limits and laser diode shorting relays.

Remote communication through an IEEE/GPIB interface simplifies testing and control of multiple devices. LabVIEW® drivers are also available for any combination of mainframe and module.

**Specifications**

**TEC Modules**

**TEC OUTPUT CONNECTORS**

- **Temperature Control Output**: 15V, 0–6A, 0°C–199.9°C

**TEC MEASUREMENT DISPLAY**

- **Temperature**: 0.01°C, ±0.2°C
  - Range: –20°C to 20°C
  - Resolution: 0.1°C
  - Accuracy: ±0.2°C
  - Range: 20°C to 50°C
  - Resolution: 0.2°C
  - Accuracy: ±0.2°C

**TEC OUTPUT**

- **Isolated Outputs**: 15-pin, D-sub
- **Thermistor Setpoint Resolution and Accuracy**: 0.01°C, ±0.1°C
- **10µA Setting**: –99.9°C to 199.9°C
- **100µA Setting**: –99.9°C to 199.9°C

**Laser Current Source Modules**

- **Current Limits**: 0–4A
- **Ripple/Noise**: <1mA, rms

**Remote Communication**

Flexible, Comprehensive Control of Laser Diodes

**Ordering Information**

- **LDC-3900 Modular Laser Diode Controller**
- **CC-505S TE Controller/Laser Diode Mount Interconnect Cable**
- **TS-510 Calibrated 10k Thermistor**
- **LNF-320 Low Noise Filter**
- **LabVIEW® Instrument Driver**

For information call 1-800-459-9459

International: (949) 980-2461
email: sales@ilxlightwave.com

www.ilxlightwave.com

**Product Features**

- 4 independent channels with 8 isolated outputs
- Laser current source modules from 200mA to 8A
- LD controller modules from 200mA to 2A with integrated 12W TEC
- 32W TEC only modules with voltage measurement
- TEC modules accept thermistor, IC and RTD temperature sensors
- Standard GPIB IEEE interface

**Technical Notes**

1. Model 39034 has TEC Voltage measurement through GPIB only.
2. Voltage measurement accuracy while driving calibration load. Accuracy is dependent upon load used.
3. Software limits of display range.
4. Measured at 1A output over a bandwidth of 10Hz to 10MHz.
5. To use RTD sensors with model 39034, order TSC-595...
Wide Range of Modules

Five current source modules and five combination modules along with two TE controller only modules make the LDC-3900 configurable for many laser diode testing and control applications. Each module is electrically floating or fully isolated from all other modules. This allows you to configure your laser diode test system without the worry of potential laser diode damaging ground loops.

Current Source Modules

The LDC-3900 current source design offers superior laser protection and low noise, high stability performance. These modules also feature a photo-diode measurement circuit for devices with backlight monitor photodiode and analog modulation up to 500Hz for dithering the laser current for wavelength tuning. Five different current source modules up to 8A can be driven in any one of the following modes:

1) Constant current, low bandwidth
2) Constant current, high bandwidth
3) Constant optical power

Highly Stable Temperature Control

The LDC-3900 TECC modules control temperature of your devices with 32W of power. These TEC modules offer maximum flexibility with a choice of operating modes and temperature sensors covering thermistors, IC, and RTDs. A low noise, biopolar output with TE voltage measurement and an ultra-stable topology achieves stabilities better than 0.005°C. A smart integrator control loop, programmable from the front panel or through GPIB, delivers fast settling times.

Controller Modules

Controller modules combine a current source with a temperature controller in one module. Laser current from 200mA to 2A is available with an integrated 12W temperature controller for current and temperature control of laser diodes. All of the features found in the current only and temperature control modules are incorporated into these flexible modules and include multiple modes of operation, external modulation, a choice of temperature sensors, and all protection features.

Intuitive Front Panel

Divided into two sections, TEC and LASER, the front panel offers quick, easy operation and information display without confusing multi-layer menus. Each channel is directly addressable from the front panel “adjust” section and indicated through discrete LEDs next to the respective display. Laser and TEC parameters and modes are easily selected or adjusted through discrete push buttons.

Powerful GPIB Interface

For automated control, the IEEE/GPIB interface allows programming and readout from most computers. All instrument and module functions are accessible through the interface allowing you to simultaneously control multiple laser diodes from the same address. For virtual instrument programming, LabVIEW® drivers are available upon request or through the ILX website.

* Semiconductor lasers are sensitive devices. Always take appropriate antistatic precautions and use extreme care when handling laser diodes. For more information, request ILX Application Note #3, “Protecting Your Laser Diode.”

Specifications

Current Source Modules 1

<table>
<thead>
<tr>
<th>Current Source Module</th>
<th>390020</th>
<th>39050</th>
<th>39100</th>
<th>39400</th>
<th>39800</th>
</tr>
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<tbody>
<tr>
<td>DRIVE CURRENT OUTPUT</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Output Current Range</td>
<td>0–200 mA</td>
<td>0–500 mA</td>
<td>0–1000 mA</td>
<td>0–4000 mA</td>
<td>0–8000 mA</td>
</tr>
<tr>
<td>Setpoint Resolution</td>
<td>10 µA</td>
<td>10 µA</td>
<td>100 µA</td>
<td>100 µA</td>
<td>125 µA</td>
</tr>
<tr>
<td>Setpoint Accuracy</td>
<td>±0.1% of FS</td>
<td>±0.1% of FS</td>
<td>±0.1% of FS</td>
<td>±0.1% of FS</td>
<td>±0.1% of FS</td>
</tr>
<tr>
<td>Compliance Voltage</td>
<td>7V</td>
<td>6.5V</td>
<td>6V</td>
<td>5V</td>
<td>SV at connector</td>
</tr>
<tr>
<td>Temperature Coefficient:</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Short-Term Stability (24 hours):</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>High Bandwidth Mode</td>
<td>&lt;1 ppm</td>
<td>&lt;1 ppm</td>
<td>&lt;1 ppm</td>
<td>&lt;1 ppm</td>
<td>&lt;1 ppm</td>
</tr>
<tr>
<td>Low Bandwidth Mode</td>
<td>&lt;1 ppm</td>
<td>&lt;1 ppm</td>
<td>&lt;1 ppm</td>
<td>&lt;1 ppm</td>
<td>&lt;1 ppm</td>
</tr>
<tr>
<td>With LNF-320:</td>
<td>&lt;1 ppm</td>
<td>&lt;1 ppm</td>
<td>&lt;1 ppm</td>
<td>&lt;1 ppm</td>
<td>&lt;1 ppm</td>
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<tr>
<td>Noise and Ripple (µA RMS):</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>High Bandwidth Mode</td>
<td>&lt;20 µA</td>
<td>&lt;20 µA</td>
<td>&lt;20 µA</td>
<td>&lt;20 µA</td>
<td>&lt;20 µA</td>
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<tr>
<td>Low Bandwidth Mode</td>
<td>&lt;20 µA</td>
<td>&lt;20 µA</td>
<td>&lt;20 µA</td>
<td>&lt;20 µA</td>
<td>&lt;20 µA</td>
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<tr>
<td>With LNF-320:</td>
<td>&lt;20 µA</td>
<td>&lt;20 µA</td>
<td>&lt;20 µA</td>
<td>&lt;20 µA</td>
<td>&lt;20 µA</td>
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<tr>
<td>Transients: 1</td>
<td>1A</td>
<td>1A</td>
<td>1A</td>
<td>1A</td>
<td>1A</td>
</tr>
<tr>
<td>Laser-diode induced</td>
<td>&lt;5 mA</td>
<td>&lt;5 mA</td>
<td>&lt;5 mA</td>
<td>&lt;5 mA</td>
<td>&lt;5 mA</td>
</tr>
<tr>
<td>Output Current</td>
<td>&lt;10 mA</td>
<td>&lt;10 mA</td>
<td>&lt;10 mA</td>
<td>&lt;10 mA</td>
<td>&lt;10 mA</td>
</tr>
</tbody>
</table>

MEASUREMENT (DISPLAY) 2

<table>
<thead>
<tr>
<th>Current Source Module</th>
<th>390020</th>
<th>39050</th>
<th>39100</th>
<th>39400</th>
<th>39800</th>
</tr>
</thead>
<tbody>
<tr>
<td>Output Current Range</td>
<td>0–200 mA</td>
<td>0–500 mA</td>
<td>0–1000 mA</td>
<td>0–4000 mA</td>
<td>0–8000 mA</td>
</tr>
<tr>
<td>Resolution</td>
<td>±0.01 mA</td>
<td>±0.01 mA</td>
<td>±0.1 mA</td>
<td>±0.1 mA</td>
<td>±0.1 mA</td>
</tr>
<tr>
<td>Accuracy</td>
<td>±0.01% of FS</td>
<td>±0.01% of FS</td>
<td>±0.1% of FS</td>
<td>±0.1% of FS</td>
<td>±0.1% of FS</td>
</tr>
<tr>
<td>Photodiode Response</td>
<td>0.00–0.0005 µA/mW</td>
<td>0.00–0.0005 µA/mW</td>
<td>0.00–0.0005 µA/mW</td>
<td>0.00–0.0005 µA/mW</td>
<td>0.00–0.0005 µA/mW</td>
</tr>
<tr>
<td>Optical Power Range</td>
<td>0.00–300.00 mW</td>
<td>0.00–300.00 mW</td>
<td>0.00–500.00 mW</td>
<td>0.00–1000.00 mW</td>
<td>0.00–2000.00 mW</td>
</tr>
<tr>
<td>Resolution</td>
<td>±1 mW</td>
<td>±1 mW</td>
<td>±1 mW</td>
<td>±1 mW</td>
<td>±1 mW</td>
</tr>
<tr>
<td>Accuracy</td>
<td>±0.01% of FS</td>
<td>±0.01% of FS</td>
<td>±0.01% of FS</td>
<td>±0.01% of FS</td>
<td>±0.01% of FS</td>
</tr>
</tbody>
</table>

CURRENT SOURCES NOTES

1) All values relate to a one-hour warm-up period.
2) Over any one-hour period, half-scale output at 25°C ambient.
3) Over any one-hour period, half-scale output at 25°C ambient.
4) Measured from input to output in the LDC-3900. Assumes test inputs with a 2MΩ impedance. Accuracy is ±0.1% of FS.
5) Measured from input to output in the LDC-3900. Assumes test inputs with a 2MΩ impedance. Accuracy is ±0.1% of FS.
6) 50Ω and 50Ω with 0.0005% phase accuracy.
7) Maximum current into the load of 1000V power line transient spike.
8) Tested to ILX Lightwave Technical Standard #LDC-00196.8 Maximum monitor photodiode current drift over any 30 minute period. Accuracy may vary depending on load and cable length used.
9) Maximum input voltage of 2000V power line transient spike.
10) Maximum input voltage of 2000V power line transient spike.
11) Maximum input voltage of 2000V power line transient spike.
12) Maximum input voltage of 2000V power line transient spike.
13) Maximum input voltage of 2000V power line transient spike.
14) Maximum input voltage of 2000V power line transient spike.
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1. Constant current, low bandwidth
2. Constant current, high bandwidth
3. Constant optical power
4. Linear-voltage, high bandwidth
5. Linear-voltage, low bandwidth

Highly Stable Temperature Control
The LDC-3900 TEC modules control temperature of your devices with 32W of power. These TEC modules offer maximum flexibility with a choice of operating modes and temperature sensors covering thermistors, IC, and RTDs. A low noise, bipolar output with TE voltage measurement and an ultra-stable topology achieves stabilities better than 0.005°C. A smart integrator control loop, programmable from the front panel or through GPIB, delivers fast settling times.

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Up to four modules can be easily adjusted and controlled from the LDC-3900 front panel.

Specifications
Current Source Modules

<table>
<thead>
<tr>
<th>Current Source</th>
<th>39020</th>
<th>39050</th>
<th>39100</th>
<th>39400</th>
<th>39800</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>DRIVE CURRENT OUTPUT</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Output Current Range</td>
<td>0–200 mA</td>
<td>0–500 mA</td>
<td>0–1000 mA</td>
<td>0–4000 mA</td>
<td>0–8000 mA</td>
</tr>
<tr>
<td>Setpoint Resolution</td>
<td>10 µA</td>
<td>10 µA</td>
<td>100 µA</td>
<td>100 µA</td>
<td>100 µA</td>
</tr>
<tr>
<td>Accuracy</td>
<td>±0.5% of FS</td>
<td>±0.5% of FS</td>
<td>±1% of FS</td>
<td>±1% of FS</td>
<td>±1% of FS</td>
</tr>
<tr>
<td>Compliance Voltage</td>
<td>7V</td>
<td>6.5V</td>
<td>6V</td>
<td>5V</td>
<td>5V</td>
</tr>
<tr>
<td>Temperature Coefficient</td>
<td>&lt;10 ppm/°C</td>
<td>&lt;20 ppm/°C</td>
<td>&lt;50 ppm/°C</td>
<td>&lt;100 ppm/°C</td>
<td>&lt;200 ppm/°C</td>
</tr>
<tr>
<td>Short-Term Stability (24 hours)</td>
<td>&lt;50 ppm</td>
<td>&lt;100 ppm</td>
<td>&lt;200 ppm</td>
<td>&lt;400 ppm</td>
<td>&lt;450 ppm</td>
</tr>
<tr>
<td>Noise and Ripples (µA)</td>
<td>&lt;4 µA</td>
<td>&lt;5 µA</td>
<td>&lt;10 µA</td>
<td>&lt;20 µA</td>
<td>&lt;120 µA</td>
</tr>
<tr>
<td>Laser Bandwidth Mode</td>
<td>&lt;4 µA</td>
<td>&lt;5 µA</td>
<td>&lt;10 µA</td>
<td>&lt;20 µA</td>
<td>&lt;120 µA</td>
</tr>
<tr>
<td>TEC Bandwidth Mode</td>
<td>&lt;3 µA</td>
<td>&lt;4.5 µA</td>
<td>&lt;9 µA</td>
<td>&lt;18 µA</td>
<td>&lt;27 µA</td>
</tr>
<tr>
<td>Transients</td>
<td>5x</td>
<td>10x</td>
<td>50x</td>
<td>100x</td>
<td>500x</td>
</tr>
<tr>
<td>Power-line spike induced</td>
<td>&lt;1mA</td>
<td>&lt;1mA</td>
<td>&lt;2mA</td>
<td>&lt;5mA</td>
<td>&lt;8mA</td>
</tr>
<tr>
<td>Output Stability</td>
<td>±2%</td>
<td>±2%</td>
<td>±2%</td>
<td>±2%</td>
<td>±2%</td>
</tr>
<tr>
<td>Photodiode Feedback</td>
<td>±0.05% of FS</td>
<td>±0.05% of FS</td>
<td>±0.05% of FS</td>
<td>±0.05% of FS</td>
<td>±0.05% of FS</td>
</tr>
<tr>
<td>Photodiode Current Range</td>
<td>0–5 mA</td>
<td>0–5 mA</td>
<td>0–10 mA</td>
<td>0–20 mA</td>
<td>0–20 mA</td>
</tr>
<tr>
<td>Resolution</td>
<td>0.01 mA</td>
<td>0.01 mA</td>
<td>0.1 mA</td>
<td>0.5 mA</td>
<td>1 mA</td>
</tr>
<tr>
<td>Accuracy</td>
<td>±0.05% of FS</td>
<td>±0.05% of FS</td>
<td>±0.05% of FS</td>
<td>±0.05% of FS</td>
<td>±0.05% of FS</td>
</tr>
<tr>
<td>Photodiode Responsivity</td>
<td>0.00–600.00 µA/mW</td>
<td>0.00–600.00 µA/mW</td>
<td>0.00–600.00 µA/mW</td>
<td>0.00–1000.00 µA/mW</td>
<td>0.00–1000.00 µA/mW</td>
</tr>
<tr>
<td>Resolution</td>
<td>0.01 µA/mW</td>
<td>0.01 µA/mW</td>
<td>0.1 µA/mW</td>
<td>0.5 µA/mW</td>
<td>1 µA/mW</td>
</tr>
<tr>
<td>Optical Power</td>
<td>0.00–300.00 µW</td>
<td>0.00–500.00 µW</td>
<td>0.00–1000.00 µW</td>
<td>0.00–3000.00 µW</td>
<td>0.00–4000.00 µW</td>
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<tr>
<td>Forward Voltage</td>
<td>0.00–7.000V</td>
<td>0.00–7.000V</td>
<td>0.00–7.000V</td>
<td>0.00–7.000V</td>
<td>0.00–7.000V</td>
</tr>
<tr>
<td>Resolution</td>
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<td>1 mV</td>
<td>1 mV</td>
<td>1 mV</td>
<td>1 mV</td>
</tr>
<tr>
<td>Accuracy</td>
<td>±0.05% of FS</td>
<td>±0.05% of FS</td>
<td>±0.05% of FS</td>
<td>±0.05% of FS</td>
<td>±0.05% of FS</td>
</tr>
</tbody>
</table>

**CURRENT SOURCE NOTES**

3. Tested with a 1000V power line transient spike. Tested to ILX Lightwave Technical Standard #LDC-00196.
4. Measured from output photodiode feedback to laser diode with a 20mA, 150Ω load connected to the rear panel connector.
5. All modules isolated from other modules and earth ground.
TEC Modules

| Specifications | LDC-3900 Modular Laser Diode Controller

**TEC Modules**

- **TEC Modules**
- **Temperature Control**
  - **Temperature Control Range**: -99.9°C to 199.9°C
  - **Temperature Resolution**: ±0.1°C
  - **Temperature Accuracy**: ±0.2°C
- **Short Term Stability (one hour)**
  - **Temperature**: ±0.05°C
  - **Voltage**: ±0.04°C
- **Long Term Stability (24 hours)**
  - **Temperature**: ±0.1°C
  - **Voltage**: ±0.04°C

**Product Features**

- 4 independent channels with 8 isolated outputs
- Laser current source modules from 200mA to 8A
- LD controller modules from 200mA to 2A with integrated 12W TEC
- 32W TEC only modules with voltage measurement

**TEC Modules accept thermistor, IC and RTD temperature sensors**

**Standard GPIB Interface**

- **Ordering Information**
  - LDC-3900 Modular Laser Diode Controller
  - LDC-3900 Modular Laser Diode Controller Mainframe
  - CSM-39020 200mA Current Source Module
  - CSM-39050 500mA Current Source Module
  - CSM-39100 1A Current Source Module
  - CSM-39400 4A Current Source Module
  - CC-505S TE Controller/Laser Diode Mount Interconnect Cable
  - TS-510 Calibrated 10k Ω Thermistor
  - TS-520 Uncalibrated 10k Ω Thermistor
  - TS-599 RTD Temperature Sensor
  - TS-599 RTD Temperature Sensor
  - TS-510 Calibrated 10k Ω Thermistor
  - CC-505S TE Controller/Laser Diode Mount Interconnect Cable
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  - **Manufacturers**

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- **LDC-3900 Modular Laser Diode Controller Mainframe**
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- **TS-599 RTD Temperature Sensor**
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**For more information call**

**www.newport.com/ilxlightwave**

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  - CSM-39400 4A Current Source Module
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  - TS-520 Uncalibrated 10k Ω Thermistor
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  - **Manufacturers**

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**www.newport.com/ilxlightwave**

**LDC-3900 Modular Laser Diode Controller**

**4 independent channels with 8 isolated outputs**
- Laser current source modules from 200mA to 8A
- LD controller modules from 200mA to 2A with integrated 12W TEC
- 32W TEC only modules with voltage measurement

**TEC modules accept thermistor, IC and RTD temperature sensors**

**Standard GPIB Interface**

- **Ordering Information**
  - LDC-3900 Modular Laser Diode Controller Mainframe
  - CSM-39020 200mA Current Source Module
  - CSM-39050 500mA Current Source Module
  - CSM-39100 1A Current Source Module
  - CSM-39400 4A Current Source Module
  - CC-505S TE Controller/Laser Diode Mount Interconnect Cable
  - TS-510 Calibrated 10k Ω Thermistor
  - TS-520 Uncalibrated 10k Ω Thermistor
  - TS-599 RTD Temperature Sensor
  - TS-599 RTD Temperature Sensor
  - TS-510 Calibrated 10k Ω Thermistor
- **Manufacturers**

**ORDERING INFORMATION**

- **LDC-3900 Modular Laser Diode Controller Mainframe**
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- **TS-599 RTD Temperature Sensor**
- **TS-510 Calibrated 10k Ω Thermistor**

**For more information call**
## Specifications

### Combination Modules

#### ISOLATION

Each module is isolated from other modules and earth ground. TEC and current source independently isolated.

#### OUTPUT CONNECTORS

<table>
<thead>
<tr>
<th>Current Source Output</th>
<th>Photodiode Input</th>
</tr>
</thead>
<tbody>
<tr>
<td>9-pin, D-sub</td>
<td>15-pin, D-sub</td>
</tr>
<tr>
<td>9-pin, D-sub</td>
<td>15-pin, D-sub</td>
</tr>
<tr>
<td>9-pin, D-sub</td>
<td>15-pin, D-sub</td>
</tr>
<tr>
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<td>15-pin, D-sub</td>
</tr>
<tr>
<td>9-pin, D-sub</td>
<td>15-pin, D-sub</td>
</tr>
</tbody>
</table>

#### DRIVE CURRENT OUTPUT

<table>
<thead>
<tr>
<th>Output Current Range</th>
<th>Setpoint Resolution</th>
<th>Setpoint Accuracy</th>
<th>Compliance Voltage</th>
<th>Temperature Coefficient</th>
<th>Short-Term Stability (1 hour)</th>
<th>Long-Term Stability (24 hours)</th>
<th>Noise and Ripple (µA/rms)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0–200 mA</td>
<td>10 µA</td>
<td>±0.05% of FS</td>
<td>5V</td>
<td>100 ppm/°C</td>
<td>25 ppm</td>
<td>50 ppm</td>
<td>&lt;2.5 µA</td>
</tr>
<tr>
<td>0–500 mA</td>
<td>10 µA</td>
<td>±0.05% of FS</td>
<td>6V</td>
<td>100 ppm/°C</td>
<td>25 ppm</td>
<td>50 ppm</td>
<td>&lt;4 µA</td>
</tr>
<tr>
<td>0–500 mA</td>
<td>10 µA</td>
<td>±0.05% of FS</td>
<td>6V</td>
<td>100 ppm/°C</td>
<td>25 ppm</td>
<td>50 ppm</td>
<td>&lt;4 µA</td>
</tr>
<tr>
<td>0–1000 mA</td>
<td>100 µA</td>
<td>±0.01% of FS</td>
<td>6V</td>
<td>100 ppm/°C</td>
<td>25 ppm</td>
<td>50 ppm</td>
<td>&lt;4 µA</td>
</tr>
<tr>
<td>0–2000 mA</td>
<td>100 µA</td>
<td>±0.01% of FS</td>
<td>5V</td>
<td>100 ppm/°C</td>
<td>25 ppm</td>
<td>50 ppm</td>
<td>&lt;10 µA</td>
</tr>
</tbody>
</table>

#### DRIVE CURRENT LIMIT SETTINGS

<table>
<thead>
<tr>
<th>Range</th>
<th>Accuracy</th>
</tr>
</thead>
<tbody>
<tr>
<td>0–200 mA</td>
<td>±2 mA</td>
</tr>
<tr>
<td>0–500 mA</td>
<td>±2 mA</td>
</tr>
<tr>
<td>0–500 mA</td>
<td>±2 mA</td>
</tr>
<tr>
<td>0–1000 mA</td>
<td>±10 mA</td>
</tr>
<tr>
<td>0–2000 mA</td>
<td>±20 mA</td>
</tr>
</tbody>
</table>

#### PHOTODIODE FEEDBACK

<table>
<thead>
<tr>
<th>Type</th>
<th>Output Stability</th>
<th>Setpoint Accuracy</th>
</tr>
</thead>
<tbody>
<tr>
<td>Current input differential, zero bias, all modules</td>
<td>±2 µA</td>
<td>±2 µA</td>
</tr>
<tr>
<td>20–2000 µA</td>
<td></td>
<td>±2 µA</td>
</tr>
<tr>
<td>0–5000 µA</td>
<td></td>
<td>±2 µA</td>
</tr>
</tbody>
</table>

#### EXTERNAL ANALOG MODULATION

<table>
<thead>
<tr>
<th>Input</th>
<th>Transfer Function</th>
<th>Bandwidth (3dB)</th>
</tr>
</thead>
<tbody>
<tr>
<td>N/A</td>
<td>N/A</td>
<td>DC to 250 kHz</td>
</tr>
<tr>
<td>N/A</td>
<td>N/A</td>
<td>DC to 200 kHz</td>
</tr>
</tbody>
</table>

#### DRIVE CURRENT MEASUREMENT (DISPLAY)

<table>
<thead>
<tr>
<th>Output Current Range</th>
<th>Output Current Resolution</th>
<th>Output Current Accuracy</th>
<th>Photodiode Current Range</th>
<th>PD Current Resolution</th>
<th>PD Responsivity Range</th>
<th>PD Responsivity Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>0–200.00 mA</td>
<td>0.01 mA</td>
<td>±0.1 mA</td>
<td>0–2000 µA</td>
<td>1 µA</td>
<td>0.00–1000.00µA/mW</td>
<td>0.00–1000.00µA/mW</td>
</tr>
<tr>
<td>0–500.00 mA</td>
<td>0.1 mA</td>
<td>±0.05 mA</td>
<td>4–4000 µA</td>
<td>1 µA</td>
<td>0.00–1000.00µA/mW</td>
<td>0.00–1000.00µA/mW</td>
</tr>
</tbody>
</table>

#### TEMPERATURE CONTROL OUTPUT

<table>
<thead>
<tr>
<th>Temperature Control Range</th>
<th>Thermistor Setpoint</th>
<th>Resolution and Accuracy</th>
<th>Compliance Voltage</th>
<th>Short Circuit Output Current</th>
<th>Maximum Output Power</th>
<th>Current Noise and Ripples</th>
<th>Current Limit Range</th>
<th>Current Limit Set Accuracy</th>
<th>Control Algorithm</th>
</tr>
</thead>
<tbody>
<tr>
<td>-99.9°C to 99.9°C</td>
<td>Bipolar, constant current source, all modules</td>
<td>-20°C to +20°C: 0.1°C ±0.2°C</td>
<td>-4 V DC</td>
<td>2 A</td>
<td>8 W</td>
<td>&lt;2 mA</td>
<td>0–2 A</td>
<td>0.05 A</td>
<td>Smart Integrator, Hybrid PI, all modules</td>
</tr>
<tr>
<td>-99.9°C to 99.9°C</td>
<td></td>
<td>+20°C to +50°C: 0.2°C ±0.2°C</td>
<td>-6 V DC</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>-99.9°C to 99.9°C</td>
<td></td>
<td>&lt; ±0.05°C</td>
<td>+6 V DC</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>-99.9°C to 99.9°C</td>
<td></td>
<td>&lt; ±0.05°C</td>
<td>+6 V DC</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>0°C to 99.9°C</td>
<td></td>
<td>&lt; ±0.05°C</td>
<td>+6 V DC</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**LDC Modular Laser Diode Controller**
### Specifications

#### TEMPERATURE SENSOR

<table>
<thead>
<tr>
<th></th>
<th>39420</th>
<th>39425</th>
<th>39427</th>
<th>39437</th>
<th>39440</th>
</tr>
</thead>
<tbody>
<tr>
<td>Types</td>
<td>Thermistor (2-wire NTC)</td>
<td>Thermistor (2-wire NTC)</td>
<td>Thermistor (2-wire NTC)</td>
<td>Thermistor (2-wire NTC)</td>
<td>Thermistor (2-wire NTC)</td>
</tr>
<tr>
<td>Thermistor Sensing Current</td>
<td>10/100 µA (user-selectable)</td>
<td>10/100 µA (user-selectable)</td>
<td>10/100 µA (user-selectable)</td>
<td>10/100 µA (user-selectable)</td>
<td>10/100 µA (user-selectable)</td>
</tr>
<tr>
<td>Usable Thermistor Range</td>
<td>25–450,000Ω</td>
<td>25–450,000Ω</td>
<td>25–450,000Ω</td>
<td>25–450,000Ω</td>
<td>25–450,000Ω</td>
</tr>
</tbody>
</table>

#### TEC MEASUREMENT (DISPLAY)

<table>
<thead>
<tr>
<th>Range</th>
<th>39420</th>
<th>39425</th>
<th>39427</th>
<th>39437</th>
<th>39440</th>
</tr>
</thead>
<tbody>
<tr>
<td>Temperature</td>
<td>–99.9°C to 99.9°C</td>
<td>–99.9°C to 99.9°C</td>
<td>–99.9°C to 99.9°C</td>
<td>–99.9°C to 99.9°C</td>
<td>–99.9°C to 99.9°C</td>
</tr>
<tr>
<td>Thermistor Resistance</td>
<td>±0.5°C</td>
<td>±0.5°C</td>
<td>±0.5°C</td>
<td>±0.5°C</td>
<td>±0.5°C</td>
</tr>
<tr>
<td>10 µA Setting</td>
<td>0.00–450.00 kΩ</td>
<td>0.00–450.00 kΩ</td>
<td>0.00–450.00 kΩ</td>
<td>0.00–450.00 kΩ</td>
<td>0.00–450.00 kΩ</td>
</tr>
<tr>
<td>100 µA Setting</td>
<td>0.000–45.000 kΩ</td>
<td>0.000–45.000 kΩ</td>
<td>0.000–45.000 kΩ</td>
<td>0.000–45.000 kΩ</td>
<td>0.000–45.000 kΩ</td>
</tr>
<tr>
<td>TE Current</td>
<td>–2.000 to 2.000 A</td>
<td>–2.000 to 2.000 A</td>
<td>–2.000 to 2.000 A</td>
<td>–2.000 to 2.000 A</td>
<td>–2.000 to 2.000 A</td>
</tr>
</tbody>
</table>

#### COMBINATION MODULES NOTES:

1. All values measured after 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 from resulting intensity fluctuations of a laser diode, measured optically with a 150 kHz bandwidth photo detector. Measurements made with 1 MHz detector are typically 10% higher.
5. ILX Lightwave model LNF-320 low-noise filter option may be used if lower noise performance is required.
6. Maximum output current transient resulting from normal operational situations (e.g., power on-off), as well as accidental situations (e.g., power line plug removal). For more information request ILX “Transient Test Standards” #LDC-00196.
8. Maximum monitor photodiode current drift over any 30-minute period. Constant-power mode stability specification assumes zero drift in detector responsivity.
9. Output current rated into a 1Ω load.
10. Measured at 25°C.
11. Software limits of range.
12. Accuracy figures quoted for a 10kΩ thermistor. Accuracy figures are relative to calibration standard. Both resolution and accuracy are dependent on the user-defined configuration of the instrument.
13. Over any one-hour period at 25°C. Short-term temperature stability is a strong function of the thermal environment of the thermistor and TE module. Room air currents in particular can easily cause fluctuations of 0.1°C in an exposed mounting configuration.
14. Over any 24 hour period at 25°C.

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