**16-Channel Laser Diode Controller**

**16-Channel Laser Diode Controller**

**Specifications**

**GENERAL**

**3916**

Chassis Ground: 4 mm Banana jack
GPIB Connector: 24-pin IEEE-488
RS-232 Connector: 9-pin D-sub
Power Requirements:* 110 - 130 VAC; 60 Hz / 210 - 240 VAC; 50 - 60 Hz

Size (HxWxD): 133 mm x 482 mm x 653 mm
5.25”x 18.98”x 25.7”

Weight (typical)
Mainframe only: 34.4 kg; 76 lbs.
With modules: 41 kg; 91 lbs.

Operating Temperature: 0°C to 40°C
Storage Temperature: -40°C to +70°C
Humidity:* 20-85%, non-condensing
Laser Safety Features: Keyswitch, Interlock, Output Delay

Display: Vacuum fluorescent, 64 x 128 pixels
83 mm x 41 mm

**NOTES**

1. All channels driving 6A
2. Based on the vacuum fluorescent display specification.

**ORDERING INFORMATION**

LDC-3916 16-Channel Laser Diode Controller Mainframe
LDC-391671 Fine Temperature Resolution 50mA/9W Controller Module
LDC-391672 50mA/9W Controller Module
LDC-391674 1A/9W Controller Module
LDC-391676 1.5A/9W Controller Module
LDC-391682 50mA/50mA Dual Current Source Module
LDC-391684 1A/1A Dual Current Source Module
LDC-391688 3A Current Source Module
LDC-391690 9W/9W Dual Temperature (TEC) Controller Module
LDC-391558 3A (24W) Temperature (TEC) Controller Module

RM-137 Rack Mount Kit, 20.5” hole spacing
RM-138 Rack Mount Kit, 25” hole spacing
CC-506S Current Source/Laser Diode Mount Interconnect Cable
CC-306S Current Source/Unterminated Interconnect Cable
CC-316L Laser Current Cables (Bundle of 8)
CC-501S TE Controller/Laser Diode Mount Interconnect Cable
CC-505S TE Controller/Laser Diode Mount Interconnect Cable
CC-516L TE Controller Cables (Bundle of 8)
LNF-320 Low Noise Filter
LDM-4616 16-Channel Laser Diode Mount
UCA-350 Unipolar Heater Control Adapter
LabVIEW® Instrument Driver; LabVIEW® is a registered trademark of National Instruments.

This product has passed all CE requirements and bears the CE mark.

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

**Product Features**

16 independent, isolated channels for laser and TEC control

Wide variety of laser controller modules (current and temperature) with up to 3A available per channel

Dual channel laser current or temperature control modules for control of up to 32 laser diodes on one mainframe

Laser current sources feature low noise and high stability and operate in constant current or constant power operating modes with direct modulation up to 1MHz

Temperature controllers operate in constant temperature or constant resistance mode with expanded gain setting from 1 to 127

GPIB / IEEE488 or RS-232 remote control interface

The LDC-3916 Laser Diode Controller offers 16 channels of laser diode current source and temperature control in a space-saving, rack-mountable instrument for simultaneous control of both current and temperature of up to 16 laser diodes in one mainframe. ILX Lightwave developed the LDC-3916 for multiple pump control in optical amplifier testing. The high stability, low noise, current, and temperature controllers also make the 3916 suitable for low-channel count burn-in systems or, coupled with ILX’s 16-channel laser diode mount, a 16-channel DBF source bank.

A wide variety of laser control modules are available, including laser controller modules, dual channel laser current source, and dual channel temperature control modules. Controller modules source up to 1.5A of laser current with an integrated 9W temperature controller. Dual laser current source modules, with two isolated outputs, source up to 1A per channel, while dual temperature control modules provide two independent 9W outputs for control of up to 32 laser diodes per mainframe.

Remote operation for independent control of all 16 channels is provided through in IEEE488 GPIB interface or RS-232 serial interface.
FRONT PANEL INTERFACE PROVIDES SIMPLE OPERATION

The bright vacuum fluorescent display is readable from almost any angle. Status screens show four channels at once and scroll both directions to view any channel easily. Monitoring operations, changing setpoints, and switching any output on or off can be done from the status menu. Plus, you can define any two parameters may be displayed on the status screen for each channel.

For initial or detailed setup, simple and intuitive menus supported by screen-specific soft keys quickly configure and operate each channel. Menu depths have been limited to keep the front panel operation concise, while more sophisticated operations are reserved for the GPIB interface. An “All Channel” menu facilitates initial setup, and ten storage bins allow you to save and recall all instrument settings. Setpoints and other values can be entered through a numeric keypad, up/down arrow keys, or the rotary adjustment knob.

POWERFUL GPIB INTERFACE

A powerful master processor platform drives the LDC-3916 controller, communicating with all sixteen microprocessor-controlled modules. When coupled with the H5488TNT chipset GPIB technology from National Instruments®, the LDC-3916 provides all of the necessary processing capabilities for automated production testing. With microprocessors on each module, the mainframe master manages 16 independent control channels quickly and reliably. Free LabVIEW® instrument drivers are available upon request or online at www.newport.com/ilxlightwave.

SUPPORT FUTURE SYSTEM EXPANSION

Designed to provide the most efficient and safest control available for multiple laser diodes, each module’s control functions are managed locally and communicated to the master processor. On-board intelligence simplifies future addition of modules since all operational and calibration data is stored in the module. Simply plug in the new module and power up the system. The mainframe never needs to leave the rack.

STATE-OF-THE-ART LASER DIODE CURRENT SOURCE

The LDC-3926 current source topology uses an innovative, proprietary control loop and incorporates the latest techniques for signal filtering and circuit board shielding. Adjustable voltage limit and faster shutoff help prevent dangerous reconnect transients that can occur from intermittent connections between controller and laser diode. Investment in this instrument provides assurance for safe, worry-free testing and control of higher power laser diodes.

Operational modes including constant current in low or high bandwidth or constant optical power are selectable from the front panel or via the remote interface. Measurement of the laser diode forward voltage is provided with 4-wire accuracy for protection environments where longer cable runs are common. A single, rear panel modulation port provides direct modulation of each channel’s laser current and supports external modulation bandwidths of up to 1MHz (lower current modules). Individual channel modulation ports are available upon request.

HIGH STABILITY TEC CONTROL

Achieve up to +0.007°C temperature stability with the low noise temperature controller modules. The temperature control circuits optimize temperature setting times with a smart integrator control loop with expanded gain setting ranges. All TEC control modules for the LDC-3916 include voltage measurement capabilities and internal thermistor current selectivity front panel or remotely for control over a wide temperature range.

FLEXIBLE CONTROL OVER A WIDE RANGE OF APPLICATIONS

By combining true modularity and high channel density, the LDC-3916 easily adapts to a wide variety of applications. This system can be used for controlling multiple pump lasers in amplifier test or low channel count burn-in applications. When coupled with ILX’s LDM-4616 16-channel laser diode mount, the LDC-3916 can provide a cost effective DWDM optical source test set. For picometer tuning of wavelengths, select the LDC-3916371 module with 0.01°C temperature setpoint resolution.

When coupled with the LDM-4616 Modular Laser Diode Mount, the LDC-3916 Multi-channel controller provides a configurable, cost-effective solution for multi-channel, DWDM signal sources. This mount can also support many popular 980nm and 1480nm pump laser diodes for EDFA test applications.

PROTECT YOUR INVESTMENT WITH THE LEADERS IN LASER DIODE PROTECTION

The LDC-3916 provides all of ILX Lightwave’s proven laser protection features like independent current limits, slow start turn-on circuits, and isolated power supplies. The adjustable laser voltage limit brings even greater levels of protection. If a temperature limit is reached, the TEC temperature control modules can be programmed to turn off any or all lasers in a mainframe.

Designed for production test, the LDC-3916 will satisfy higher power multiple laser diode operation with reliable and secure control.

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 LDC-3916 16-Channel Laser Diode Current Source, call us today or visit us online at www.newport.com/ilxlightwave.
FRONT PANEL INTERFACE PROVIDES SIMPLE OPERATION

The bright vacuum fluorescent display is readable from almost any angle. Status screens show four channels at once and scroll both directions to view any channel easily. Monitoring operations, changing setpoints, and switching any output on or off can be done from the status menu. Plus, you can define any two parameters may be displayed on the status screen for each channel.

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A powerful master processor platform drives the LDC-3916 controller, communicating with all sixteen microprocessor-controlled modules. When coupled with the HS488 TNT chipset GPIB technology from National Instruments®, the LDC-3916 provides all of the necessary processing capabilities for automated production testing. With microprocessors on each module, the mainframe master manages 16 independent control channels quickly and reliably. Free LabVIEW® instrument drivers are available upon request or online at www.newport.com/ilxlightwave.

SUPPORT FUTURE SYSTEM EXPANSION

Designed to provide the most efficient and safest control available for multiple laser diodes, each module’s control functions are managed locally and communicated to the master processor. On-board intelligence simplifies future addition of modules since all operational and calibration data is stored in the module. Simply plug in the new module and power up the system. The mainframe never needs to leave the rack.

STATE-OF-THE-ART LASER DIODE CURRENT SOURCE

The LDC-3926 current source topology uses an innovative, proprietary control loop and incorporates the latest techniques for signal filtering and circuit board shielding. Adjustable voltage limit and faster shutoff help prevent dangerous reconnect transients that can occur from intermittent connections between controller and laser diode. Investment in this instrument provides assurance for safe, worry-free testing and control of higher power laser diodes. Operational modes including constant current in low or high bandwidth or constant optical power are selectable from the front panel or via the remote interface. Measurement of the laser diode forward voltage is provided with 4-wire accuracy for protection environments where longer cable runs are common. A single, rear panel modulation port provides direct modulation of each channel’s laser current and supports external modulation bandwidths of up to 1MHz (lower current modules). Individual channel modulation ports are available on request.

HIGH STABILITY TEC CONTROL

Achieve up to +0.007°C temperature stability with the low noise temperature controller modules. The temperature control circuits optimize temperature settling times with a smart integrator control loop with expanded gain setting ranges. All TEC control modules for the LDC-3916 include voltage measurement capabilities and internal thermistor current selection via front panel or remotely for control over a wide temperature range.

FLEXIBLE CONTROL OVER A WIDE RANGE OF APPLICATIONS

By combining true modularity and high channel density, the LDC-3916 easily adapts to a wide variety of applications. This system can be used for controlling multiple pump lasers in amplifier test or low channel count burn-in applications. When coupled with ILX’s LDM-4616 16-channel laser diode mount, the LDC-3916 can provide a cost effective DWDM optical source test set. For picometer tuning of wavelengths, select the LDC-3916ST1 module with 0.01°C temperature setpoint resolution.

PROTECT YOUR INVESTMENT WITH THE LEADERS IN LASER DIODE PROTECTION

The LDC-3916 provides all of ILX Lightwave’s proven laser protection features like independent current limits, slow start turn-on circuits, and isolated power supplies. The adjustable laser voltage limit brings even greater levels of protection. If a temperature limit is reached, the TEC temperature control modules can be programmed to turn off any or all lasers in a mainframe.

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PUT OUR EXPERTISE TO WORK

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For more information about the LDC-3916 16-Channel Laser Diode Current Source, call us today or visit us online at www.newport.com/ilxlightwave.
Specifications

**GENERAL**

- **Chassis Ground:** 4 mm Banana jack
- **GPIB Connector:** 24-pin IEEE-488
- **RS-232 Connector:** 9-pin D-sub
- **Power Requirements:**
  - 110 - 130 VAC, 60 Hz / 210 - 240 VAC, 50 - 60 Hz
  - Selectable voltage
- **Size (HxWxD):** 133 mm x 482 mm x 653 mm
  - 5.25" x 18.98" x 25.77"

- **Weight (typical):**
  - Mainframe only: 34.4 kg / 76 lbs.
  - With modules: 41 kg / 91 lbs.

- **Operating Temperature:** 0°C to 40°C
- **Storage Temperature:** -40°C to +70°C
- **Humidity:**
  - 20-85%, non-condensing
  - laser safety features: keyswitch, interlock, output delay
- **GPIB / IEEE488 or RS-232 remote control interface**

**NOTES**

1. All channels driving 6A.
2. Based on the vacuum fluorescent display specification.

**ORDERING INFORMATION**

- **LDC-3916**
  - 16-Channel Laser Diode Controller Mainframe

- **LDC-3916371**
  - Fine Temperature Resolution 50mA/9W Controller Module

- **LDC-3916372**
  - 50mA/9W Controller Module

- **LDC-3916374**
  - 1A/9W Controller Module

- **LDC-3916376**
  - 1.5A/9W Controller Module

- **LDC-391632**
  - 50mA/50mA Dual Current Source Module

- **LDC-391634**
  - 1A/1A Dual Current Source Module

- **LDC-391638**
  - 3A Current Source Module

- **LDC-391630**
  - 9W/9W Dual Temperature (TEC) Controller Module

- **LDC-391558**
  - 3A (24W) Temperature (TEC) Controller Module

- **RM-137**
  - Rack Mount Kit, 20.5" hole spacing

- **RM-138**
  - Rack Mount Kit, 25" hole spacing

- **CC-306S**
  - Current Source/Laser Diode Mount Interconnect Cable

- **CC-306E**
  - Current Source/Unterminated Interconnect Cable

- **CC-316M**
  - Laser Current Cables (Bundle of 8)

- **CC-911S**
  - TE Controller/Laser Diode Mount Interconnect Cable

- **CC-605S**
  - TE Controller/Laser Diode Mount Interconnect Cable

- **CC-516M**
  - TE Controller Cables (Bundle of 8)

- **LNF-320**
  - Low Noise Filter

- **LDM-4616**
  - 16-Channel Laser Diode Mount

- **UCA-350**
  - Unipolar Heater Control Adapter

- **LabVIEW** Instrument Driver: LabVIEW® is a registered trademark of National Instruments.

**NOTES**

- This product has passed all CE requirements and bears the CE mark.
- In keeping with our commitment to continuous improvement, ILX Lightwave reserves the right to change specifications without notice and without liability for such changes.

**PRODUCT FEATURES**

- **16 independent, isolated channels for laser and TEC control**
- **Wide variety of laser controller modules (current and temperature) with up to 3A available per channel**
- **Dual channel laser current or temperature control modules for control of up to 32 laser diodes on one mainframe**
- **Laser current sources feature low noise and high stability and operate in constant current or constant power operating modes with direct modulation up to 1MHz**
- **Temperature controllers operate in constant temperature or constant resistance mode with expanded gain setting from 1 to 127**
- **GPIB / IEEE488 or RS-232 remote control interface**

The LDC-3916 Laser Diode Controller offers 16 channels of laser diode current source and temperature control in a space-saving, rack-mountable instrument for simultaneous control of both current and temperature of up to 16 laser diodes in one mainframe. ILX Lightwave developed the LDC-3916 for multiple pump control in optical amplifier testing. The high stability, low noise, current, and temperature controllers also make the 3916 suitable for low-channel count burn-in systems or, coupled with ILX’s 16-channel laser diode mount, a 16-channel DFB source bank.

A wide variety of laser control modules are available, including laser controller modules, dual channel laser current source, and dual channel temperature control modules. Controller modules source up to 1.5A of laser current with an integrated 9W temperature controller. Dual laser current source modules, with two isolated outputs, source up to 1A per channel, while dual temperature control modules provide two independent 9W outputs for control of up to 32 laser diodes per mainframe.

Remote operation for independent control of all 16 channels is provided through the IEEE488 GPIB interface or RS-232 serial interface.
### Specifications

#### TEMPERATURE CONTROL MODULES (CONTINUED)

<table>
<thead>
<tr>
<th>Module Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>391650 DUAL 9W</td>
<td>Thermistor (2-wire NTC) 3916558 SINGLE 2.4W (3A)</td>
</tr>
</tbody>
</table>

#### TEMPERATURE SENSOR

<table>
<thead>
<tr>
<th>Type</th>
<th>Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>Thermistor (2-wire NTC)</td>
<td>25-450,000, typical</td>
</tr>
<tr>
<td>User Calibration</td>
<td>Steinhart-Hart, 3 constants</td>
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</table>

#### TEMPERATURE CONTROL

<table>
<thead>
<tr>
<th>Module Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>3916558 SINGLE 2.4W (3A)</td>
<td>Thermistor (2-wire NTC) 3916550 DUAL 9W</td>
</tr>
</tbody>
</table>

#### CURRENT SOURCE MODULES

<table>
<thead>
<tr>
<th>Module Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>391632* DUAL 500mA</td>
<td>0-500 mA 0-1000 mA 0-3000 mA</td>
</tr>
<tr>
<td>391634* DUAL 1A</td>
<td>10A 20A 80A</td>
</tr>
<tr>
<td>391635* SINGLE 3A</td>
<td>50mA 1A 3A</td>
</tr>
</tbody>
</table>

#### LASER CURRENT OUTPUT

<table>
<thead>
<tr>
<th>Module Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>391635* SINGLE 3A</td>
<td>50mA 1A 3A</td>
</tr>
</tbody>
</table>

#### LASER DRIVE LIMIT SETTINGS

<table>
<thead>
<tr>
<th>Module Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>391635* SINGLE 3A</td>
<td>2.00mA 4.0mA 12.0mA</td>
</tr>
</tbody>
</table>

#### PHOTODIODE FEEDBACK

<table>
<thead>
<tr>
<th>Module Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>391635* SINGLE 3A</td>
<td>Differential 10k input, Selectable Zero-Bias, or 5V Reverse Bias</td>
</tr>
</tbody>
</table>

#### LASER DRIVER MEASUREMENTS

<table>
<thead>
<tr>
<th>Module Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>391635* SINGLE 3A</td>
<td>0.00-1000.00 µA/mW 0.00-1000.00 µA/mW 0.00-1000.00 µA/mW</td>
</tr>
</tbody>
</table>

#### LASER DRIVER PERFORMANCE

<table>
<thead>
<tr>
<th>Module Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>391635* SINGLE 3A</td>
<td>+10% +10% +10%</td>
</tr>
</tbody>
</table>

#### LASER DRIVER MEASUREMENTS (DISPLAY)

<table>
<thead>
<tr>
<th>Module Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>391635* SINGLE 3A</td>
<td>0.00-1000.00 µA/mW 0.00-1000.00 µA/mW 0.00-1000.00 µA/mW</td>
</tr>
</tbody>
</table>

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**Specifications**

### Laser Diode Controller Module

<table>
<thead>
<tr>
<th>Model</th>
<th>Laser Diode Current (mA)</th>
<th>Laser Diode Power (W)</th>
</tr>
</thead>
<tbody>
<tr>
<td>3916571/572</td>
<td>0-500</td>
<td>0-1000</td>
</tr>
<tr>
<td>3916574/576</td>
<td>1A</td>
<td>1A</td>
</tr>
</tbody>
</table>

#### Laser Current Output
- **Current Range:** 0-500 mA, 0-1000 mA, 0-1500 mA
- **Accuracy:** ±0.05% of FS

#### Laser Drive Limit Settings
- **Current Range:** 0-500 mA, 0-1000 mA, 0-1500 mA
- **Resolution:** 0.01 mA
- **Accuracy:** ±0.05% of FS

#### Photodiode Feedback
- **Current Range:** 0-500 mA, 0-1000 mA, 0-1500 mA
- **Resolution:** 0.01 mA
- **Accuracy:** ±0.05% of FS

#### Temperature Control Output
- **Range:** -99°C to 150°C
- **Resolution:** 0.1°C
- **Accuracy:** ±0.2°C
- **Short Term Stability:** <0.007°C
- **Long Term Stability:** <0.01°C

#### Temperature Control Modules
- **Range:** -99°C to 150°C
- **Resolution:** 0.1°C
- **Accuracy:** ±0.2°C
- **Short Term Stability:** <0.007°C
- **Long Term Stability:** <0.01°C

---

### Notes
- For more detailed specifications, consult the manufacturer's documentation.
- Temperature control and laser drive limits are adjustable over a wide range.
- Photodiode feedback provides accurate monitoring of laser output power.
- Temperature stability is maintained within ±0.05°C over time.

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**N.B.** All specifications are subject to change without notice. Please refer to the latest product manual for the most accurate information.
**Specifications**

**LASER DIODE CONTROLLER MODULE**

<table>
<thead>
<tr>
<th>Model</th>
<th>Laser Diode</th>
<th>Current Limit Range</th>
<th>Resolution (mA)</th>
<th>Setpoint Accuracy (°C)</th>
<th>Short Term Stability (1 hr.)</th>
<th>Long Term Stability (24 hrs.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>3916571 / 3916572</td>
<td>3916372</td>
<td>0–500 mA</td>
<td>0.1 mA</td>
<td>+0.05% of FS</td>
<td>&lt;+0.007 °C</td>
<td>&lt;±0.007 °C</td>
</tr>
<tr>
<td>3916574</td>
<td>3916374</td>
<td>0–1000 mA</td>
<td>0.2 mA</td>
<td>+0.1 °C</td>
<td>&lt;+0.007 °C</td>
<td>&lt;±0.007 °C</td>
</tr>
<tr>
<td>3916576</td>
<td>3916376</td>
<td>0–1500 mA</td>
<td>0.5 mA</td>
<td>+0.2 °C</td>
<td>&lt;+0.007 °C</td>
<td>&lt;±0.007 °C</td>
</tr>
</tbody>
</table>

**Temperature Control Output**

- Temperature Control Range: -99 °C to 150 °C
- Temperature Setpoint Resolution: 0.1 °C
- Accuracy (20 °C to 20 °C): ±0.1 °C
- Resolution (20 °C to 50 °C): ±0.2 °C
- Accuracy (50 °C to 90 °C): ±0.5 °C
- Short Term Stability (1 hr.): <±0.007 °C
- Long Term Stability (24 hrs.): <±0.01 °C

**Output Types**

- Compliance Voltage: >7V DC
- Maximum Output Current: 1.5A
- Maximum Output Power: 9W
- Current Noise and Ripple: <1mA rms
- Current Limit Range: 0–1.5A
- Current Limit Accuracy: ±0.05A
- Control Algorithm: Smart Integrator, Hybrid PI

**TEMPERATURE SENSOR**

- Thermistor (2-wire NTC)
- Thermistor Sensing Current: 100mA
- Usable Thermistor Range: 25-450 °C, typical 2, 35-45 °C, typical
- Thermistor Resistance Range (10 mA setting): 0.01% ±50k
- Thermistor Accuracy (100 mA setting): ±0.005k
- TEC Current Range: -1.50 to 1.50A
- TEC Current Accuracy: ±0.004A
- TEC Current Resolution: ±0.001A
- Voltage Range: -9.999 to 9.999V
- Voltage Resolution: ±10mV (1mV through GPIB)
- Voltage Accuracy: ±10mV (±25mV in GPIB)

**TEMPERATURE CONTROL MODULES**

<table>
<thead>
<tr>
<th>Model</th>
<th>Laser Diode</th>
<th>Current Limit Range</th>
<th>Resolution (mA)</th>
<th>Setpoint Accuracy (°C)</th>
<th>Short Term Stability (1 hr.)</th>
<th>Long Term Stability (24 hrs.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>3916572</td>
<td>3916372</td>
<td>0–500 mA</td>
<td>0.1 mA</td>
<td>+0.05% of FS</td>
<td>&lt;±0.007 °C</td>
<td>&lt;±0.007 °C</td>
</tr>
<tr>
<td>3916574 1A/9W</td>
<td>3916374 1A/9W</td>
<td>0–1000 mA</td>
<td>0.2 mA</td>
<td>±0.1 °C</td>
<td>&lt;+0.007 °C</td>
<td>&lt;±0.007 °C</td>
</tr>
<tr>
<td>3916576 1.5A/9W</td>
<td>3916376 1.5A/9W</td>
<td>0–1500 mA</td>
<td>0.5 mA</td>
<td>±0.2 °C</td>
<td>&lt;+0.007 °C</td>
<td>&lt;±0.007 °C</td>
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**Temperature Control Output**

- Temperature Control Range: -99 °C to 150 °C
- Temperature Setpoint Resolution: 0.1 °C
- Accuracy (20 °C to 20 °C): ±0.1 °C
- Resolution (20 °C to 50 °C): ±0.2 °C
- Accuracy (50 °C to 90 °C): ±0.5 °C
- Short Term Stability (1 hr.): <±0.007 °C
- Long Term Stability (24 hrs.): <±0.01 °C

**Output Types**

- Compliance Voltage: >7V DC
- Maximum Output Current: 1.5A
- Maximum Output Power: 9W
- Current Noise and Ripple: <1mA rms
- Current Limit Range: 0–1.5A
- Current Limit Accuracy: ±0.05A
- Control Algorithm: Smart Integrator, Hybrid PI

**External Analog Modulation**

- Transfer Function: 50 mA/kV
- Small Signal Bandwidth: DC to 1.2MHz
- Large Signal Bandwidth: DC to 1.0MHz
- Low Bandwidth Mode: DC to 30kHz

**Laser Current Measurement (Display)**

<table>
<thead>
<tr>
<th>Model</th>
<th>Laser Diode</th>
<th>Output Current Range</th>
<th>Resolution (mA)</th>
<th>Setpoint Accuracy (°C)</th>
<th>Short Term Stability (1 hr.)</th>
<th>Long Term Stability (24 hrs.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>3916572</td>
<td>3916372</td>
<td>0–500 mA</td>
<td>0.1 mA</td>
<td>±0.05% of FS</td>
<td>&lt;+0.007 °C</td>
<td>&lt;±0.007 °C</td>
</tr>
<tr>
<td>3916574 1A/9W</td>
<td>3916374 1A/9W</td>
<td>0–1000 mA</td>
<td>0.2 mA</td>
<td>±0.1 °C</td>
<td>&lt;+0.007 °C</td>
<td>&lt;±0.007 °C</td>
</tr>
<tr>
<td>3916576 1.5A/9W</td>
<td>3916376 1.5A/9W</td>
<td>0–1500 mA</td>
<td>0.5 mA</td>
<td>±0.2 °C</td>
<td>&lt;+0.007 °C</td>
<td>&lt;±0.007 °C</td>
</tr>
</tbody>
</table>
### Specifications

#### TEMPERATURE CONTROL MODULES (CONTINUED)

<table>
<thead>
<tr>
<th>391650 DUAL 9W</th>
<th>391658 SINGLE 2.4W (3A)</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th><strong>TEMPERATURE SENSOR</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Types:</td>
</tr>
<tr>
<td>Thermistor Sensing Current:</td>
</tr>
<tr>
<td>Usable Thermistor Range:</td>
</tr>
<tr>
<td>User Calibration:</td>
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</table>

<table>
<thead>
<tr>
<th><strong>TEC MEASUREMENT (DISPLAY)</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Temperature Range:</td>
</tr>
<tr>
<td>Temperature Accuracy:</td>
</tr>
<tr>
<td>Thermistor Resistance:</td>
</tr>
<tr>
<td>Thermistor Sensing Current:</td>
</tr>
<tr>
<td>TEC Current Range:</td>
</tr>
<tr>
<td>TEC Current Accuracy:</td>
</tr>
<tr>
<td>Voltage Range:</td>
</tr>
<tr>
<td>Voltage Resolution:</td>
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<tr>
<td>Voltage Accuracy:</td>
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#### CURRENT SOURCE MODULES

<table>
<thead>
<tr>
<th>391632* DUAL 500mA</th>
<th>391634* DUAL 1A</th>
<th>391635* SINGLE 3A</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th><strong>LASER CURRENT OUTPUT</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Output Current Range:</td>
</tr>
<tr>
<td>Setpoint Resolution:</td>
</tr>
<tr>
<td>Setpoint Accuracy:</td>
</tr>
<tr>
<td>Compliance Voltage:</td>
</tr>
<tr>
<td>Temperature Coefficient:</td>
</tr>
<tr>
<td>Short Term Stability (1 hr.):</td>
</tr>
<tr>
<td>Long Term Stability (24 hrs.):</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>LASER DRIVE LIMIT SETTINGS</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Current Limit Range:</td>
</tr>
<tr>
<td>Voltage Limit Range:</td>
</tr>
<tr>
<td>Laser Drive Voltage Limit:</td>
</tr>
<tr>
<td>Laser Drive Voltage Accuracy:</td>
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</table>

<table>
<thead>
<tr>
<th><strong>PHOTODIODE FEEDBACK</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Photodiode Current Range:</td>
</tr>
<tr>
<td>Output Stability:</td>
</tr>
<tr>
<td>Setpoint Accuracy:</td>
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</table>

<table>
<thead>
<tr>
<th><strong>EXTERNAL ANALOG MODULATION</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Input:</td>
</tr>
<tr>
<td>Transfer Function:</td>
</tr>
<tr>
<td>High Bandwidth Mode:</td>
</tr>
<tr>
<td>Low Bandwidth Mode:</td>
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<table>
<thead>
<tr>
<th><strong>LASER CURRENT MEASUREMENT (DISPLAY)</strong></th>
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<tbody>
<tr>
<td>Output Current Range:</td>
</tr>
<tr>
<td>Output Resolution:</td>
</tr>
<tr>
<td>Output Current Accuracy:</td>
</tr>
<tr>
<td>Photodiode Current Range:</td>
</tr>
<tr>
<td>Resolution:</td>
</tr>
<tr>
<td>Accuracy:</td>
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</table>

<table>
<thead>
<tr>
<th><strong>LASER DRIVE REPLACEMENT NOTES</strong></th>
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<tbody>
<tr>
<td>Over any one-hour warm-up period.</td>
</tr>
<tr>
<td>Over any one-hour warm-up period.</td>
</tr>
<tr>
<td>Over any 24-hour period, half-scale output.</td>
</tr>
<tr>
<td>Over any 24-hour period, half-scale output.</td>
</tr>
<tr>
<td>Measured at 1mA output over a bandwidth of 10Hz to 10MHz.</td>
</tr>
</tbody>
</table>