LDC 3908

8 Channel Laser Diode Controller

Product Features

Mainframe
8 independent channels with up to 16 isolated outputs

Fast GPIB/IEEE-488 interface

"Smart" modules for flexibility and speed

Laser Current Sources
High compliance voltage

Direct modulation up to 1.2MHz

Four-wire measurement of laser diode forward voltage

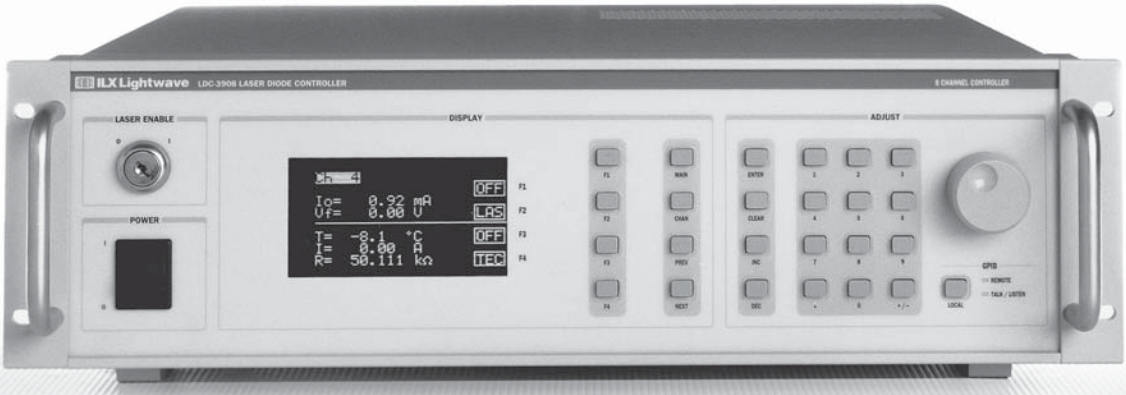
Advanced laser protection features including adjustable voltage limit

TEC Controllers
TEC voltage measurement

Resistive heater control adapters available

The LDC-3908 8-Channel Laser Diode Controller has all of the same great features as our popular LDC-3916 16-Channel Laser Diode Controller. In fact, modules are interchangeable between the two instruments. The smaller size and lighter weight of the LDC-3908 make it an ideal instrument for smaller channel count applications such as R&D or production test of EDFAs and Raman amplifiers.

Handles on the front panel and flip-up feet on the bottom facilitate bench-top use, while flanges facilitate installation into standard 19 inch instrument racks. "Smart" modules include controller modules with up to 1.5A of laser current source and 9W of TEC control, dual current source modules with two isolated currents of up to 1A, a dual 9W TEC module, a 3A laser current module, and a 3A 24W TEC module.



8 Channels of Laser Diode Control

ILX Lightwave
Laser Diode Instrumentation & Test Systems

LDC 3908

8 Channel Laser Diode Controller

Front Panel Interface Provides Simple Operation

The front-panel interface features a bright vacuum fluorescent display, making the information readable from almost any angle. You can easily monitor the operations of up to four channels at a time. Simple and intuitive menus, supported by screen-specific soft-keys, allow you to quickly configure and operate each channel. Menu depths have been intentionally limited to keep the front-panel operation concise, while more sophisticated operations are reserved for the GPIB interface. Setpoints and other values can be entered through your choice of numeric keypad entry, up-down arrow keys, or a rotary adjustment knob.

Powerful GPIB Interface Offers Robust, Automated Control

A powerful processor platform drives the LDC-3908 8 Channel Laser Diode Controller. When coupled with GPIB technology from National Instruments' HS488 TNT chipset, you get all the processing capability needed for mission-critical production testing. With microprocessors on each module, the mainframe engine manages 8 independent control channels quickly and reliably. Free LabVIEW® instrument drivers are available upon request or by downloading them from www.ilxlightwave.com.

High Performance Modules Support Future System Expansion

Designed to provide the cleanest, safest power available for laser diode control, each module's control functions are handled locally and communicated quickly to the host processor. On-board intelligence simplifies future addition of modules since all operational and calibration data is stored in the module. Simply plug in your new module and power up the system. Your mainframe never needs to leave the rack. This simplicity, coupled with low noise, high stability outputs, and state-of-the-art laser diode protection equals ultimate performance.

State-of-the-Art Current Source Design Brings New Levels of Performance

This new current source topology uses an innovative, proprietary control loop and incorporates the latest techniques for signal filtering and circuit board shielding. These advancements provide unbeatable stability and unparalleled noise performance, ideal for the most demanding production test applications. This design also incorporates adjustable compliance voltage and faster shutoff, helping prevent dangerous "reconnect" transients that can occur from intermittent connections between the controller and your laser diode. This new level of protection adds to our proven list of protection features: independent current limits, output shorting circuits, and a slow start turn-on feature.

New Capabilities from the Flexible Current Source You Trust

Operational modes including constant current, constant current high-bandwidth, or constant optical power are selectable from the front panel or via the GPIB interface. Measurement of your laser diode's forward voltage is possible with 4-wire accuracy, which can be helpful in production environments where longer cable runs are common. A single, rear-panel modulation port can individually enable direct modulation of each channel's laser current. This new current source design supports modulation bandwidths of up to 1.2MHz (small signal), achieving the highest direct modulation levels available today. Modules also include reverse photodiode bias capabilities, especially important for telecom wavelength devices.

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8 Channel Laser Diode Controller

High-Stability TEC Control Keeps Your Device Temperature in Check

Equipped with a smart integrator control loop and an expanded gain setting range, the temperature control circuits optimize settling times. These modules also provide voltage measurement of your TEC and allow internal selection of thermistor current ranges via front-panel or GPIB. Achieve unparalleled temperature stabilities with ultra-stable design topology and low noise bipolar output stages.

Flexible Control Over a Wide Range of Applications

By combining true modularity with high channel density, the LDC-3908 easily grows with your applications. When coupled with our 16-channel mounting tray, this controller also serves as a cost effective DWDM optical source set. Simply mount your choice of WDM DFB laser diodes in the mounting tray, connect to the controller, and you'll have full control over 8 WDM signal sources at a time. If your specified test wavelengths change, simply drop in new DFB laser diodes. For even higher channel counts, add another controller and mounting tray to your rack. If your device drive specifications change, look to ILX Lightwave for new modules that can be easily added to your system in the future.

Protect Your Investment with the Leader in Laser Diode Protection

The LDC-3908 8 Channel Controller 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 compliance voltage capability brings even greater levels of protection to your devices. Designed for time-critical production test needs, the LDC-3908 will satisfy your test requirements with fast, reliable, and secure laser diode control.

** 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."*

LDC 3908

8 Channel Laser Diode Controller

Specifications[1]

Fine Temperature Resolution Controller Module

CURRENT SOURCE[1]	3916371 500mA/9W
LASER CURRENT OUTPUT	
Output Current Range:	0–500mA
Setpoint	
Resolution:	10µA
Accuracy:	±0.1% of FS
Compliance Voltage:	>6V (adjustable voltage limit)
Temperature Coefficient:	<50ppm/°C
Short-Term Stability (one-hour):[2]	<20ppm
Long-Term Stability (24 hours):[3]	<50ppm
Noise and Ripple[4]	
High bandwidth:	<10µA rms
Low bandwidth:	<5µA rms
Transients	
Operational:[5]	<3mA
1kV EFT:	<4mA
Surge:[6]	<8mA
LASER DRIVE LIMIT SETTINGS	
Current Limit	
Range:	0–500mA
Resolution:	0.2mA
Accuracy:	±0.7mA
Voltage Limit	
Range:	0–7.5V
Resolution:	0.1V
PHOTODIODE FEEDBACK	
Type:	Differential 10Ω Input. Selectable Zero Bias or 5 V Reverse Bias
Photodiode Current Range:	0–5000µA
Output Stability:[7]	0.01%
Setpoint Accuracy:	±0.1% of FS
EXTERNAL ANALOG MODULATION	
Input:[8]	0–10V, 50Ω
Transfer Function:	50mA/V
High Bandwidth Mode	
Small Signal Bandwidth:[9]	DC to 1.2MHz
Large Signal Bandwidth:[10]	DC to 1.0MHz
Low Bandwidth Mode:	DC to 30kHz
LASER CURRENT MEASUREMENT (DISPLAY)	
Output Current	
Range:	0–500.00mA
Resolution:	0.01mA
Accuracy (at 25°C):	±0.05% of FS
Photodiode Current	
Range:	0–5000µA
Resolution:	0.1µA
Accuracy:	±2µA (at 25°C)
Photodiode Responsivity	
Range:[11]	0.00–1000.00µA/mW
Resolution:	0.01µA/mW
Optical Power	
Range:	0.00–5000.0mW
Resolution:	100µW
Forward Voltage	
Range:	0.00–7.5V
Resolution:	10mV
Accuracy:[12]	±7mV

TEMPERATURE CONTROL[1]	3916371 500mA/9W
TEMPERATURE CONTROL OUTPUT	
Temperature Control Range:[2]	-5°C to 50°C
Thermistor Setpoint	
Resolution:	0.01°C
Accuracy:[3]	±0.2°C
Short-Term Stability (1 hr.):[4]	<±0.007°C
Long-Term Stability (24 hrs.):[5]	<±0.01°C
Output Type:	Bipolar current source
Compliance Voltage:	>7V DC
Maximum Output Current:	1.5A
Maximum Output Power:	9W
Current Noise and Ripple:[6]	<1mA rms
Current Limit	
Range:	0–1.5A
Set Accuracy:	±0.05A
Control Algorithm:	Smart Integrator, Hybrid PI, Gain adjustable from 1–127
TEMPERATURE SENSOR	
Types:	Thermistor (2-wire NTC)
Thermistor Sensing Current:	100µA
Usable Thermistor Range:	5100–13,000Ω, typical
User Calibration:	Steinhart-Hart, 3 constants
TEC MEASUREMENT (DISPLAY)	
Temperature	
Range:[7]	–99.9°C to 199.9°C
Accuracy:[3]	±0.5°C
Thermistor Resistance	
Range:	5100–13,000Ω
Accuracy:	±5Ω
TEC Current	
Range:	–1.50 to 1.50A
Accuracy:	±0.04A
Voltage	
Range:	–9.999 to 9.999V
Resolution:	100mV (1mV in GPIB)
Accuracy:[8]	±70mV (±20mV in GPIB)

NOTES

The 3916371 Laser Current Source specifications are the same as the 3916372 Controller Module specifications.

Current Source Notes and Temperature Control Notes are on the following pages.

LDC 3908

8 Channel Laser Diode Controller

Specifications[1]

3 Amp Current Source Module

CURRENT SOURCE 3916338 Single 3A

LASER CURRENT OUTPUT

Output Current Range:	0–3000mA
Setpoint	
Resolution:	80µA
Accuracy:[2]	±0.1% of FS
Compliance Voltage:	4.5V (adjustable voltage limit)
Temperature Coefficient:	≤100ppm/°C
Short-Term Stability (one-hour):[3]	≤50ppm
Long-Term Stability (24-hour):[4]	≤75ppm
Noise and Ripple[5]	
High bandwidth:	<36µA rms
Low bandwidth:	<24µA rms
Transients	
Operational:[6]	<5mA
1kV EFT/Surge:[7]	<5mA/<10 mA

LASER DRIVE LIMIT SETTINGS

Current Limit	
Range:	0–3000mA
Resolution:	1.025mA
Accuracy:	±9mA
Voltage Limit	
Range:	0–7.5V
Resolution:	0.2V
Accuracy:	±0.2V

PHOTODIODE FEEDBACK

Type:	Differential 10Ω Input. Selectable Zero Bias or 5V Reverse Bias
Photodiode Current Range:	0–5000µA
Output Stability:[8]	±0.01%
Accuracy, Setpoint:	±0.1% of FS

EXTERNAL ANALOG MODULATION

Input:[9]	0–8.0V, 50Ω
Transfer Function:	375mA/V ±10%
High Bandwidth Mode	
Small Signal Bandwidth:[10]	DC to 0.6MHz
Large Signal Bandwidth:[11]	DC to 0.6MHz
Low Bandwidth Mode:	DC to 30kHz

LASER CURRENT MEASUREMENT (DISPLAY)

Output Current	
Range:	0–3000.0mA
Resolution:	0.01mA
Accuracy (at 25°C):	±0.07% of FS
Photodiode Current	
Range:	0–5000µA
Resolution:	0.1µA
Accuracy (at 25°C):	±2µA
Photodiode Responsivity	
Range:[12]	0.00–1000.00µA/mW
Resolution:	0.01µA/mW
Optical Power	
Range:	0.0–5000.0mW
Resolution:	100µW
Forward Voltage	
Range:	0.00–7.5V
Resolution:	10 mV (1mV GPIB)
Accuracy:[13]	±7mV (±2mV GPIB)

CURRENT SOURCE NOTES

1 All values relate to a one-hour warm-up period.
2 Accuracy is 0.15% above 2.5A after one-hour warm-up period.
3 Over any one-hour period, half-scale output.
4 Over any 24-hour period, half-scale output.
5 Measured optically, evaluating noise intensity of a laser diode into a photodetector with 150kHz bandwidth.
6 Maximum output current transient resulting from normal operational situations (e.g. power on-off, current on-off), as well as accidental situations (e.g. power line plug removal).
7 Maximum output current transient resulting from a 1000V power-line transient spike. Tested to ILX Lightwave Technical Standard #LDC-00196. Request ILX Application Note #3, "Protecting Your Laser Diode".
8 Maximum monitor photodiode current drift over any 30-minute period. Assumes zero drift in responsivity of photodiode.
9 Modulation input is 50Ω terminated inside the mainframe.
10 250mA setpoint, 50mA modulation current, 1Ω load. High bandwidth mode.
11 50% modulation at mid-scale output, 1Ω load. High bandwidth mode.
12 Responsivity value is user-defined and is used to calculate the optical power.
13 Four-wire voltage measurement while driving calibration load. Specification valid for values above 10mV.

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LDC 3908

8 Channel Laser Diode Controller

Specifications

Controller Modules (Laser and TE Control)

CURRENT SOURCE[1]	3916372 500mA/9W	3916374 1A/9W	3916376 1.5A/9W
LASER CURRENT OUTPUT			
Output Current Range:	0–500mA	0–1000mA	0–1500mA
Setpoint			
Resolution:	10µA	20µA	40µA
Accuracy:	±0.1% of FS	±0.1% of FS	±0.1% of FS
Compliance Voltage:	6V (adjustable voltage limit)	6V (adjustable voltage limit)	4.75V (adjustable voltage limit)
Temperature Coefficient:	≤50ppm/°C	≤50ppm/°C	≤50ppm/°C
Short-Term Stability (one-hour):[2]	≤20ppm	≤20ppm	≤20ppm
Long-Term Stability (24-hour):[3]	≤50ppm	≤50ppm	≤50ppm
Noise and Ripple[4]			
High Bandwidth:	<10µA rms	<10µA rms	<12µA rms
Low Bandwidth:	<5µA rms	<5µA rms	<8µA rms
Transients			
Operational:[5]	<3mA	<3mA	<3mA
1kV EFT:	<4mA	<5mA	<5mA
Surge:[6]	<8mA	<10mA	<10mA
LASER DRIVE LIMIT SETTINGS			
Current Limit			
Range:	0–500mA	0–1000mA	0–1500mA
Resolution:	0.2mA	0.4mA	0.6mA
Accuracy:	±0.7mA	±1.4mA	±4.5mA
Voltage Limit			
Range:	0–7.5V	0–7.5V	0–7.5V
Resolution:	0.1V	0.1V	0.1V
Accuracy:	±0.2V	±0.2V	±0.2V
PHOTODIODE FEEDBACK			
Type:	Differential 10Ω Input, Selectable Zero Bias or 5V Reverse Bias on all modules		
Photodiode Current Range:	0–5000µA	0–5000µA	0–5000µA
Output Stability:[7]	±0.01%	±0.01%	±0.01%
Setpoint Accuracy:	±0.1% of FS	±0.1% of FS	±0.1% of FS
EXTERNAL ANALOG MODULATION			
Input:[8]	0–10V, 50Ω	0–10V, 50Ω	0–7.5V, 50Ω
Transfer Function:	50mA/ V	100mA/ V	200mA/ V
High Bandwidth Mode			
Small Signal Bandwidth:[9]	DC to 1.2 MHz	DC to 1.0MHz	DC to 0.9MHz
Large Signal Bandwidth:[10]	DC to 1.0MHz	DC to 1.0MHz	DC to 0.9MHz
Low Bandwidth Mode:	DC to 30kHz	DC to 30kHz	DC to 30kHz
LASER CURRENT MEASUREMENT (DISPLAY)			
Output Current			
Range:	0–500.00mA	0–1000.0mA	0–1500.0mA
Resolution:	0.01mA	0.01mA	0.03mA
Accuracy (@25°C):	±0.05% of FS	±0.05% of FS	±0.07% of FS
Photodiode Current			
Range:	0–5000µA	0–5000µA	0–5000µA
Resolution:	0.1µA	0.1µA	0.1µA
Accuracy (@25°C):	±2µA	±2µA	±2µA
Photodiode Responsivity			
Range:[11]	0.0–1000.00µA/mW	0.0–1000.00µA/mW	0.0–1000.00µA/mW
Resolution:	0.01µA/mW	0.01µA/mW	0.01µA/mW
Optical Power			
Range:	0.0–5000.00mW	0.0–5000.00mW	0.0–5000.00mW
Resolution:	100µW	100µW	100µW
Forward Voltage			
Range:	0.00–7.5V	0.00–7.5V	0.00–5V
Resolution:	10mV (1mV through GPIB)	10mV (1mV through GPIB)	10mV (1mV through GPIB)
Accuracy:[12]	±7mV (±2mV through GPIB)	±7mV (±2mV through GPIB)	±7mV (±2mV through GPIB)

CURRENT SOURCE NOTES

1 All values relate to 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 optically, evaluating noise intensity of a laser diode into a photodetector with 150kHz bandwidth.
5 Maximum output current transient resulting from normal operational situations (e.g., power on-off, current on-off), as well as accidental situations (e.g., power line plug removal).
6 Maximum output current transient resulting from a 1000V power-line transient spike. Tested to ILX Lightwave Technical Standard #LDC-00196. Request ILX Application Note #3.
7 Maximum monitor photodiode current drift over any 30-minute period. Assumes zero drift in responsivity of photodiode.
8 Modulation input is 50Ω terminated inside the mainframe.
9 250mA setpoint, 50mA modulation current, 1Ω load.
10 50% modulation at mid-scale output, 1Ω load.
11 Responsivity value is user-defined and is used to calculate the optical power.
12 Four-wire voltage measurement while driving calibration load. Specification valid for values above 10mV.

LDC 3908

8 Channel Laser Diode Controller

Specifications

Controller Modules (Laser and TE Control) continued

TEMPERATURE CONTROL[1]	3916372 500mA/9W	3916374 1A/9W	3916376 1.5A/9W
OUTPUT			
Temperature Control Range:[2]	–99°C to 150°C	–99°C to 150°C	–99°C to 150°C
Temperature Setpoint Resolution and Accuracy:	Resolution / Accuracy[3]	Resolution / Accuracy[3]	Resolution / Accuracy[3]
–20°C to 20°C:	0.1°C / ±0.2°C	0.1°C / ±0.2°C	0.1°C / ±0.2°C
20°C–50°C:	0.2°C / ±0.2°C	0.2°C / ±0.2°C	0.2°C / ±0.2°C
Short-Term Stability (one-hour):[4]	<±0.007°C	<±0.007°C	<±0.007°C
Long-Term Stability (24 hours):[5]	<±0.01°C	<±0.01°C	<±0.01°C
Output Type:	Bipolar current source	Bipolar current source	Bipolar current source
Compliance Voltage:	>7V DC	>7V DC	>7V DC
Short Circuit Output Current:	1.5A	1.5A	1.5A
Maximum Output Power:	9W	9W	9W
Current Noise and Ripple:[6]	<1mA rms	<1mA rms	<1mA rms
Current Limit			
Range:	0–1.5A	0–1.5A	0–1.5A
Set Accuracy:	±0.05A	±0.05A	±0.05A
Control Algorithm:	Smart Integrator, Hybrid PI Gain adjustable from 1–127	Smart Integrator, Hybrid PI Gain adjustable from 1–127	Smart Integrator, Hybrid PI Gain adjustable from 1–127
TEMPERATURE SENSOR			
Types:	Thermistor (2-wire NTC)	Thermistor (2-wire NTC)	Thermistor (2-wire NTC)
Thermistor Sensing Current:[7]	10/100µA	10/100µA	10/100µA
Usable Thermistor Range:	25–450,000Ω, typical	25–450,000Ω, typical	25–450,000Ω, typical
User Calibration:	Steinhart-Hart, 3 constants	Steinhart-Hart, 3 constants	Steinhart-Hart, 3 constants
TEC MEASUREMENT (DISPLAY)			
Temperature:			
Range:[8]	–99.9°C to 199.9°C	–99.9°C to 199.9°C	–99.9°C to 199.9°C
Accuracy:	±0.5°C	±0.5°C	±0.5°C
Thermistor Resistance			
10µA Setting			
Range:	0.01–450.00kΩ	0.01–450.00kΩ	0.01–450.00kΩ
Accuracy:[9]	±0.05kΩ	±0.05kΩ	±0.05kΩ
100µA Setting			
Range:	0.001–45.000kΩ	0.001–45.000kΩ	0.001–45.000kΩ
Accuracy:[10]	±0.005kΩ	±0.005 kΩ	±0.005kΩ
TEC Current			
Range:	–1.50 to 1.50A	–1.50 to 1.50A	–1.50 to 1.50A
Accuracy:	±0.04A	±0.04A	±0.04A
Current Resolution:	±0.01A	±0.01A	±0.01A
Voltage			
Range:	–9.999 to 9.999V	–9.999 to 9.999V	–9.999 to 9.999V
Resolution:	100mV (1mV in GPIB)	100mV (1mV in GPIB)	100mV (1mV in GPIB)
Accuracy:[11]	±70mV (±20mV in GPIB)	±70mV (±20mV in GPIB)	±70mV (±20mV in GPIB)

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

TEMPERATURE CONTROL NOTES

1 All values relate to a one-hour warm-up period.
2 Software limits of range. Actual range possible depends on the physical load, thermistor type, and TEC module used.
3 Accuracy figures are quoted for a typical 10kΩ thermistor and 100µA current setting for –5°C to 50°C and typical 100kΩ thermistor and 10µA current setting for –20°C to –5°C. Accuracy figures are relative to the calibration standard. Both resolution and accuracy are dependent upon the user-defined configuration of the instrument.
4 Over any one-hour period, half-scale output, controlling an LDM-4412 mount at 25°C with 10kΩ thermistor on 100µA setting.
5 Over any 24-hour period, half-scale output, controlling an LDM-4412 Mount at 25°C with 10kΩ thermistor on 100µA setting.
6 Measured at 1A output over a bandwidth of 10Hz to 10MHz.
7 Thermistor current range software selectable by front panel or GPIB.
8 Software limits of display range.
9 Using a 10kΩ thermistor, controlling an LDM-4412 mount over –30°C to 65°C (~200–2kΩ) or a 100kΩ thermistor controlling an LDM-4412 mount over 10°C–85°C (~200–10kΩ).
10 Using a 10kΩ thermistor, controlling an LDM-4412 mount over –5°C to 90°C (~45–1kΩ).
11 Voltage measurement accuracy while driving calibration load. Accuracy is dependent upon load used.
12 Measured at 2A output over a bandwidth of DC to 25MHz.

Specifications

LDC 3908

8 Channel Laser Diode Controller

Dual Current Source Modules*

CURRENT SOURCE	3916332 Dual 500mA	3916334 Dual 1A
LASER CURRENT OUTPUT		
Output Current Range:	0–500mA	0–1000mA
Setpoint		
Resolution:	10µA	20µA
Accuracy:	0.1% of FS	0.1% of FS
Compliance Voltage:	6V (adjustable voltage limit)	6V (adjustable voltage limit)
Temperature Coefficient:	≤50ppm/°C	≤50ppm/°C
Short-Term Stability (one-hour):[2]	≤20ppm	≤20ppm
Long-Term Stability (24-hours):[3]	≤50ppm	≤50ppm
Noise and Ripple[4]		
High Bandwidth:	<10µA rms	<12µA rms
Low Bandwidth:	<5µA rms	<8µA rms
Transients		
Operational:[5]	<3mA	<3mA
1kV EFT:	<4mA	<5mA
Surge:[6]	<8mA	<10mA
LASER DRIVE LIMIT SETTINGS		
Current Limit		
Range:	0–500mA	0–1000mA
Resolution:	0.2mA	0.4mA
Accuracy:	±0.7mA	±1.4mA
Voltage Limit		
Range:	0–7.5V	0–7.5V
Resolution:	0.1V	0.1V
PHOTODIODE FEEDBACK		
Type:	Differential 10Ω Input. Selectable Zero Bias or 5V Reverse Bias	Differential 10Ω Input. Selectable Zero Bias or 5V Reverse Bias
Photodiode Current Range:	0–5000µA	0–5000µA
Output Stability:[7]	0.01%	0.01%
Setpoint Accuracy:	±0.1% of FS	±0.1% of FS
EXTERNAL ANALOG MODULATION		
Input:[8]	0–10V, 50W	0–10V, 50W
Transfer Function:	50mA/V	100mA/V

	3916332 Dual 500mA	3916334 Dual1A
High Bandwidth Mode		
Small Signal Bandwidth:[9]	DC to 1.2MHz	DC to 1.0MHz
Large Signal Bandwidth:[10]	DC to 1.0MHz	DC to 1.0MHz
Low Bandwidth Mode:	DC to 30kHz	DC to 30kHz
LASER CURRENT MEASUREMENT (DISPLAY)		
Output Current		
Range:	0–500.0mA	0–1000.0mA
Resolution:	0.01mA	0.01mA
Accuracy (at 25°C):	±0.05% of FS	±0.05% of FS
Photodiode Current		
Range:	0–5000µA	0–5000µA
Resolution:	0.1µA	0.1µA
Accuracy (at 25°C):	±2µA	±2µA
Photodiode Responsivity		
Range:[11]	0.00–1000.00µA/mW	0.00–1000.00µA/mW
Resolution:	0.01µA/mW	0.01µA/mW
Optical Power		
Range:	0.0– 5000.00mW	0.0– 5000.00mW
Resolution:	100µW	100µW
Forward Voltage		
Range:	0.00– 7.5V	0.0– 7.5V
Forward Voltage		
Resolution:[12]	10mV	10mV
Accuracy:[13]	±7mV	±7mV

DUAL CURRENT SOURCE NOTES

*Two isolated laser sources in each module.

1 All values 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 optically, evaluating noise intensity of a laser diode into a photodetector with 150kHz bandwidth.
5 Maximum output current transient resulting from normal operational situations (e.g. power on-off, current on-off), as well as accidental situations (e.g. power line plug removal).
6 Maximum output current transient resulting from a 1000V power-line transient spike. Tested to ILX Lightwave Technical Standard #LDC-00196. Request ILX Application Note #3.
7 Maximum monitor photodiode current drift over any 30-minute period. Assumes zero drift in responsivity of photodiode.
8 Modulation input is 50Ω terminated inside the mainframe.
9 250mA setpoint, 50mA modulation current, 1Ω load.
10 50% modulation at mid-scale output, 1Ω load, high bandwidth mode.
11 Responsivity value is user-defined and is used to calculate the optical power.
12 1mV through GPIB.
13 Four-wire voltage measurement while driving calibration load. Specifications valid for values above 10mV. Accuracy is ±2mV through GPIB.

TEC Modules

TEMPERATURE CONTROL	3916550 Dual 9W	3916558 Single 24W (3A)
TEMPERATURE CONTROL OUTPUT		
Temperature Control Range:[2]	–99.9°C to 150°C	–99.9°C to 150°C
Temperature Setpoint		
Resolution and Accuracy:	Resolution Accuracy[3]	Resolution Accuracy[3]
–20°C to 20°C:	0.1°C ±0.2°C	0.1°C ±0.2°C
20°C–50°C:	0.2°C ±0.2°C	0.2°C ±0.2°C
Short-Term Stability (one-hour):[4]	<±0.007°C	<±0.007°C
Long-Term Stability (24-hours):[5]	<±0.01°C	<±0.01°C
Output Type:	Bipolar current source	Bipolar current source
Compliance Voltage:	>6V DC	>8V DC
Maximum Output Current:	1.5A	3A
Maximum Output Power:	9W	24W
Current Noise and Ripple:	<1mA rms[6]	<2mA rms[12]
Current Limit		
Range:	0.1–1.6A	0.1–3.10A
Set Accuracy:	±0.05A	±0.05A
Control Algorithm:	Smart Integrator, Hybrid PI Gain adjustable from 1–127	Smart Integrator, Hybrid PI Gain adjustable from 1–127
TEMPERATURE SENSOR		
Types:	Thermistor (2-wire NTC)	Thermistor (2-wire NTC)
Thermistor Sensing Current:[7]	10µA/100µA	10µA/100µA
Usable Thermistor Range:	25–450,000Ω, typical	25–450,000Ω, typical
User Calibration:	Steinhart-Hart, 3 constants	Steinhart-Hart, 3 constants

	3916550 Dual 9W	3916558 Single 24W (3A)
TEC MEASUREMENT (DISPLAY)		
Temperature		
Range:[8]	–99.9°C to 199.9°C	–99.9°C to 199.9°C
Accuracy:	±0.5°C	±0.5°C
Thermistor Resistance		
10 µA Setting		
Range:	0.01–450.00kΩ	0.01–450.00kΩ
Accuracy:	±0.05kΩ[9]	±0.05kΩ[9]
100 µA Setting		
Range:	0.001–45.000kΩ	0.001–45.000kΩ
Accuracy:	±0.005kΩ[10]	±0.005kΩ[10]
TEC Current		
Range:	–1.50 to 1.50A	–3.00 to 3.00A
Accuracy:	±0.04A	±0.04A
Voltage		
Range:	–9.999 to 9.999V	–10.75 to 10.75V
Resolution:	100mV (1 mV in GPIB)	100mV (1mV in GPIB)
Accuracy:[11]	±70mV (±20mV in GPIB)	±70mV(±20mV in GPIB)

NOTES

See Current Source Notes and Temperature Control Notes under Controller Modules Specifications.

LDC 3908

8 Channel Laser Diode Controller

Specifications

GENERAL	3908	3916
Chassis Ground:	4mm Banana Jack	4mm Banana Jack
GPIB Connector:	24-pin IEEE-488	24-pin IEEE-4888
RS-232 Connector:	9–pin D–sub	9–pin D–sub
Power Requirements:	50–60Hz; selectable voltage 100V, 120V, 220V, 240V, (+6%, –10%)	50–60Hz; selectable voltage 120V, 220V, 240V, (+6%, –10%)
Size (HxWxD):	133mm x 482mm x 389mm 5.25" x 18.98" x 15.3"	133mm x 482mm x 653mm 5.25" x 18.98" x 25.7"
Weight (typical)		
Mainframe Only:	20 kg (44lbs)	34.4kg (76lbs)
With Modules:	24kg (52lbs)	41kg (91lbs)
Operating Temperature:	0°C to 40°C	0°C to 40°C
Storage Temperature:	–40°C to 70°C	–40°C to 70°C
Humidity:[1]	20–85%, noncondensing	20–85%, noncondensing
Laser Safety Features:	Keyswitch, Interlock, Output Delay: (Meets 21CFR1040.10)	Keyswitch, Interlock, Output Delay: (Meets 21CFR1040.10)
Display:	Vacuum fluorescent, 64 x 128 pixels 83 mm x 41 mm	Vacuum fluorescent, 64 x 128 pixels 83mm x 41mm

NOTES

1 Based on the vacuum fluorescent display specification.

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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.

ORDERING INFORMATION

LDC-3908	8-Channel Laser Diode Controller Mainframe
LDC-3916	16-Channel Laser Diode Controller Mainframe
LDC-3916371	High TEC Resolution 500mA/9W Controller Module
LDC-3916372	500mA/9W Controller Module
LDC-3916374	1A/9W Controller Module
LDC-3916376	1.5A/9W Controller Module
LDC-3916332	500mA/ 500mA Dual Current Source Module
LDC-3916334	1A /1A Dual Current Source Module
LDC-3916338	3A Current Source Module
LDC-3916550	9W/9W Dual Temperature (TEC) Controller Module
LDC-3916558	3A (24W) Temperature (TEC) Controller Module
RM-137	Rack Mount Kit, 20.5" hole spacing
RM-138	Rack Mount Kit, 25" hole spacing
CC-305S	Current Source/Laser Diode Mount Interconnect Cable
CC-306S	Current Source/Unterminated Interconnect Cable
CC-316M	Laser Current Cables (bundle of 8)
CC-501S	TE Controller/Unterminated Interconnect Cable
CC-505S	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
LDM-4604/xBFY	Butterfly Module for LDM-4616 Mount
LDM-4604/xDFB	DFB Butterfly Module for LDM-4616 Mount
LDM-4604/xDIL	DIL Module for LDM-4616 Mount
UCA-350	Unipolar Heater Control Adapter
LabVIEW® Instrument Driver	

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