ARTISAN®
TECHNOLOGY GROUP

Your **definitive** source for quality pre-owned equipment.

Artisan Technology Group
(217) 352-9330 | sales@artisantg.com | artisantg.com

Full-service, independent repair center
with experienced engineers and technicians on staff.

We buy your excess, underutilized, and idle equipment
along with credit for buybacks and trade-ins.

Custom engineering
so your equipment works exactly as you specify.

- Critical and expedited services
- In stock / Ready-to-ship
- Leasing / Rentals / Demos
- ITAR-certified secure asset solutions

Expert team | Trust guarantee | 100% satisfaction

All trademarks, brand names, and brands appearing herein are the property of their respective owners.

Find the *Newport / ILX Lightwave LDC-3916376* at our website: ***Click HERE***

LDC 3916

16-Channel Laser Diode Controller

Specifications

GENERAL	3908	3916
Chassis Ground:	4mm Banana Jack	4mm Banana Jack
GPIB Connector:	24-pin IEEE-488.1	24-pin IEEE-4888
RS-232 Connector:	9–pin D–sub	9–pin D–sub
Power Requirements:	50–60 Hz; selectable voltage 100 V, 120 V, 220 V, 240 V, (+6%, –10%)	50–60 Hz; selectable voltage 120 V, 220 V, 240 V, (+6%, –10%)
Size (HxWxD):	133 mm x 482 mm x 389 mm 5.25" x 18.98" x 15.3"	133 mm x 482 mm x 653 mm 5.25" x 18.98" x 25.7"
Weight (typical)		
Mainframe Only:	20 kg (44 lbs)	34.4 kg (76 lbs)
With Modules:	24 kg (52 lbs)	41 kg (91 lbs)
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: (Mets CDRH US21, CFR 1040.10)	Keyswitch, Interlock, Output Delay: (Mets CDRH US21, CFR 1040.10)
Display:	Vacuum fluorescent, 64 x 128 pixels.	Vacuum fluorescent, 64 x 128 pixels.
83 mm x 41 mm	83 mm x 41 mm	

NOTES

1 Based on the vacuum fluorescent display specification.

Instrument Driver for LabVIEW®
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.

ORDERING INFORMATION

LDC-3908	8-Channel Laser Diode Controller Mainframe
LDC-3916	16-Channel Laser Diode Controller Mainframe
LDC-3916371	High TEC Resolution 500 mA/9 W Controller Module
LDC-3916372	500 mA/9 W Controller Module
LDC-3916374	1 A/9 W Controller Module
LDC-3916376	1.5 A/9 W Controller Module
LDC-3916332	500 mA/ 500 mA Dual Current Source Module
LDC-3916334	1 A /1 A Dual Current Source Module
LDC-3916338	3 A Current Source Module
LDC-3916550	9 W/9 W Dual Temperature (TEC) Controller Module
LDC-3916558	3 A (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 Butterfly Mount
LDM-4604/xDIL	DIL Module for LDM-4616 Mount
UCA-350	Unipolar Heater Control Adapter
LabVIEW® Instrument Driver	

ILX Lightwave
Laser Diode Instrumentation & Test Systems

P.O. Box 6310, Bozeman, MT 59771 • FAX: 406-586-9405

www.ilxlightwave.com

For information call
1-800-459-9459
International Inquiries: 406-586-1244
email: sales@ilxlightwave.com

Rev. 10/31/01

Product Features

Mainframe
16 independent channels, with 32 isolated outputs

"Smart" modules for flexibility and speed

Laser Current Sources
High compliance voltage

Direct modulation up to 1.2 MHz

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-3916 16-Channel Laser Diode Controller packs 16 channels of laser diode current source and temperature control into a space-saving 3U-high instrument. An on-board processor powers each module, simplifying future module additions and accelerating performance. A variety of "smart" modules are available. These include controller modules with up to 1.5 A of laser current source, with 9 W of TEC control; dual laser current source modules with two isolated currents of up to 1 A; a dual 9 W TEC module; a 3 A laser current module; and a 3 A 24 W TEC module. Additional modules are currently in development.

An independent, isolated power supply powers each module, delivering unparalleled stability. This design brings even greater levels of laser diode protection through our adjustable compliance voltage feature. Communications and instrument operations are controlled by a separate mainframe processor, paired with a powerful GPIB chipset that is fully tested to ensure IEEE 488.2 compliance.



16 Channels of Laser Diode Control

ILX Lightwave
Laser Diode Instrumentation & Test Systems

LDC 3916

16-Channel Laser Diode Controller

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

LDC 3916

16-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-3916 16-Channel Laser Diode Controller. When coupled with the latest 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 16 independent control channels quickly and reliably. Free LabVIEW® instrument drivers are available upon request, or by downloading them at **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 1.2 MHz (small signal), achieving the highest direct modulation

Dual Current Source Modules*

CURRENT SOURCE	3916332 Dual 1A	3916334 Dual 500 mA
LASER CURRENT OUTPUT		
Output Current Range:	0–500 mA	0–1000 mA
Setpoint Resolution:	10 µA	20 µA
Setpoint Accuracy:	0.1% of FS	0.1% of FS
Compliance Voltage:	6 V (adjustable voltage limit)	6 V
Temperature Coefficient:	≤50 ppm/°C	≤50 ppm/°C
Short-Term Stability (1 hr.):[2]	≤20 ppm	≤20 ppm
Long-Term Stability (24 hr.):[3]	≤50 ppm	≤50 ppm
Noise and Ripple[4]		
High Bandwidth:	<10 µA rms	<12 µA rms
Low Bandwidth:	<5 µA rms	<8 µA rms
Transients		
Operational:[5]	<3 mA	<3 mA
1kV EFT:	<4 mA	<5 mA
Surge:[6]	<8 mA	<10 mA
LASER DRIVE LIMIT SETTINGS		
Current Limit Range:	0–500 mA	0–1000 mA
Current Limit Resolution:	0.2 mA	0.4 mA
Current Limit Accuracy:	±0.7 mA	±1.4 mA
Voltage Limit Range:	0–7.5 V	0–7.5 V
Voltage Limit Resolution:	0.1 V	0.1 V
PHOTODIODE FEEDBACK		
Type:	Differential 10 Ω Input. Selectable Zero Bias or 5 V Reverse Bias	Differential 10 Ω Input. Selectable Zero Bias or 5 V Reverse Bias
Photodiode Current Range:	0–5000 µA	0–5000 µA
Output Stability:[7]	0.01%	0.01%
Setpoint Accuracy:	±0.1% of FS	±0.1% of FS
EXTERNAL ANALOG MODULATION		
Input:[8]	0–10 V, 50 W	0–10 V, 50 W
Transfer Function:	50 mA/V	100 mA/V
High Bandwidth Mode		
Small Signal Bandwidth:[9]	DC to 1.2 MHz	DC to 1.0 MHz
Large Signal Bandwidth:[10]	DC to 1.0 MHz	DC to 1.0 MHz
Low Bandwidth Mode:	DC to 30 kHz	DC to 30 kHz

	3916332 Dual 500 mA	3916334 Dual 1A
LASER CURRENT MEASUREMENT (DISPLAY)		
Output Current Range:	0–500.0 mA	0–1000.0 mA
Output Current Resolution:	0.01 mA	0.01 mA
Output Current Accuracy (@25°C):	±0.05% of FS	±0.05% of FS
Photodiode Current Range:	0–5000 µA	0–5000 µA
Photodiode Current Resolution:	0.1 µA	0.1 µA
Photodiode Current Accuracy (@25°C):	±2 µA	±2 µA
Photodiode Responsivity Range:[11]	0.00–1000.00 µA/mW	0.00–1000.00 µA/mW
Photodiode Responsivity Resolution:	0.01 µA/mW	0.01 µA/mW
Optical Power Range:	0.0– 5000.00 mW	0.0– 5000.00 mW
Optical Power Resolution:	100 µW	100 µW
Forward Voltage Range:	0.00– 7.5 V	0.0– 7.5 V
Forward Voltage Resolution:	10 mV	10 mV
Forward Voltage Accuracy:[12]	±7 mV	±7 mV

DUAL CURRENT SOURCE NOTES

*Two isolated laser sources in each module.
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 150 kHz 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 1000 V 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 50 W terminated inside the mainframe.
9 250 mA setpoint, 50 mA modulation current, 1 Ω load.
10 50% modulation at mid-scale output, 1 Ω load, High Bandwidth Mode.

TEC Modules

TEMPERATURE CONTROL	3916550 Dual 9W	3916558 Single 24W (3 A)
TEMPERATURE CONTROL OUTPUT		
Temperature Control Range:[2]	–99.9°C to 150°C	–99.9°C to 150°C
Thermistor 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 (1 hr.):[4]	<±0.007°C	<±0.007°C
Long-Term Stability (24 hrs.):[5]	<±0.01°C	<±0.01°C
Output Type:	Bipolar current source	Bipolar current source
Compliance Voltage:	>6 V DC	>8 V DC
Maximum Output Current:	1.5 A	3 A
Maximum Output Power:	9 W	24 W
Current Noise and Ripple:	<1 mA rms[6]	<2 mA rms[12]
Current Limit Range:	0.1–1.6 A	0.1–3.10 A
Current Limit Set Accuracy:	±0.05 A	±0.05 A
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]	10 µA/100 µA	10 µA/100 µA
Usable Thermistor Range:	25–450,000 Ω, typical	25–450,000 Ω, typical
User Calibration:	Steinhart-Hart, 3 constants	Steinhart-Hart, 3 constants

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

NOTES

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

LDC 3916

16-Channel Laser Diode Controller

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

LDC 3916

16-Channel Laser Diode Controller

Controller Modules (Laser and TE Control)continued

TEMPERATURE CONTROL[1]	3916372 500 mA/9 W		3916374 1 A/9 W		3916376 1.5 A/9 W	
OUTPUT						
Temperature Control Range:[2]	–99°C to 150°C		–99°C to 150°C		–99°C to 150°C	
Thermistor 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 (1 hr.):[4]	<±0.007°C		<±0.007°C		<±0.007°C	
Long-Term Stability (24 hrs.):[5]	<±0.01°C		<±0.01°C		<±0.01°C	
Output Type:	Bipolar current source		Bipolar current source		Bipolar current source	
Compliance Voltage:	>7 V DC		>7 V DC		>7 V DC	
Short Circuit Output Current:	1.5 A		1.5 A		1.5 A	
Maximum Output Power:	9 W		9 W		9 W	
Current Noise and Ripple:[6]	<1 mA rms		<1 mA rms		<1 mA rms	
Current Limit Range:	0–1.5 A		0–1.5 A		0–1.5 A	
Current Limit Set Accuracy:	±0.05 A		±0.05 A		±0.05 A	
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]	10/100 µA		10/100 µA		10/100 µA	
Usable Thermistor Range:	25–450,000 Ω, typical		25–450,000 Ω, typical		25–450,000 Ω, 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						
10 µA Setting						
Range:	0.01–450.00 kΩ		0.01–450.00 kΩ		0.01–450.00 kΩ	
Accuracy:[9]	±0.05 kΩ		±0.05 kΩ		±0.05 kΩ	
100 µASetting						
Range:	0.001–45.000 kΩ		0.001–45.000 kΩ		0.001–45.000 kΩ	
Accuracy:[10]	±0.005 kΩ		±0.005 kΩ		±0.005 kΩ	
TEC Current						
Range:	–1.50 to 1.50 A		–1.50 to 1.50 A		–1.50 to 1.50 A	
Accuracy:	±0.04 A		±0.04 A		±0.04 A	
Current Resolution:	±0.01 A		±0.01 A		±0.01 A	
Voltage						
Range:	–9.999 to 9.999 V		–9.999 to 9.999 V		–9.999 to 9.999 V	
Resolution:	100 mV (1 mV in GPIB)		100 mV (1 mV in GPIB)		100 mV (1 mV in GPIB)	
Accuracy:[11]	±70 mV (±20 mV in GPIB)		±70 mV (±20 mV in GPIB)		±70 mV (±20 mV 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 980 nm and 1480 nm 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 10 kW thermistor and 100 µA current setting for –5°C to 50°C, and typical 10 kW thermistor and 10 µA 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 @ 25°C, with 10 kW thermistor, on 100 µA setting.
5 Over any 24-hour period, half-scale output, controlling an LDM-4412 Mount @ 25°C, with 10 kW thermistor, on 100 µA setting.
6 Measured at 1 A output over a bandwidth of 10 Hz to 10 MHz.
7 Thermistor current range software selectable by front panel or GPIB.
8 Software limits of display range.
9 Using a 10 kW thermistor, controlling an LDM-4412 mount over –30°C to 65°C (~200–2 kW) or a 100kW thermistor controlling an LDM-4412 mount over 10°C–85°C (~200–10 kW).
10 Using a 10 kW thermistor, controlling an LDM-4412 mount over –5°C to 90°C (~45–1 kW).
11 Voltage measurement accuracy while driving calibration load. Accuracy is dependent upon load used.
12 Measured at 2 A output over a bandwidth of DC to 25 MHz.



High channel-density laser diode control for production test.

levels available today. Modules also include reverse photodiode bias capabilities, especially important for telecom wavelength devices.

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 via 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-3916 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
16 WDM signal sources. 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-3916 16-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-3916 will satisfy your test requirements with fast, reliable and secure laser diode control.

LDC 3916

16-Channel Laser Diode Controller

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

LDC 3916

16-Channel Laser Diode Controller

Specifications[1]

Fine Temperature Resolution Controller Module

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

TEMPERATURE CONTROL[1]	3916371 500 mA/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:	>7 V DC
Maximum Output Current:	1.5 A
Maximum Output Power:	9 W
Current Noise and Ripple:[6]	<1 mA rms
Current Limit Range:	0–1.5 A
Current Limit Set Accuracy:	±0.05 A
Control Algorithm:	Smart Integrator, Hybrid PI, Gain adjustable from 1–127
TEMPERATURE SENSOR	
Types:	Thermistor (2-wire NTC)
Thermistor Sensing Current:	100 µA
Usable Thermistor Range:	5100–13,000 Ω, 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:	5100–13,000 Ω
Accuracy:	±5 Ω
TEC Current	
Range:	–1.50 to 1.50 A
Accuracy:	±0.04 A
Voltage	
Range:	–9.999 to 9.999 V
Resolution:	100 mV (1 mV in GPIB)
Accuracy:[8]	±70 mV (±20 mV 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.

Controller Modules (Laser and TE Control)

CURRENT SOURCE[1]	3916372 500 mA/9 W	3916374 1 A/9 W	3916376 1.5 A/9W
LASER CURRENT OUTPUT			
Output Current Range:	0–500 mA	0–1000 mA	0–1500 mA
Setpoint Resolution:	10 µA	20 µA	40 µA
Setpoint Accuracy:	±0.1% of of FS	±0.1% of of FS	±0.1% of of FS
Compliance Voltage:	6 V (adjustable voltage limit)	6 V (adjustable voltage limit)	4.75 V (adjustable voltage limit)
Temperature Coefficient:	≤50 ppm/°C	≤50 ppm/°C	≤50 ppm/°C
Short-Term Stability (1 hr.):[2]	≤20 ppm	≤20 ppm	≤20 ppm
Long-Term Stability (24 hr.):[3]	≤50 ppm	≤50 ppm	≤50 ppm
Noise and Ripple[4]			
High Bandwidth:	<10 µA rms	<10 µA rms	<12 µA rms
Low Bandwidth:	<5 µA rms	<5 µA rms	<8 µA rms
Transients			
Operational:[5]	<3 mA	<3 mA	<3 mA
1kV EFT	<4 mA	<5 mA	<5 mA
Surge:[6]	<8 mA	<10 mA	<10 mA
LASER DRIVE LIMIT SETTINGS			
Current Limit Range:	0–500 mA	0–1000 mA	0–1500 mA
Current Limit Resolution:	0.2 mA	0.4 mA	0.6 mA
Current Limit Accuracy:	±0.7 mA	±1.4 mA	±4.5 mA
Voltage Limit Range:	0–7.5 V	0–7.5 V	0–7.5 V
Voltage Limit Resolution:	0.1 V	0.1 V	0.1 V
Voltage Limit Accuracy:	±0.2 V	±0.2 V	±0.2 V
PHOTODIODE FEEDBACK			
Type:	Differential 10 Ω Input, Selectable Zero Bias or 5 V Reverse Bias on all modules		
Photodiode Current Range:	0–5000 µA	0–5000 µA	0–5000 µA
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]	0–10 V, 50 Ω	0–10 V, 50 Ω	0–7.5 V, 50 Ω
Transfer Function:	50 mA/ V	100 mA/ V	200 mA/ V
High Bandwidth Mode			
Small Signal Bandwidth:[9]	DC to 1.2 MHz	DC to 1.0 MHz	DC to 0.9 MHz
Large Signal Bandwidth:[10]	DC to 1.0 MHz	DC to 1.0 MHz	DC to 0.9 MHz
Low Bandwidth Mode:	DC to 30 kHz	DC to 30 kHz	DC to 30 kHz
LASER CURRENT MEASUREMENT (DISPLAY)			
Output Current Range:	0–500.00 mA	0–1000.0 mA	0–1500.0 mA
Output Current Resolution:	0.01 mA	0.01 mA	0.03 mA
Output Current Accuracy (@25°C):	±0.05% of FS	±0.05% of FS	±0.07% of FS
Photodiode Current Range:	0–5000 µA	0–5000 µA	0–5000 µA
Photodiode Current Resolution:	0.1 µA	0.1 µA	0.1 µA
Photodiode Current Accuracy (@25°C):	±2 µA	±2 µA	±2 µA
Photodiode Responsivity Range:[11]	0.0–1000.00 µA/mW	0.0–1000.00 µA/mW	0.0–1000.00 µA/mW
Responsivity Resolution:	0.01 µA/mW	0.01 µA/mW	0.01 µA/mW
Optical Power Range:	0.0–5000.00 mW	0.0–5000.00 mW	0.0–5000.00 mW
Optical Power Resolution:	100 µW	100 µW	100 µW
Forward Voltage Range:	0.00–7.5 V	0.00–7.5 V	0.00–5 V
Forward Voltage Resolution:	10 mV (1 mV through GPIB)	10 mV (1 mV through GPIB)	10 mV (1 mV through GPIB)
Forward Voltage Accuracy:[12]	±7 mV (±2 mV through GPIB)	±7 mV (±2 mV through GPIB)	±7 mV (±2 mV 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 150 kHz 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 1000 V 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 50 Ω terminated inside the mainframe.
9 250 mA setpoint, 50 mA modulation current, 1 Ω load.
10 50% modulation at mid-scale output, 1 Ω 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 10 mV.

LDC 3916

16-Channel Laser Diode Controller

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

LDC 3916

16-Channel Laser Diode Controller

Specifications[1]

Fine Temperature Resolution Controller Module

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

TEMPERATURE CONTROL[1]	3916371 500 mA/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:	>7 V DC
Maximum Output Current:	1.5 A
Maximum Output Power:	9 W
Current Noise and Ripple:[6]	<1 mA rms
Current Limit Range:	0–1.5 A
Current Limit Set Accuracy:	±0.05 A
Control Algorithm:	Smart Integrator, Hybrid PI, Gain adjustable from 1–127
TEMPERATURE SENSOR	
Types:	Thermistor (2-wire NTC)
Thermistor Sensing Current:	100 µA
Usable Thermistor Range:	5100–13,000 Ω, 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:	5100–13,000 Ω
Accuracy:	±5 Ω
TEC Current	
Range:	–1.50 to 1.50 A
Accuracy:	±0.04 A
Voltage	
Range:	–9.999 to 9.999 V
Resolution:	100 mV (1 mV in GPIB)
Accuracy:[8]	±70 mV (±20 mV 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.

Controller Modules (Laser and TE Control)

CURRENT SOURCE[1]	3916372 500 mA/9 W	3916374 1 A/9 W	3916376 1.5 A/9W
LASER CURRENT OUTPUT			
Output Current Range:	0–500 mA	0–1000 mA	0–1500 mA
Setpoint Resolution:	10 µA	20 µA	40 µA
Setpoint Accuracy:	±0.1% of of FS	±0.1% of of FS	±0.1% of of FS
Compliance Voltage:	6 V (adjustable voltage limit)	6 V (adjustable voltage limit)	4.75 V (adjustable voltage limit)
Temperature Coefficient:	≤50 ppm/°C	≤50 ppm/°C	≤50 ppm/°C
Short-Term Stability (1 hr.):[2]	≤20 ppm	≤20 ppm	≤20 ppm
Long-Term Stability (24 hr.):[3]	≤50 ppm	≤50 ppm	≤50 ppm
Noise and Ripple[4]			
High Bandwidth:	<10 µA rms	<10 µA rms	<12 µA rms
Low Bandwidth:	<5 µA rms	<5 µA rms	<8 µA rms
Transients			
Operational:[5]	<3 mA	<3 mA	<3 mA
1kV EFT	<4 mA	<5 mA	<5 mA
Surge:[6]	<8 mA	<10 mA	<10 mA
LASER DRIVE LIMIT SETTINGS			
Current Limit Range:	0–500 mA	0–1000 mA	0–1500 mA
Current Limit Resolution:	0.2 mA	0.4 mA	0.6 mA
Current Limit Accuracy:	±0.7 mA	±1.4 mA	±4.5 mA
Voltage Limit Range:	0–7.5 V	0–7.5 V	0–7.5 V
Voltage Limit Resolution:	0.1 V	0.1 V	0.1 V
Voltage Limit Accuracy:	±0.2 V	±0.2 V	±0.2 V
PHOTODIODE FEEDBACK			
Type:	Differential 10 Ω Input, Selectable Zero Bias or 5 V Reverse Bias on all modules		
Photodiode Current Range:	0–5000 µA	0–5000 µA	0–5000 µA
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]	0–10 V, 50 Ω	0–10 V, 50 Ω	0–7.5 V, 50 Ω
Transfer Function:	50 mA/ V	100 mA/ V	200 mA/ V
High Bandwidth Mode			
Small Signal Bandwidth:[9]	DC to 1.2 MHz	DC to 1.0 MHz	DC to 0.9 MHz
Large Signal Bandwidth:[10]	DC to 1.0 MHz	DC to 1.0 MHz	DC to 0.9 MHz
Low Bandwidth Mode:	DC to 30 kHz	DC to 30 kHz	DC to 30 kHz
LASER CURRENT MEASUREMENT (DISPLAY)			
Output Current Range:	0–500.00 mA	0–1000.0 mA	0–1500.0 mA
Output Current Resolution:	0.01 mA	0.01 mA	0.03 mA
Output Current Accuracy (@25°C):	±0.05% of FS	±0.05% of FS	±0.07% of FS
Photodiode Current Range:	0–5000 µA	0–5000 µA	0–5000 µA
Photodiode Current Resolution:	0.1 µA	0.1 µA	0.1 µA
Photodiode Current Accuracy (@25°C):	±2 µA	±2 µA	±2 µA
Photodiode Responsivity Range:[11]	0.0–1000.00 µA/mW	0.0–1000.00 µA/mW	0.0–1000.00 µA/mW
Responsivity Resolution:	0.01 µA/mW	0.01 µA/mW	0.01 µA/mW
Optical Power Range:	0.0–5000.00 mW	0.0–5000.00 mW	0.0–5000.00 mW
Optical Power Resolution:	100 µW	100 µW	100 µW
Forward Voltage Range:	0.00–7.5 V	0.00–7.5 V	0.00–5 V
Forward Voltage Resolution:	10 mV (1 mV through GPIB)	10 mV (1 mV through GPIB)	10 mV (1 mV through GPIB)
Forward Voltage Accuracy:[12]	±7 mV (±2 mV through GPIB)	±7 mV (±2 mV through GPIB)	±7 mV (±2 mV 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 150 kHz 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 1000 V 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 50 Ω terminated inside the mainframe.
9 250 mA setpoint, 50 mA modulation current, 1 Ω load.
10 50% modulation at mid-scale output, 1 Ω 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 10 mV.

LDC 3916

16-Channel Laser Diode Controller

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

LDC 3916

16-Channel Laser Diode Controller

Controller Modules (Laser and TE Control)continued

TEMPERATURE CONTROL[1]	3916372 500 mA/9 W		3916374 1 A/9 W		3916376 1.5 A/9 W	
OUTPUT						
Temperature Control Range:[2]	–99°C to 150°C		–99°C to 150°C		–99°C to 150°C	
Thermistor 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 (1 hr.):[4]	<±0.007°C		<±0.007°C		<±0.007°C	
Long-Term Stability (24 hrs.):[5]	<±0.01°C		<±0.01°C		<±0.01°C	
Output Type:	Bipolar current source		Bipolar current source		Bipolar current source	
Compliance Voltage:	>7 V DC		>7 V DC		>7 V DC	
Short Circuit Output Current:	1.5 A		1.5 A		1.5 A	
Maximum Output Power:	9 W		9 W		9 W	
Current Noise and Ripple:[6]	<1 mA rms		<1 mA rms		<1 mA rms	
Current Limit Range:	0–1.5 A		0–1.5 A		0–1.5 A	
Current Limit Set Accuracy:	±0.05 A		±0.05 A		±0.05 A	
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]	10/100 µA		10/100 µA		10/100 µA	
Usable Thermistor Range:	25–450,000 Ω, typical		25–450,000 Ω, typical		25–450,000 Ω, 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						
10 µA Setting						
Range:	0.01–450.00 kΩ		0.01–450.00 kΩ		0.01–450.00 kΩ	
Accuracy:[9]	±0.05 kΩ		±0.05 kΩ		±0.05 kΩ	
100 µASetting						
Range:	0.001–45.000 kΩ		0.001–45.000 kΩ		0.001–45.000 kΩ	
Accuracy:[10]	±0.005 kΩ		±0.005 kΩ		±0.005 kΩ	
TEC Current						
Range:	–1.50 to 1.50 A		–1.50 to 1.50 A		–1.50 to 1.50 A	
Accuracy:	±0.04 A		±0.04 A		±0.04 A	
Current Resolution:	±0.01 A		±0.01 A		±0.01 A	
Voltage						
Range:	–9.999 to 9.999 V		–9.999 to 9.999 V		–9.999 to 9.999 V	
Resolution:	100 mV (1 mV in GPIB)		100 mV (1 mV in GPIB)		100 mV (1 mV in GPIB)	
Accuracy:[11]	±70 mV (±20 mV in GPIB)		±70 mV (±20 mV in GPIB)		±70 mV (±20 mV 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 980 nm and 1480 nm 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 10 kW thermistor and 100 µA current setting for –5°C to 50°C, and typical 10 kW thermistor and 10 µA 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 @ 25°C, with 10 kW thermistor, on 100 µA setting.
5 Over any 24-hour period, half-scale output, controlling an LDM-4412 Mount @ 25°C, with 10 kW thermistor, on 100 µA setting.
6 Measured at 1 A output over a bandwidth of 10 Hz to 10 MHz.
7 Thermistor current range software selectable by front panel or GPIB.
8 Software limits of display range.
9 Using a 10 kW thermistor, controlling an LDM-4412 mount over –30°C to 65°C (~200–2 kW) or a 100kW thermistor controlling an LDM-4412 mount over 10°C–85°C (~200–10 kW).
10 Using a 10 kW thermistor, controlling an LDM-4412 mount over –5°C to 90°C (~45–1 kW).
11 Voltage measurement accuracy while driving calibration load. Accuracy is dependent upon load used.
12 Measured at 2 A output over a bandwidth of DC to 25 MHz.



High channel-density laser diode control for production test.

levels available today. Modules also include reverse photodiode bias capabilities, especially important for telecom wavelength devices.

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 via 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-3916 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
16 WDM signal sources. 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-3916 16-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-3916 will satisfy your test requirements with fast, reliable and secure laser diode control.

LDC 3916

16-Channel Laser Diode Controller

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

LDC 3916

16-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-3916 16-Channel Laser Diode Controller. When coupled with the latest 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 16 independent control channels quickly and reliably. Free LabVIEW® instrument drivers are available upon request, or by downloading them at **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 1.2 MHz (small signal), achieving the highest direct modulation

Dual Current Source Modules*

CURRENT SOURCE	3916332 Dual 1A	3916334 Dual 500 mA
LASER CURRENT OUTPUT		
Output Current Range:	0–500 mA	0–1000 mA
Setpoint Resolution:	10 µA	20 µA
Setpoint Accuracy:	0.1% of FS	0.1% of FS
Compliance Voltage:	6 V (adjustable voltage limit)	6 V
Temperature Coefficient:	≤50 ppm/°C	≤50 ppm/°C
Short-Term Stability (1 hr.):[2]	≤20 ppm	≤20 ppm
Long-Term Stability (24 hr.):[3]	≤50 ppm	≤50 ppm
Noise and Ripple[4]		
High Bandwidth:	<10 µA rms	<12 µA rms
Low Bandwidth:	<5 µA rms	<8 µA rms
Transients		
Operational:[5]	<3 mA	<3 mA
1kV EFT:	<4 mA	<5 mA
Surge:[6]	<8 mA	<10 mA
LASER DRIVE LIMIT SETTINGS		
Current Limit Range:	0–500 mA	0–1000 mA
Current Limit Resolution:	0.2 mA	0.4 mA
Current Limit Accuracy:	±0.7 mA	±1.4 mA
Voltage Limit Range:	0–7.5 V	0–7.5 V
Voltage Limit Resolution:	0.1 V	0.1 V
PHOTODIODE FEEDBACK		
Type:	Differential 10 Ω Input. Selectable Zero Bias or 5 V Reverse Bias	Differential 10 Ω Input. Selectable Zero Bias or 5 V Reverse Bias
Photodiode Current Range:	0–5000 µA	0–5000 µA
Output Stability:[7]	0.01%	0.01%
Setpoint Accuracy:	±0.1% of FS	±0.1% of FS
EXTERNAL ANALOG MODULATION		
Input:[8]	0–10 V, 50 W	0–10 V, 50 W
Transfer Function:	50 mA/V	100 mA/V
High Bandwidth Mode		
Small Signal Bandwidth:[9]	DC to 1.2 MHz	DC to 1.0 MHz
Large Signal Bandwidth:[10]	DC to 1.0 MHz	DC to 1.0 MHz
Low Bandwidth Mode:	DC to 30 kHz	DC to 30 kHz

	3916332 Dual 500 mA	3916334 Dual 1A
LASER CURRENT MEASUREMENT (DISPLAY)		
Output Current Range:	0–500.0 mA	0–1000.0 mA
Output Current Resolution:	0.01 mA	0.01 mA
Output Current Accuracy (@25°C):	±0.05% of FS	±0.05% of FS
Photodiode Current Range:	0–5000 µA	0–5000 µA
Photodiode Current Resolution:	0.1 µA	0.1 µA
Photodiode Current Accuracy (@25°C):	±2 µA	±2 µA
Photodiode Responsivity Range:[11]	0.00–1000.00 µA/mW	0.00–1000.00 µA/mW
Photodiode Responsivity Resolution:	0.01 µA/mW	0.01 µA/mW
Optical Power Range:	0.0– 5000.00 mW	0.0– 5000.00 mW
Optical Power Resolution:	100 µW	100 µW
Forward Voltage Range:	0.00– 7.5 V	0.0– 7.5 V
Forward Voltage Resolution:	10 mV	10 mV
Forward Voltage Accuracy:[12]	±7 mV	±7 mV

DUAL CURRENT SOURCE NOTES

*Two isolated laser sources in each module.
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 150 kHz 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 1000 V 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 50 W terminated inside the mainframe.
9 250 mA setpoint, 50 mA modulation current, 1 Ω load.
10 50% modulation at mid-scale output, 1 Ω load, High Bandwidth Mode.

TEC Modules

TEMPERATURE CONTROL	3916550 Dual 9W	3916558 Single 24W (3 A)
TEMPERATURE CONTROL OUTPUT		
Temperature Control Range:[2]	–99.9°C to 150°C	–99.9°C to 150°C
Thermistor 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 (1 hr.):[4]	<±0.007°C	<±0.007°C
Long-Term Stability (24 hrs.):[5]	<±0.01°C	<±0.01°C
Output Type:	Bipolar current source	Bipolar current source
Compliance Voltage:	>6 V DC	>8 V DC
Maximum Output Current:	1.5 A	3 A
Maximum Output Power:	9 W	24 W
Current Noise and Ripple:	<1 mA rms[6]	<2 mA rms[12]
Current Limit Range:	0.1–1.6 A	0.1–3.10 A
Current Limit Set Accuracy:	±0.05 A	±0.05 A
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]	10 µA/100 µA	10 µA/100 µA
Usable Thermistor Range:	25–450,000 Ω, typical	25–450,000 Ω, typical
User Calibration:	Steinhart-Hart, 3 constants	Steinhart-Hart, 3 constants

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

NOTES

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

LDC 3916

16-Channel Laser Diode Controller

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

LDC 3916

16-Channel Laser Diode Controller

Specifications

GENERAL	3908	3916
Chassis Ground:	4mm Banana Jack	4mm Banana Jack
GPIB Connector:	24-pin IEEE-488.1	24-pin IEEE-4888
RS-232 Connector:	9–pin D–sub	9–pin D–sub
Power Requirements:	50–60 Hz; selectable voltage 100 V, 120 V, 220 V, 240 V, (+6%, –10%)	50–60 Hz; selectable voltage 120 V, 220 V, 240 V, (+6%, –10%)
Size (HxWxD):	133 mm x 482 mm x 389 mm 5.25" x 18.98" x 15.3"	133 mm x 482 mm x 653 mm 5.25" x 18.98" x 25.7"
Weight (typical)		
Mainframe Only:	20 kg (44 lbs)	34.4 kg (76 lbs)
With Modules:	24 kg (52 lbs)	41 kg (91 lbs)
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: (Mets CDRH US21, CFR 1040.10)	Keyswitch, Interlock, Output Delay: (Mets CDRH US21, CFR 1040.10)
Display:	Vacuum fluorescent, 64 x 128 pixels.	Vacuum fluorescent, 64 x 128 pixels.
83 mm x 41 mm	83 mm x 41 mm	

NOTES

1 Based on the vacuum fluorescent display specification.

Instrument Driver for LabVIEW®
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.

ORDERING INFORMATION

LDC-3908	8-Channel Laser Diode Controller Mainframe
LDC-3916	16-Channel Laser Diode Controller Mainframe
LDC-3916371	High TEC Resolution 500 mA/9 W Controller Module
LDC-3916372	500 mA/9 W Controller Module
LDC-3916374	1 A/9 W Controller Module
LDC-3916376	1.5 A/9 W Controller Module
LDC-3916332	500 mA/ 500 mA Dual Current Source Module
LDC-3916334	1 A /1 A Dual Current Source Module
LDC-3916338	3 A Current Source Module
LDC-3916550	9 W/9 W Dual Temperature (TEC) Controller Module
LDC-3916558	3 A (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 Butterfly Mount
LDM-4604/xDIL	DIL Module for LDM-4616 Mount
UCA-350	Unipolar Heater Control Adapter
LabVIEW® Instrument Driver	

ILX Lightwave
Laser Diode Instrumentation & Test Systems

P.O. Box 6310, Bozeman, MT 59771 • FAX: 406-586-9405

www.ilxlightwave.com

For information call
1-800-459-9459
International Inquiries: 406-586-1244
email: sales@ilxlightwave.com

Rev. 10/31/01

Product Features

Mainframe
16 independent channels, with 32 isolated outputs

"Smart" modules for flexibility and speed

Laser Current Sources
High compliance voltage

Direct modulation up to 1.2 MHz

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-3916 16-Channel Laser Diode Controller packs 16 channels of laser diode current source and temperature control into a space-saving 3U-high instrument. An on-board processor powers each module, simplifying future module additions and accelerating performance. A variety of "smart" modules are available. These include controller modules with up to 1.5 A of laser current source, with 9 W of TEC control; dual laser current source modules with two isolated currents of up to 1 A; a dual 9 W TEC module; a 3 A laser current module; and a 3 A 24 W TEC module. Additional modules are currently in development.

An independent, isolated power supply powers each module, delivering unparalleled stability. This design brings even greater levels of laser diode protection through our adjustable compliance voltage feature. Communications and instrument operations are controlled by a separate mainframe processor, paired with a powerful GPIB chipset that is fully tested to ensure IEEE 488.2 compliance.



16 Channels of Laser Diode Control

ILX Lightwave
Laser Diode Instrumentation & Test Systems

LDC 3916

16-Channel Laser Diode Controller

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

Artisan Technology Group is an independent supplier of quality pre-owned equipment

Gold-standard solutions

Extend the life of your critical industrial, commercial, and military systems with our superior service and support.

We buy equipment

Planning to upgrade your current equipment? Have surplus equipment taking up shelf space? We'll give it a new home.

Learn more!

Visit us at **artisantg.com** for more info on price quotes, drivers, technical specifications, manuals, and documentation.

Artisan Scientific Corporation dba Artisan Technology Group is not an affiliate, representative, or authorized distributor for any manufacturer listed herein.

We're here to make your life easier. How can we help you today?

(217) 352-9330 | sales@artisantg.com | artisantg.com

ARTISAN® TECHNOLOGY GROUP