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LDX 36000 Series

High Power Laser Diode Driver

Product Features

- Output current to 220A QCW and 125A CW
- Compliance voltage up to 70V
- Proven high power laser diode protection features
- Precision current control with 10 mA setpoint resolution
- Hard pulse capability with pulse widths to 2 seconds and duty cycle to 90%
- Peak and CW forward voltage and photodiode measurement
- TTL trigger input and output with adjustable delay
- Temperature measurement with thermistor input
- IEEE488/GPIB interface

The LDX-36000 Series High Power Laser Diode Drivers are a family of high performance current sources designed specifically for controlling and testing high power laser diodes. Over twelve models offer maximum current ranges from 10 amps to 220 amps QCW and 125 amps CW with maximum compliance voltages from 12V to 70V. Each instrument offers high setpoint accuracy, low output noise with forward voltage and photodiode measurements in CW, QCW-Pulse and hard pulse operating modes making these instruments ideal for precision, high power laser diode testing.

Multiple laser diode protection features include adjustable voltage and current limits, output shorting relays, slow turn on/off circuits, fast error detection circuits, and transient protection during power up and laser operation. A thermistor based temperature monitor provides additional protection through a programmable temperature limit which can be used to disable the laser output when the limit is exceeded.

Designed for automated laser diode testing in CW or pulse mode, these drivers combine precision control and measurement and an IEEE488/GPIB interface with on-board data storage for high power laser diode characterization. For virtual instrument programming, LabView instrument drivers are available free of charge and can be downloaded from the ILX website.



High Voltage Current Sources for High Power Laser Diode Testing

ILX Lightwave

Laser Diode Instrumentation & Test Systems

LDX 36000 Series

High Power Laser Diode Driver



LDX-36000 Series instruments accept an external trigger to synchronize the output pulse.

AUTOMATE HIGH POWER LASER TESTING

Remote instrument operation is available on all of the LDX-36000 Series High Power Drivers through an IEEE488/GPIB interface. All instrument controls and functions are accessible through the interface for easy remote programming and control in automated test systems where repeatable and accurate test sequencing, measurements, and data handling are required. Whether the application is data intensive L-I-V testing, pulsed control for thermal characterization, or R&D evaluations, remote operation of the LDX-36000's saves time and ensures systematic data collection and instrument operation.

PRECISION L-I-V TESTING

Each LDX-36000 Series Laser Diode Driver was developed specifically for precision L-I-V testing of high power laser diodes with 0.1% set point accuracy, low noise and precision forward voltage measurement capability in CW or QCW pulsed modes. Additionally, the instrument can perform power measurements through an independent photo-diode input calibrated with a user-programmable responsivity. An adjustable 0 to -15V reverse bias ensures linear measurements and fast conversion speed. Accurate forward voltage measurements even with high current and long cable lengths are accomplished real time through a four wire measurement system. Reduce total system cost with these high current drivers; there is no need for separate pulsed sources, voltage measuring instruments, or low current measuring instruments for high power L-I-V testing.

EASE OF OPERATION

Designed for ease of use and readability, the front panel features dual 7-segment LED displays with instrument controls grouped by mode and function. The dual display lets you view laser parameters simultaneously with the bright 7-segment LED display highly visible from a distance in darkened labs. Parameters such as output current setpoint, current and voltage limits and calibration constants are easily selected and adjusted with the rotary digital encoder. Each display is easily configured to indicate laser parameters such as current, voltage, power, and temperature with discrete control pushbuttons located below each display. System errors such as open circuits and current or voltage limits are indicated with discrete LED's with an error code indicated on the appropriate seven-segment LED display.

SAVE AND RECALL INSTRUMENT SETTINGS

For multiple instrument test configurations, the LDX-36000 Series Laser Diode Drivers offer a SAVE and RECALL feature. The SAVE function allows you to store all the front panel settings for any given instrument configuration to a numbered bin. The RECALL function allows you to retrieve any of the saved configurations at any time through simple front panel button presses or remotely through the GPIB interface. This saves time in instrument re-configuration for different manufacturing runs or R&D experiments.

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 LDX-36000 Series High Power Laser Diode Drivers, and our complete family of Laser Diode Instrumentation and Test Systems, call us today or visit our website at www.ilxlightwave.com.

LDX 36000 Series

High Power Laser Diode Current Source

Specifications [1]

	36010-12	36025-12	36050-12	36085-12	36125-12
DRIVE CURRENT OUTPUT					
Output Current Range:					
CW	10A	25A	50A	85A	125A
Pulse	20A	50A	100A	170A	220A
HPulse	10A	25A	50A	85A	125A
Set-Point Resolution:	10 mA	10 mA	10 mA	10 mA	10 mA
Set-Point Accuracy:[2]	0.1% +10 mA	0.1% +10 mA	0.1% +20 mA	0.1% +80 mA	0.1% +120 mA
Settling Time:					
CW[3]	20 µs	20 µs	20 µs	20 µs	20 µs
Pulse[4]	80 µs	80 µs	80 µs	80 µs	80 µs
HPulse[4]	550 µs	550 µs	550 µs	550 µs	550 µs
Maximum CW Power:	120W	300W	600W	1020W	1500W
Compliance Voltage:[5]	12V	12V	12V	12V	12V
Temperature Coefficient:	±50 ppm/°C	±50 ppm/°C	±50 ppm/°C	±50 ppm/°C	±50 ppm/°C
Stability:[6]	±100 ppm	±100 ppm	±100 ppm	±100 ppm	±100 ppm
Noise and Ripple:[7]	<5 mA rms	<10 mA rms	<20 mA rms	<40 mA rms	<60 mA rms
Transients:					
Operational:[8]	<40 mA	<40 mA	<40 mA	<40 mA	<40 mA
1kV EFT/Surge:[9]	<80 mA	<80 mA	<100 mA	<320 mA	<320 mA
QCW MODE [10]					
Pulse Width:					
Range					
Pulse Mode:	40 µs to 1 ms	40 µs to 1 ms	40 µs to 1 ms	40 µs to 1 ms	40 µs to 1 ms
HPulse Mode:	1 ms to 2s	1 ms to 2s	1 ms to 2s	1 ms to 2s	1 ms to 2s
Resolution:					
Pulse Mode:	2 µs	2 µs	2 µs	2 µs	2 µs
HPulse Mode:	0.01% + 0.5 µs	0.01% + 0.5 µs	0.01% + 0.5 µs	0.01% + 0.5 µs	0.01% + 0.5 µs
Accuracy:					
Pulse Mode:	± 10 µs	± 10 µs	± 10 µs	± 10 µs	± 10 µs
HPulse Mode:	±20 µs	±20 µs	±20 µs	±20 µs	±20 µs
Pulse Frequency:					
Range:	0.1 to 1000 Hz	0.1 to 1000 Hz	0.1 to 1000 Hz	0.1 to 1000 Hz	0.1 to 1000 Hz
Resolution:	0.1 Hz	0.1 Hz	0.1 Hz	0.1 Hz	0.1 Hz
Accuracy:[11]	±0.1%	±0.1%	±0.1%	±0.1%	±0.1%
Duty Cycle:					
Pulse Mode:	0.5 to 20%	0.5 to 20%	0.5 to 20%	0.5 to 20%	0.5 to 10%
HPulse Mode:	20 to 90%	20 to 90%	20 to 90%	20 to 90%	10 to 90%
Resolution:	0.1%	0.1%	0.1%	0.1%	0.1%
Rise/Fall Time:[12]					
Pulse Mode:	<10 µs	<10 µs	<20 µs	<25 µs	<20 µs
HPulse Mode:	200 µs	200 µs	200 µs	200 µs	200 µs
Overshoot:[13]	<2%	<2%	<2%	<2%	<2%
VOLTAGE LIMIT [14]					
Range:	0 – 14.0 V	0 – 14.0 V	0 – 14.0 V	0 – 14.0 V	0 – 14.0 V
Resolution:	100 mV	100 mV	100 mV	100 mV	100 mV
Accuracy:[11]	±1% + 200 mV	±1% + 200 mV	±1% + 200 mV	±1% + 200 mV	±1% + 200 mV

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VISA

Rev05.011409

LDX 36000 Series

High Power Laser Diode Current Source

Specifications

	36010-12	36025-12	36050-12	36085-12	36125-12
CURRENT LIMIT					
Range					
CW:	0 to 10.5A	0 to 26.2A	0 to 52.5A	0 to 89.2A	0 to 131.2A
QCW:	0 to 22.0A	0 to 53.5A	0 to 106.0A	0 to 179.5A	0 to 232.0A
Resolution:	10 mA	10 mA	10 mA	10 mA	10 mA
Firmware Accuracy Limit:[15]	±0.1% + 10 mA	±0.1% + 10 mA	±0.1% + 20 mA	±0.1% + 80 mA	±0.1% + 120 mA
Hardware Accuracy Limit:[15]	±1% + 10 mA	±1% + 10 mA	±1% + 20 mA	±1% + 80 mA	±1% + 120 mA
MEASUREMENT					
Forward Voltage					
Range:	0.00 to 12.00 V	0.00 to 12.00 V	0.00 to 12.00 V	0.00 to 12.00 V	0.00 to 12.00 V
Resolution:	10 mV	10 mV	10 mV	10 mV	10 mV
Accuracy:[18]	±0.05% of 20mV	±0.05% of 20mV	±0.05% of 20mV	±0.05% of 20mV	±0.05% of 20mV
PD Current					
Range:	3 to 10000 µA	3 to 10000 µA	3 to 10000 µA	3 to 10000 µA	3 to 10000 µA
Resolution:	3 µA	3 µA	3 µA	3 µA	3 µA
Accuracy:[19]	±0.1%	±0.1%	±0.1%	±0.1%	±0.1%
Reverse Bias					
Range:	0 to -15V	0 to -15V	0 to -15V	0 to -15V	0 to -15V
Resolution:	100 mV	100 mV	100 mV	100 mV	100 mV
Accuracy:	±2.5% FS	±2.5% FS	±2.5% FS	±2.5% FS	±2.5% FS
PD Responsivity					
Range:[20] (mA/W)	0 to 100.00	0 to 100.00	0 to 100.00	0 to 100.00	0 to 100.00
Resolution: (mA/W)	.001	.001	.001	.001	.001
Power Control Range					
Range:	0 to 1000W	0 to 1000W	0 to 1000W	0 to 1000W	0 to 1000W
Resolution:	1W	1W	1W	1W	1W
P1 (Slope Efficiency)					
Range (W/A):	0.00 to 10.00	0.00 to 10.00	0.00 to 10.00	0.00 to 10.00	0.00 to 10.00
Resolution (W/A):	0.01	0.01	0.01	0.01	0.01
P2 (Threshold)					
Range (A):	0.00 to 10.00	0.00 to 25.00	0.00 to 50.00	0.00 to 85.00	0.00 to 125.00
Resolution (A):	0.01	0.01	0.1	0.1	0.1
Temperature					
Sensor Type:	10K Thermistor	10K Thermistor	10K Thermistor	10K Thermistor	10K Thermistor
Range:	-99 to +199.9 °C	-99 to +199.9 °C	-99 to +199.9 °C	-99 to +199.9 °C	-99 to +199.9 °C
Thermistor Current:	100 µA	100 µA	100 µA	100 µA	100 µA
Accuracy:[21]	±0.1 °C	±0.1 °C	±0.1 °C	±0.1 °C	±0.1 °C

EVENT TRIGGERING (ALL MODELS)

Trigger Output:[16]	TTL Level; active high
Pulse Width:	10 µs
Delay:	Programmable
Accuracy:	2 µs ± 0.05%
Range:	0s to 1s
Resolution:	0.01% + 5 µs
Jitter:	100 ns
Trigger Input:[17]	TTL Level; rising edge triggered, single shot to 1 KHz; high impedance
Delay to Output:	Programmable
Accuracy:	2 µs ± 0.05%
Range:	20 µs to 1s
Resolution:	0.01% + 5 µs
Jitter:	200 ns
Pulse Output Trigger:	TTL Level, high impedance, active high

Notes

1. All values measured after 1-hour warm-up and at 25°C.
2. ± (% of setpoint + mA)
3. Time from 50% of current ramp to setpoint for step sizes 3A or less.
4. From the rising edge of the pulse to the setpoint.
5. At the end of CC-390 output cable.
6. % of full scale over 1 hour, all instrument modes.
7. RMS electrical noise measured with a resistive load over a 300 KHz bandwidth.
8. Maximum output current transient from normal operations (e.g. power on-off, current on-off), as well as accidental situations (e.g. power line plug removal); normal operations exclude pulse characteristics such as overshoot and undershoot.
9. Maximum output current transient from a 1000W power line transient spike.
10. All QCW mode pulse specifications taken with ILX CC-390 output cable. Use of the instrument with alternative cabling may affect pulse performance.
11. % of reading.
12. Measured from 10% to 90% points at half-scale output at the end of an ILX CC-390 cable into a non-inductive load.
13. % of setpoint, at the end of ILX CC-390 cable into a low inductance load. Overshoot may increase with inductance.
14. Voltage limit is higher than compliance to ensure output is not disabled due to overshoot caused by impedance mismatch.
15. Firmware and calibrated hardware limit accuracy.
16. From start of output pulse to trigger.
17. From start of trigger to output pulse.
18. % of reading + offset.
19. % of FS.
20. The responsivity value is user-defined and is used to calculate optical power.
21. Accuracy while using ILX Lightwave TS-510 calibrated 10 kΩ thermistor.
22. Interlock fault time measured from event to device shorting protection enabled.
23. Total external dimensions including handles and support feet. Handles add 1.5" (3.8 cm) and feet add 0.56" (1.4 cm) to overall dimensions.

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

LDX 36000 Series

High Power Laser Diode Current Source

Specifications [1]

	36010-35	36018-35	36040-30	36070-30	*36125-24*	36010-70	36018-70	36040-70
DRIVE CURRENT OUTPUT								
Output Current Range:								
CW	10A	18A	40A	70A	125A	10A	18A	40A
Pulse	20A	40A	80A	160A	220A	20A	40A	80A
HPulse	10A	18A	40A	70A	125A	10A	18A	40A
Set-Point Resolution:	10 mA	10 mA	10 mA	10 mA	10 mA	10 mA	10 mA	10 mA
Set-Point Accuracy:[2]	0.1% +10 mA	0.1% +10 mA	0.1% +20 mA	0.1% +80 mA	0.1% +120 mA	0.1% +10 mA	0.1% +10 mA	0.1% +20 mA
Settling Time:								
CW[3]	20 µs	20 µs	20 µs	20 µs	20 µs	20 µs	20 µs	20 µs
Pulse[4]	80 µs	80 µs	80 µs	80 µs	80 µs	80 µs	80 µs	80 µs
HPulse[4]	550 µs	550 µs	550 µs	550 µs	550 µs	550 µs	550 µs	550 µs
Maximum CW Power:	350W	630W	1200W	2100W	3000W	700W	1400W	2800W
Compliance Voltage:[5]	35V	35V	30V	30V	24V	70V	70V	70V
Temperature Coefficient:	±50 ppm/°C	±50 ppm/°C	±50 ppm/°C	±50 ppm/°C	±50 ppm/°C	±50 ppm/°C	±50 ppm/°C	±50 ppm/°C
Stability:[6]	±100 ppm	±100 ppm	±100 ppm	±100 ppm	±100 ppm	±100 ppm	±100 ppm	±100 ppm
Noise and Ripple:[7]	<10 mA rms	<10 mA rms	<10 mA rms	<40 mA rms	<60 mA rms	<10 mA rms	<10 mA rms	< 10 mA rms
Transients:								
Operational:[8]	<40 mA	<40 mA	<40 mA	<40 mA	<40 mA	<40 mA	<40 mA	<40 mA
1kV EFT/Surge:[9]	<80 mA	<80 mA	<100 mA	<320 mA	<320 mA	<80 mA	<80 mA	<100 mA
QCW MODE [10]								
Pulse Width:								
Range								
Pulse Mode:	40 µs to 1 ms	40 µs to 1 ms	40 µs to 1 ms	40 µs to 1 ms	40 µs to 1 ms	40 µs to 1 ms	40 µs to 1 ms	40 µs to 1 ms
HPulse Mode:	1 ms to 2s	1 ms to 2s	1 ms to 2s	1 ms to 2s	1 ms to 2s	1 ms to 2s	1 ms to 2s	1 ms to 2s
Resolution:								
Pulse Mode:	2 µs	2 µs	2 µs	2 µs	2 µs	2 µs	2 µs	2 µs
HPulse Mode:	0.01% + 0.5 µs	0.01% + 0.5 µs	0.01% + 0.5 µs	0.01% + 0.5 µs	0.01% + 0.5 µs	0.01% + 0.5 µs	0.01% + 0.5 µs	0.01% + 0.5 µs
Accuracy:								
Pulse Mode:	± 10 µs	± 10 µs	± 10 µs	± 10 µs	± 10 µs	± 10 µs	± 10 µs	± 10 µs
HPulse Mode:	±20 µs	±20 µs	±20 µs	±20 µs	±20 µs	±20 µs	±20 µs	±20 µs
Pulse Frequency:								
Range:	0.1 to 1000 Hz	0.1 to 1000 Hz	0.1 to 1000 Hz	0.1 to 1000 Hz	0.1 to 1000 Hz	0.1 to 1000 Hz	0.1 to 1000 Hz	0.1 to 1000 Hz
Resolution:	0.1 Hz	0.1 Hz	0.1 Hz	0.1 Hz	0.1 Hz	0.1 Hz	0.1 Hz	0.1 Hz
Accuracy:[11]	±0.1%	±0.1%	±0.1%	±0.1%	±0.1%	±0.1%	±0.1%	±0.1%
Duty Cycle:								
Pulse Mode:	0.5 to 20%	0.5 to 20%	0.5 to 20%	0.5 to 20%	0.5 to 10%	0.5 to 20%	0.5 to 20%	0.5 to 20%
HPulse Mode:	20 to 90%	20 to 90%	20 to 90%	20 to 90%	10 to 90%	20 to 90%	20 to 90%	20 to 90%
Resolution:	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%
Rise/Fall Time:[12]								
Pulse Mode:	<10 µs	<10 µs	<10 µs	<15 µs	<20 µs	<20 µs	<20 µs	<20 µs
HPulse Mode:	200 µs	200 µs	200 µs	200 µs	200 µs	200 µs	200 µs	200 µs
Overshoot:[13]	<2%	<2%	<2%	<2%	<2%	<2%	<2%	<2%
VOLTAGE LIMIT [14]								
Range:	0 – 38 V	0 – 38 V	0 – 33 V	0 – 33 V	0 – 27 V	0 - 77 V	0 - 77 V	0 - 77 V
Resolution:	100 mV	100 mV	100 mV	100 mV	100 mV	100 mV	100 mV	100 mV
Accuracy:[11]	±1% + 200 mV	±1% + 200 mV	±1% + 200 mV	±1% + 200 mV	±1% + 200 mV	±1% + 200 mV	±1% + 200 mV	±1% + 200 mV

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