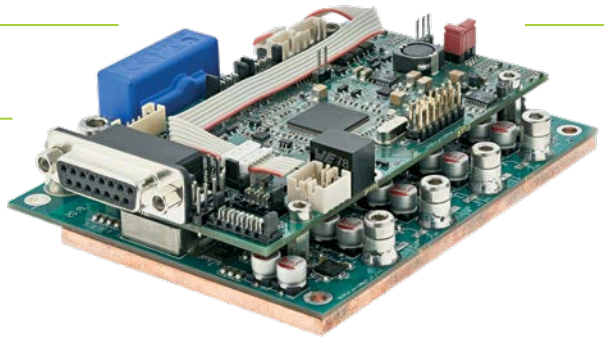
Laser Diode Drivers

uniLDD

Made By
Laser Electronics Experts



uniLDD is the product line of laser diode drivers, also known as laser diode controllers, for pumping of diode pumped solid state lasers (DPSSL) as well as powering and beam modulation of direct diode lasers for vast variety of industrial, medical, scientific and military applications.

Main specifications and compatibility with diodes:

Our uniLDD laser diode drivers can power wide range of diodes (single emitters, bars, stacks, VCSELs, LEDs) in pulsed (QCW) and continuous (CW) operation modes. Laser diode controllers can supply currents from 10 A to 1200 A while maintaining 0.1% pk-pk current stability. Compliance voltages of uniLDD laser diode drivers vary in 1 V – 600 V range.

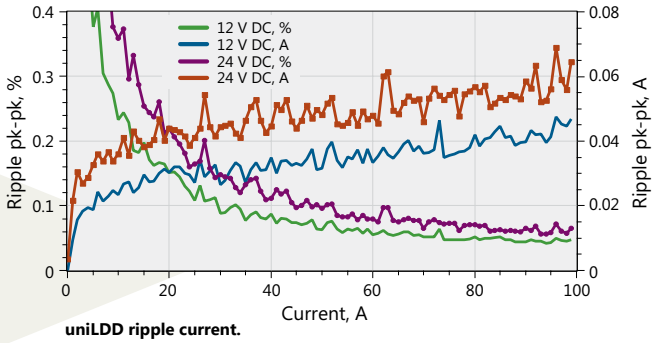
Internal TEC controller option:

Additionally to powering of laser diodes our uniLDD drivers can simultaneous function as TEC controllers, also known as Peltier element temperature controllers. Each laser diode driver contains two output channels which can be utilized as two independent TEC controllers.

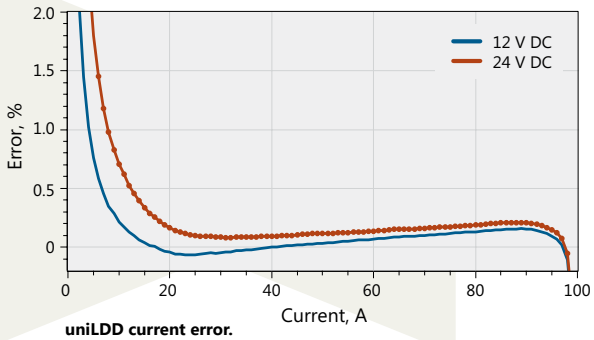
uniLDD Main Features

- **Current stability: 0.1% pk to pk**
- **Current range: from 10 A to 1200 A**
- **Compliance voltage range: from 1 V to 600 V**
- **Internal TEC option: one driver can contain up to 2 independently controlled TEC channels**
- **Power density: up to 2.8 kW in 130×90×30 mm form factor**
- **Analog and digital (CAN*, RS232) control interfaces**

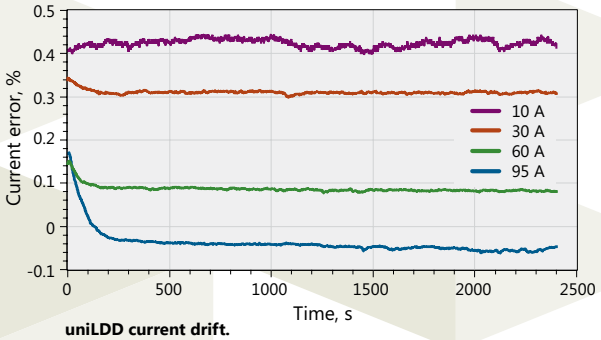
* For CAN communication at evaluation stage Ekspla's CAN-USB adapter is required.



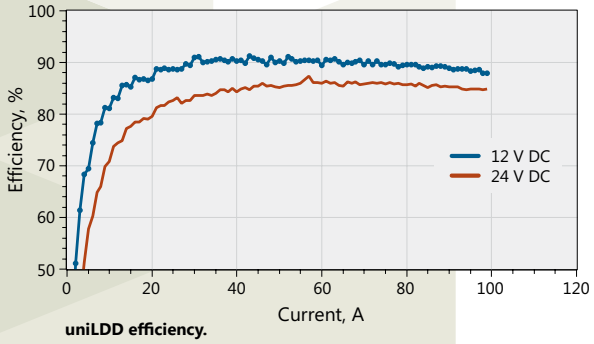
uniLDD ripple current.
12 V and 24 V DC power, 2 V junction + 10 MΩ series R load



uniLDD current error.
12 V and 24 V DC power, 2 V junction + 10 MΩ series R load



uniLDD current drift.
From cold start for different currents



uniLDD efficiency.
12 V and 24 V DC power, 2 V junction + 10 MΩ series R load

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uniLDD General Specifications

INPUT
Supply voltage, power stage **12...90 VDC**
Supply voltage, control stage **12...30 VDC**

PHYSICAL CHARACTERISTICS
Assembly dimensions (L × W × H)
190 × 68 × 55 mm (air cooled version)
130 × 90 × 30 mm (conductively cooled version)

PROTECTIONS
Current transient protection and shut-down
Open circuit shut-down
Over temperature shut-down
Power **voltage brownout** shut-down
Interlock shut-down

OUTPUT, CW mode		
Diode compliance voltage	**1...55 V**	Up to 95% of power stage supply voltage. Can be extended using voltage booster layout
Max current	**50 – 120 A**	Can be extended using parallel connection of several drivers
Current ripple	**0.1% pk-pk**	DC...100 kHz bandwidth, in ×0.5...×1 of max current range
Current drift	**< 0.2%**	Cold start, 8 h period, after 5 min. warm up
OUTPUT, OCW (Pulse mode)		
Diode compliance voltage	**1...80 V**	Can be extended using voltage booster layout. Custom solutions up to 600 V available upon request
Max pulse current	**160 – 360 A**	Can be extended using parallel connection of several drivers. Custom solutions up to 1200 A available upon request
Duty cycle	**≤ 20%**	
Current pulse raise, typical range	**10...50 µs**	@ minimal connection cable inductance and sufficient power stage voltage
Max RMS current	**100 A**	80 A for diode compliance voltage >28 V
Current pulse amplitude stability	**0.1% pk-pk**	In ×0.5...×1 of max current range
Current drift	**< 0.2%**	Cold start, 8 h period, after 5 min. warm up
OUTPUT, TEC control (if equipped)		
Quantity of output channels	**1 or 2**	
Maximal output current	**25 A**	
Maximal output voltage	**25 V**	
ENVIRONMENT		
Operating temperature	**0 to 40 °C**	De-rate current at higher temperature
Cooling	**Forced air or conductive**	Installed or external shared fan. Conductively cooled version available as option

NOTES:
Specifications are subject to change without prior notice.
Not all combinations of parameters are possible at the same time.

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uniLDD Configuration Examples

CW

Fig.1
CW uniLDD conductively cooled driver version

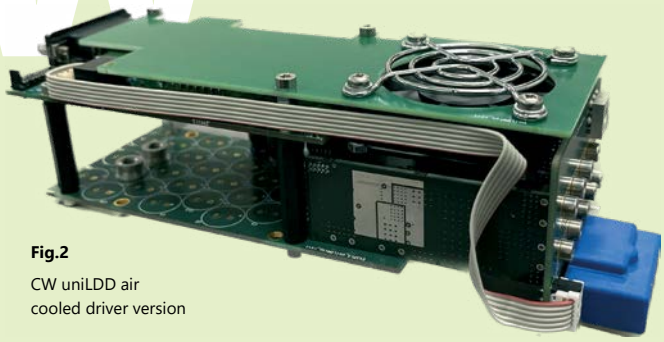

Fig.2
CW uniLDD air cooled driver version

uniLDD-C-CW-30-100

Driver for CW mode operation (conductively cooled)

Maximum current to laser diode	**100 A**
Maximum compliance voltage	**30 V**

Voltage extension possible by customization and current reduction.

uniLDD-A-CW-25-75-1TEC

Driver for CW mode operation and one stage bidirectional TEC control (air-cooled)

Maximum current to laser diode	**75 A**
Maximum compliance voltage	**25 V**
Maximum current to TEC	**25 A**
Maximum TEC voltage	**25 V**

uniLDD-A-CW-25-100

Driver for CW mode operation (air-cooled)

Maximum current to laser diode	**100 A**
Maximum compliance voltage	**25 V**

Voltage extension possible by customization and current reduction.

QCW

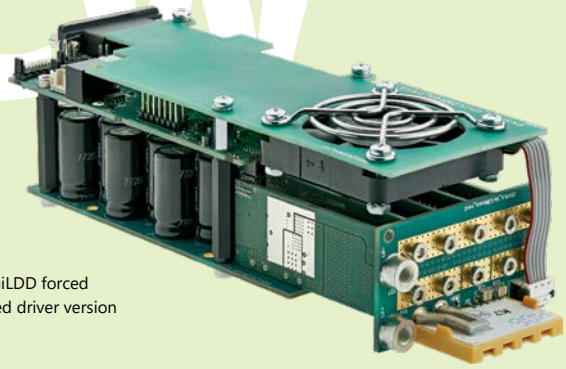

Fig.3
QCW uniLDD forced air cooled driver version

uniLDD-A-QCW-80-360

Driver for QCW mode operation (air-cooled)

Maximum current to laser diode	**360 A**
Maximum compliance voltage	**80 V**

Hardware options rated 30, 60, 100 V

uniLDD-A-QCW-80-270-1TEC

Driver for QCW mode operation and one channel bidirectional TEC control (air-cooled)

Maximum current to laser diode	**270 A**
Maximum compliance voltage	**80 V**

Hardware options rated 30, 60, 100 V

uniLDD-A-QCW-80-180-2TEC

Driver for QCW mode operation and two channels bidirectional TEC control (air-cooled)

Maximum current to laser diode	**180 A**
Maximum compliance voltage	**80 V**

Hardware options rated 30, 60, 100 V

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