

Laser Diode Drivers' Family



Driver that can supply almost any middle- and high-power laser diode in continuous or pulsed operation mode.

uniLDD is a DC input power converter designed to supply CW or pulsed (QCW) current for the single emitter, bar, stacked laser diode or high power VCSEL in constant current mode. Using different software versions together with specific hardware sets, the uniLDD driver is adapted for different types of laser diodes and modes of operation. The driver is based on DSP technology assuring high specifications. Typical performance is presented in below illustrations.

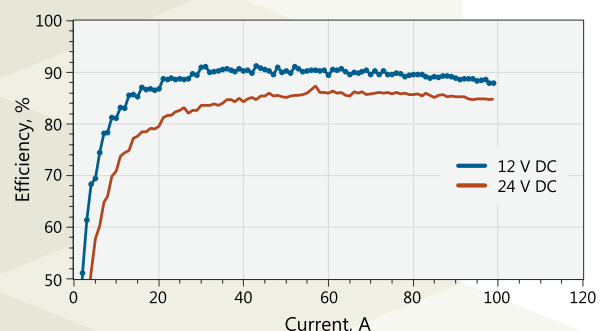
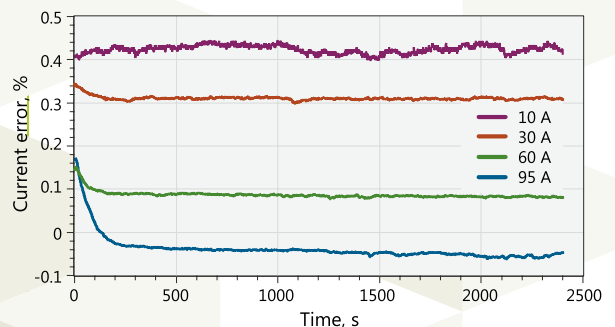
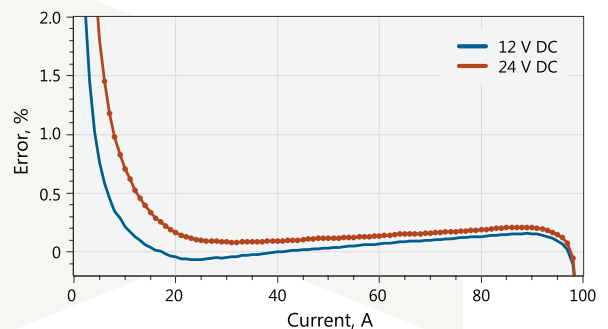
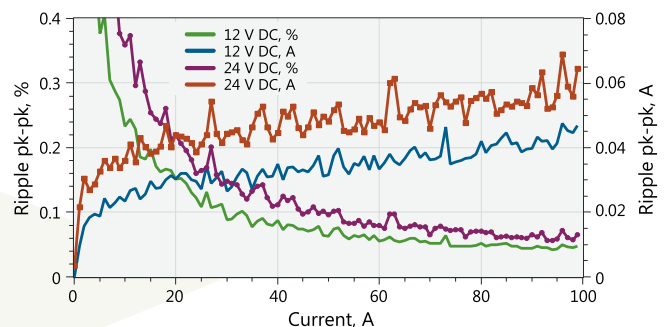
Next optimizations are done while adapting according to customer requirements (current, voltage, cables...):

- Firmware version (chosen from different 5 ready versions)
- Hardware components set
- Regulation loop frequency response analysis and PID constants defining
- Hardware and software settings

One or two TEC control channels can be added as option. However, the price for the feature is reduction of maximal possible output current to laser diode since 2 or 3 output stages of total 5 are utilized for TEC supply.

uniLDD Main Features

- Best suitable for high-current and high-power applications
- Different firmware versions featuring CW, QCW, ..., TEC control operation
- Hardware versions for CW, QCW, TEC control, Conductive cooling options
- At factory frequency response analysis is used to optimize performance to achieve stable operation with particular laser diode and connection cables combination
- High efficiency switching mode converter
- Multi-phase power stage for low current ripple
- Low current drift
- Parallel operation of two drivers to double output current
- "Voltage booster" layout option to extend output voltage to 200V and more
- External storage capacitor option for long-pulse QCW operation
- Analog and digital (CAN, RS232) control interfaces



uniLDD General Specifications

INPUT

Supply voltage, power stage
12...90 VDC

Supply voltage, control stage
12...30 VDC

PHYSICAL CHARACTERISTICS

Assembly dimensions
(L x W x H)

190 x 68 x 55 mm

PROTECTIONS

Current transient protection and shut-down

Open circuit shut-down

Over temperature shut-down

Power **voltage brownout** shut-down

Interlock shut-down

AUXILIARY OUTPUTS

+5V @ 200mA

+15V @ 100mA

-15V @ 100mA

OUTPUT, CW mode

Diode compliance voltage	1...28V	Up to 95% of power stage supply voltage. Can be extended using voltage booster layout
Max current	50A – 100A	Can be extended above 100A using parallel connection of several drivers
Current ripple	0.1% pk-pk	DC...100kHz bandwidth, in x0.5...x1 of max current range
Current drift	<0.2%	Cold start, 8h period, after 5min. warm up
Bandwidth of $I_{programm}$ control input frequency	>10kHz	At minimal connection cable inductance

OUTPUT, OCW (Pulse mode)

Diode compliance voltage	1...80 V	Can be extended using voltage booster layout
Max pulse current	160A-360A	Can be extended above 360A using parallel connection of the drivers
Duty cycle	≤20%	
Current pulse raise, typical range	10μs...50 μs	@ minimal connection cable inductance and sufficient power stage voltage
Max RMS current	100A	80A for diode compliance voltage >28V
Current pulse amplitude stability	0.1% pk-pk	In x0.5...x1 of max current range
Current drift	<0.2%	Cold start, 8h period, after 5min. warm up

OUTPUT, TEC control (if equipped)

Quantity of output channels	1 or 2	
Maximal output current	25A	
Maximal output voltage	28V	

ENVIRONMENT

Operating temperature	0 to 40°C	De-rate current at higher temperature
Cooling	Forced air	Installed or external shared fan. Conductive cooling version available as option

NOTES:

Specifications are subject to change without prior notice.

Not all combinations of parameters are possible at the same time.

uniLDD Possible Configurations

CW



Fig.2
CW uniLDD
conductive cooled
driver version



Fig.1
CW uniLDD forced air cooled
driver version

uniLDD-CW

Driver for CW mode operation

Firmware	CW
Maximum current to laser diode	100A
Maximum compliance voltage	27V

*Voltage extension possible by customization
and current reduction.*

uniLDD-CW+1TEC

Driver for CW mode operation and
one stage bidirectional TEC control

Firmware	CW-TEC
Maximum current to laser diode	75A
Maximum compliance voltage	27V
Maximum current to TEC	25A
Maximum TEC voltage	28V

QCW

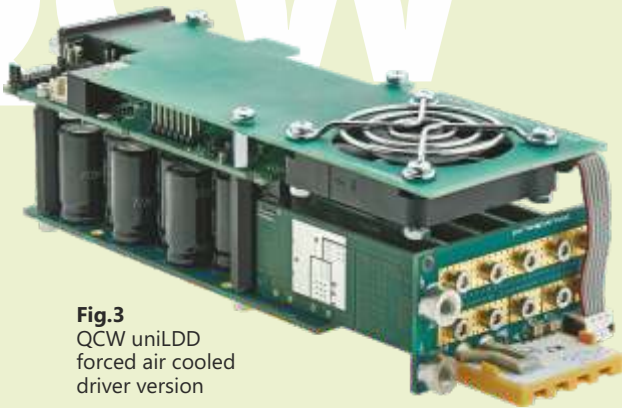


Fig.3
QCW uniLDD
forced air cooled
driver version

uniLDD-QCW

Driver for
QCW mode operation

Firmware	QCW
Maximum current to laser diode	360A
Maximum compliance voltage	80V

Hardware options rated 30, 60, 100 V

uniLDD-QCW-1TEC

Driver for QCW mode operation and
one channel bidirectional TEC control

Firmware	QCW-TEC
Maximum current to laser diode	270A
Maximum compliance voltage	80V

Hardware options rated 30, 60, 100 V

uniLDD-QCW-2TEC

Driver for QCW mode operation and
two channels bidirectional TEC control

Firmware	QCW-2TEC
Maximum current to laser diode	180A
Maximum compliance voltage	80V

Hardware options rated 30, 60, 100 V