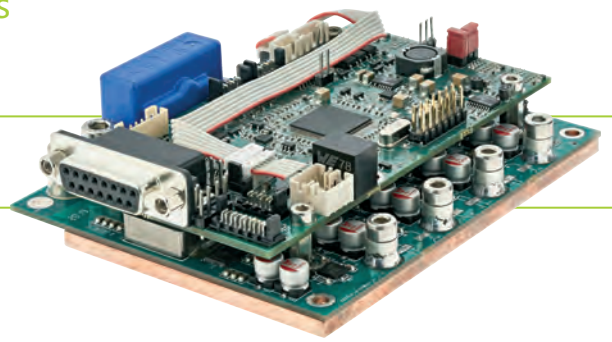


## Laser Diode Drivers' Family



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.

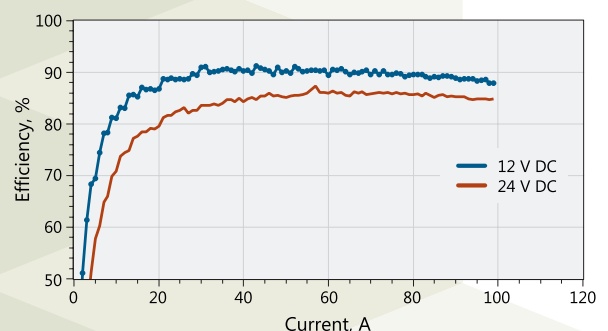
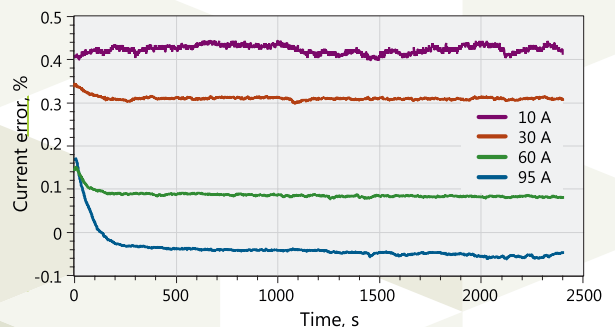
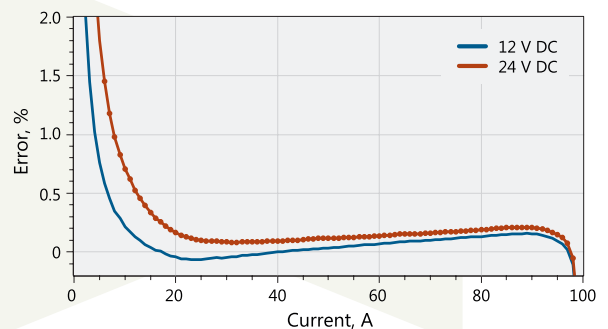
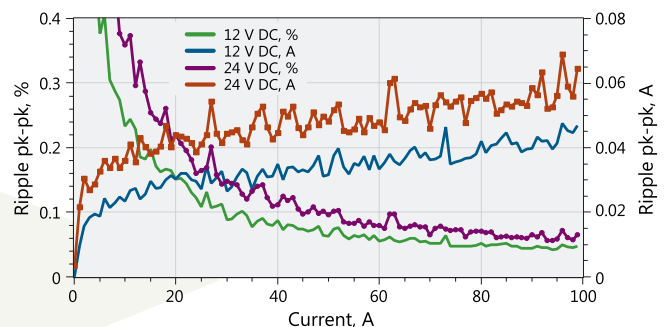
Next optimizations are done while adapting according to customer requirements (current, voltage, cables...):

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

## OUTPUT, OCW (Pulse mode)

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

## OUTPUT, TEC control (if equipped)

Quantity of output channels	<b>1 or 2</b>	
Maximal output current	<b>25A</b>	
Maximal output voltage	<b>28V</b>	

## ENVIRONMENT

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

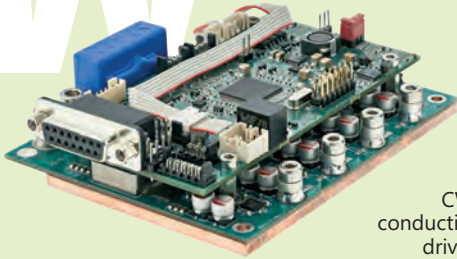
## NOTES:

Specifications are subject to change without prior notice.

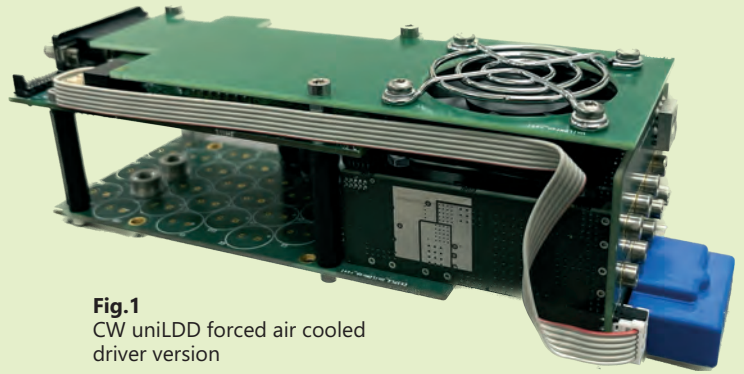
Not all combinations of parameters are possible at the same time.

# 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	<b>CW</b>
Maximum current to laser diode	<b>100A</b>
Maximum compliance voltage	<b>27V</b>

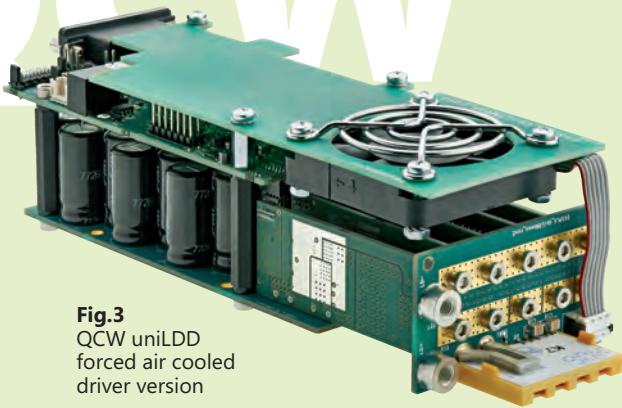
*Voltage extension possible by customization  
and current reduction.*

## uniLDD-CW+1TEC

Driver for CW mode operation and  
one stage bidirectional TEC control

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

# QCW



**Fig.3**  
QCW uniLDD  
forced air cooled  
driver version

## uniLDD-QCW

Driver for  
QCW mode operation

Firmware	<b>QCW</b>
Maximum current to laser diode	<b>360A</b>
Maximum compliance voltage	<b>80V</b>

**Hardware options rated 30, 60, 100 V**

## uniLDD-QCW-1TEC

Driver for QCW mode operation and  
one channel bidirectional TEC control

Firmware	<b>QCW-TEC</b>
Maximum current to laser diode	<b>270A</b>
Maximum compliance voltage	<b>80V</b>

**Hardware options rated 30, 60, 100 V**

## uniLDD-QCW-2TEC

Driver for QCW mode operation and  
two channels bidirectional TEC control

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

**Hardware options rated 30, 60, 100 V**