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## How to use the Manual



### Remark:

Please read all instructions before powering up the device.  
Please see section "Power Dissipation" for more details about thermal power losses during operation.



Please pay attention to all safety warnings.

If you have any doubt or suggestion, please do not hesitate to contact us!

## Absolute maximum Ratings (destroying limits)

- All input pins may not exceed the voltage range below zero (GND) and beyond VCC, resp. 5 V TTL.
- VCC limit: see table in section "Power Supply (#1)"
- Peak output current: 5.0 A
- Operating temperature range: 0 °C .. +60 °C
- Best performance operating temperature range: +10 °C .. +35 °C
- Storage temperature range: -20 °C .. +70 °C

## Dos and Don'ts

**Never** ground any output connector.

**Never** use any grounded probes at the output.

**Do not** connect your oscilloscope to the output!

Driver and the probe will immediately be destroyed!



Keep the connecting cables between power supply and driver as well as between driver and laser diode as short as possible.



**Be aware of hot surfaces! Do not touch!**



**PicoLAS**

FOCUSSING POWER TO THE POINT

Rev. 1911

## LDP-VRM 045-12 CA

### Laser Diode Driver



### Product Description

The LDP-VRM 045-12 CA is a fast driver for typical single laser diodes. With its high output voltage it is suitable for IR, blue LD's and all kinds of LEDs.  
Depending on the supply voltages output currents of up to 5.0 A can be achieved. The internal DC/DC converter stabilizes the voltage drop across the driving MOSFET to prevent excessive losses.

- Analog modulation dc .. 100 kHz
- Output current: 0 .. 5 A
- High speed
- Adaptive DC/DC converter

### Technical Data\*

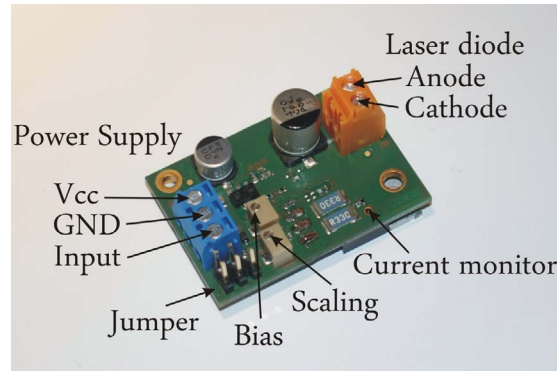
Output current (depending on supply voltage)	0 .. 3.4 A @ $U_{in} > 12$ V 0 .. 4.5 A @ $U_{in} > 18$ V 0 .. 5.0 A @ $U_{in} = 24$ V
Max. compliance voltage	Single laser diode, up to 10 V
Current noise	< 3 %
Current overshoot	< 5 %
Analog modulation (Bandwidth)	Approx. 100 kHz
Current setting input	0 .. 5 V
Current monitor	100 mV/A
Trigger	Analog / TTL (jumper)
Supply voltage	12 .. 24 V, min. 3 V above compliance
Power dissipation	6 W @ 4.5 A and $U_{in} 12$ V
Dimensions in mm	40 x 28 x 20
Weight	14 g
Operating temperature	0 to +55 °C


\* Specifications measured with a fast recovery diode instead of a laser diode. Technical data is preliminary and subject to change without further notice.


- Innovative current regulation concept actively prevents laser diode from overshoots and overcurrent
- Protection against transients through regulated current rise time
- Adaptive DC/DC converter for lowest losses

Optional Accessories: None

## How to get started



 The basic settings (scaling and BIAS current etc.) can be adjusted by potentiometer. Bias set a dc output current up to 1.6 A without connecting input signal.

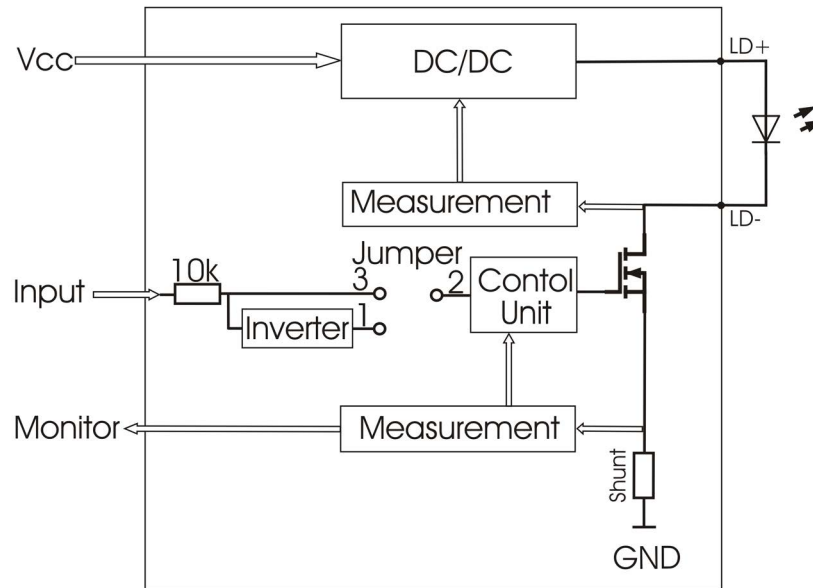
 You need an additional waveform generator which has to be connected to the input terminal. There is no AWG included within the driver!

Step	What to do	Check
1	Solder a dummy diode between LD+ and LD-. Alternatively make a short circuit there.	See section "Test Load" range of compliance voltage 0 V .. 12 V.
2	Connect GND, VCC to power connector (power source disabled).	Range of VCC 12 V .. 24 V. Required max. current is about 5.0 A.
3	Connect waveform generator to input terminal (no pulse before enabling power supply).	See all section discussing input (connector #2).
4	Enable the power source.	
5	Adjust scaling and bias.	See potentiometer for scaling a bias.
6	Feed a signal on the input terminal. For example 1 kHz sine wave with 1 V amplitude.	Make sure not to overload the laser diode or the driver. Range of input signal 0 V .. 5 V.
7	Monitor the current output.	The current monitor measures a signal proportionally with the input signal. Use an oscilloscope with a 1 MEG ohm termination. Scale: 100 mV/A.
8	Disable the input signal and turn off the power source. Remove the test diode or bypass and assemble the final laser diode.	
9	Turn the power supply for the VCC on again.	Range of VCC 12 V .. 24 V.
10	Feed a signal to the input terminal.	Make sure not to overload the laser diode!

## Required Laser Diode Pinout

The LDP-VRM 045-12 CA is designed for a direct connection to almost all kinds of laser diodes. Be careful to consider the polarity of the laser diode and connect it correctly to the driver.

## Power Driver Block Diagram



## Description of the Connectors

Connector	Function	
#1	Power connector	Screw terminal
#2	Jumper	Analog / Digital
#3	Current monitor	Scale 100 mV / A
#4	LD connector	Screw terminal

## Power Supply (#1) and absolute maximum Ratings

Pin of conn. #3	Allowed range	Best performance	Destroying limit
1 VCC (laser supply)	12 V .. 24 V	3 V (above compliance)	25 V
2 GND	-	-	-
3 Input terminal	0 V .. 5 V	-	< -0.3 V; >+ 5.3 V

### Input (#1)

The analog setpoint signal is provided via connector #1 on pin 3. The output current follows the input signal proportionally within the driver's limitations (bandwidth, max. current, rise time).

### Jumper (#2)

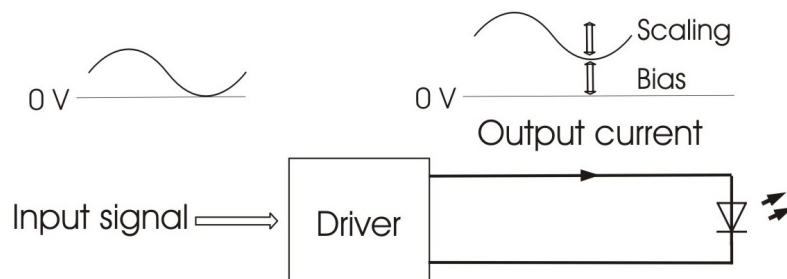
The analog input can be switched to an inverted digital input. Set the jumper left to activate the inverted digital input.

### Current Monitor (#3)

The scale of current monitor is 100 mV / A.

### Potentiometer for Bias and Scaling

The bias potentiometer sets a dc output current up to 1.6 A which is added to the input signal. Turn it clockwise to increase the bias current. The scaling potentiometer sets the scaling for the input signal. Turn it clockwise to increase the scale from 0 A / V to 0.5 A / V.



### Test Load

For the first verification an appropriate test load may be assembled instead of the laser diode. This test load can either be a short circuit or a schottky diode like the ES3C. Please connect the test load only between anode and cathode (LD+ and LD-) and prevent shorts to any other part of the circuit.

### Power Dissipation

The control of the driver reduces the power dissipation automatically to a minimum.

The driver has to be cooled and allows a maximum power dissipation of 6 W.

### Mechanical Dimensions

The following dimensions are in millimetres (mm).

Width: 40, Length: 28, Height: 20