



LASER DIODE DRIVER HPLDD1540

High Power Laser Diode Driver

Precision current control for demanding laser diode systems. The HPLDD1540 combines high electrical efficiency, fine 1 mA setpoint resolution, fast gated operation, and layered protection features in a compact platform ready for lab and OEM use.

Why HPLDD1540

- Designed for systems that need both **precision at low power** and **stability at high power**.
- Supports clean CW operation as well as **QCW / gated workflows**.
- Built-in protection layers help reduce the risk of damaging the driver or the laser diode during setup and operation.

Up to 600 W

1 mA setpoint resolution

Controlled ramp up / down

Up to 97% efficiency

QCW / gated operation

USB / RS-232 / RS-485

Windows / Linux app

Electrical Specifications

Input voltage	10-55 VDC
Output voltage	1-40 V, max. 73% of input voltage
Output power	Up to 600 W
Current setpoint range	0-15 A
Current setpoint resolution	1 mA
Efficiency	Up to 97%, operating-point dependent
Current monitor output	0-15 V analog output for 0-15 A
External gate input	3.3 V logic input

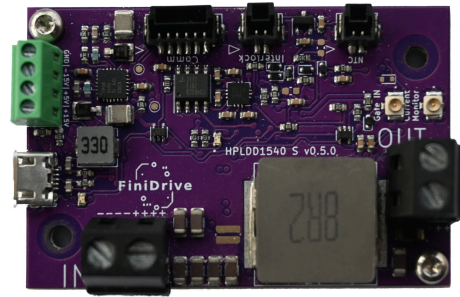
Safety and Control Features

- Crowbar output protection
- Programmable and regulated overcurrent protection
- Programmable driver overtemperature protection
- Programmable diode overtemperature protection
- Reverse current protection
- Interlock loop tied directly to crowbar and converter logic
- Programmable current ramping
- Load check and power-good status monitoring

AT A GLANCE

- **Wide load range** - from **1 W** to **600 W**.
- **Wide 10-55 V input**, with **up to 40 V** output and **up to 15 A** programmable current.
- **Ultra-compact footprint** - only **40 x 60 mm** with **25 x 50 mm** mounting hole spacing.
- **1 mA resolution** and **precisely controlled ramp up / ramp down** current behavior.
- **USB / RS-232 / RS-485**

Product Overview



Compact high-power laser diode driver platform with power stage, monitoring, and external control interfaces on a single board. The top-side view is shown at 1:1 physical scale.

Integration Options

The driver can be used as a standalone lab unit or embedded into a larger control system.

- USB port for setup, diagnostics, and laboratory setups
- RS-232 for direct system integration
- RS-485 for multidrop installations and addressed devices
- Dedicated control application for Windows and Linux
- Internal, external, and combined gating modes for QCW workflows

AUX and Monitoring

Board footprint	40 x 60 mm
Mounting hole spacing	25 x 50 mm
AUX terminal	GND, +5 V, +15 V, -15 V
NTC input	External 10 k NTC sensor input
Interlock loop	Minimum loop current 4 mA, max. loop resistance 355 Ohm

Interfaces and Working Principle

Pin assignments are summarized below for faster integration work, while the functional scheme gives a high-level view of the control and protection path.

Pinout Reference

Input Terminal

Pin 1 IN-

Pin 2 IN+

AUX Terminal

Pin 1 GND

Pin 2 -15 V

Pin 3 +5 V

Pin 4 +15 V

USB

Type USB Micro-B

Note Recognized as COM port

Interlock

Pin 1 +3.3 V

Pin 2 I-L return

Minimum loop current 4 mA.

Maximum loop resistance 355 Ohm.

Output Terminal

Pin 1 OUT+

Pin 2 OUT-

COMM Terminal

Pin 1 RS-485 GND

Pin 2 RS-485 B

Pin 3 RS-485 A

Pin 4 RS-232 RxD

Pin 5 RS-232 TxD

Pin 6 RS-232 GND

NTC

Pin 1 GND

Pin 2 NTC input

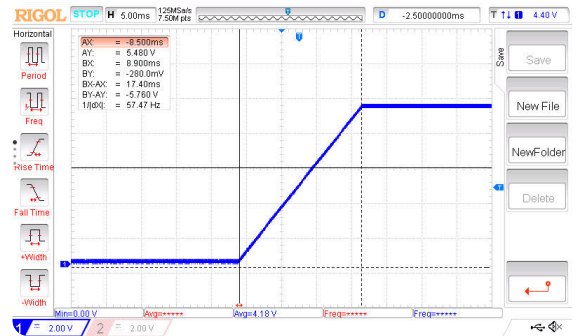
For external 10 k NTC sensor connection.

Coax Connectors

Gate In 3.3 V logic input

Monitor 0-15 V analog output

Controlled Current Ramping



Example oscilloscope capture showing 600 A/s controlled current rise from 0 A to 10 A with no overshoot.

Typical Applications

- Laboratory laser diode sources and test benches
- OEM laser subsystems requiring repeatable current control
- CW/QCW optical power delivery with external triggering
- Installations where monitoring, interlock, and software control matter

Functional Scheme

High-level view of the power path, current feedback, protection logic, and external interfaces.

FiniDrive HPLDD Working Principle

