FiniDrive

LASER DIODE DRIVER

HPLDD3040

High Power Laser Diode Driver

Precision current control for demanding laser diode systems. The HPLDD3040 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.

AT A GLANCE

- **Wide load range** - from **1 W** to **1200 W**.
- **Wide 10-55 V input**, with **up to 40 V** output and **up to 30 A** programmable current.
- **Compact footprint** - only **50 x 60 mm** with **40 x 50 mm** mounting hole spacing.
- **1 mA protocol resolution**, **2 mA effective setpoint accuracy**, and **precisely controlled ramp up / ramp down** current behavior.
- **USB / RS-232 / RS-485**

Why HPLDD3040

- 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 1200 W | **1 mA protocol resolution** | **2 mA effective accuracy** | **Controlled ramp up / down** | **Up to 97% efficiency** | **QCW / gated operation** | **USB / RS-232 / RS-485** | **Windows / Linux app**

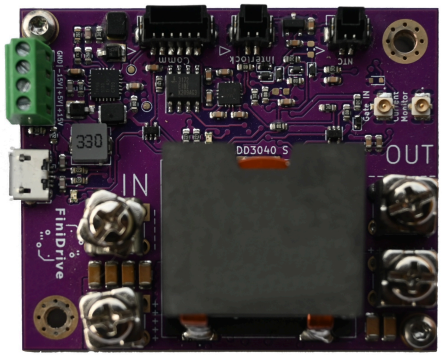
Electrical Specifications

Input voltage	10-55 VDC
Output voltage	1-40 V, max. 73% of input voltage
Output power	Up to 1200 W
Current setpoint range	0-30 A
Current setpoint resolution	1 mA
Effective setpoint accuracy	2 mA
Efficiency	Up to 97%, operating-point dependent
Current monitor output	0-15 V analog output for 0-30 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

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	50 x 60 mm
Mounting hole spacing	40 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

INTEGRATION SUMMARY

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+

Output Terminal

Pin 1	OUT+
Pin 2	OUT-

AUX Terminal

Pin 1	GND
Pin 2	-15 V
Pin 3	+5 V
Pin 4	+15 V

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

USB

Type	USB Micro-B
Note	Recognized as COM port

NTC

Pin 1	GND
Pin 2	NTC input

For external 10 k NTC sensor connection.

Interlock

Pin 1	+3.3 V
Pin 2	I-L return

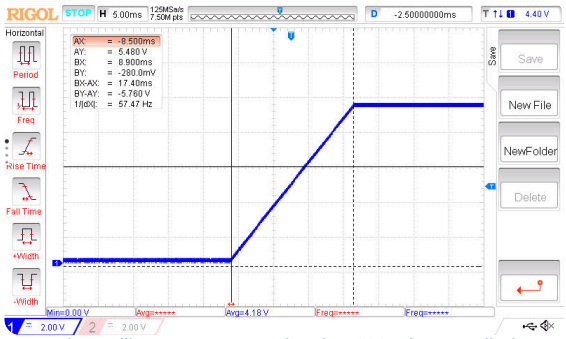
Minimum loop current 4 mA.
Maximum loop resistance 355 Ohm.

Coax Connectors

Gate In 3.3 V logic input

Monitor0-15 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.