

LTD-series - Laser-TEC-Controller

Systems of the LTD-series are compact plug&play Laser-TEC driver units for controlling especially fiber coupled laser diodes. They combine a laser current source with a thermoelectrical controller for driving and TE-cooling the customer specific fc-laser diode.

There are two standard sizes with 3U for smaller diodes with up to 90 W dissipated power and 6U for up to 295 W thermal load.

Under industrial conditions of 40 °C ambient temperature and 15 °C cold side temperature the thermal power limit is 160 W.



The laser driver is free configured ex works to fit exactly the requirements of the customer specific fiber coupled laser diode module.

The integrated heat sink is prepared for easy electrical and mechanical mounting of the customers laser diode. A lead-through at the systems backplate is prepared for the outgoing fiber.



In case of a thermal failure the system detects via an independent secondary circuitry an over temperature condition and shuts of the laser driver safely whilst cooling is maintained to protect the laser diode.

For pulsed and qcw solutions contact Schulz-Electronic.

- Laser diode and thermoelectric controller LTD-xx-yy-zz
'xx' min. thermal load, 'yy' laser diode current and 'zz' laser diode voltage adapted to customer specification
Laser driver output current up to 100 A
- Suited for fiber-coupled laser diodes up to approx. 100 W optical power (depending on efficiency and cold side and ambient temperature)
- TE-cooling power up to 400 W electrically
- Thermal transport power:

LTD-040

74 W at $T_{Amb} = 20\text{ °C} / T_{cold} = 20\text{ °C}$
52 W at $T_{Amb} = 30\text{ °C} / T_{cold} = 15\text{ °C}$
42 W at $T_{Amb} = 40\text{ °C} / T_{cold} = 15\text{ °C}$

LTD-045

94 W at $T_{Amb} = 20\text{ °C} / T_{cold} = 20\text{ °C}$
60 W at $T_{Amb} = 30\text{ °C} / T_{cold} = 15\text{ °C}$
44 W at $T_{Amb} = 40\text{ °C} / T_{cold} = 15\text{ °C}$

LTD-050

125 W at $T_{Amb} = 20\text{ °C} / T_{cold} = 20\text{ °C}$
73 W at $T_{Amb} = 30\text{ °C} / T_{cold} = 15\text{ °C}$
48 W at $T_{Amb} = 40\text{ °C} / T_{cold} = 15\text{ °C}$

LTD-100

200 W at $T_{Amb} = 20\text{ °C} / T_{cold} = 20\text{ °C}$
140 W at $T_{Amb} = 30\text{ °C} / T_{cold} = 15\text{ °C}$
104 W at $T_{Amb} = 40\text{ °C} / T_{cold} = 15\text{ °C}$

LTD-160

295 W at $T_{Amb} = 20\text{ °C} / T_{cold} = 20\text{ °C}$
210 W at $T_{Amb} = 30\text{ °C} / T_{cold} = 15\text{ °C}$
160 W at $T_{Amb} = 40\text{ °C} / T_{cold} = 15\text{ °C}$

- Size: LTD-040 / LTD-045 / LTD-050 - 3 U, 19", 460 mm
LTD-100 / LTD-160 - 6 U, 19", 460 mm
- Input: 110 VAC or 230 VAC, 50 - 60 Hz, max. input power 1.500 W
- Max. operating temperature 40 °C

cw-driver specifications:

PERFORMANCE

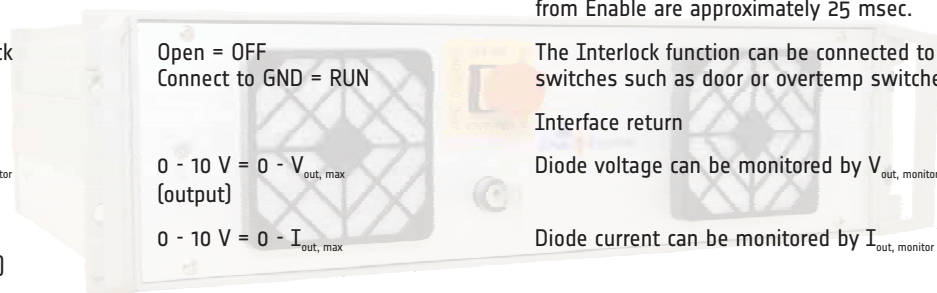
- Rise/fall time: <1 ms standard (10% to 90% full current) (<350 μ s available upon request)
- Current regulation: <0.5% of maximum output current
- Current ripple: <0.5% of maximum output current
- Current overshoot: <1% of maximum output current
- Power limit: Limited to maximum power with power fold-back circuit

INTERFACE

- Connector: 15 Pin "D" Sub female
- Current program: 0 - 10 V for 0 - max. current
- Current monitor: 0 - 10 V for 0 - max. current
- Voltage monitor: 0 - 10 V for 0 - max. voltage

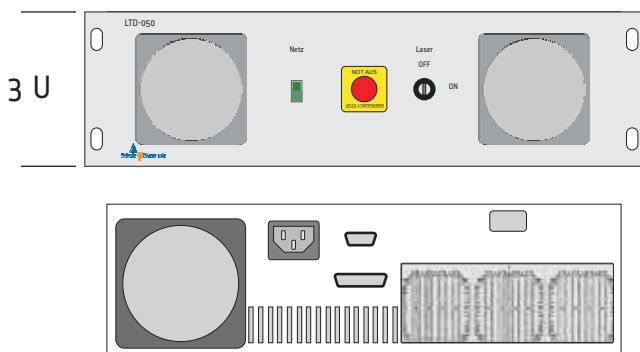
CONNECTOR TYPE: 15 PIN D-SUB FEMALE

Pin #	Pin Name	Functional Voltage Level	Description
1	Enable (input)	High = RUN = +5 V to +15 V Low = OFF = 0 V	The Enable function turns the output section of the power supply ON and OFF. When the power supply is enable, current is delivered to load as programmed via $I_{prog}(+)$, Pin 7. Rise times resulting from Enable are approximately 25 msec.
3	Interlock (input)	Open = OFF Connect to GND = RUN	The Interlock function can be connected to external interlock switches such as door or overtemp switches.
4	GND		Interface return
5	* $V_{out, monitor}$	0 - 10 V = 0 - $V_{out, max}$ (output)	Diode voltage can be monitored by $V_{out, monitor}$. See note below
6	$I_{out, monitor}$ (output)	0 - 10 V = 0 - $I_{out, max}$	Diode current can be monitored by $I_{out, monitor}$
7	$I_{prog}(+)$ (input)	0 - 10 V = 0 - $I_{out, max}$	Diode current is set by applying 0 - 10 V analog signal to $I_{prog}(+)$
9	GND		Interface return
10, 11	+5V @ 0.5A (output)		Auxiliary +5 V power supply for user. Up to 0.5 A
12	-15V @0.5A (output)		Auxiliary -15 V power supply for user. Up to 0.5 A
13, 14	+15V @0.5A (output)		Auxiliary +15 V power supply for user. Up to 0.5 A
15	GND		Interface return



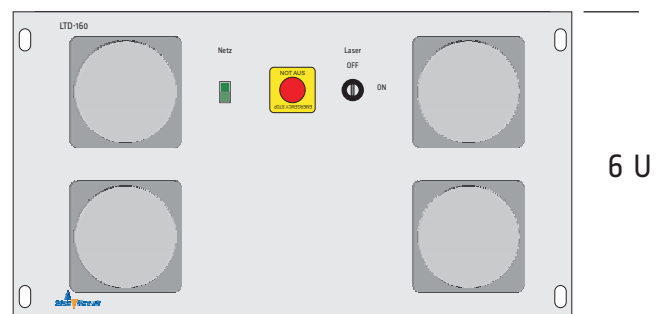
* If maximum compliance voltage is less than 10 V, $V_{out, monitor}$ will read output voltage directly.
If maximum compliance voltage is greater than 10 V, then $V_{out, monitor}$ will be scaled such that 0 - 10 V = 0 - $V_{out, max}$.

LTD-040 / 045 / 050



LTD-100 / 160

19" rack, depth 460 mm



qcw-driver specifications:

Several pulsed and qcw-drivers can be integrated into the LTD-series.

Following qcw-configurations are possible:

P_{avg, max} 50 W, max. 120 A

PW 50 μ s - 2 ms
PRF max. 10 kHz
U_{max} 100 V

P_{avg, max} 250 W, max. 200 A

PW 50 μ s - 2 ms
PRF max. 10 kHz
U_{max} 100 V

P_{avg, max} 90 W, max. 18 A

PW 1 μ s - DC
PRF max. 500 kHz
U_{max} 5 V

P_{avg, max} 200 W, max. 40 A

PW 1 μ s - DC
PRF max. 500 kHz
U_{max} 5 V

P_{avg, max} 300 W, max. 200 A

PW 5 μ s - DC
PRF max. 500 kHz
U_{max} 22 V

TEC-Controller

The TEC-controller is programmed and monitored either by serial commands or graphical user interface. Here the setpoint temperature can be programmed and stored in non-volatile memory. The last saved configuration will be activated automatically after power up, so a communication does not need to be established to run and cool the system.

Depending on the thermal load the PID-parameters need to be adapted by the user to his specific load.

At any moment the current temperature of the laser diode can be monitored either by the runtime window or can be read via RS232 commands.

