



HighFinesse

Laser Control System

LCS 02/6

Laser Current Source

LTC 40

Laser Temperature Controller

Introduction

The Laser Control System is designed for controlling temperature and current of semiconductor laser diodes. Highly developed soft-turn-on and soft-turn-off circuits protect your laser diode from electronic transients while activating the current as well as from interruptions of the mains voltage.

The Laser Control System consists of two units, the laser temperature controller (LTC) and the laser current source (LCS). The LTC is designed for the temperature sensor PT10000 and thermo electric cooler (TEC) based on peltier elements.

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1 Operation

1.1 Operation Elements

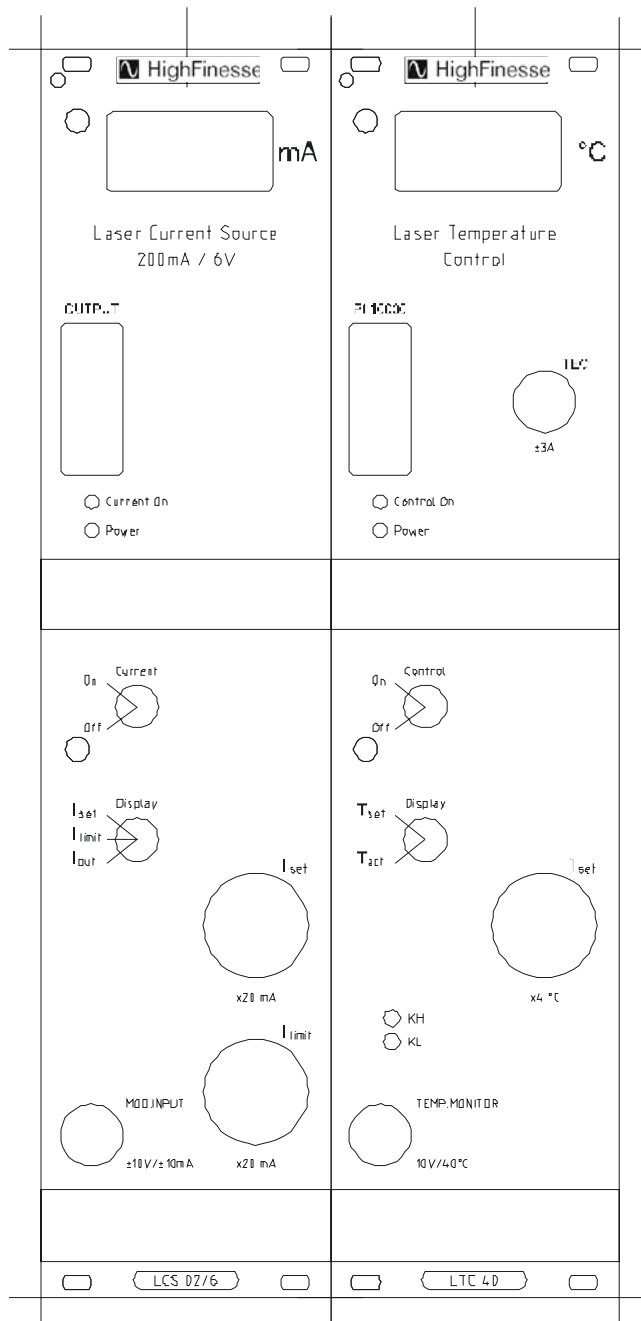


Figure 1: Frontpanel of the Laser Control System

1.2 Pinout Information and Grounding of the System

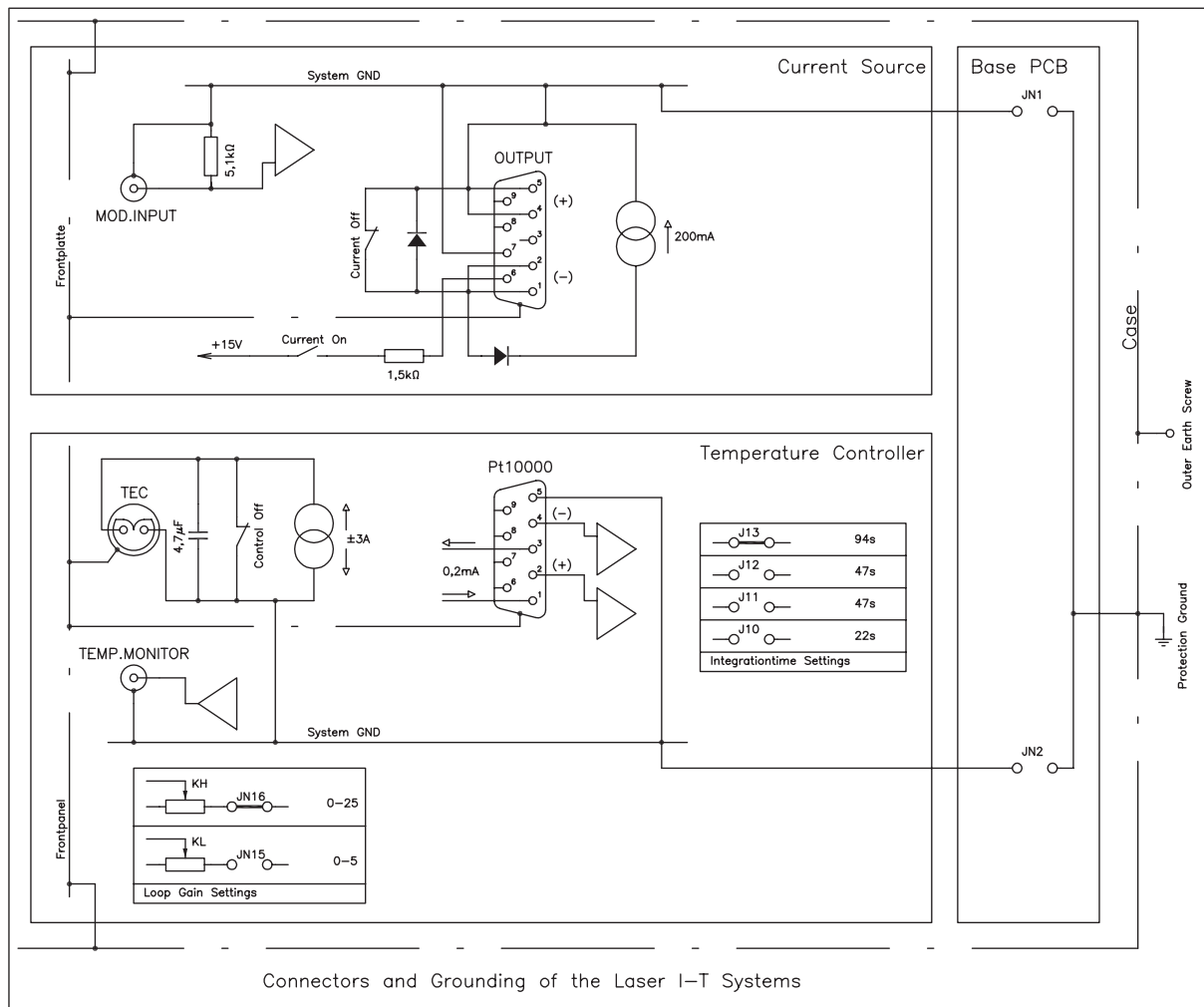


Figure 2: Connectors, Pinout and Grounding

Laser Current Source Output:

Cathode (-): Pins 1,2 (System GND)

Anode (+): Pins 4,5

The System GND is floating (factory set). The System Ground can be connected to the protection wire by the jumper JN1 (Figure 2). Before connecting JN1 please make sure that this does not lead to parasitic circuits and does not damage your laser diode. JN1 is on the base electronic plate in the rack behind the Current Source module.

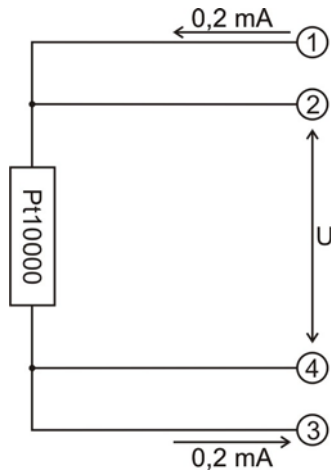


Figure 3: Connecting the Pt10000

Laser Temperature Control Pt10000:

The temperature is determined by a four point measurement of voltage and current on the Pt10000 temperature sensor element. Therefore it's necessary to connect a four wire cable as close as possible to the Pt10000 as shown in the figure 3.

The Peltier cooler is connected to the Twinax connector.

The System GND is floating (factory set). The System Ground can be connected to the protection wire by the jumper JN2 (Figure 2). Before connecting JN2 please make sure that this does not lead to parasitic circuits and does not damage your laser system or electronics. JN2 is on the base electronic plate in the rack behind the Current Source module.

1.3 Getting Started

Please mind that the electrical connections of the laser diode are floating. If there is a need to ground one pin of the laser diode please adjust the grounding scheme of the electronics properly by connecting/disconnecting the jumper JN1 on the back panel (Fig. 2.).

Please mind configuring the cables for the temperature sensor, peltier cooler, and laser diode as depicted in Section 1.2.

Please mind that the mains voltage switch on the back panel of the rack and both the current switch and the temperature control switch are OFF!

Connect the device to the mains ~230 V/50 Hz. Plug in the 9 pin Sub-D-connector of the laser diode and the BNC-modulation input into the current source unit. Connect the 9 pin Sub-D-connector of the PT10000 temperature sensor and the Twinax-connector of thermo electric cooler to the temperature controller unit.

Switch the device on by the mains voltage (cutout) switch on the backside.

1.4 Laser Temperature Control

The LC-display is used to monitor both the actual temperature (T_{act}) and the temperature to be set (T_{set}). The temperature is displayed in degree Celsius. Please select first T_{set} using the switch "Display". The desired temperature can be set by the potentiometer. Please mind also the calibration below the knob. The values on the knob multiplied by a factor of four will give the temperature in °C. After setting the temperature, the Control switch can be switched ON. The state is indicated by the LED „Control on“. The actual temperature can be monitored also by the BNC output while the voltage range 0-10 V correspond to the temperature range of 0-40 °C.

Note: In order not to damage the controller never switch the control ON without having the PT10000 connected to the temperature controller!

1.5 Laser Current Source

The LC-display is used to monitor three quantities: the set current (I_{set}), the current limit (I_{limit}), and the actual source current (I_{act}). The current is displayed in mA. Please select first I_{set} using the switch "Display". By the potentiometer I_{set} the desired Current can be adjusted. Please also mind to set a current limitation by the potentiometer I_{limit} . Please make sure that I_{limit} is larger than I_{set} ! Please mind that the setting of the current limit is not exact, it may deviate up to 20% from its nominal value.

Please mind also the calibration below the knob. The values on both knobs multiplied by a factor of 20 correspond to the current in mA.

The source current is activated by the switch „Current“. The operation state is indicated by the LED „Current on“.

The source current may be modulated using the analog voltage input MOD. INPUT. ± 10 V input voltage will modulate the current by ± 10 mA. The modulation current is added to the DC-output-current I_{out} .



2 Operating conditions

The *Laser Control System* is designed for indoor use under the following environmental conditions:

Air temperature:	15 ... 28 °C
Humidity:	up to 60 %
Atmospheric pressure:	680 ... 820 mm Hg

2.1 Technical Data

max. laser output current :	200 mA
max. laser output voltage:	6 V
current modulation ratio:	$\pm 10 \text{ V} / \pm 10 \text{ mA}$
max TEC output current :	3 A
max TEC output voltage:	6 V
Temperature monitor ratio:	10 V / 40 °C
Dimensions:	200 mm / 360 mm / 275 mm
Weight:	ca. 3 kg



3 HighFinesse Information-Service

For further information please feel free to contact us.

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