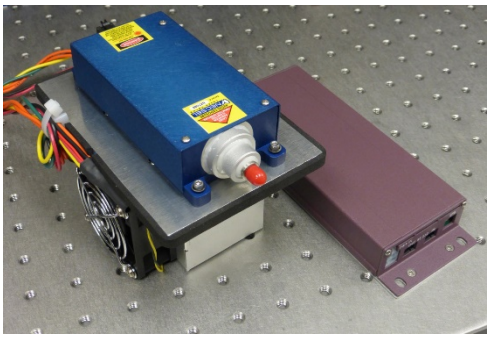
NECSEL™ THERMAL PLATFORM DEVELOPER'S KIT

Specifications Document



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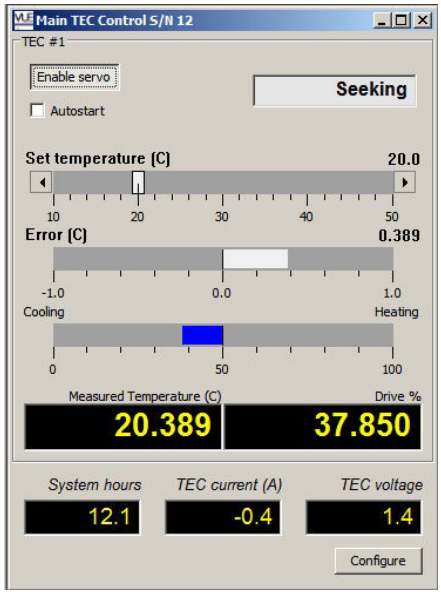
1. Introduction

The Necsel Thermal Platform Developer's Kit is the easiest way to start using Necsel NovaLum lasers. Each kit includes the Necsel Thermal Platform Intelligent Controller that is pre-calibrated and matched to your TEC based active thermal platform module for immediate use out of the box. The heatspreader is pre-drilled for the mounting of all standard Necsel NovaLum laser modules.

The Necsel Thermal Platform Developer's Kit consists of two basic modules: the Necsel Thermal Platform Intelligent Controller with a Microsoft Windows based software interface, and the TEC based Active Thermal Platform Module.

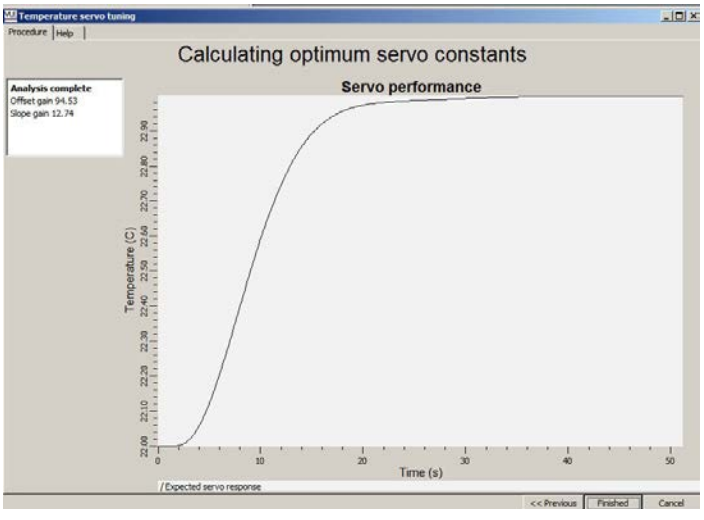
The Necsel Thermal Platform Intelligent Controller is a bi-directional, high frequency, high efficiency switch mode power converter with filter. It provides smooth DC power for maximum drive efficiency to a Peltier-effect thermoelectric cooler (TEC) and is capable of bidirectional operation (heating and cooling). The controller incorporates advanced servo logic that will regulate the temperature of the heatspreader to a user-defined set point. It controls the voltage applied to the TEC, and the current that results is a characteristic of the TEC rather than the driver. In the event that the TEC tries to draw more current than the driver can provide, a shutoff will occur to protect the driver. When this occurs and if the Pass-through feature is in use, the laser driver will be automatically shut off as well. The voltage capability of the TEC controller is determined by the input DC power supply. The controller output voltage is limited to 90% of the input. Our Thermal Platform Development Kits come

configured with a 15V DC power supply - providing a 13.5V TEC controller maximum output, however, the standard controller will work with any DC power supply in the range of 15V - 24V. Lower voltages are also possible but will require factory modification. The output current limit is 10A.



The advanced Windows based interface program, virtually eliminates the tedious first-time setup process typically required with a temperature controller. No potentiometers to adjust. No guessing at PID constants. The servo tuning wizard empirically characterizes your thermal load and performs a numerical analysis procedure to optimize the temperature control coefficients. In only a few minutes the controller can be properly configured for your load. User system settable parameters include:

- Limit maximum permissible output voltage
- Manual drive level control
- Manual servo constant adjustment
- Settable servo lock range to prevent nuisance faults



The Tuning Wizard will solve your temperature control problems with a few mouse clicks.

Never again spend frustrating hours tuning a P-I-D temperature controller.

Integrated with the TEC controller, the wizard will analyze your system and effortlessly produce the correct solution.

The system includes an Autostart feature, whereby the controller may be used without a host computer. The temperature servo is turned on and stabilized to the preset value, remaining on indefinitely. If a controller is connected utilizing the Pass-through feature, the command to start the laser can be sent automatically once the servo is locked.

The Active Thermal Platform Module consists of a predrilled isolated heat spreader with an integrated thermistor for temperature monitoring, TEC module, and a forced air cooled heatsink. The heat capacity for the Active Thermal Platform Module is 100W.

2. General Controller Specifications

ITEM	PARAMETER	SYMBOL	MIN	TYP	MAX	UNIT
1	Input Power	VDC	15	15	24	Volts
2	Output Voltage	VDC		± 13.5		Volts
3	TEC Output Voltage Resolution	VDC		.021		Volts
4	TEC Output Voltage Ripple (Peak to Peak)			<6%		
3	Output Current	I	-	± 10.0	-	Amp
4	Electrical Efficiency		-	>90%	-	
5	Fan Driver Power Output		-	12V, 1A	-	-
6	Thermistor Input (NTC, 25 °C)	-	-	10K	-	Ohms
7	Temperature Resolution	°C		± 0.01		Celsius
8	Computer Interfaces			RS232 USB 2.0		

Temperature Sensor Connector

Pin 1	Thermistor Minus
Pin 2	Thermistor Plus
Connector Type	Molex Microfit PN: 43045-0200
Mating Connector Housing	Molex 43025-0200
Mating Terminal / Wire	Molex 43030-0009 (or compatible) / 24AWG wire

TEC Output Connector

Pin 1	Fan return
Pin 2	TEC Output Minus[1]
Pin 3	TEC Output Plus[1]
Pin 4	TEC Output Plus[1]
Pin 5	Fan positive (+12V)
Pin 6	TEC Output Minus[1]
Pin 7	TEC Output Minus[1]
Pin 8	TEC Output Plus[1]
Connector Type	Molex Mini-Fit Jr. 39-30-1080
Mating Connector Housing	Molex 39-01-2080
Mating Terminal / Wire	Molex 44476-1111 (or compatible) / 18 AWG wire

[1] The TEC connection polarity should be such that a positive voltage causes the temperature to rise.

3. Mechanical Specifications

Note: Recommended maximum laser module mounting screw depth should not exceed 6mm