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Incoherent Sources

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LED Mounts

Temperature Controller, ± 15 A, 225 W (Page 1 of 2)

Power Cord, Connection Cable for Our Laser Mounts, Sub-D Connector Kit, and USB Cable Included.

The TED4015 is a high performance Digital Temperature Controller designed to drive thermoelectric cooler (TEC) elements with currents up to ± 15 A. It supports most common temperature sensors and can be adapted to different thermal loads. The TED4015 can be fully controlled via its SCPI-compatible USB Interface. The digital PID control offers an auto PID setting function for separate control of the P, I, and D parameters. The TED4015 boasts an excellent temperature stability of 0.002 °C over 24 hrs, enhanced safeguard features, and error indicators, making this device ideal for cooling very sensitive devices where high stability, reliability, and precision is required.

Compared to the TED200 Series, the TED4015 Controller offers a wider TEC current range plus additional features like full digital control, easy auto PID settings, constant TEC current mode, set temperature protection, TEC voltage measurement, and adjustable temperature window protection. These features, together with the silent and efficient operation, make the TED4015 Laser Diode Controller an ideal choice for demanding applications.

Adaptability to Different Thermal Loads

The TED4015 can easily be adapted to different thermal loads via a digital PID loop. The proportional (P) gain, integral (I) offset control, and derivative or differential (D) rates can be individually adjusted by the user or by the auto PID function. With optimum PID parameters, the settling time for a temperature change of 1 °C for a laser mounted in our LM14S2 Laser Diode Mount is less than 2 seconds.

Supported Temperature Sensors

The TED4015 Temperature Controller supports almost all common temperature sensors. A sensor selection in the Temperature Control Menu allows thermistors up to 1000 k Ω , the use of a temperature sensing IC sensor (AD590, AD592, LM335, LM235, LM135, LM35), or the use of Platinum RTD sensors like Pt100 or Pt1000. The temperature can be displayed in Celsius, Fahrenheit, or Kelvin. For thermistors, two temperature calculation methods can be selected: the Steinhart-Hart or exponential method. The maximum control range of -55 to 150 °C is limited by the rated temperature range of the connected sensor and thermal setup.

Enhanced Security Features

The TED4015 is designed for maximum TEC element protection and stabilization, as well as reliable operation. An adjustable TEC output current limit prevents the controller from overdriving the TEC element. This limit can be set from 0.1 A to 15 A. Adjustable temperature limits and the temperature window protection provide alerts if the temperature of the sensor exceeds certain values.

The system indicates the presence of an incorrect or missing temperature sensor and a failed connection between sensor and controller by an LED placed on the TEC "On" key and an audible warning signal. The TEC current is automatically switched off if an error occurs.

Temperature Monitor Output

The TED4015 provides a monitoring signal proportional to the difference between the actual and set temperatures. An oscilloscope or analog data acquisition card can be connected directly to the rear panel BNC connector to monitor the settling behavior with different thermal loads.

Companion Products

The LDC4000 or LDC200C Laser Diode Controller Series are an ideal companion for the TED4015 (see page 1438). When combined with our TEC laser mounts (see page 1483), the TED4015 can achieve a thermal stability of <0.002 °C. This temperature stability is required for applications such as diode laser wavelength tuning and atomic absorption cell spectroscopy.

Features

- For TEC Elements up to 15 A, 225 W
- Excellent Temperature Stability of <0.002 °C (24 hrs)
- Digital PID Control with Auto PID Setting Function
- Temperature Display in °C, °F, or K
- Adjustable Temperature Sensor Offset
- Supports all Common Temperature Sensors; NTC Thermistor, IC Sensors, Pt100/Pt1000 RTD Sensors
- Constant Temperature and Constant Current Control Modes
- Enhanced TEC Element Protection
- SCPI-Compliant USB Interface and Driver Set
- Power Efficient by Active Power Management

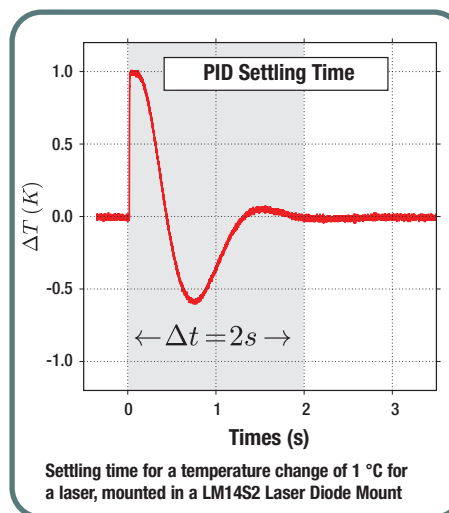
Applications

- Precise Temperature Stabilization of Laser Diodes for use in Interferometry and Spectroscopy
- Cooling of Detectors for Noise Reduction
- Temperature Stabilization of Nonlinear Crystals
- Temperature Stabilization of Industrial Systems

Temperature Controller, ±15 A, 225 W (Page 2 of 2)

The TED4015 ships complete with the CAB4000 Laser Mount Cable (5 A, 17W2, D-Sub-9), the CON4001 Mixed D-Sub Connector (17W2, male, including two high current contacts, 20 A), and a 2 m long USB Cable A-B.

SPECIFICATIONS	FRONT PANEL*	REMOTE CONTROL*
TEC Current Output		
Control Range	-15 to +15 A	
Compliance Voltage	>15 V	
Output Power	>225 W (Max)	
Resolution (Constant Current Mode)	1 mA	0.1 mA
Accuracy	±(0.2% + 20 mA)	
Noise and Ripple (Typical)	<10 mA rms	
TEC Current Limit		
Setting Range	0.1 to 15 A	
Resolution	1 mA	0.1 mA
Accuracy	±(0.2% + 10 mA)	
NTC Thermistor Sensors		
Resistance Measurement Range	100 Ω to 100 kΩ / 1 kΩ to 1 MΩ (2 Ranges)	
Control Range (Max)**	-55 to 150 °C	
Resolution (Temperature)	0.001 °C	
Resolution (Resistance, 100 kΩ/1 MΩ Range)	0.1 Ω / 1 Ω	0.03 Ω / 0.3 Ω
Accuracy (100 kΩ/1 MΩ Range)	±(0.06% + 1 Ω / 5 Ω)	
Temperature Stability 24 Hours (Typical)**	<0.002 °C	
Temperature Coefficient	<5 mK/°C	
IC Sensors		
Supported IC Temperature Sensors	AD590, AD592 (Current); LM335, LM235, LM135, LM35 (Voltage)	
IC Control Ranges	Up to -55 to 150 °C (Depending on Connected IC Sensor)	
Resolution	0.001 °C	0.0001 °C
Accuracy	±(0.04% + 0.08 μA) for AD590; ±(0.03% + 1.5 mV) for LM335/LM35	
Temperature Stability 24 Hours	<0.002 °C	
Temperature Coefficient	<5 mK/°C	
Pt100/Pt1000 RTD Sensors		
Temperature Control Range	-55 to 150 °C	
Resolution	0.001 °C	0.0003 °C
Accuracy Pt100 / Pt1000 (4-Wire Measurement)	±0.3 °C / ±0.1 °C	
Temperature Stability 24 Hours	<0.005 °C	
Temperature Coefficient	<20 mK/°C	
Temperature Window Protection		
Setting Range T _{win}	0.01 to 100.0 °C	
Temperature Control Output		
Load Resistance	>10 kΩ	
Transmission Coefficient	ΔT * 5V / T _{win} ±0.2 % (Temperature Deviation Scaled to Temperature Window)	



SPECIFICATIONS	FRONT PANEL*	REMOTE CONTROL*
TEC Voltage Measurement		
Measurement Principle	4-Wire / 2-Wire	
Resolution	100 mV	40 mV
Accuracy (with 4-Wire Measurement)	±50 mV	
Digital I/O Port		
Number of I/O Lines	4 (Separately Configurable)	
Interface		
USB2.0	According to USBTMC / USBTMC-USB488 Specification Rev. 1.0	
Protocol	SCPI-Compliant Command Set	
Drivers	VISA VXI pnp™, MS Visual Studio™, MS Visual Studio.net™, LabVIEW™, Labwindows/CVI™	
General Data		
Safety Features	TEC Current Limit, Sensor Fault Protection, Short Circuit when TEC Off, Open Circuit Protection, Temperature Setpoint Limit, Window Protection, Over Temperature Protection	
Display	LCD 320 x 240 Pixels	
Connectors Deviation Out Window Protection Out	17W2 Mixed D-Sub Jack (Female)	
Connector for Sensor, TE Cooler, TEC On Signal	BNC	
Connector for USB Interface	USB Type B	
Line Voltage/Frequency	100 to 120 VAC / 200 to 240 VAC ±10%, 50 to 60 Hz	
Maximum Power Consumption	600 VA	
Operating Temperature	0 to 40 °C	
Dimensions (W x H x D) w/o Operating Elements	10.35" x 4.80" x 12.09" (263 mm x 122 mm x 307 mm)	

*Via the front panel, the resolution is limited by the display. Via Remote Control, a higher resolution is offered.

**Control range and thermal stability depend on thermistor parameters.

ITEM #	\$	£	€	RMB	DESCRIPTION
TED4015	\$ 3,200.00	£ 2,304.00	€ 2,784.00	¥ 25,504.00	Benchtop Temperature Controller ±15 A, 225 W
CAB4000	\$ 65.00	£ 46.80	€ 56.55	¥ 518.05	Cable for TED4000, 5 A, 17W2, D-Sub-9
CAB4001	\$ 170.00	£ 122.40	€ 147.90	¥ 1,354.90	Cable for TED4000, 20 A, 17W2, 17W2
CON4001	\$ 22.00	£ 15.84	€ 19.14	¥ 175.34	Connector Kit for TED4000, 20 A, 17W2 Male