## Specifications

### Temperature Control Output

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<th>Temperature Control Range</th>
<th>Temperature Setpoint Resolution</th>
<th>Temperature Setpoint Accuracy</th>
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<td>-99°C to 199.9°C</td>
<td>0.1°C</td>
<td>±0.5°C</td>
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<tr>
<td>LDT-5545B</td>
<td>-99°C to 199.9°C</td>
<td>0.1°C</td>
<td>±0.5°C</td>
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</tbody>
</table>

### Temperature Setpoint Resolution

- 24W and 50W models
- Wide temperature control range
- -99°C to +199°C

### Temperature Setpoint Accuracy

- 24W and 50W models
- ±0.2°C

### Short-Term Stability (1 hr)

- ±0.006°C

### Long-Term Stability (24 hr)

- ±0.01°C

### Thermistor

- ±0.2°C

### Current Noise and Ripple

- 24W and 50W models
- <1 mA rms

### Current Limit Range

- 0 - 4.04 A
- 0 - 5.05 A

### Current Limit Set Accuracy

- + 50 mA

### Controller

- Operational with thermistors and IC temperature sensors

### Thermistor Sensing Current

- 10 /100 µA

### IC Sensor Bias

- AD590 = 8V
- LM335 = 0.6 mA

### Type

- Bipolar current source

### Compliance Voltage

- >6 V DC (@ 4A)
- >10 V DC (@ 5A)

### Maximum Output Current

- 4.0 A
- 5.0 A

### Maximum Output Power

- 24W
- 50W

### Current Limit Range

- 0 - 4.04 A
- 0 - 5.05 A

### User Calibration

- Thermistor: Steinhart-Hart, 3 constants
- IC Sensor: Two point

### Analog Output

- 0-5V

### Transfer Function

- Thermistor: 10 kΩ/°C
- LM335: 1 V/V
- AD590: 100 µA/V

### TEC Measurement (Display)

<table>
<thead>
<tr>
<th>Display Type</th>
<th>Temperature Range</th>
<th>Temperature Resolution</th>
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<tr>
<td>4 digit green LED</td>
<td>-99.9°C to 199.9°C</td>
<td>±0.5°C</td>
<td>±0.5°C</td>
</tr>
</tbody>
</table>

### Analog Output

- BNC

### Communication

- USB 2.0 serial interface

### USB Interface

- Data transfer rate: 480 Mbps
- Supports USB protocol version 2.0

### Display Type

- 4 digit green LED

### Power, VAC (50-60 Hz)

- 100 + 10%; 120 + 10%; 230 + 10%

### Current Draw (5525B):

- 100-120VAC: 0.86A; 230VAC: 0.42A
- 120-230VAC: 0.58A; 230VAC: 0.55A

### Size:

- 88mm x 185mm x 304mm
- 3.5” x 7.3” x 12”

### Weight:

- 3.6 kg (8 lbs.)

### Operating Temperature

- 0°C to 40°C

### Storage Temperature

- -40°C to 70°C

### Humidity

- <80% relative, non-condensing

### Notes

1. Actual temperature control range depends primarily on the thermal load, sensor and TE module used.
2. Accuracy figures are quoted for a typical 10 kΩ thermistor and 100 µA current setting. Accuracy figures are relative to the specified performance characteristics.
3. Stability is a strong function of the thermal environment of the temperature sensor and the TE module. Ambient air currents in particular can cause fluctuations of ±0.1°C in an exposed mounting configuration.
4. Output power rated into a 1.5 Ω load.
5. Output power rated into a 2.0 Ω load.
6. Measured with the instrument in ITE mode at half scale output over a bandwidth of 10 Hz to 10 MHz.
8. 0 to 5V representing measured temperature.

### Product Features

- 24W and 50W models
- Low noise, bi-polar output
- Typical drift less than ±0.004°C
- Wide temperature control range
- -99°C to +199°C
- Operational with thermistors and IC temperature sensors
- Smart integrator control loop with fast response and temperature settling
- USB 2.0 serial interface

### Exceptional Value for Temperature Controlling Laser Diodes

The LDT-5500B Series Temperature Controllers are optimized for precision temperature control of laser diodes and other optoelectronic components. Two models combine up to 24W and 50W of thermoelectric control power with a hybrid smart-integrator feedback loop for precise temperature control. The LDT-5500B Series accept thermistor, IC, and RTD temperature sensors providing convenience and flexibility over a broad range of temperature control applications.

These instruments utilize a hybrid smart-integrator algorithm to ensure fast settling times and maintain high temperature stability typically within ±0.004°C. A simple, intuitive front-panel interface makes these instruments easy to use and with ILX interconnect cables and the industry’s widest selection of laser diode mounts, you can set up and be controlling the temperature of your laser diode in minutes.

The USB interface and control software allows for fast, repeatable instrument control in R&D and manufacturing testing and other automated control applications.

Ordering Information

- LDT51025B-120V: 24W Thermoelectric Temperature Controller, 120V
- LDT51045B-120V: 50W Thermoelectric Temperature Controller, 120V
- LDT51045B-220V: 50W Thermoelectric Temperature Controller, 220V
- CC-505S TE Controller / Laser Diode Mount Interconnect Cable
- CC-501HT TE Interconnect Cable, 15 pin to 7W
- TS-510 10 kΩ Uncalibrated Thermistor
- TS-520 10 kΩ Uncalibrated Thermistor
- TSC-599 RTD Temperature Sensor Converter

In keeping with our commitment to continuing improvement, ILX Lightwave reserves the right to change specifications without notice or liability for such changes.
The LDT-5500B Series are precision, microprocessor based thermoelectric (TE) temperature controllers that deliver a low noise, bipolar constant current output of up to 5 Amps and 50W of heating or cooling power. These instruments close a precision temperature control loop through a variety of temperature sensors and display temperature from -99°C to 199°C or sensor resistance. The temperature controller topology, paired with a hybrid smart-integrator control loop result in fast settling times with a temperature stability of 0.004°C which is ideal for laser diode or optoelectronic component testing requiring stable wavelength and optical power.

**PRECISION TEMPERATURE CONTROL**
The LDT-5500B's operate in constant temperature, constant resistance (sensor), or constant current mode. Attention to detail in the design of the low noise current source, feedback loop, and sensor measurement circuits ensure accurate, low noise temperature control that won't drift over time in any of the instrument operating modes.

In constant temperature mode, the instrument will control to a setpoint temperature between -99°C and 199°C depending on the thermoelectric module performance characteristics, heat load, and temperature sensor connected to the instrument. Because these instruments are micro-processor controlled, the temperature can be displayed in °C accurately with the appropriate sensor constants entered through the front panel or USB interface.

Even with two-terminal thermistors and their non-linear relationship between temperature and resistance and IC temperature sensors where a highly linear relationship exists, the instrument controller calculates the temperature for display and controls precisely to a temperature set point.

**SAFEGUARDING YOUR DEVICES**
In addition to normal instrument control and operating modes, the current output of the LDT-5500B’s are bound by fully independent programmable current limits. The temperature control loop can also be bound by programmable temperature limits. Adjustment of either of the limit settings is easy and precise even with the instrument controlling temperature. Furthermore, if a temperature sensor or the TE module should open, the LDT-5500B automatically shuts the control output off and lights up a front panel LED indicating the cause of the fault.

**SIMPLIFY ROUTINE MAINTENANCE**
The LDT-5500B architecture simplifies routine maintenance; calibration of the TEC current and sensor measurement can be performed via the front panel or through USB interface, without opening the instrument up or manual adjustments. A calibration mode is entered through unique push button combinations or remote commands, and all calibration data is easily entered via the USB interface. Calibration data is automatically stored in non-volatile memory.

**PUT OUR EXPERTISE TO WORK**
ILX Lightwave is a recognized world leader in Laser Diode Instrumentation and Test Systems. Our products are not only renowned for their reliability, quality, and value, they’re backed by industry-leading after sales support. For more information about the LDT-5500B Series Temperature Controllers, and our complete family of Laser Diode Instrumentation and Test Systems, call us today or visit our website at www.newport.com/ilxlightwave.
The LDT-5500B Series are precision, microprocessor based thermoelectric (TE) temperature controllers that deliver a low noise, bipolar constant current output of up to 5 Amps and 50W of heating or cooling power. These instruments close a precision temperature control loop through a variety of temperature sensors and display temperature from -99°C to 199°C or sensor resistance.

The temperature controller topology, paired with a hybrid smart-integrator control loop result in fast settling times with a temperature stability of 0.004°C which is ideal for laser diode or optoelectronic component testing requiring stable wavelength and optical power.

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In constant temperature mode, the instrument will control to a setpoint temperature between -99°C and 199°C depending on the thermoelectric module performance characteristics, heat load, and temperature sensor connected to the instrument. Because these instruments are micro-processor controlled, the temperature can be displayed in °C accurately with the appropriate sensor constants entered through the front panel or USB interface.

Even with two-terminal thermistors and their non-linear relationship between temperature and resistance and IC temperature sensors where a highly linear relationship exists, by using the appropriate equation for the selected temperature sensor and the pertinent calibration constants, residual errors of less than 0.01°C can be realized over wide temperature ranges.

The LDT-5500B’s low noise bipolar current source reduces the noise coupled to your laser diode for precise control and measurements in your application.

**WIDE TEMPERATURE CONTROL RANGE**

The LDT-5500B’s offer user-selectable thermistor source currents of 10 μA and 100 μA allowing the instruments to measure resistance from 250kΩ to 450kΩ providing control over a wide range of temperatures and applications. For a typical 10 kΩ thermistor, this corresponds to a temperature control range from -25°C to 80°C. Other temperature control ranges are possible by choosing different resistance value thermistors.

For more information, refer to ILX Application Note “Selecting Thermistors for Temperature Control”.

In addition to compatibility with a wide range of thermistors, the LDT-5500B also accepts IC temperature sensors and with the TSC-599 sensor converter, platinum RTD sensors. Depending on the temperature sensor selected, the LDT-5500B measures the thermistor resistance, the AD590 current or the LM335 voltage, calculates the temperature for display and controls precisely to a temperature set point.

**SAFEGUARDING YOUR DEVICES**

In addition to normal instrument control and operating modes, the current output of the LDT-5500B’s are bound by fully independent programmable current limits. The temperature control loop can also be bound by programmable temperature limits. Adjustment of either of the limit settings is easy and precise even with the instrument controlling temperature. Furthermore, if a temperature sensor or the TE module should open, the 5500B automatically shuts the control output off and lights up a front panel LED indicating the cause of the fault.

**SIMPLIFY ROUTINE MAINTENANCE**

The LDT-5500B architecture simplifies routine maintenance; calibration of the TEC current and sensor measurement can be performed via the front panel or through USB interface, without opening the instrument up or manual adjustments. A calibration mode is entered through unique push button combinations or remote commands, and all calibration data is easily entered via the front panel or USB interface. Calibration data is automatically stored in on-board non-volatile memory.

**PUT OUR EXPERTISE TO WORK**

ILX Lightwave is a recognized world leader in Laser Diode Instrumentation and Test Systems. Our products are not only renowned for their reliability, quality, and value, they’re backed by industry-leading after sales support. For more information about the LDT-5500B Series Temperature Controllers, and our complete family of Laser Diode Instrumentation and Test Systems, call us today or visit our website at www.newport.com/ilxlightwave.
**Specifications**

**TEMPERATURE CONTROL OUTPUT**
- Temperature Control Range: -99°C to +199.9°C
- Temperature Setpoint Resolution: 0.1°C

**TEMPERATURE SENSOR**
- Thermistor Sensing Current: 10–100 µA
- Thermistor Resistance Range: 2.5 – 450 kΩ
- Thermistor Resistance Accuracy: ±0.05% of FS

**TEC CURRENT**
- TE Current Range: -4.00 to 4.00 A
- TE Current Resolution: 0.01 A
- TE Current Accuracy: ±0.03 A

**TEC MEASUREMENT (DISPLAY)**
- Display Type: 4 digit green LED
- Temperature Range: -99.9°C to 199.9°C
- Temperature Resolution: 0.1°C

**OUTLET CONNECTOR**
- Power: 100–240 VAC, 50–60 Hz
- Current Draw: 0.42 A (120 VAC), 0.55 A (230 VAC)
- Size: 88mm x 185mm x 304mm
- Weight: 3.6 kg (8 lbs.)
- Operating Temperature: 0°C to 50°C
- Humidity: <80% relative, non-condensing

**NOTES**
1. Temperature control system performance depends on the thermal design and electrical supply.
2. Thermistor and IC sensor bias values may be changed over a bandwidth of 10 Hz to 10 MHz.
3. Stability is a function of the thermal environment of the thermistor and IC sensor.
4. Output power is limited to 24W and 50W for safety considerations.
5. TEC module power limit is based on a thermal sensitivity of 1.5°C per watt.
6. Inrush current may be higher than the额定值.
7. The USB interface and control software allows for fast, repeatable instrument control in R&D and manufacturing testing and other automated control applications.

**Product Features**
- 24W and 50W models
- Low noise, bi-polar output
- Typical drift less than ±0.004°C
- Wide temperature control range from -99°C to +199°C
- Operational with thermistors and IC temperature sensors
- Smart integrator control loop with fast response and temperature settling
- USB 2.0 serial interface

**ORDERING INFORMATION**
- LDT5525B-120V: 24W Thermoelectric Temperature Controller, 120V
- LDT5545B-120V: 50W Thermoelectric Temperature Controller, 120V
- LDT5525B-230V: 24W Thermoelectric Temperature Controller, 230V
- LDT5545B-230V: 50W Thermoelectric Temperature Controller, 230V
- CC-0105: 10 kΩ Load MME
- CC-0327: Thermistor (100-450°C)
- CC-0328: 10 kΩ Load MME
- CC-0329: Thermistor (100-450°C)
- CC-0330: 10 kΩ Load MME
- TS-010: 10 kΩ Thermistor
- TS-025: 10 kΩ Load MME
- RM-124: Single Instrument Rack Mount Kit
- RM-105: Dual Instrument Rack Mount Kit
- TSC-899: 10 kΩ Load MME

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