

Product Features

Long term temperature stability control within ± 0.01 °C

Linearized thermistor mode for display and control of temperature

Hybrid P-I control loop for fast settling time

Three display modes provide easy operation

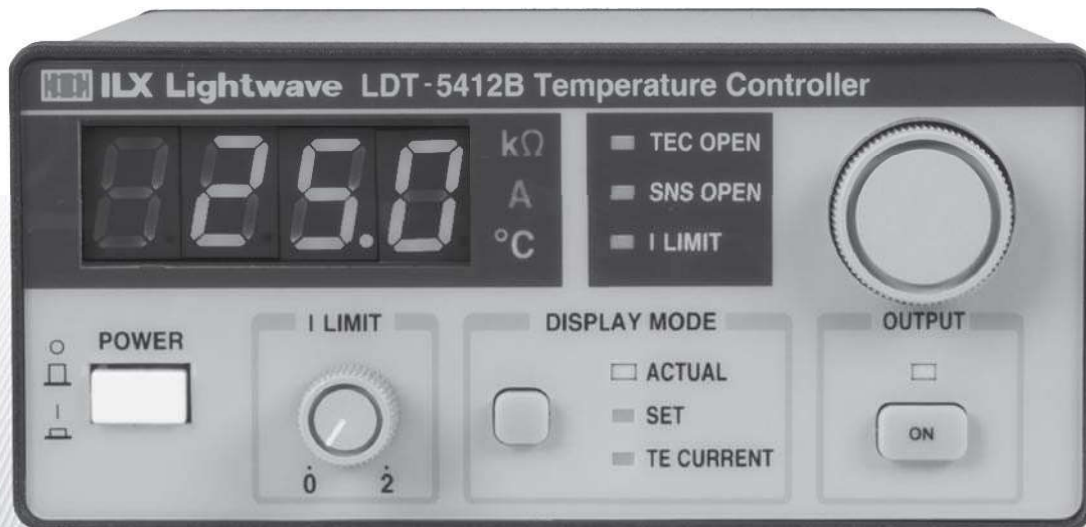
Application flexibility through user set control and limits

User selectable thermistor current

Designed to be economical and flexible, the LDT-5412B Thermoelectric Temperature Controller offers a stable, low noise bipolar output and is optimized for controlling the temperature of laser diodes and photodetectors. Two of the temperature sensor modes, 10 μ A and 100 μ A, allow the thermoelectric controller to control and display thermistor resistance while delivering bipolar current to a thermoelectric module. A third temperature sensor mode, linearized 10 k Ω , allows the temperature controller to display and control a calculated temperature set point with a 10 k Ω thermistor. The unit's hybrid proportional-integral control loop offers fast settling times with a typical long term temperature stability of ± 0.01 °C.

LDT 5412B

Thermoelectric Temperature Controller



Low Cost, High Stability, Thermoelectric Temperature Control

 **ILX Lightwave**[®]
A Newport Corporation Brand

LDT 5412B

Thermoelectric Temperature Controller

Easy Operation

The intuitive front panel features a highly visible LED display, which has three display modes for easy operation: (1) SET, which displays the setpoint resistance or temperature (linearized mode only) level, (2) ACTUAL, which displays the actual resistance of the thermistor sensor or calculated temperature (linearized mode), and (3) TE CURRENT, which displays the drive current to the TE module.

Multiple Temperature Sensor Control Modes

The incorporation of user-selectable temperature sensor modes of 10 μ A, 100 μ A, and linearized ensures versatility over a wide range of temperatures and applications. This allows the LDT-5412B to operate over a thermistor control resistance range of 10 k Ω to 200 k Ω . In addition, the unique linearized thermistor mode of the LDT-5412B can display and

control temperature using a 10 k Ω thermistor. By using a precision 10 k Ω thermistor, users can achieve temperature accuracy of ± 1.0 $^{\circ}$ C without programming in Steinhart-Hart constants. In linearized thermistor mode, the LDT-5412B can operate over a 10 to 40 $^{\circ}$ C temperature range.

Application Flexibility

The LDT-5412B allows the user to bypass the internal set resistance function of the front panel knob and control resistance set point with an external resistor of known value. This is convenient for reproducing the same temperature quickly and accurately.

In addition, the LDT-5412B's PI control loop optimizes slew rate and settling time. Adjustment is easy with the rear panel GAIN control. For automated testing or to remotely compute actual temperature, the LDT-5412B also offers an analog voltage output that corresponds to the thermistor resistance.

Specifications¹

CONTROL SYSTEM

| | |
|--|---|
| Temperature Stability (1 hour): ² | ± 0.005 $^{\circ}$ C |
| Temperature Stability (24 hours): ² | ± 0.01 $^{\circ}$ C |
| Temperature Coefficient: | < 0.0025 $^{\circ}$ C/ $^{\circ}$ C |
| Control Algorithm: | Proportional (Adjustable) Integral (Fixed) |

SENSOR

| | |
|---|--|
| Thermistor: | NTC (2-wire) |
| Thermistor Sensor Resistance | |
| 10 μ A Bias Setting | |
| Range: | 0 to 199.9 k Ω |
| Resolution (Display): | 0.1 k Ω |
| Accuracy: | $\pm 1\%$ of reading $\pm 100\Omega$ |
| 100 μ A Bias Setting | |
| Range: | 0 to 19.99 k Ω |
| Resolution (Display): | 0.01 k Ω |
| Accuracy: | $\pm 1\%$ of reading $\pm 10\Omega$ |
| Linearized Thermistor Mode ³ | |
| Range: | 10 - 40 $^{\circ}$ C (0 to 15 k Ω) |
| Resolution (Display): | 0.1 $^{\circ}$ C |
| Accuracy: | ± 1 $^{\circ}$ C |

TEC OUTPUT

| | |
|---------------------------|---------------------------------------|
| Output Type: | Bidirectional, linear |
| Isolation: | Floating with respect to earth ground |
| Output Current | |
| Range: | -2.00 A to + 2.00 A |
| Resolution (Display): | 0.01 A |
| Accuracy: | ± 0.05 A |
| Current Limit Range: | -2.05 A to +2.05 A |
| Compliance Voltage: | ± 3 V |
| Maximum Output Power: | > 6 W |
| Current Noise and Ripple: | < 250 μ A rms |

AUXILIARY OUTPUT

| | |
|-----------------------------------|--|
| Analog Output Gain Factor: | 100 mV/k Ω (100 μ A) 10 mV/k Ω (10 μ A) |
| Analog Output Impedance: | 2 k Ω (nominal) |
| External Fan Output Voltage: | 12 V (nominal) |
| External Fan Output Max. Current: | 100 mA (maximum) |

GENERAL

| | |
|------------------------|---|
| I/O Connectors: | Female 15-pin, D-sub (TEC I/O) Isolated Female BNC (Analog Output) |
| Power Requirements: | 100-240 VAC; 50/60 Hz; 75W |
| Size (HxWxD): | 14.2 cm x 29.9 cm x 6.6 cm; 5.6" x 10.2" x 2.6" |
| Weight: | 1.35 kg (3.0 lbs.) |
| Operating Temperature: | 10 $^{\circ}$ C to 40 $^{\circ}$ C |
| Storage Temperature: | -40 $^{\circ}$ C to 70 $^{\circ}$ C |
| Humidity: | $< 85\%$, relative, non-condensing |
| Compliance: | CE |

NOTES

1. All specifications unless otherwise noted are for a one hour warm up.
2. Temperature stability tested at 25 $^{\circ}$ C with a 10 k Ω thermistor on the 100 μ A setting.
3. To achieve rated accuracy, a 10 k Ω thermistor with at least 1% accuracy and a Beta in the range of 3900 to 4050 must be used. Use of a thermistor outside of this accuracy and Beta will result in inaccurate temperature readings and set points.

ORDERING INFORMATION

| | |
|-----------|---|
| LDT-5412B | Thermoelectric Temperature Controller |
| LDM-4405 | Low Cost TO-Can Laser Diode Mount |
| CC-501S | TE Controller / Terminated Interconnect Cable |
| CC-505S | TE Controller / Laser Diode Mount Interconnect Cable |
| TS-510 | 10k Ω Calibrated Thermistor ($\pm 0.2^{\circ}$ C) |
| UCA-350 | Unipolar Heater Control Adapter |

In keeping with our commitment to continuing improvement, ILX Lightwave reserves the right to change specifications without notice or liability for such changes.



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