

# CTL200 - Digital butterfly laser diode controller



Koheron CTL200 is the digital version of the popular [CTL100 analog laser controller](#). It drives up to 200 / 400 / 600 mA laser current with a current noise density of only 230 / 450 / 670 pA /  $\sqrt{\text{Hz}}$ . The CTL200 fits in a 75 mm x 75 mm square, uses a single 5.9 V supply, and can operate between 0 and 50°C. The CTL200 is conduction-cooled. It comes with an aluminum base plate and a zero insertion force socket for easy mounting.

## Includes

- CTL200 digital laser controller
- 5.9 V 3 A power supply

## Specifications

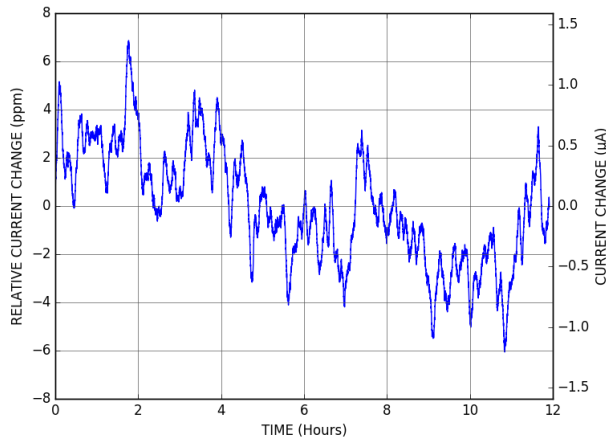
CTL200 laser controller is available for type 1 lasers (CTL200-1-) and type 2 lasers (CTL200-2).

	<b>B-200 (200 mA)</b>	<b>B-400 (400 mA)</b>	<b>B-600 (600 mA)</b>
<b>Current driver</b>			
Laser current	5 - 225 mA	10 - 450 mA	15 - 675 mA
Laser current resolution	5 $\mu$ A	10 $\mu$ A	15 $\mu$ A
Compliance voltage at max. current	3.0 V	3.0 V	2.9 V
RMS noise (10 Hz - 1 MHz)	220 nA <sub>rms</sub>	430 nA <sub>rms</sub>	650 nA <sub>rms</sub>
Current noise density (1 kHz)	230 pA / Hz <sup>1/2</sup>	450 pA / Hz <sup>1/2</sup>	670 pA / Hz <sup>1/2</sup>
1 / f corner noise	100 Hz	100 Hz	100 Hz
Temperature coefficient	35 ppm / °C	35 ppm / °C	35 ppm / °C
Slow start (90 % setpoint)	5000 ms	5000 ms	5000 ms
Modulation gains	250 $\mu$ A / V, 2.5 mA / V, 25 mA / V	500 $\mu$ A / V, 5 mA / V, 50 mA / V	750 $\mu$ A / V, 7.5 mA / V, 75 mA / V
3 dB modulation bandwidth	10 MHz	10 MHz	10 MHz
AC modulation cutoff frequency	80 kHz	80 kHz	80 kHz
<b>TEC controller</b>			
Maximum current	1.5 A	1.5 A	1.5 A
Compliance voltage	+/- 3 V	+/- 3 V	+/- 3 V
Temperature stability	0.002 °C / °C	0.002 °C / °C	0.002 °C / °C
<b>Laser power monitor</b>			
Photodiode current	0 - 2.5 mA	0 - 2.5 mA	0 - 2.5 mA
<b>Other</b>			
Dimensions	78.5 mm x 84.7 mm x 20 mm	78.5 mm x 84.7 mm x 20 mm	78.5 mm x 84.7 mm x 20 mm
Weight	104 g	104 g	104 g
Supply voltage	5.7 V to 6.5 V	5.7 V to 6.5 V	5.7 V to 6.5 V
Operating temperature	0 °C - 50 °C	0 °C - 50 °C	0 °C - 50 °C
Compatible lasers	Floating diodes / anode-grounded (isolation pad available upon request)	Floating diodes / anode-grounded (isolation pad available upon request)	Floating diodes / anode-grounded (isolation pad available upon request)

## Current driver

### Current stability

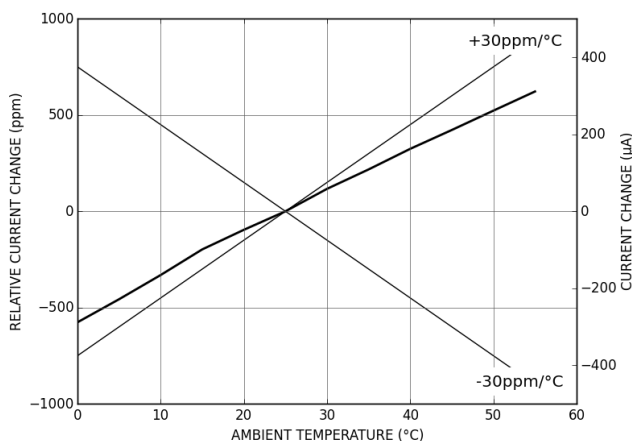
Current stability is depicted in the following figure showing a 12-hour long evolution of current at 25 °C ambient temperature. A controller with 200 mA laser current (B-200) set at 200 mA was used for this measurement.



Current is stable within +/- 10 ppm.

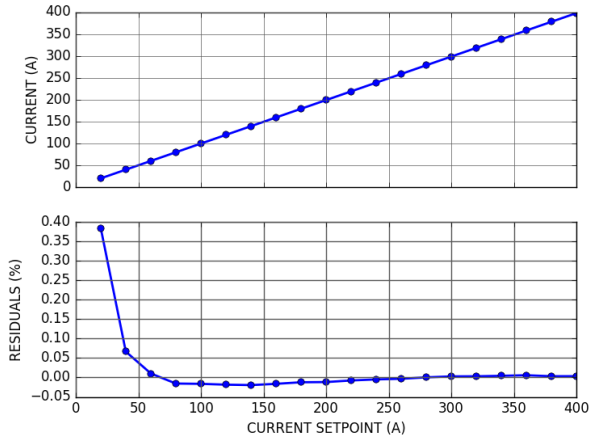
### Temperature coefficient

The figure below shows the current variation of the controller for the 600 mA laser current version (B-600) operated at 550 mA for different ambient temperatures between 0 and 55 °C. The current is measured using a high precision 5 Ohm resistor and a 7.5-digit digital voltmeter. Temperature coefficient is below 30 ppm/°C.



### Current linearity

CTL200 controllers are calibrated at 21 °C by measuring the voltage across a high-precision 5 Ohm resistor with a 7.5-digit digital voltmeter. Here is a typical result for the calibration for the 400 mA laser current version (B-400):



Relative residuals from a linear fit show that linearity is better than 0.1% for currents above 50 mA.

## Modulation

The CTL200 laser diode controller features a DC modulation which controls the current setpoint input with 10 MHz bandwidth. An AC input provides direct laser diode RF modulation for frequencies above 100 kHz.

