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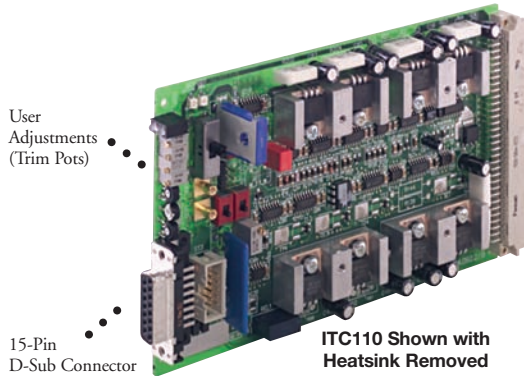
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LED Mounts

OEM Laser Diode/TEC Controllers (Page 1 of 2)

ITC110 Shown with
Heatsink RemovedITC110 with Optional ITC100D
Display Module, ITC100F Front
Panel, and Heatsink

ITC100D

Introduction

The ITC100 Series of OEM Controllers combine a low-noise, low-drift current controller with a precise thermoelectric cooler (TEC) controller on a single eurocard-sized board (100 x 42 x 160 mm), which can be extended by the optional ITC100D display unit.

The ITC100 Series includes three controller models for laser currents up to ± 200 mA, ± 1 A, or ± 3 A. All three models feature bipolar temperature control with TEC current/power up to ± 2 A/12 W, ± 2 A/12 W, and ± 3 A/18 W, respectively. To operate the ITC133 version with a laser current of ± 3 A and a TEC current of ± 3 A, forced cooling or a bigger heat sink is required.

Constant Current and Constant Power Modes

The ITC100 Series offers constant current (CC) and constant power (CP) operation modes and supports all laser diode and photodiode pin configurations. For temperature control, all common NTC thermistors and IC temperature sensors (AD590, AD592, and LM335) can be used. The temperature displays in $k\Omega$ when using a thermistor and in $^{\circ}\text{C}$ when using IC temperature sensors.

Adaptable PID Temperature Control Loop

The TEC controller features a full PID feedback loop with independent P, I, and D settings for temperature stabilization. When tuned correctly, the PID circuit typically settles to the desired temperature setpoint within seconds.

External Modulation

All ITC100 Series controllers can be externally modulated in constant current (CC) or constant power (CP) mode.

Extensive Laser Protection Features

After the module is powered on, a soft-start circuit ensures a slow increase in laser current without peaks. The laser is also protected when the laser controller is turned off by an automatic shorting of the laser diode to ground. A built-in protection feature prevents the laser current limits from being exceeded, even while using external modulation. Additional protection features a temperature window protection, a supply voltage monitor to ensure appropriate supply voltage, and a safety interlock signal that can be used to shut down the laser immediately, which is often required for higher power lasers.

Temperature Window Protection

To additionally safeguard the laser diode, the ITC100 series provides an adjustable temperature window that allows both an upper and lower temperature limit to be set. If the actual laser temperature departs from the preset window, the laser diode injection current will automatically be switched off. When the laser temperature returns back to the set window, the laser current can soft started again.

System Integration

Setting up the ITC100 Series modules requires solid knowledge and skills in electronics and laser diode control techniques. The ITC100 Series OEM board is ideal for system integrators experienced in this technology.

Two electrical connectors are provided to facilitate integrating these OEM drivers into larger systems. A 15-pin D-sub connector located along the front edge of the main board provides all the required connections to operate the laser diode and TEC element. The optional CAB430 Series Y cable can be used to connect to Thorlabs laser mounts (see pages 1481 - 1492). The 64-pin DIN connector located along the back edge of the board provides access to the full array of Input/Output functions of the ITC100 series for the laser diode, a photodiode for power monitoring, and the TEC element.

To get further information and facilitate the integration of an OEM ITC100 Series Controller into your system, please contact Technical Support.

Features

- Excellent Temperature Stability (<0.004 $^{\circ}\text{C}$ Typical)
- Supports All Laser Diode Pin Configurations
- Supports AD590, AD592, and LM335 IC and NTC Thermistors as Temperature Sensor
- Extensive Laser Diode Protection Features
- Individually Adjustable P, I, and D Parameters
- Analog Modulation of Laser Power up to 200 kHz

OEM Laser Diode/TEC Controllers (Page 2 of 2)

ITC100 Series Controller Specifications

ITEM #	ITC102	ITC110	ITC133
Current Control			
Control Range of Laser Current	0 to ±200 mA	0 to ±1 A	0 to ±3 A*
Compliance Voltage	>4 V		
Setting Accuracy/Repeatability (Full Scale)	±2% (Typical) / ±0.1%		
Noise (10 Hz to 10 MHz, rms)	<2 µA	<6 µA	<25 µA
Drift (30 min., 0-10 Hz, Typical)	<20 µA	<100 µA	<300 µA
Temperature Coefficient	<50 ppm/°C		
Power Control			
Control Range Photocurrent	5 µA to 2 mA		
Accuracy / Repeatability (Full Scale)	±2% (Typical) / ±0.1%		
Current Limit			
Setting Range	0 to >200 mA	0 to >1 A	0 to >3 A
Setting Accuracy/Repeatability (Full Scale)	±2% (Typical) / ±0.1%		
Analog Modulation Input			
Input Resistance	10 kΩ		
Modulation Coefficient, CC	40 mA/V ±5%	200 mA/V ±5%	600 mA/V ±5%
Small Signal 3 dB Bandwidth, CC	DC to 200 kHz	DC to 50 kHz	DC to 20 kHz
Modulation Coefficient, CP	0.4 mA/V ±5%		
TTL Modulation Input			
Rise/Fall time	<10 µs	<50 µs	<100 µs
General Data			
Supply Voltage/Current	±12 to ±15 V/2.3 A	±12 to ±15 V/3.1 A	±12 to ±15 V/3.1 A*
Operating Temperature	0 to 40 °C		
Dimensions (W x H x D)	3.94" x 1.64" x 6.30" (100 mm x 42 mm x 160 mm), Eurocard		
TEC Output			
Control Range of TEC current	-2 to 2 A	-2 to 2 A	-3 to 3 A*
Compliance Voltage	>6 V		
Thermistor Temperature Sensors			
Control Range	0.1 Ω to 80 kΩ		
Setting Accuracy (Full Scale)	±2% (Typical)		
Repeatability (Full Scale)	±0.1%		
Temperature Stability (Typical)	<2 Ω		
IC Temperature Sensors AD590, AD592, & LM335			
Control Range	-20 to +80 °C		
Setting Accuracy (Full Scale)	±2% (Typical)		
Repeatability (Full Scale)	±0.1%		
Temperature Stability (Typical)	<0.004 °C		
TEC Current Limit			
Setting Range	0 to ≥2 A	0 to ≥2 A	0 to ≥3 A
Accuracy	±5%		

*The total combined current for the ITC133 is limited by the total thermal dissipation loss. Optimized cooling by fan or bigger heat sink allows 3 A LD and 3 A TEC at the same time provided the power supply provides 6.1 A

ITEM #	\$	£	€	RMB	DESCRIPTION
ITC102	\$ 572.00	£ 411.84	€ 497.64	¥ 4,558.84	OEM LD and TEC Controller, ±200 mA (LD), 12 W (TEC)
ITC110	\$ 572.00	£ 411.84	€ 497.64	¥ 4,558.84	OEM LD and TEC Controller, ±1 A (LD), 12 W (TEC)
ITC133	\$ 610.00	£ 439.20	€ 530.70	¥ 4,861.70	OEM LD and TEC Controller, ±3 A (LD), 18 W (TEC)
ITC100D	\$ 154.00	£ 110.88	€ 133.98	¥ 1,227.38	ITC100 Display Control Module, Removable
ITC100F	\$ 51.00	£ 36.72	€ 44.37	¥ 406.47	ITC100 Series Front Plate
ITC100P	\$ 19.00	£ 13.68	€ 16.53	¥ 151.43	64-Pin Female DIN Connector
CAB430	\$ 120.00	£ 86.40	€ 104.40	¥ 956.40	15-Pin to 9-Pin D-Sub Y-Cable for LD and TEC Controller, 1.5 m Long

Have you seen our...

Laser Diodes

Thorlabs offers an extensive selection of laser diodes, with output in the 375 - 2000 nm range and powers up to 3 W. Choose from standard Ø5.6 mm, Ø9 mm, butterfly, laser pigtail, chip on submount, or C-mount package styles.

See pages 1212 - 1266



- ◆ Ø5.6 mm, Ø9 mm, Butterfly, Chip on Submount, and C-mount Packages
- ◆ Wavelengths from 375 nm to 2000 nm
- ◆ Output Powers up to 3 W