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THORLABS

TLD001 - JUN 7, 2019

Item # TLD001 was discontinued on JUN 7, 2019. For informational purposes, this is a copy of the website content at that time and is valid only for the stated product.

T-CUBE LASER DIODE DRIVER

- ► Compatible with All Laser Diode Pin Configurations
- ► Reliable Protection of Laser Diodes
- ► Control Via Local Panel or USB PC Connection
- ► Full Software Control Suite Included



TLD001
Power Supply
Sold Separately

apt Software Included



Features

- Compatible with All Laser Diode Pin Configurations
- Low Noise (<3.0 µA)
- 5-Digit Display
- Reliable Laser Diode Protection
- Current Output up to 200 mA
- Safety Enable Key Switch and Laser Safety Interlock Facility
- Compact Footprint
- USB Plug-and-Play
- Analog Control Input, Manual, or PC-Controlled Operation
- Software Control Suite and Extensive ActiveX® Programming Interfaces Included all Compatible with Other APT™ Controllers



Click to Enlarge
Top View of the TLD001 T-Cube™ LD Driver



Click to Enlarge
Back View of the TLD001 T-Cube LD Driver (See *Pin Diagrams* Tab for More Information)

T-Cube Light Source & Driver Modules
Laser Diode Driver
Laser Sources
High Power LED Driver

The TLD001 T-Cube™ is a versatile, high precision laser diode and LED controller, designed to drive a wide range of semiconductor laser diodes. It supports operating currents of up to 200 mA, a high compliance voltage of 8 V (suitable for driving blue laser diodes) and both constant current and constant power operating modes. As a member of the T-cube family of products, the TLD001 allows both standalone use or PC-based operation via USB interface.

This laser diode controller is a highly compact, yet fully functional, unit. It is provided with a USB interface for easy PC control and also a manual interface panel containing a 5-digit, 7-segment display, adjustment potentiometer, mode, display and laser on buttons, and safety key switch. The unit can be set to control either the injection current or the optical output power of the laser diode. The footprint of this unit has been kept to a minimum, measuring only 120 mm x 60 mm x 47 mm (4.8" x 2.4" x 1.8") and able to directly mount to the optical table. The manual controls for this unit are conveniently located on the upper surface. The mode and display buttons allow the various operating modes to be selected easily. There is also a key switch and interlock connector fitted to this compact unit for use in laser applications requiring such functionality.

The unit has been designed specifically for use with our TTC001 TEC controller and LDM21 mount for a complete temperature controller laser diode driver system. It is also compatible with our High-Power Laser Diode Mounts and LM14S2 Mount when used to drive diodes up to 200 mA.

USB connectivity provides easy plug and play PC controlled operation. The TLD001 also includes the very user friendly APT™ software which allows the user to interface with the motion control units in the APT family. Advanced custom control applications and sequences are also possible using the extensive ActiveX® programming environment described in more detail on the *Motion Control Software* and *APT Tutorials* tabs.



Click to Enlarge
A KCH301 USB Controller Hub with installed T-Cube and K-Cube module. A KAP102 Adapter Plate is used to mount the T-Cube to the hub.

For multi-axis motion control applications, multiple units can be connected to a single PC via standard USB hub technology or by using the KCH301 or KCH601 USB Controller Hub. A KAP102 Adapter Plate is required for each TLD001 T-Cube on the controller hub.

Power Supply Options

The preferred power supply (i.e., single channel, multi-channel, or hub-based) depends on the end user's application and whether you already own compatible power supplies. To that end and in keeping with Thorlabs' green initiative, we do not ship these units bundled with a power supply. This avoids the cost and inconvenience of receiving an unwanted single channel supply if a multi-channel or hub-based system would be more appropriate. The power supply options compatible with the TLD001 Laser Diode Driver are listed below. Note that if using the TLD001 LD Driver with one of our K-Cube™ Controller Hubs, the KAP102 Adapter Plate should be used to accommodate the larger 120 mm footprint of this T-Cube.

Connection Cables

A CAB400 cable is required to connect the TLD001 laser diode controller to a Thorlabs' Laser Diode Mount.

Power Supply Options for T-Cube Laser Diode Controller	
Operation of TLD001 (T-Cube Laser Diode Driver)	**Power Supply**
Standalone / Single Channel Operation	TPS002 ±15 V/ 5 V Power Supply for up to Two T-Cubes
System / Multi-channel Operation	KCH301 or KCH601 USB Controller Hub

Laser Diode Accessory Selection Guide

Laser Diode Accessory Selection Guide					
Temperature Controlled Mounts	**Passive Mounts**	**Passive Mounts with Collimation Package**	**Strain Relief Cables**	**Diode Sockets**	**Other Controllers**
					

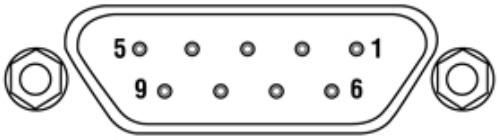
SPECS

Item #	TLD001
Laser Diode (LD) Output	9-Pin D-Type
Maximum LD Current	200 mA
Max LD Current Limit Range	20 to 200 mA
LD Compliance Voltage	>8 V
LD Current Setting Resolution	10 µA
LD Power Setting Resolution	1 µW
LD Current/Power Measurement Res.	10 µA (14-bit)
Temperature Drift	<70 ppm/°C Typical
LD Current Noise	<3 µA RMS Typical
General	
Supported LD/PD Configurations	All
LD Protection	Relay - Open Circuit, Under/over Voltage
Operating Modes	Constant Current, Constant Power
Modulation Input	SMA 0 to10 V = 0 to Full Power, DC or Sine Wave Input Only
Modulation Bandwidth	20 kHz Full Depth of Mod
Power Input	+15 V, -15 V, +5 V
Housing Dimensions (W x D x H)	120 mm x 60 mm x 47 mm (4.8" x 2.4" x 1.8")
Weight	160 g (5.5 oz)

PIN DIAGRAMS

Laser Diode Out

D-type Female

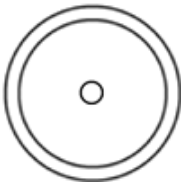


Pin	Connection	Pin	Connection
1	Interlock*	6	Not Connected
2	Photodiode Cathode	7	Laser Diode Cathode (Polarity Anode Grounded)
3	Laser Diode Ground	8	Laser Diode Anode (Polarity Cathode Grounded)
4	Photodiode Anode		
5	Ground for Pin 1*	9	Not Connected

*The Interlock must be shorted to the ground before the laser can be enabled. See the manual in the Drawings and Documents tab for more details.

Modulation In

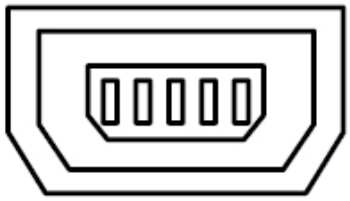
SMA Female



Modulation or analog control input, -10 V to +10 V

Computer Connection

USB Mini-B*



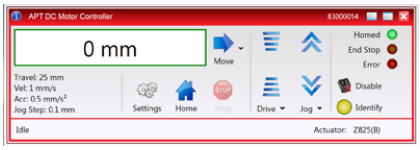
*USB type Mini-B to type A cable included.

MOTION CONTROL SOFTWARE

Thorlabs offers two platforms to drive our wide range of motion controllers: our Kinesis® software package or the legacy APT™ (Advanced Positioning Technology) software package. Either package can be used to control devices in the Kinesis family, which covers a wide range of motion controllers ranging from small, low-powered, single-channel drivers (such as the K-Cubes™ and T-Cubes™) to high-power, multi-channel, modular 19" rack nanopositioning systems (the APT Rack System).

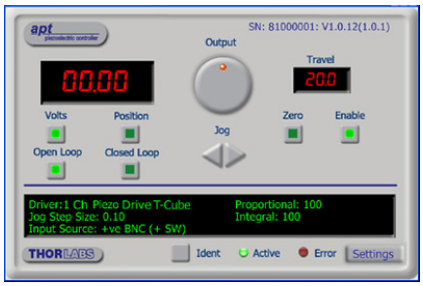
The Kinesis Software features .NET controls which can be used by 3rd party developers working in the latest C#, Visual Basic, LabVIEW™, or any .NET compatible languages to create custom applications. Low-level DLL libraries are included for applications not expected to use the .NET framework. A Central Sequence Manager supports integration and synchronization of all Thorlabs motion control hardware.

Our legacy APT System Software platform offers ActiveX-based controls which can be used by 3rd party developers working on C#, Visual Basic, LabVIEW™, or any Active-X compatible languages to create custom applications and includes a simulator mode to assist in developing custom applications without requiring hardware.



Kinesis GUI Screen

By providing these common software platforms, Thorlabs has ensured that users can easily mix and match any of the Kinesis and APT controllers in a single application, while only having to learn a single set of software tools. In this way, it is perfectly feasible to combine any of the controllers from single-axis to multi-axis systems and control all from a single, PC-based unified software interface.



APT GUI Screen

The software packages allow two methods of usage: graphical user interface (GUI) utilities for direct interaction with and control of the controllers 'out of the box', and a set of programming interfaces that allow custom-integrated positioning and alignment solutions to be easily programmed in the development language of choice.

A range of video tutorials is available to help explain our APT system software. These tutorials provide an overview of the software and the APT Config utility. Additionally, a tutorial video is available to explain how to select simulator mode within the software, which allows the user to experiment with the software without a controller connected. Please select the *APT Tutorials* tab above to view these videos, which are also available on the software CD included with the controllers.

Software

Kinesis Version 1.14.17

The Kinesis Software Package, which includes a GUI for control of Thorlabs' Kinesis and APT™ system controllers.

Also Available:

- Software rotocol

Software

APT Version 3.21.4

The APT Software Package, which includes a GUI for control of Thorlabs' APT™ and Kinesis system controllers.

Also Available:

- Software rotocol

APT TUTORIALS

These videos illustrate some of the basics of using the APT System Software from both a non-programming and a programming point of view. There are videos that illustrate usage of the supplied APT utilities that allow immediate control of the APT controllers out of the box. There are also a number of videos that explain the basics of programming custom software applications using Visual Basic, LabView and Visual C++. Watch the videos now to see what we mean.

Click here to view the video tutorial

To further assist programmers, a guide to programming the APT software in LabView is also available.

Click here to view the LabView guide

Laser Diode Controller Selection Guide

The tables below are designed to give a quick overview of the key specifications for our laser diode controllers and dual diode/temperature controllers. For more details and specifications, or to order a specific item, click on the appropriate item number below.

Current Controllers						
Item #	**Drive Current**	**Compliance Voltage**	**CC[a]**	**CP[b]**	**Modulation**	**Package**
LDC200CV	20 mA	6 V	✓	✓	External	Benchtop
VLDC002	25 mA	5 V	✓	-	Int/Ext	OEM
LDC201CU	100 mA	5 V	✓	✓	External	Benchtop
LD2000R	100 mA	3.5 V	-	✓	External	OEM
EK2000	100 mA	3.5 V	-	✓	External	OEM
LDC202C	200 mA	10 V	✓	✓	External	Benchtop
TLD001	200 mA	8 V	✓	✓	External	T-Cube™
IP250-BV	250 mA	8 V[c]	✓	✓	External	OEM
LD1100	250 mA	6.5 V[c]	-	✓	--	OEM
LD1101	250 mA	6.5 V[c]	-	✓	--	OEM
EK1101	250 mA	6.5 V[c]	-	✓	--	OEM
EK1102	250 mA	6.5 V[c]	-	✓	--	OEM
LD1255R	250 mA	3.3 V	✓	-	External	OEM
LDC205C	500 mA	10 V	✓	✓	External	Benchtop
IP500	500 mA	3 V	✓	✓	External	OEM
LDC210C	1 A	10 V	✓	✓	External	Benchtop
LDC220C	2 A	4 V	✓	✓	External	Benchtop
LD3000R	2.5 A	--	✓	-	External	OEM
LDC240C	4 A	5 V	✓	✓	External	Benchtop
LDC4005	5 A	12 V	✓	✓	Int/Ext	Benchtop
LDC4020	20 A	11 V	✓	✓	Int/Ext	Benchtop

- Constant current.
- Constant power.
- When using a 12 V power supply.

Dual Temperature and Current Controllers							
Item #	**Drive Current**	**Compliance Voltage**	**TEC Power (Max)**	**CC[a]**	**CP[b]**	**Modulation**	**Package**
VITC002	25 mA	5 V	>2 W	✓	-	Int/Ext	OEM
ITC102	200 mA	>4 V	12 W	✓	✓	Ext	OEM
ITC110	1 A	>4 V	12 W	✓	✓	Ext	OEM
ITC4001	1 A	11 V	>96 W	✓	✓	Int/Ext	Benchtop
CLD1010LP[c]	1.0 A	>8 V	>14.1 W	✓	✓	Ext	Benchtop
CLD1011LP[d]	1.0 A	>8 V	>14.1 W	✓	✓	Ext	Benchtop
CLD1015[e]	1.5 A	>4 V	>14.1 W	✓	✓	Ext	Benchtop
ITC4002QCL[f]	2 A	17 V	>225 W	✓	✓	Int/Ext	Benchtop
ITC133	3 A	>4 V	18 W	✓	✓	Ext	OEM
ITC4005	5 A	12 V	>225 W	✓	✓	Int/Ext	Benchtop
ITC4005QCL[f]	5 A	20 V	>225 W	✓	✓	Int/Ext	Benchtop

Dual Temperature and Current Controllers							
ITC4020	20 A	11 V	>225 W	✓	✓	Int/Ext	Benchtop

- Constant current.
- Constant power.
- Combined controller and mount for pigtailed laser diodes in TO can packages with A, D, E, or G pin codes only.
- Combined controller and mount for pigtailed laser diodes in TO can packages with B, C, or H pin codes only.
- Combined controller and mount for laser diodes in butterfly packages only.
- Enhanced compliance voltage for QCL operation.

We also offer a variety of OEM and rack-mounted laser diode current & temperature controllers (OEM Modules, TXP Rack Modules, PRO8 Current Control Rack Modules, and PRO8 Current and Temperature Control Rack Modules).

T-Cube™ Laser Diode Driver

Power supplies sold separately below.

Part Number	Description	Price	Availability
TLD001	**T-Cube Laser Diode Controller (Power Supply Not Included)**	**$828.92**	**Lead Time**
CAB400	**Cable; Current Controller with 9-Pin D-Sub Connector, 1.5 m**	**$73.02**	**Today**

Compatible Power Supplies

- Individual ±15 V/5 V Power Supply
  - TPS002: For up to Two K-Cubes™ or T-Cubes™ with Mini-DIN Input*
- USB Controller Hubs Provide Power and Communications
  - KCH301: For up to Three K-Cubes or T-Cubes
  - KCH601: For up to Six K-Cubes or T-Cubes

The TPS002 supplies power for up to two K-Cubes* or T-Cubes. The cubes still require individual computer connection via USB cable.

The KCH301 and KCH601 USB Controller Hubs each consist of two parts: the hub, which can support up to three (KCH301) or six (KCH601) K-Cubes or T-Cubes, and a power supply that plugs into a standard wall outlet. The hub draws a maximum current of 10 A; please verify that the cubes being used do not require a total current of more than 10 A. In addition, the hub provides USB connectivity to any docked K-Cube or T-Cube through a single USB connection.

For more information on the USB Controller Hubs, see the full web presentation.

*The TPS002 can only support one KNA-VIS or KNA-IR controller and should not be used to power any additional units as that may exceed current limitations.

Part Number	Description	Price	Availability
TPS002	**±15 V/5 V Power Supply Unit with Mini-DIN Connectors for up to Two K- or T-Cubes**	**$113.46**	**Today**
KCH301	**USB Controller Hub and Power Supply for Three K-Cubes or T-Cubes**	**$509.54**	**Today**
KCH601	**USB Controller Hub and Power Supply for Six K-Cubes or T-Cubes**	**$616.70**	**Today**

Visit the *T-Cube Laser Diode Driver* page for pricing and availability information:
https://www.thorlabs.com/newgrouppage9.cfm?objectgroup_id=3355

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