THORLABS

High Power LED Controller

DC2200
Quick Start

2018

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Contents

We aim to develop and produce the best solution for your application in the field of optical measurement technique. To help us to live up to your expectations and improve our products permanently we need your ideas and suggestions. Therefore, please let us know about possible criticism or ideas. We and our international partners are looking forward to hearing from you.

Thorlabs GmbH

Warning

Sections marked by this symbol explain dangers that might result in personal injury or death. Always read the associated information carefully, before performing the indicated procedure.

Attention

Paragraphs preceded by this symbol explain hazards that could damage the instrument and the connected equipment or may cause loss of data.

Note

This manual also contains "NOTES" and "HINTS" written in this form.

Please read these advices carefully!

1 General Information

The Thorlabs DC2200 High-Power LED controller features:

- Color Touch-Panel Display
- Two output terminals
  - LED1 (12 pin connector) for Thorlabs SOLIS High-Power LED Series
  - LED2 (4 pin connector) for Thorlabs Mounted (MxxxLx) or Fiber-Coupled (MxxxFx) LEDs.

  Using the supplied CAB-DC2200 and CAB-LEDD1 cables, custom LEDs can be connected as well, see Appendix in the full manual, section Connecting Custom LED.

- Constant Current Mode
- Brightness Mode
- Internal PWM (Pulse-Width Modulation) Mode with adjustable frequency, duty cycle and pulse count
- Internal Pulse Mode with adjustable On- /Off-Time and pulse count
- Internal Modulation (sine, square and triangle waveforms, 20 Hz to 100 kHz)
- External Modulation Mode
- External TTL Modulation Mode
- Remote Control via USB interface (DC2200 Remote Application; USB Test & Measurement Device driver)
- Firmware Update Capability via USB Interface and Thorlabs DFU Wizard application.

Terminal LED1

Terminal LED1 is capable of driving an LED with a forward voltage of up to 50 V and a current of up to 10 A. Five "pairs" of max. voltage and max. current are given:

- Max. current 10 A @ max. forward voltage 5 V
- Max. current   5 A @ max. forward voltage 10 V
- Max. current   4 A @ max. forward voltage 15 V
- Max. current   2 A @ max. forward voltage 35 V
- Max. current   1 A @ max. forward voltage 50 V

Terminal LED2

Terminal LED2 is capable of driving an LED with a forward voltage of up to 50 V and a current of up to 2 A. Two "pairs" of max. voltage and max. current are given:

- Max. current   2 A @ max. forward voltage 35 V
- Max. current 1.5 A @ max. forward voltage 50 V

1.1 Safety

Attention

The safety of any system incorporating the equipment is the responsibility of the assembler of the system.

All statements regarding safety of operation and technical data in this instruction manual will only apply when the unit is operated correctly as it was designed for.

The DC2200 must not be operated in explosion endangered environments!

Do not obstruct the air ventilation slots in the housing!

Do not remove covers!

Do not open the cabinet.There are no parts serviceable by the operator inside!

Keep in mind, that High Power LEDs may get hot!

This precision device is only serviceable if properly packed into the complete original packaging including the plastic foam sleeves. If necessary, ask for replacement packaging.

Refer servicing to qualified personnel!

Only with written consent from Thorlabs GmbH may changes to single components be made or components not supplied by Thorlabs GmbH be used.

Attention

Prior to applying power to the DC2200, make sure that the protective conductor of the 3 conductor mains power cord is correctly connected to the protective earth ground contact of the socket outlet! Improper grounding can cause electric shock resulting in damage to your health or even death!

All modules must only be operated with duly shielded connection cables.

Attention

The following statement applies to the products covered in this manual, unless otherwise specified herein. The statement for other products will appear in the respective accompanying documentation.

Note This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules and meets all requirements of the Canadian Interference-Causing Equipment Standard ICES-003 for digital apparatus. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

Users that change or modify the product described in this manual in a way not expressly approved by Thorlabs GmbH (party responsible for compliance) could void the user's authority to operate the equipment.

Thorlabs GmbH is not responsible for any radio television interference caused by modifications of this equipment or the substitution or attachment of connecting cables and equipment other than those specified by Thorlabs GmbH. The correction of interference caused by such unauthorized modification, substitution or attachment will be the responsibility of the user.

The use of shielded I/O cables is required when connecting this equipment to any and all optional peripheral or host devices. Failure to do so may violate FCC and ICES rules.

Attention

Mobile telephones, cellular phones or other radio transmitters are not to be used within the range of three meters of this unit since the electromagnetic field intensity may then exceed the maximum allowed disturbance values according to IEC 61326-1.

This product has been tested and found to comply with the limits according to IEC 61326-1 for using connection cables shorter than 3 meters (9.8 feet).

1.2 Ordering Codes and Accessories

DC2200	High-Power LED Current Controller
CAB-DC2200	Connection Cable for custom LED - terminal LED1 (one end open wires, included)
CAB-LEDD1	Connection Cable for custom LED - terminal LED2 (one end open wires, included)

Compatible LEDs

SOLIS Series	Thorlabs High Power LED
MxxxLx	Thorlabs Mounted LED
MxxxFx	Thorlabs Fiber Coupled LED

1.3 Requirements

These are the requirements for the PC intended to be used for remote operation of the DC2200.

Hardware Requirements

CPU:	1 GHz or higher
RAM:	256 MB
Graphic card	Min. 32 MB memory
Hard disc	Min 100 MB free storage space
Interface	free USB2.0 port, USB cable according the USB 2.0 specification

Software Requirements

The DC2200 software is compatible with the following operating systems:

- Windows® XP (32-bit) SP3
- Windows® Vista (32-bit, 64-bit)
- Windows® 7 (32-bit, 64-bit)
- Windows® 8 / 8.1 (32-bit, 64-bit)

For operation of the DC2200, the NI-VISA™ Runtime (V 5.1.1 or later) is required as well. This NI-VISA™ software is included with the Thorlabs GmbH DC2200 installation package, but can be downloaded also from National Instruments' website www.ni.com.

2 Getting Started

2.1 Parts List

Inspect the shipping container for damage.

If the shipping container seems to be damaged, keep it until you have inspected the contents and you have inspected the DC2200 mechanically and electrically.

Verify that you have received the following items within the package:

1. DC2200
2. Power Supply 100 - 240 V AC / 48 V 2.08 A DC
3. Custom Cable CAB-DC2200 for connecting a custom LED to terminal LED1
4. Custom Cable CAB-LEDD1 for connecting a custom LED to terminal LED2
5. USB2.0 Cable
6. Quick Start Manual

Note

As a part of Thorlabs Green Initiative, we aim to save paper and decided to offer electronic documentation to our products. This Quick Reference gives only a short introduction and states safety and legal information.

The full manual can be downloaded in PDF format from the Thorlabs web site http://www.thorlabs.com/manuals.cfm (enter DC2200 into the search box). Alternatively, the full manual can be downloaded by scanning the QR code below

On the product web site
http://www.thorlabs.com/software_pages/ViewSoftwarePage.cfm?Code=DC2200

you can find also software package that contains the full manual, a Remote Control application, the DFU Device Firmware Upgrade wizard and - so far available - a firmware image for updating.
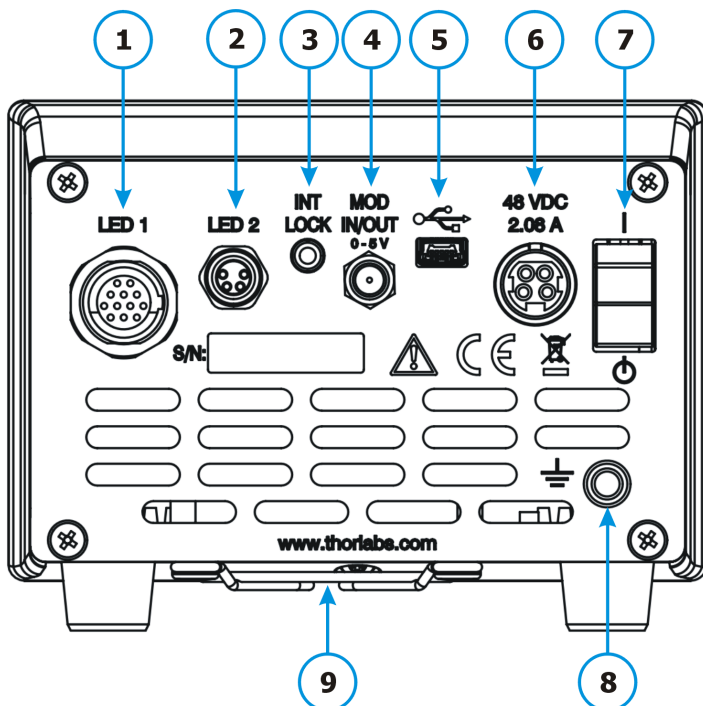
2.2 Operating Elements

Front Panel

1   LED On / Off Button
2   Main Menu
3   Status Bar
4   Device Information Button
5   System Settings Button

**Rear Panel**


1   LED1 High-Power Terminal
2   LED2 Standard Terminal
3   Interlock Connector
4   SMA Connector: External Modulation Input / Internal Modulation Monitor
5   USB 2.0 Interface
6   DC Supply Input
7   Power-On Switch
8   Ground Jack
9   Ventilation Slots

2.3 First Steps

1. Connect the included power supply to the mains power and to the jack (6) on the rear panel.

2. Connect your LED to the appropriate Terminal (LED1 (1) for SOLIS or custom high-power LED - or LED2 (2) for MxxxLx / MxxxFx or custom LED).

3. Make sure that the interlock pin (3) is inserted. Alternatively, if you use an external interlock, connect it to the 3.5 mm jack (3).

4. Switch on your DC2200.

5. For a quick start, the basic operation - set user current limit and operate the LED in Constant Current Mode - is explained below. For detailed operating instructions please see the full manual⁶.

6. From the main menu, select LED Settings:
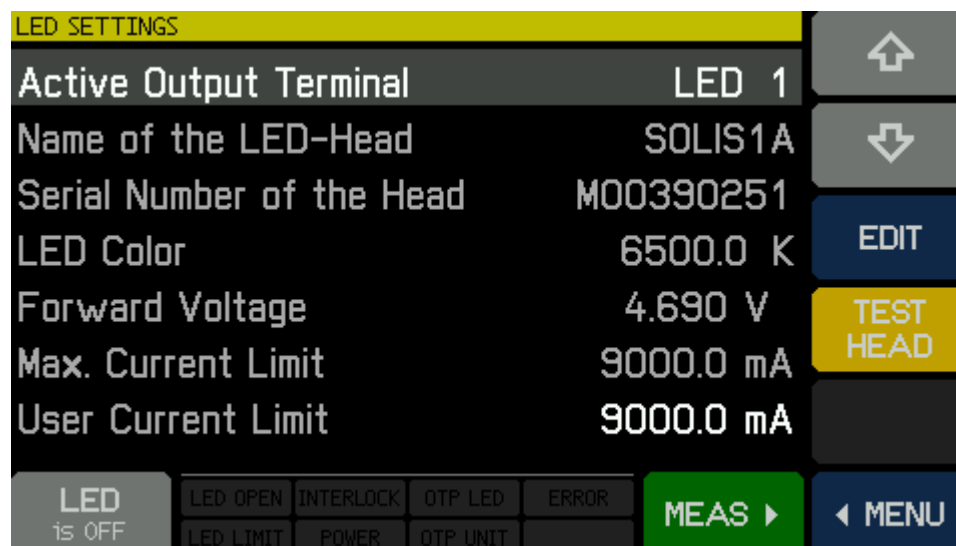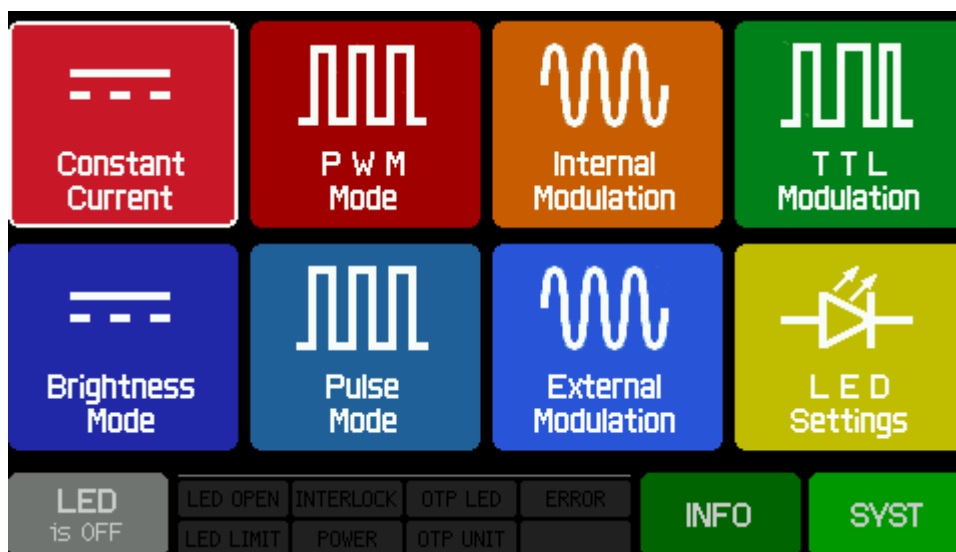
7. If only one LED is connected, the appropriate output terminal (LED1 or LED2) is activated automatically.

8. Select the line "User Current Limit", then tap the EDIT button and adjust any current limit below or equal to the maximum LED current.
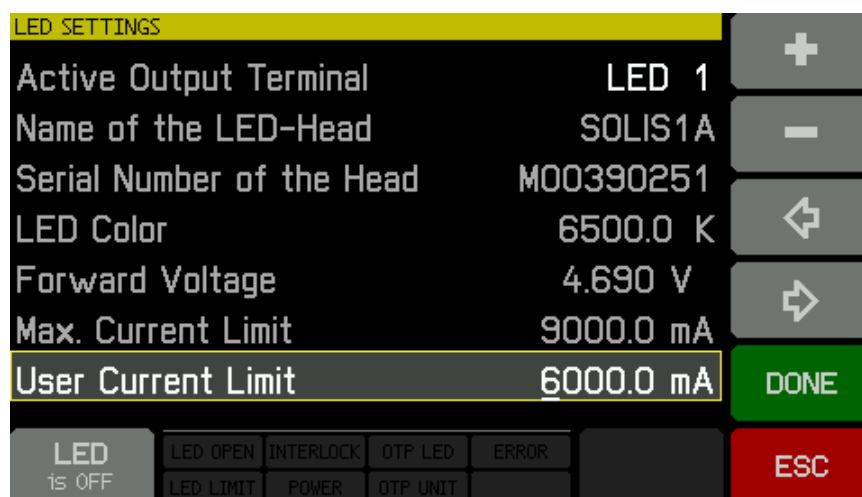
9. Tap [DONE] to save the setting.
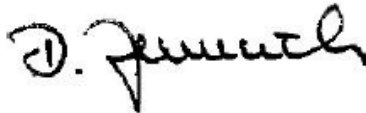
10. Select from main menu **Constant Current** mode:

11. Tap the [EDIT] button to adjust the current trough the LED using the small or large "PLUS" and "MINUS" buttons:
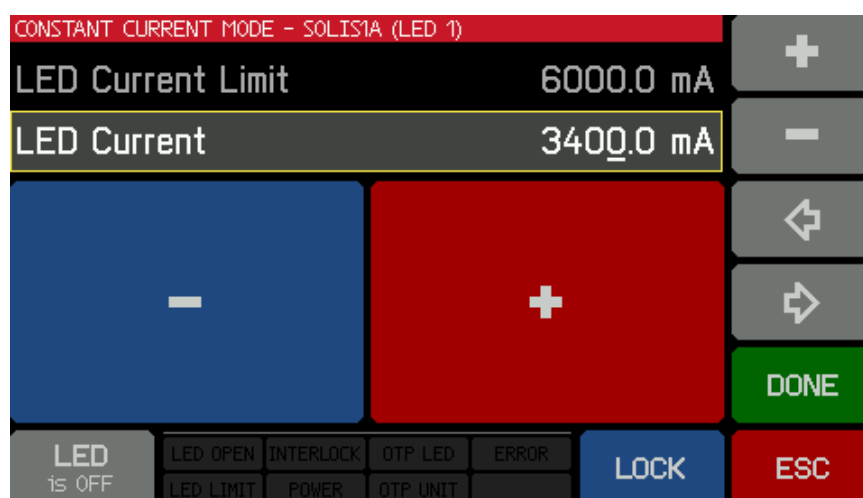
12. Tap the [LED is OFF] button to switch on the LED. The LED current can still be adjusted. To save the set value, press the [DONE] button.

3 Appendix

3.1 Certifications and Compliances

<div style="border:1px solid">

EU Declaration of Conformity

in accordance with EN ISO 17050-1:2010

We: Thorlabs GmbH

Of: Hans-Boeckler-Str. 6, 85221 Dachau/München, Deutschland

in accordance with the following Directive(s):

2014/35/EU Low Voltage Directive (LVD)

2014/30/EU Electromagnetic Compatibility (EMC) Directive

2011/65/EU Restriction of Use of Certain Hazardous Substances (RoHS)

hereby declare that:

Model: **DC2200**

Equipment: **High Power LED Driver**

is in conformity with the applicable requirements of the following documents:

EN 61010-1 Safety Requirements for Electrical Equipment for Measurement, Control and Laboratory Use. 2010

EN 61326-1 Electrical Equipment for Measurement, Control and Laboratory Use - EMC Requirements 2013

and which, issued under the sole responsibility of Thorlabs, is in conformity with Directive 2011/65/EU of the European Parliament and of the Council of 8th June 2011 on the restriction of the use of certain hazardous substances in electrical and electronic equipment, for the reason stated below:

does not contain substances in excess of the maximum concentration values tolerated by weight in homogenous materials as listed in Annex II of the Directive

I hereby declare that the equipment named has been designed to comply with the relevant sections of the above referenced specifications, and complies with all applicable Essential Requirements of the Directives.

Signed: *On:* 08 July 2015

CE 15

Name: Dorothee Jennrich

Position: General Manager

EDC - DC2200 -2015-07-08

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3.2 Warranty

Thorlabs GmbH warrants material and production of the DC2200 for a period of 24 months starting with the date of shipment. During this warranty period Thorlabs GmbH will see to defaults by repair or by exchange if these are entitled to warranty.

For warranty repairs or service the unit must be sent back to Thorlabs GmbH. The customer will carry the shipping costs to Thorlabs GmbH, in case of warranty repairs Thorlabs GmbH will carry the shipping costs back to the customer.

If no warranty repair is applicable the customer also has to carry the costs for back shipment.

In case of shipment from outside EU duties, taxes etc. which should arise have to be carried by the customer.

Thorlabs GmbH warrants the hard- and/or software determined by Thorlabs GmbH for this unit to operate fault-free provided that they are handled according to our requirements. However, Thorlabs GmbH does not warrant a fault free and uninterrupted operation of the unit, of the software or firmware for special applications nor this instruction manual to be error free. Thorlabs GmbH is not liable for consequential damages.

Restriction of Warranty

The warranty mentioned before does not cover errors and defects being the result of improper treatment, software or interface not supplied by us, modification, misuse or operation outside the defined ambient stated by us or unauthorized maintenance.

Further claims will not be consented to and will not be acknowledged. Thorlabs GmbH does explicitly not warrant the usability or the economical use for certain cases of application.

Thorlabs GmbH reserves the right to change this instruction manual or the technical data of the described unit at any time.

3.3 Copyright and Exclusion of Reliability

Thorlabs GmbH has taken every possible care in preparing this document. We however assume no liability for the content, completeness or quality of the information contained therein. The content of this document is regularly updated and adapted to reflect the current status of the hardware and/or software. We furthermore do not guarantee that this product will function without errors, even if the stated specifications are adhered to.

Under no circumstances can we guarantee that a particular objective can be achieved with the purchase of this product.

Insofar as permitted under statutory regulations, we assume no liability for direct damage, indirect damage or damages suffered by third parties resulting from the purchase of this product. In no event shall any liability exceed the purchase price of the product.

Please note that the content of this document is neither part of any previous or existing agreement, promise, representation or legal relationship, nor an alteration or amendment thereof. All obligations of *Thorlabs GmbH* result from the respective contract of sale, which also includes the complete and exclusively applicable warranty regulations. These contractual warranty regulations are neither extended nor limited by the information contained in this document. Should you require further information on this product, or encounter specific problems that are not discussed in sufficient detail in the document, please contact your local *Thorlabs GmbH* dealer or system installer.

3.4   Thorlabs 'End of Life' Policy

As required by the WEEE (Waste Electrical and Electronic Equipment Directive) of the European Community and the corresponding national laws, Thorlabs GmbH offers all end users in the EC the possibility to return "end of life" units without incurring disposal charges.

This offer is valid for Thorlabs GmbH electrical and electronic equipment
- sold after August 13th 2005
- marked correspondingly with the crossed out "wheelie bin" logo (see figure below)
- sold to a company or institute within the EC
- currently owned by a company or institute within the EC
- still complete, not disassembled and not contaminated

As the WEEE directive applies to self contained operational electrical and electronic products, this "end of life" take back service does not refer to other Thorlabs GmbH products, such as
- pure OEM products, that means assemblies to be built into a unit by the user (e. g. OEM laser driver cards)
- components
- mechanics and optics
- left over parts of units disassembled by the user (PCB's, housings etc.).

Waste treatment on your own responsibility

If you do not return an "end of life" unit to Thorlabs GmbH, you must hand it to a company specialized in waste recovery. Do not dispose of the unit in a litter bin or at a public waste disposal site.

WEEE Number (Germany) : DE97581288

Ecological background

It is well known that waste treatment pollutes the environment by releasing toxic products during decomposition. The aim of the European RoHS Directive is to reduce the content of toxic substances in electronic products in the future.

The intent of the WEEE Directive is to enforce the recycling of WEEE. A controlled recycling of end-of-life products will thereby avoid negative impacts on the environment.

Crossed out
"Wheelie Bin" symbol

3.5 Thorlabs Worldwide Contacts

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