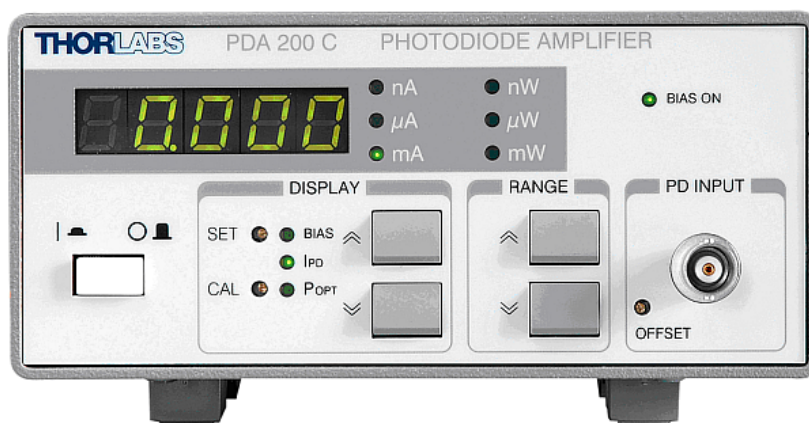




## Photodiode Amplifier

# PDA200C Operation Manual



2016

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Version: 3.3  
Date: 09-Mar-2016

Item No.: M0009-510-305

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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 PDA200C is a precise photodiode current amplifier compatible with all kinds of photodiodes. After a calibration the PDA200C can be used as precise optical power meter.

Typical applications of the PDA200C are:

- simple operation of photodiodes (transimpedance amplifier)
- sensitive pico-Ampère meter
- low noise amplification of photodiode current
- simple optical power meter

The PDA200C is easy to operate via the operating elements on the front panel. The operating parameters are shown on an illuminated 5-digit LED display. Either PD-current, optical power or bias voltage can be displayed. The displayed parameter is chosen by up / down toggle switches and indicated by LEDs. The units of the measurement for current and power ranges are indicated by LEDs. The unit for bias voltage is V.

The offset of the input amplifier and of the photodiode can easily be adjusted using a 12-turn potentiometer.

The bias voltage ranging from 0 V to +10 V (for polarity anode grounded) or from 0 V to -10 V (for polarity cathode grounded) can be applied to the photodiode using the sliding switch on the rear panel of the PDA200C. The voltage is set using a 12-turn potentiometer.

The displayed power values can be calibrated for a known power level by a potentiometer.

The Analog Out provides a DC voltage proportional to the photodiode current.

The installed mains filter and the transformer shielding provide a low ripple at the analog control output.

If requested Thorlabs offers calibrated photodiodes as accessories.

## 1.1 Safety

### Attention

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.

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

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

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

Before applying power to your PDA200C controller, make sure that the protective conductor of the 3 conductor mains power cord is correctly connected to the protective earth contact of the socket outlet!

Improper grounding can cause electric shock with damages to your health or even death!

Also make sure that the line voltage setting of the fuse holder at the rear panel agrees with your local supply and that the corresponding fuses are inserted. If not, please change the line voltage setting (see section [Line voltage setting](#)) and the mains fuses (see section [Replacing the mains fuses](#)).

The PDA200C controller must not be operated in explosion endangered environments!

Do not obstruct the air ventilation slots in housing!

Do not remove covers!

Refer servicing to qualified personnel!

**Attention**

Use only duly shielded connection cables for photodiode and control input/output connections.

Mobile telephones, cellular phones or other radio transmitters must not 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 IEC61326-1.

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

**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 accompanying documentation.

Note: This equipment has been tested and found to comply with the limits for a Class B 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 in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/T.V. technician for help.

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.

**Vous pouvez trouver les traductions françaises des paragraphes ayant trait à la sécurité d'utilisation de ce produit sur le lien suivant:**

[http://www.thorlabs.com/thorcat/15900/PDA200C-CSADocument\(Français\).pdf](http://www.thorlabs.com/thorcat/15900/PDA200C-CSADocument(Français).pdf)

**Vous pouvez aussi simplement scanner le code QR**



## 1.2 Ordering Codes and Accessories

<u>Ordering code</u>	<u>Short description</u>
----------------------	--------------------------

<b>PDA200C</b>	Photodiode amplifier / optical power meter
----------------	--

Thorlabs offers a variety of photodiodes for different wavelengths and power ranges, which can be used with the PDA200C.

Please visit our homepage <http://www.thorlabs.com> for further information.

## 2 Installation

### 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 PDA200C mechanically and electrically.

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

1. 1 PDA200C
2. 1 grounding cable
3. 1 flat-bladed screwdriver 1.8 x0.5 mm
4. 1 power cord, connector according to ordering country
5. 1 operation manual

### 2.2 Getting Started

Prior to operate a PDA200C controller, check if the set line voltage matches with your local power supply and if the appropriate fuses are inserted. (See sections [Line Voltage Setting](#) and [Replacing the Mains Fuses](#))

Connect the unit to the power line using the supplied cable. Turn the unit on by pressing the [line switch \(F9\)](#).

Via the connector jack of the chassis ground (R2) the external optical setup can be connected to ground potential, if required. The required grounding cable is attached.

#### **Note**

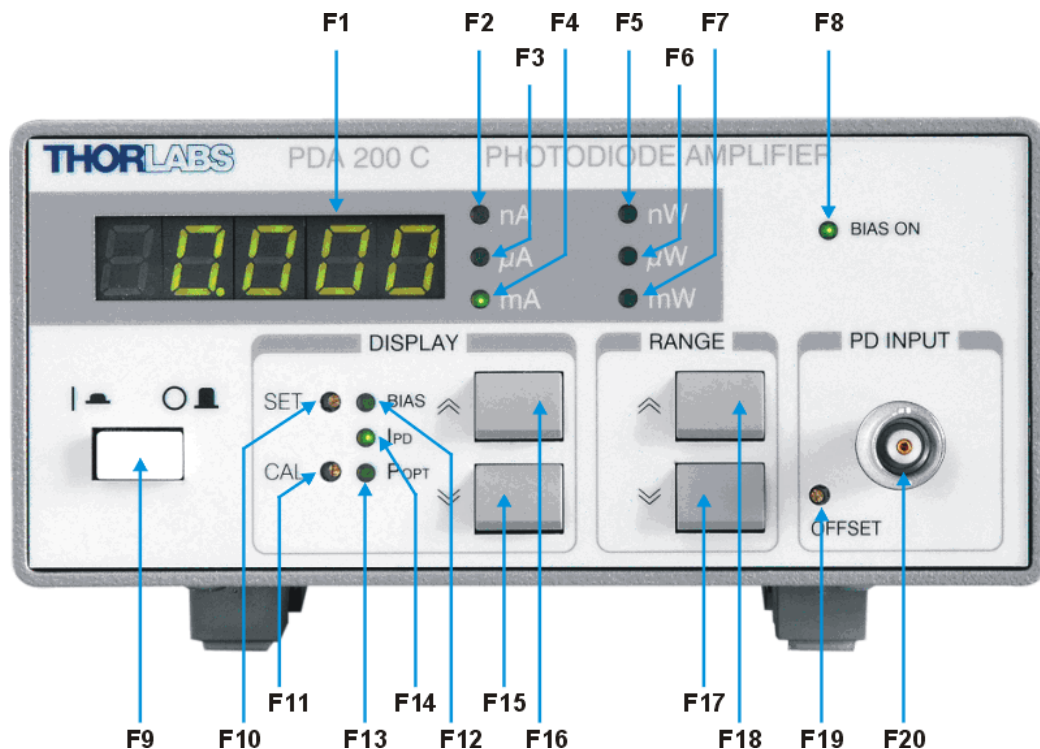
Grounding is strongly recommended in order to avoid hum and noise interference to the photodiode input, particularly when measuring low photodiode current.



## 3 Operating Instruction

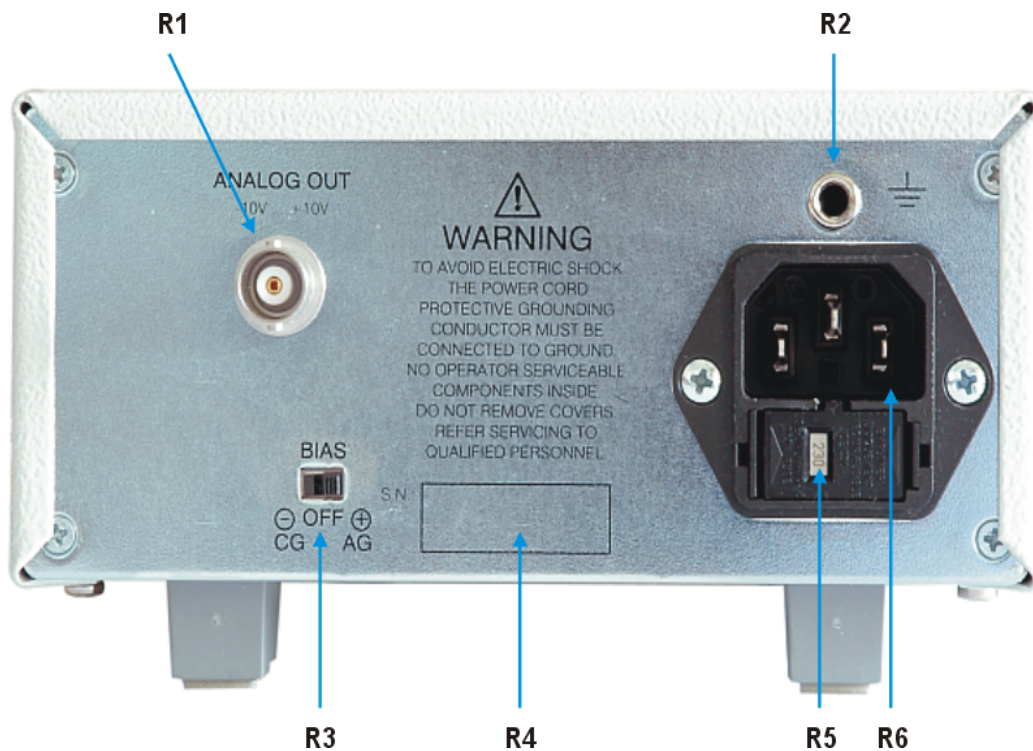
### 3.1 Operating elements

Operating elements at front panel



<b>F1</b>	-	5-digit LED display
<b>F2</b>	LED "nA"	Current display in nA
<b>F3</b>	LED " $\mu$ A"	Current display in $\mu$ A
<b>F4</b>	LED "mA"	Current display in mA
<b>F5</b>	LED "nW"	Power display in nW
<b>F6</b>	LED " $\mu$ W"	Power display in $\mu$ W
<b>F7</b>	LED "mW"	Power display in mW
<b>F8</b>	LED "BIAS ON"	Bias voltage switched on
<b>F9</b>	-	Line switch (ON / OFF)
<b>F10</b>	SET	Potentiometer for setting the bias voltage
<b>F11</b>	CAL	Potentiometer for calibrating the power display "P <sub>OPT</sub> "
<b>F12</b>	LED "BIAS"	Display shows the bias voltage in volts
<b>F13</b>	LED "P <sub>OPT</sub> "	Display shows the optical power
<b>F14</b>	LED "I <sub>PD</sub> "	Display shows the photodiode current
<b>F15</b>	Key "DOWN"	Select the parameter to be displayed
<b>F16</b>	Key "UP"	Select the parameter to be displayed
<b>F17</b>	Key Range "Down"	Select the measurement range (increasing the sensitivity)
<b>F18</b>	Key Range "Up"	Select the measurement range (decreasing the sensitivity)
<b>F19</b>	OFFSET	Potentiometer for PD input offset adjustment
<b>F20</b>	PD INPUT	Photodiode input

## Operating elements at rear panel



- R1** Monitor control output "ANALOG OUT", 0 ...  $\pm 10V$
- R2** 4 mm banana jack for grounding
- R3** Selector switch for the photodiode bias voltage: CG (-) / OFF / AG (+)
- R4** Serial number of the unit
- R5** Indicator / switch for line voltage (included in fuse holder)
- R6** Mains connector and fuse holder

## 3.2 Operation

### Attention

Prior to switch on the PDA200C please check if the line voltage setting (see the indicated voltage in the fuse holder's window [R5](#)) corresponds to your mains voltage! If the selected voltage does not match, please set it correctly as described in section "[Line Voltage Setting](#)".

Push the line switch (F9) to turn the unit on.

After switching on the unit, the LED display (F1) and one of the LEDs, indicating the selected measurement value (F12 ... F14), lights up. If no display is shown, please check the line voltage setting and the mains fuses.

Using up and down keys (F15) and (F16) the desired parameter can be selected.

The PDA200C is immediately ready to use after turning on. The rated accuracy is reached, however, after a warming-up time of approx. 10 minutes.

### 3.2.1 Connecting a Photodiode

Photodiodes with both polarities, i.e. cathode or anode grounded, can be used with the PDA200C. If a photodiode with anode connected to ground is used, the display (F1) shows a negative sign.

### Attention

If the polarity of the photodiode is not known, first set the bias switch (R3) to zero to avoid damage to the diode!

- Select photo current display "IPD" using up / down keys F15) and F16).
- Select the 10 mA current (range keys F17 and F18).
- Connect the photodiode to the input jack "PD INPUT" (F20).
- Select an appropriate current range to show the actual photodiode current with the best resolution on the LED display.

### 3.2.2 Offset Adjustment

The Offset Adjustment allows to compensate the input offset of the current amplifier or - if required - to zero the dark current of the connected photodiode. Offset and/or dark current adjustment is recommended to proceed after the PDA200C has warmed up.

#### Offset compensation:

- Do not connect a photodiode to the input jack "PD INPUT" (F20).
- Select display I<sub>PD</sub> (F15/ F16).
- Select the 10  $\mu$ A current range (F17/ F18).
- Using the screwdriver coming with the PDA200C, turn the potentiometer "OFFSET" (F19) in order to achieve a zero I<sub>PD</sub> current in the display.

It is not necessary to repeat the offset correction after the current measurement range was changed.

### Zeroing the PD's dark current

Connect the photodiode to the input jack "PD INPUT" (F20) and make sure the PD is darkened completely. It might be useful to ground the photodiode's housing using the supplied grounding cable, connected to the GND jack [R2](#) on the rear panel

- Select display  $I_{PD}$  (F15/ F16).
- Select the required PD current range (F17/ F18).
- Using the screwdriver, turn the potentiometer "OFFSET" (F19) in order to achieve a zero  $I_{PD}$  current in the display. Afterward

#### Note

After changing the  $I_{PD}$  current range, the dark current compensation must be carried out again!

### 3.2.3 Calibration of the Power Display

The PDA200C can be calibrated in order to display the optical power incident to the connected photodiode. The responsivity of the photodiode must not exceed the range 0.05 to 2 A/W. If the connected PD has a responsivity exceeding this range, please contact [Thorlabs](#) for a solution.

- Connect the photodiode and turn the PDA200C on.
- Expose the photodiode to a well known optical power. Make sure that no additional optical power enters the photodiode.
- Select display  $I_{PD}$  (F15 / F16).
- Select an appropriate current range (F17 / F18) to show the actual photodiode current with the best possible resolution.
- Select display  $P_{OPT}$  (F15 / F16).
- Use the screwdriver to adjust the potentiometer "CAL" (F11) in order to get the value of the optical power  $P_{OPT}$  displayed equal to the known power level.

This calibration is valid for all current ranges of the PDA200C.

### 3.2.4 Setting a BIAS Voltage

The PDA200C provides the possibility to apply a reverse voltage of up to  $\pm 10$  V (bias) to the photodiode (photo-conductive mode).

- Set the bias switch ([R3](#)) to "OFF"
- Connect the photodiode and turn on the PDA200C
- Expose the photodiode to light.
- Select the current range (F17 / F18).

If the displayed value is positive (polarity cathode grounded), set the bias switch (R3) to " - CG". The applied bias voltage is negative.

If the displayed value is negative (polarity anode grounded), set the bias switch (R3) to " + AG". The applied bias voltage is positive.

- Select Display "Bias" (F15 / F16).
- The bias voltage is displayed in volts.
- Use the screwdriver to set the potentiometer "SET" (F10) to the desired value for the bias voltage.

**Attention**

If the polarity of the bias does not match to the photodiode polarity, the bias voltage may damage the photodiode.

If the bias voltage exceeds the reverse voltage rating of the photodiode, the bias voltage may damage the photodiode

### 3.2.5 Analog Control Output

The analog output "ANALOG OUT" ([R1](#)) at the rear panel delivers a DC voltage proportional to the display reading of photodiode current  $I_{PD}$ .

The output voltage is

- 0 ... +10 V for a display reading of 0 ... 10000 (photodiode cathode grounded) or
- 0 ... -10 V for a display reading of 0 ... -10000 (photodiode anode grounded).

The maximum bandwidth of the monitor output "ANALOG OUT" (R1) depends on the current range (see [Technical Data](#)).

The shield of the BNC "ANALOG OUT" (R1) is grounded, thus an oscilloscope or PC based AD-Converter or other recording device can be connected directly.

Take care to avoid ground loops.

Devices connected to these outputs should have an input resistance 10 k $\Omega$ .

### 3.2.6 Disabling the Beeper

If audible signals are unwanted, the beeper can be disabled in this way:

- Press and hold the key "UP" (F16).
- Press the key "Down" (F15). Now the beeper state is displayed:
  - "Sd.On" - Sound ON
  - "Sd.OFF" - Sound OFF

To change the beeper state, hold the key "UP" pressed and toggle the beeper state by pressing "DOWN" key.

## 4 Maintenance and Service

Protect the PDA200C from adverse weather conditions. The PDA200C is not water resistant.

### Attention

**To avoid damage to the instrument, do not expose it to spray, liquids or solvents!**

The unit does not need a regular maintenance by the user. It does not contain any modules and/or components that could be repaired by the user himself. If a malfunction occurs, please contact [Thorlabs](#) for return instructions.

Do not remove covers!

If necessary the unit and the display can be cleaned with a cloth dampened with water. You can use a mild 75% Isopropyl Alcohol solution for more efficient cleaning.

It is recommended to have the unit calibrated by Thorlabs every two years.

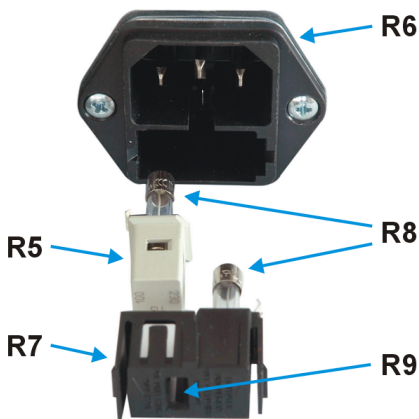
### 4.1 Line Voltage Setting

The Photodiode Amplifier PDA200C operates at fixed line voltages of

- 100 V +15% / -10% ( 90 V ... 115 V)
- 115 V +15% / -10% (104 V ... 132 V)
- 230 V +15% / -10% (207 V ... 264 V)

line frequency 50 ... 60 Hz.

The line voltage setting can be changed from the rear without opening the unit.



1. Turn off the controller and disconnect the mains cable.

2. The fuse holder (R7) is located below the 3-pole power connector of the mains jack (R6). Release the fuse holder by pressing its plastic retainers with the aid of a small screwdriver. The retainers are located on the right and left side of the holder and must be pressed towards the center.

3. Unplug the white line voltage switch/indicator (R5, containing the left fuse) from the fuse holder (R7), rotate it until the appropriate voltage marking (100V, 115V, or 230V) is on target for the cutout (R9) of the fuse holder, and plug it back into the fuse holder. Press in the fuse holder until locked on both sides. The appropriate line voltage marking

must be visible in the cutout (R9) of the fuse holder (R7).

### Attention

If you have changed to or from 230 V, also change the mains fuses to the correct value given in section [Replacing Mains Fuses](#).

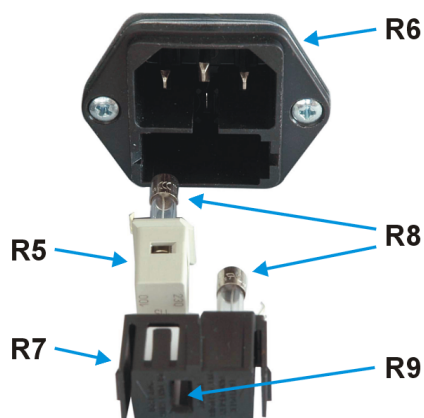


## 4.2 Replacing Mains Fuses

The two power input fuses are externally accessible. If they have opened due to line distortions, incorrect line voltage or other causes, they can be replaced from the rear without opening the unit.

### Attention

**To avoid risk of fire only the appropriate fuses for the corresponding line voltage must be used.**



1. Turn off the PDA200C and disconnect the mains cable.
2. The fuse holder (R7) is located below the 3-pole power connector of the mains jack (R6). Release the fuse holder by pressing its plastic retainers using a small screwdriver. The retainers are located on the right and left side of the holder and must be pressed towards the center.
3. Replace the defective fuses (R8) and press in the fuse holder until locked on both sides. Take care to maintain the correct rotation of the white line voltage indicator / switch (R5) which contains the left fuse and is plugged into the fuse holder. The appropriate line voltage marking must be visible in the cutout (R9) of the fuse holder.

### Fuse types

100 V	500 mA, time-lag, 250V	T0.5A 250V
115 V	500 mA, time-lag, 250V	T0.5A 250V
230 V	250 mA, time-lag, 250V	T0.25A 250V

All fuses must meet IEC specification 60127-2/III, time characteristic: time-lag (T), 250V AC, size 5 x 20 mm.

## 4.3 Troubleshooting

- Unit does not work at all (no display at the front):
  - PDA200C connected properly to the mains?
    - ➔ Check the mains cable and the line voltage setting (please refer to section [Line Voltage Setting](#)).
  - PDA200C turned on?
    - ➔ Turn on your PDA200C with the key mains-switch.
  - Check the fuses at the rear panel (see [Replacing Mains Fuses](#)).
    - ➔ If blown replace the fuses by the correct type (select the appropriate fuse type)
- The measured photo current or optical power seem to be not correct
  - Are all offset errors eliminated?
    - ➔ See "[Offset Adjustment](#)" for compensation
  - Is the photodiode calibrated?
    - ➔ See "[Calibration of the Power Display](#)".
  - Was the dark current of the photodiode compensated and subsequently the measurement range changed?
    - ➔ Repeat the [dark current calibration](#) for the actual measurement range you are using.
- Measurement results are unstable
  - Check system setup for possible ground loops which may introduce line interferences (50/60 Hz) into your setup.
  - Check if grounding of the PD housing (using the supplied grounding cable) improves noise and / or hum.
- The unit switches on, but display shows error message (e.g., "Err06")
  - This indicates a malfunction of the PDA200C.
    - ➔ In such case, the controller needs to be returned to Thorlabs for maintenance. Please contact [Thorlabs](#) with the information of the error code number and the serial number of your PDA200C in order to receive the RMA (Return Material Authorization) instructions accordingly.

If you don't find the error source by means of the trouble shooting list please contact [Thorlabs](#) for advise and/or return instructions.



## 5 Appendix

### 5.1 Technical Data

Specifications	
Full Scale Current Measurement Ranges	100 nA to 10 mA (in Decade Steps)
Maximum Resolution	10 pA
Display Range	0 to 10000 (CG), 0 to -10000 (AG)
Polarity of the Photodiode	Cathode Grounded (CG) or Anode Grounded (AG)
Bias Voltage	0 to -10 V (CG), 0 to +10 V (AG)
Photodiode Sensitivity (for Calibrated Power Display)	0.05 to 2 A/W
Max. Photodiode Capacitance for Frequency Compensated Operation	10 nF
Temperature Coefficient	<50 ppm/°C
Input Impedance	~0 $\Omega$ (Virtual Ground)
Photo Current Monitor Output	
Output Voltage Range (Analog Output)	0 to +10 V (CG), 0 to -10 V (AG)
Conversion coefficient	$10^3$ to $10^8$ V/A (depends on PD range, see table below)
Accuracy of Conversion coefficient	$\pm 5\%$
Noise (rms f.s.of current measurement range)	$\leq 0.02\%$
Load Resistance	>10 k $\Omega$
Common	
Display	LED, 5 Digits
Connectors (PD Input, Analog Output)	BNC
Chassis Ground Connector	4 mm Banana Jack
Line Voltage	100 V 115 V ( +15% -10%) 230 V
Line Frequency	50 to 60 Hz
Mains Supply Overvoltage	Category II (Cat II)
Maximum Power Consumption	10 VA
Warm-up Time for Rated Accuracy	10 min
General	
Operating Temperature Range <sup>1)</sup>	0 - 40 °C
Storage Temperature Range	-40 to 70 °C
Relative Humidity	Max. 80% up to 31 °C, decreasing to 50% at 40 °C
Pollution Degree (Indoor Use only)	2
Operation Altitude	<2000 m
Dimensions (WxHxD), w/o operating elem.	146 x 66 x 290 mm <sup>3</sup>
Dimensions (WxHxD), with operating elem.	146 x 77 x 320 mm <sup>3</sup>
Weight	<3 kg

<sup>1)</sup> non-condensing

All technical data are valid at  $23 \pm 5^\circ\text{C}$  and  $45 \pm 15\%$  rel. humidity (non condensing)

Current range	Resolution	Accuracy	Analog Output	
			Bandwidth <sup>2)</sup>	Conversion Coeff.
10 mA	1 $\mu$ A	$\pm 0.05$ % f.s.	500 kHz	$1 \times 10^3$ V/A $\pm 5\%$
1 mA	100 nA	$\pm 0.05$ % f.s.	250 kHz	$1 \times 10^4$ V/A $\pm 5\%$
100 $\mu$ A	10 nA	$\pm 0.05$ % f.s.	70 kHz	$1 \times 10^5$ V/A $\pm 5\%$
10 $\mu$ A	1 nA	$\pm 0.05$ % f.s.	20 kHz	$1 \times 10^6$ V/A $\pm 5\%$
1 $\mu$ A	100 pA	$\pm 0.05$ % f.s.	5 kHz	$1 \times 10^7$ V/A $\pm 5\%$
100 nA	10 pA	$\pm 0.1$ % f.s.	1 kHz	$1 \times 10^8$ V/A $\pm 5\%$

<sup>2)</sup> Small signal 3dB bandwidth of the control output

## 5.2 Declaration of Conformity

### *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):*

2006/95/EC	Low Voltage Directive (LVD)
2004/108/EC	Electromagnetic Compatibility (EMC) Directive
2011/65/EU	Restriction of Use of Certain Hazardous Substances (RoHS)

*hereby declare that:*

**Model:** *PDA200C*

**Equipment:** *Benchtop Photodiode Amplifier*

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

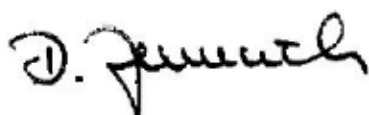
EN 61010-1	Safety Requirements for Electrical Equipment for Measurement, Control and Laboratory Use.	2010
EN 61326-1	Electrical Equipment for Measurement, Control and Laboratory Use - EMC Requirements	2013

*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:**

26 June 2015

**Name:** Dorothee Jennrich

**Position:** General Manager

EDC - PDA200C -2015-06-26

**CE 15**

## 5.3 Warranty

Thorlabs warrants material and production of the PDA200C for a period of 24 months starting with the date of shipment. During this warranty period Thorlabs 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. The customer will carry the shipping costs to Thorlabs, in case of warranty repairs Thorlabs 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 warrants the hard- and software determined by Thorlabs for this unit to operate fault-free provided that they are handled according to our requirements. However, Thorlabs 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 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 does explicitly not warrant the usability or the economical use for certain cases of application.

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

## 5.4 Exclusion of Reliability and Copyright

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

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## 5.5 Thorlabs 'End of Life' Policy (WEEE)

As required by the WEEE (Waste Electrical and Electronic Equipment Directive) of the European Community and the corresponding national laws, Thorlabs 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 electrical and electronic equipment

- sold after August 13<sup>th</sup> 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 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, 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*

## 5.6 Thorlabs Worldwide Contacts

### USA, Canada, and South America

Thorlabs, Inc.  
56 Sparta Avenue  
Newton, NJ 07860  
USA  
Tel: 973-579-7227  
Fax: 973-300-3600  
[www.thorlabs.com](http://www.thorlabs.com)  
[www.thorlabs.us](http://www.thorlabs.us) (West Coast)  
Email: [sales@thorlabs.com](mailto:sales@thorlabs.com)  
Support: [techsupport@thorlabs.com](mailto:techsupport@thorlabs.com)

### Europe

Thorlabs GmbH  
Hans-Böckler-Str. 6  
85221 Dachau  
Germany  
Tel: +49-8131-5956-0  
Fax: +49-8131-5956-99  
[www.thorlabs.de](http://www.thorlabs.de)  
Email: [europe@thorlabs.com](mailto:europe@thorlabs.com)

### France

Thorlabs SAS  
109, rue des Côtes  
78600 Maisons-Laffitte  
France  
Tel: +33-970 444 844  
Fax: +33-811 38 17 48  
[www.thorlabs.com](http://www.thorlabs.com)  
Email: [sales.fr@thorlabs.com](mailto:sales.fr@thorlabs.com)

### Japan

Thorlabs Japan, Inc.  
Higashi Ikebukuro  
Q Building 2nd Floor 2-23-2  
Toshima-ku, Tokyo 170-0013  
Japan  
Tel: +81-3-5979-8889  
Fax: +81-3-5979-7285  
[www.thorlabs.jp](http://www.thorlabs.jp)  
Email: [sales@thorlabs.jp](mailto:sales@thorlabs.jp)

### UK and Ireland

Thorlabs Ltd.  
1 Saint Thomas Place, Ely  
Cambridgeshire CB7 4EX  
United Kingdom  
Tel: +44-1353-654440  
Fax: +44-1353-654444  
[www.thorlabs.com](http://www.thorlabs.com)  
Email: [sales.uk@thorlabs.com](mailto:sales.uk@thorlabs.com)  
Support: [techsupport.uk@thorlabs.com](mailto:techsupport.uk@thorlabs.com)

### Scandinavia

Thorlabs Sweden AB  
Mölnadalsvägen 3  
412 63 Göteborg  
Sweden  
Tel: +46-31-733-30-00  
Fax: +46-31-703-40-45  
[www.thorlabs.com](http://www.thorlabs.com)  
Email: [scandinavia@thorlabs.com](mailto:scandinavia@thorlabs.com)

### Brazil

Thorlabs Vendas de Fotônicos Ltda.  
Rua Riachuelo, 171  
São Carlos, SP 13560-110  
Brazil  
Tel: +55-16-3413 7062  
Fax: +55-16-3413 7064  
[www.thorlabs.com](http://www.thorlabs.com)  
Email: [brasil@thorlabs.com](mailto:brasil@thorlabs.com)

### China

Thorlabs China  
Room A101, No. 100  
Lane 2891, South Qilianshan Road  
Putuo District  
Shanghai 200331  
China  
Tel: +86-21-60561122  
Fax: +86-21-32513480  
[www.thorlabs.com](http://www.thorlabs.com)  
Email: [chinasales@thorlabs.com](mailto:chinasales@thorlabs.com)