



Amplified MIR Photodetector

PDAVJ5, PDAVJ8, PDAVJ10 Quick Reference



2018

Version: 1.3
Date: 03-Dec-2018

Item No.: M0009-510-1073

Contents

Foreword	2
1 General Information	3
1.1 Ordering Codes and Accessories _____	3
2 Getting Started	4
2.1 Parts List _____	4
2.2 Preparation _____	4
3 Appendix	5
3.1 Safety _____	5
3.2 Warranty _____	6
3.3 Copyright and Exclusion of Reliability _____	6
3.4 Thorlabs Worldwide Contacts and WEEE _____	7

We aim to develop and produce the best solution for your application in the field of optical measurement techniques. To help us to live up to your expectations and constantly improve our products, we need your ideas and suggestions. Therefore, please contact us with your ideas and suggestions. 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 this advice carefully!

1 General Information

Thorlabs' PDAVJx Series of mid-IR (MIR) detectors combines the uncooled highly sensitive photovoltaic mercury-cadmium-telluride (MCT) sensors of the [VMLxT0](#) series with variable gain ultra-low noise transimpedance amplifiers in a shielded aluminum housing. The PDAVJx detectors are DC coupled and have a frequency response from true DC to the respective cutoff frequency. The gain can be adjusted with 8 steps over 30 dB (PDAVJ8 and PDAVJ10) or 42 dB (PDAVJ5).

The PDAVJx Series for free-space beam setups is provided in different versions with varying wavelength dependent sensitivity: the PDAVJ5 for 2.7 - 5.0 μm detection, the PDAVJ8 for 2.0 - 8.0 μm detection and the PDAVJ10 for 2.0 - 10.6 μm detection. A buffered output drives 50 Ω loads up to 1.0 V with an NEP of 14 $\text{pW}/\text{Hz}^{1/2}$ for PDAVJ5, or 170 $\text{pW}/\text{Hz}^{1/2}$ for PDAVJ8, or 210 $\text{pW}/\text{Hz}^{1/2}$ for PDAVJ10.

The sensors of the [VMLxT0](#) series that are incorporated in the PDAVJx sensors differ in their layers such that PDAVJ5 has a single layer, while PDAVJ8 and PDAVJ10 sensors have multiple layers. For that reason, the responsivities given for PDAVJ8 and PDAVJ10 are inseparable from the sensor width.

The PDAVJx detector housing can be integrated in optical setups using convenient combi-thread mounting holes that are compatible with both imperial and metric mounting. Please see the chapter Mounting for details.

The housing accommodates adapters and accessories from the Thorlabs' SM05-threaded (0.535"-40) series and the SM1-threaded (1.035"-40) series. This allows convenient mounting of external optics, light filters, and apertures. For accessories, please visit our website or contact [Thorlabs](#)^[7].

A ± 12 VDC power supply is included with each amplified photodetector. The appropriate [input voltage](#)^[4] (100 VAC, 120 VAC, or 230 VAC) can be selected with a switch on the power supply.

The PDAVJx detectors can provide amplification of input powers up to 500 μW (PDAVJ10). Detectors for amplification of higher input powers are available upon request.

Attention

Please find all safety information and warnings concerning this product in the chapter [Safety](#)^[5] in the Appendix of the full manual.

1.1 Ordering Codes and Accessories

The following models of the PDAVJx Series and accessories are available:

PDAVJ5	Adjustable-Gain MIR Photodetector, HgCdTe (MCT), 2.7 - 5.0 μm , Combi-Thread Mounting Holes Compatible with 8-32 and M4 Threads
PDAVJ8	Adjustable-Gain MIR Photodetector, HgCdTe (MCT), 2.0 - 8.0 μm , Combi-Thread Mounting Holes Compatible with 8-32 and M4 Threads
PDAVJ10	Adjustable-Gain MIR Photodetector, HgCdTe (MCT), 2.0 - 10.6 μm , Combi-Thread Mounting Holes Compatible with 8-32 and M4 Threads
LDS12B	Power Supply ± 12 V, 250 mA, switchable 100 VAC, 120 VAC, 230 VAC Line Voltage, LUMBERG RSMV3-657 Connector

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 for completeness and tested the PDAVJx Series Detector mechanically and electrically.

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

1. Amplified Adjustable-Gain MIR Photodetector
2. Metal Cover Cap, Protecting the Sensor
3. Power Supply (± 12 V, 250 mA), Switchable 100 V, 120 V or 230 V Line Voltage, Including Location Specific Power Adapters
4. Quick Reference Document

2.2 Preparation

Note

Prior to operation, please check if the selected line voltage range on the power supply matches your local mains voltage.

Please follow these steps for preparation:

- Carefully unpack the unit and accessories. If any damage is evident, do not use the unit and contact [Thorlabs](#) ⁷¹.
- Mount the unit on your optical table or application. The unit has two combi thread mounting holes, each compatible with both imperial 8-32 and metric M4 screws.
- Remove the metal cover cap that protects the optical input.
- If necessary, mount external optics, filters, or apertures.
- Adjust the power supply to accommodate your local mains voltage (100 VAC, 120 VAC, or 230 VAC).



Voltage Selector Switch

- Plug the power connector cable into the power supply connection socket on the PDAVJx.
- Plug the power supply into a 50-60 Hz, 100 VAC, 120 VAC, or 230 VAC outlet.
- Turn the power supply on.
- Connect the output BNC connector to your data acquisition device using a coaxial cable. Please note that a 50 Ω impedance device should be used for best RF performance.

Note

If you want to use your own power supply, contact Thorlabs for an appropriate power connector cable.

3 Appendix

3.1 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 under the conditions it was designed for.

The PDAVJx must not be operated in explosion endangered environments!

Do not open the housing. There are no user-serviceable parts inside!

This precision device is only serviceable if returned and properly packed into the complete original packaging including the plastic foam sleeves. If necessary, ask for replacement packaging. Refer servicing to qualified personnel!

Changes to this device cannot be made nor may components not supplied by Thorlabs be used without written consent from Thorlabs.

Attention

Prior to applying power to the PDAVJx, 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!

Ensure that the line voltage setting of the fuse holder at the power supply agrees with your local supply and that the corresponding fuses are inserted. If not, please change the line voltage setting.

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

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

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

Thorlabs 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. The correction of interference caused by such unauthorized modification, substitution, or attachment will be the responsibility of the user.

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.

3.2 Warranty

Thorlabs warrants material and production of the PDAVJx 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/or 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.

3.3 Copyright and Exclusion of Reliability

Thorlabs 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* 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* dealer or system installer.

All rights reserved. This document may not be reproduced, transmitted or translated to another language, either as a whole or in parts, without the prior written permission of *Thorlabs*.

Copyright © Thorlabs 2018. All rights reserved.

3.4 Thorlabs Worldwide Contacts and WEEE

US

A, Canada, and South America

Thorlabs, Inc.
56 Sparta Avenue
Newton, NJ 07860
USA
Tel: 973-300-3000
Fax: 973-300-3600
www.thorlabs.com
www.thorlabs.us (West Coast)
Email: sales@thorlabs.com
Support: techsupport@thorlabs.com

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
Email: sales.uk@thorlabs.com
Support: techsupport.uk@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
Email: europa@thorlabs.com

Scandinavia

Thorlabs Sweden AB
Bergfotsgatan 7
431 35 Mölndal
Sweden
Tel: +46-31-733-30-00
Fax: +46-31-703-40-45
www.thorlabs.com
Email: scandinavia@thorlabs.com

France

Thorlabs SAS
109, rue des Côtes
78600 Maisons-Laffitte
France
Tel: +33-970 444 844
Fax: +33-825 744 800
www.thorlabs.com
Email: sales.fr@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
Email: brasil@thorlabs.com

Japan

Thorlabs Japan, Inc.
3-6-3 Kitamachi
Nerima-ku, Tokyo 179-0081
Japan
Tel: +81-3-6915-7701
Fax: +81-3-6915-7716
www.thorlabs.co.jp
Email: sales@thorlabs.jp

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
Email: chinasales@thorlabs.com

Thorlabs verifies our compliance with the WEEE (Waste Electrical and Electronic Equipment) directive of the European Community and the corresponding national laws. Accordingly, all end users in the EC may return “end of life” Annex I category electrical and electronic equipment sold after August 13, 2005 to Thorlabs, without incurring disposal charges. Eligible units are marked with the crossed out “wheelie bin” logo (see right), were sold to and are currently owned by a company or institute within the EC, and are not disassembled or contaminated. Contact Thorlabs for more information. Waste treatment is your own responsibility. “End of life” units must be returned to Thorlabs or handed to a company specializing in waste recovery. Do not dispose of the unit in a litter bin or at a public waste disposal site.





THORLABS

www.thorlabs.com
