THORLABS

Thorlabs Instrumentation

TXP5004
Operation Manual

2017

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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 preceeded 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!

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1 General Information

The TXP5004 4 channel Test an Measurement Platform chassis is designed to accommodate up to 4 TXP modules. These modules are controlled by an external PC, connected via the USB interface of the TXP5004. It has a wide range power supply compatible with line voltages between 100...240VAC, 50-60Hz.

The TXP software allows to use the control PC as a gateway to a local area network so that the TXP modules can then be controlled remotely via the LAN and the local USB control PC.

- Small footprint with 4 module slots
- Hosts any TXP Series module
- Intelligent modules - memory / processor capacity where needed (real time apps)
- Configurable module pooling for complex measurement solutions
- Programming Interface
  USB interface with LabVIEW® / LabWindows/CVI® and C drivers
  Enhanced macro function capabilities
- Remote control or support via USB connection
- Ethernet remote control possible via a gateway PC

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.

Prior to applying power to the TXP5004, 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 with damages to your health or even death!

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

The TXP5004 must not be operated in explosion endangered environments!

Do not remove covers! Do not obstruct the air ventilation slots in the housing!

Do not open the cabinet, there are no parts serviceable by the operator inside!

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.

This precision device is only serviceable if properly packed into the complete original packaging. If necessary, ask for a replacement package prior to return.

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.

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.

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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.

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).

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1.2 Ordering Codes and Accessories

Ordering code:

TXP5004	4 Channel USB T&M Mainframe

Accessories:

TXP5000C	Blind module to cover empty module slots (for TXP5004 and TXP5016)

1.3 Requirements

These are the requirements to the PC intended to be used for remote operation of the TXP5004.

1.3.1 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

1.3.2 Software Requirements

The TXP5004 software is compatible with the following operating systems:

- Windows® 7 (32-bit, 64-bit)
- Windows® 8.x (32-bit, 64-bit)

For operation of the TXP5004, also an NI-VISA (version 5.4.1 or higher) is required. This NI-VISA engines comes with the Thorlabs GmbH TXP5004 installation software package, but can be downloaded also from National Instruments' website www.ni.com.

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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 TXP5004 mechanically and electrically.

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

TXP5004

1. 4 Slot Chassis with USB Control
2. Front Cover Plates TXP5000C for all unused slots
3. USB A to B Cable (TXPCABUSB)
4. Operation Manual
5. Power Cord

2.2 Installing Software

Note

Do not connect the TXP5004 to the PC prior to software installation!

Attention

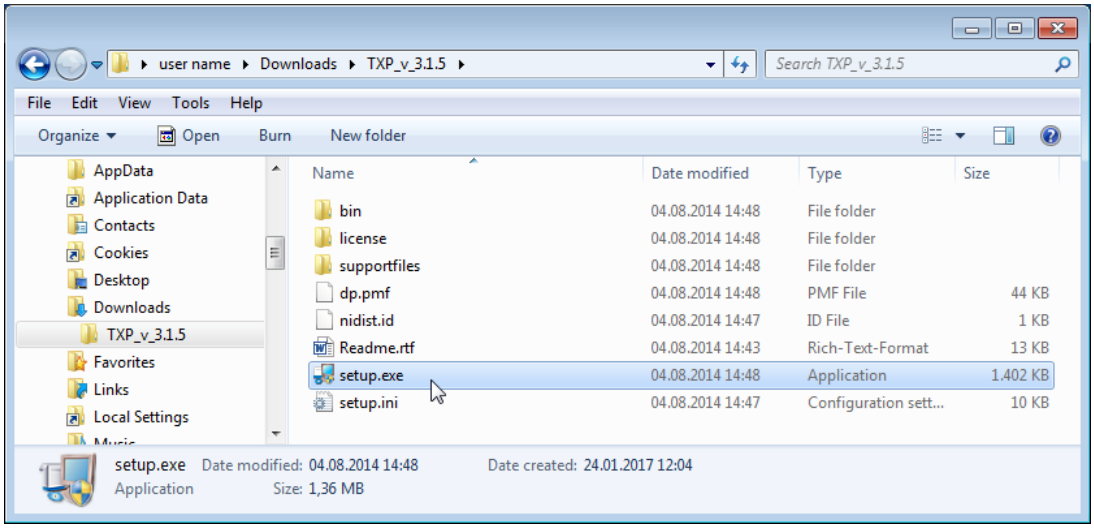
Exit all running applications on your PC as the installer may require a reboot of your PC during installation!

The TXP software package contains:

- NI VISA Runtime 5.4.1
- USB Drivers for TXP5001AD and TXP5004 and module slots
- Control software for TXP modules
- TXP Administration Tools

Below the software installation to a Windows 7® 64 bit operating system is described.

Download the ZIP archive from our website:
https://www.thorlabs.com/software_pages/ViewSoftwarePage.cfm?Code=TXP5000
and unpack the archive. Then execute the setup.exe:



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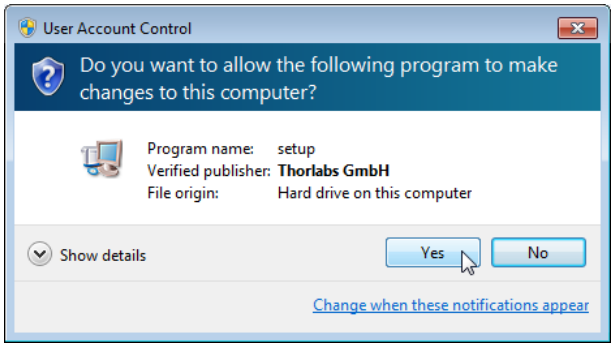
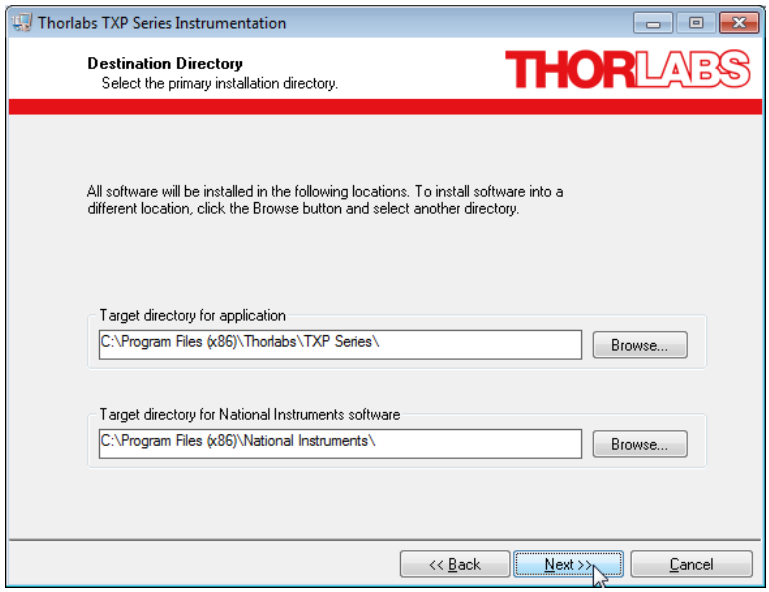
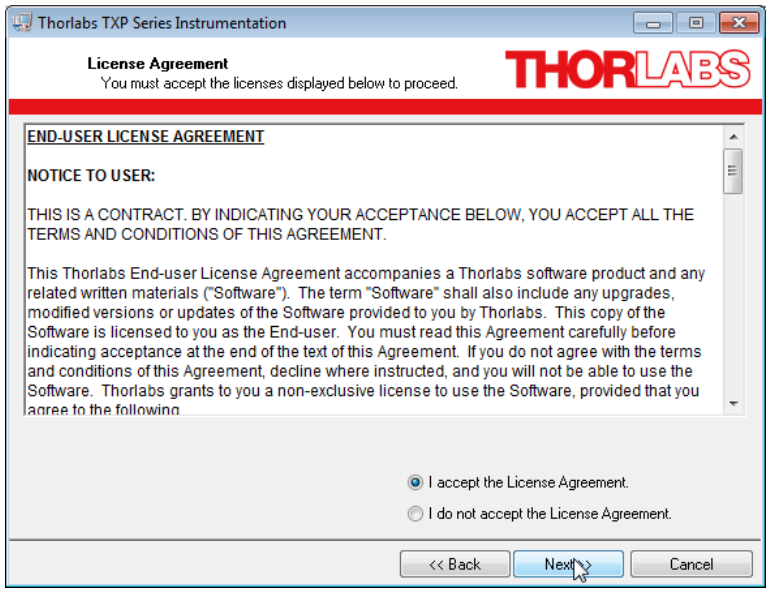
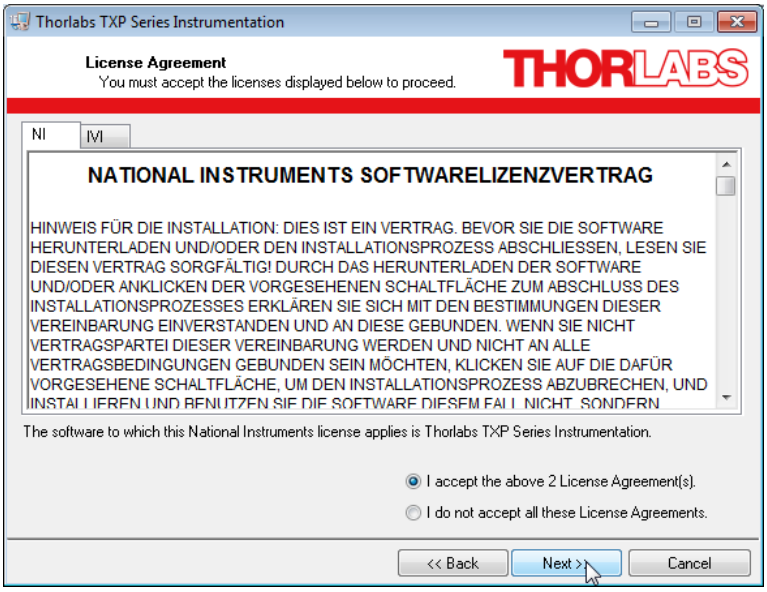
A user account control warning comes up:

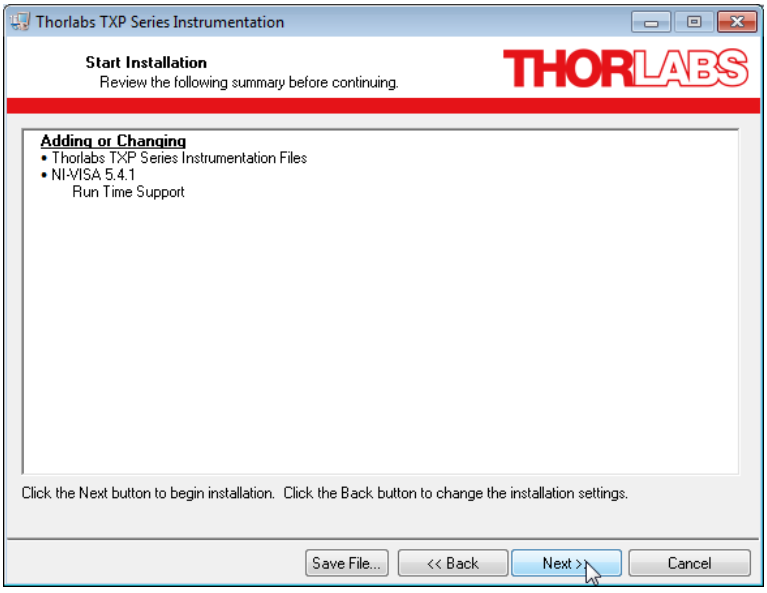


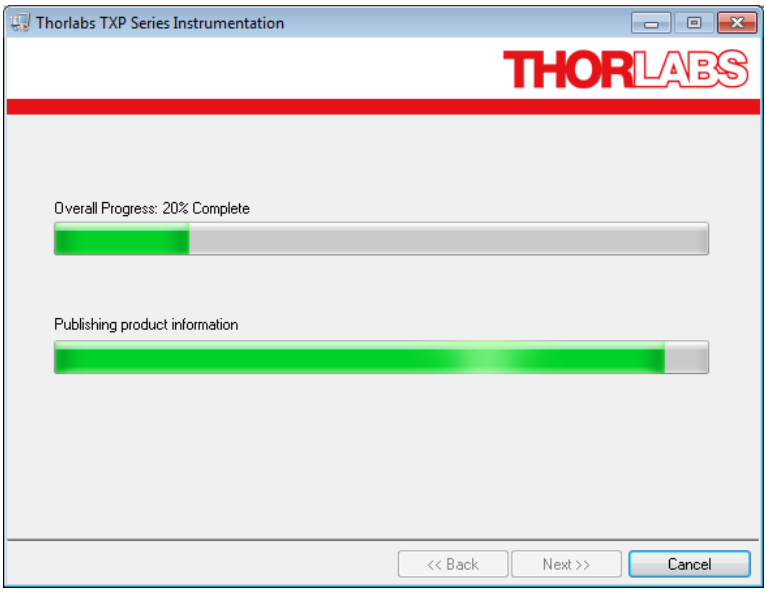
Allow the installation. Then follow the the screenshots below:











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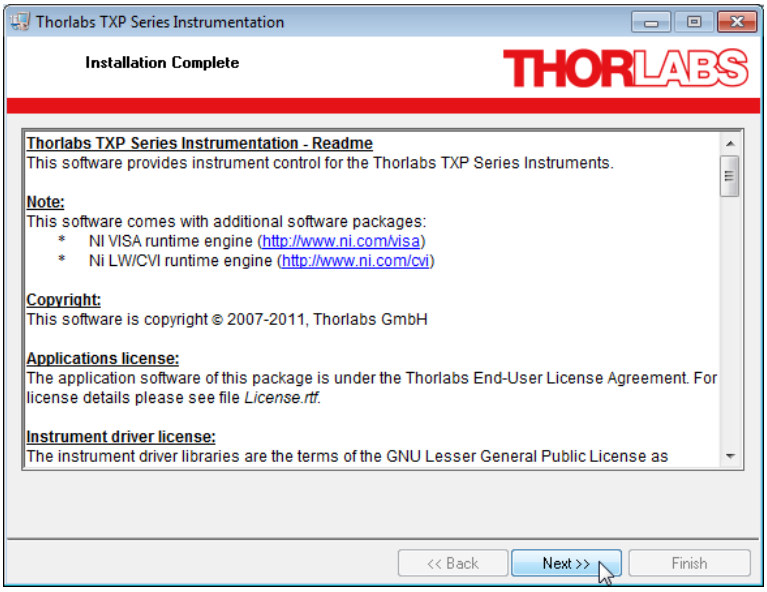
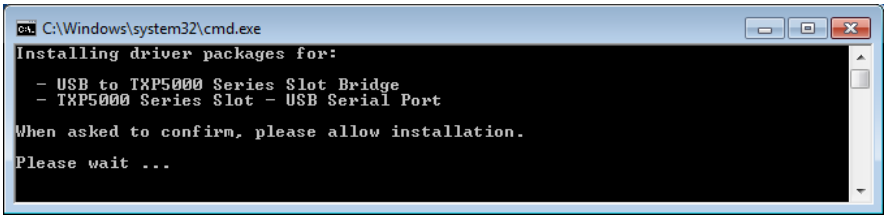
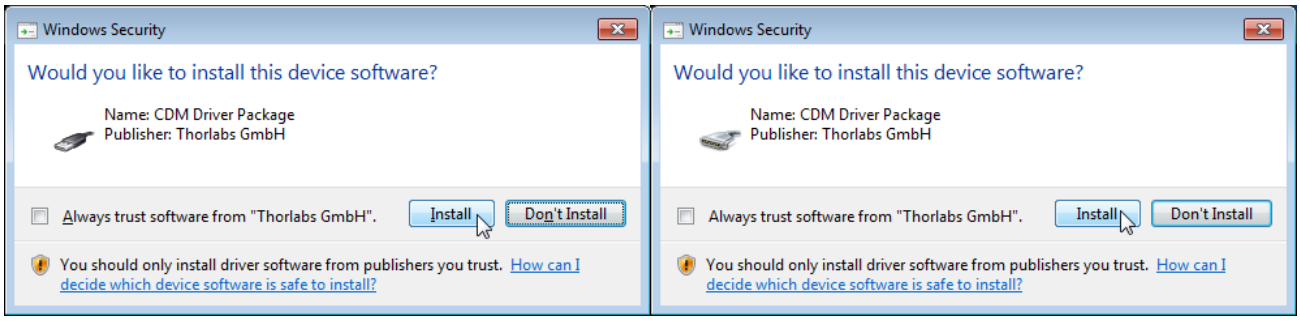
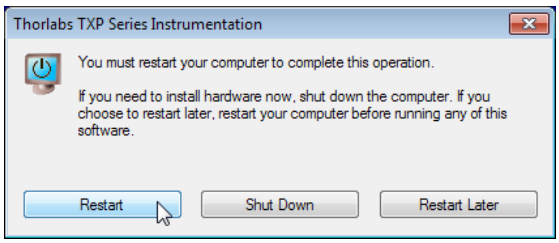




This Windows Security message appears twice.



You may be requested to restart your computer upon finishing software installation.

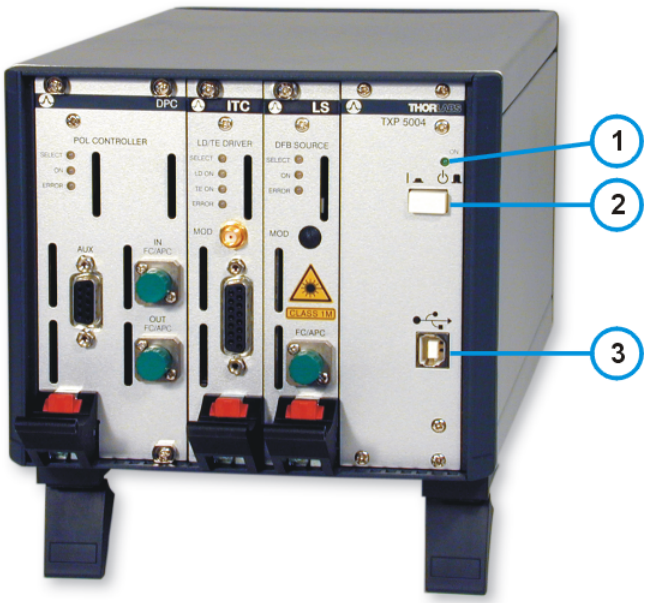


Note

If you are requested to restart your computer, please do so. Otherwise, the TXP software won't operate properly.

3 Operating Elements TXP5004

Front panel



1 LED "ON"
2 Mains switch
3 USB-B connector

Rear panel

4 Ground connector
5 Cooling fan
6 AC power connector with line fuse

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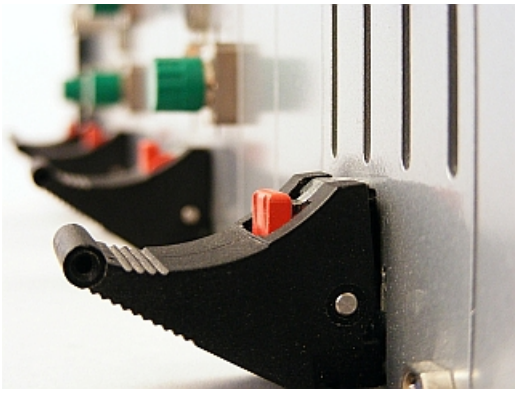
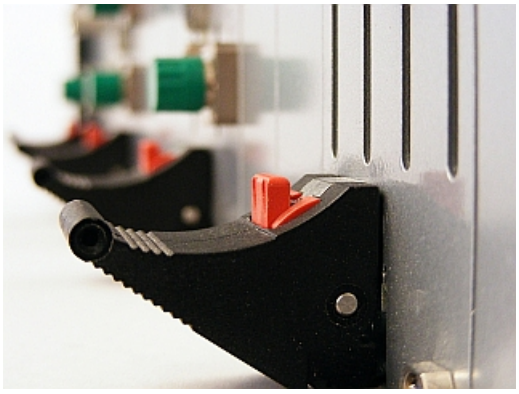
4 First Steps

- Insert your TXP module(s) into the TXP5004. Please make sure, that the ejector handle is pushed up against the stop - a click can be heard and the red locking lever is in full upper position:



In this position the TXP module is disabled!



Correct position

- Connect the power cord to your TXP5004 and switch it on. The green LED "Power ON" must light up.

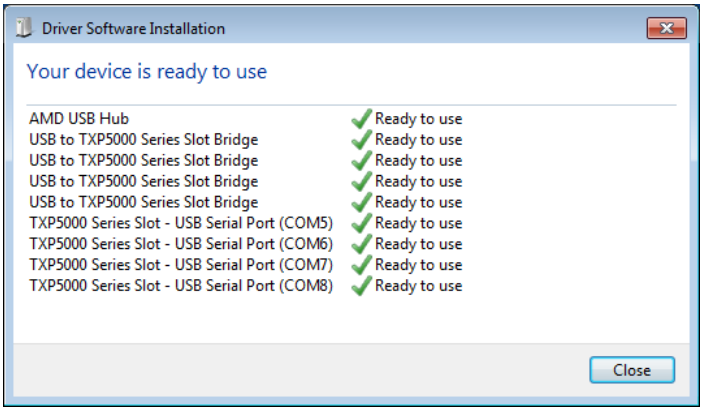
4.1 USB driver installation

Connect the TXP5004 to your computer using the USB cable provided with the unit.

The operating system recognizes the connected polarimeter and starts the driver installation.

By default, the operating system is starting to search "Windows Update", which may take a while. In order to skip the Windows Update search, click to the Driver Installation info dialog on the desktop. The Driver Installation dialog box appears; click to "Skip obtaining driver software from Windows Update".

The drivers for "USB to TXP5000 Series Slot Bridges" and "TXP5000 Series Slot - USB Serial Ports" will be installed automatically:



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4.2 TXP Server configuration

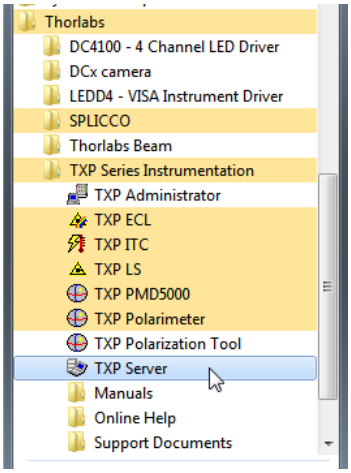
Attention

For a proper operation of the TXP Server, the Windows Firewall should be switched off. Depending on the security settings of the control PC, this might be impossible even if you have administrator privileges. In this case please be aware of the following Windows Security Alert:

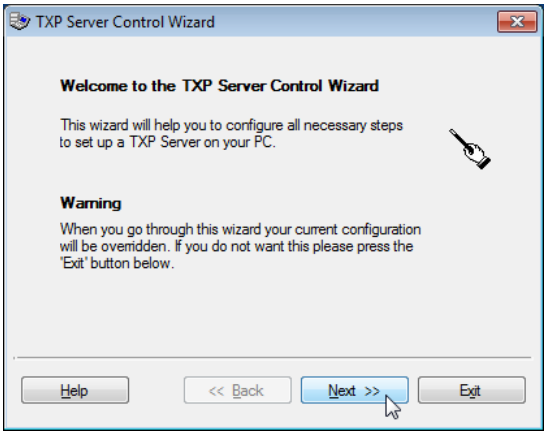
The firewall by default blocks the **txprmd.exe**, which is the executable of the TXP Server. Please allow the **txprmd.exe** access, otherwise the TXP Server cannot be started.

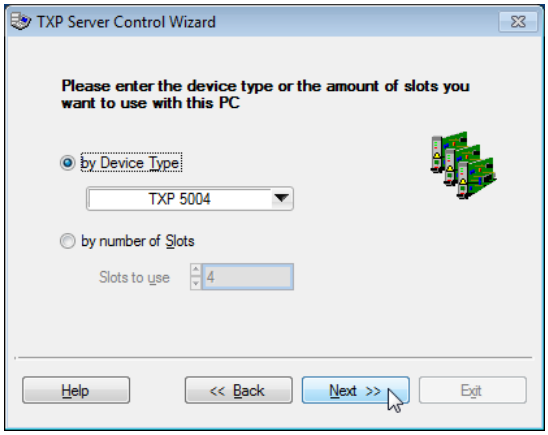
As a next step, the TXP Server must be configured. Therefore, start TXP Server from the desktop icon (

) or from the Windows Start button:



At first use of the TXP Server, a configuration wizard is started. It is strongly recommended not to change the settings in the next appearing dialog boxes - just click "Next" to continue:





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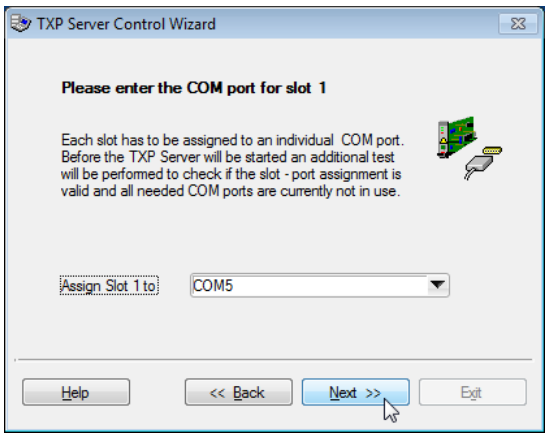
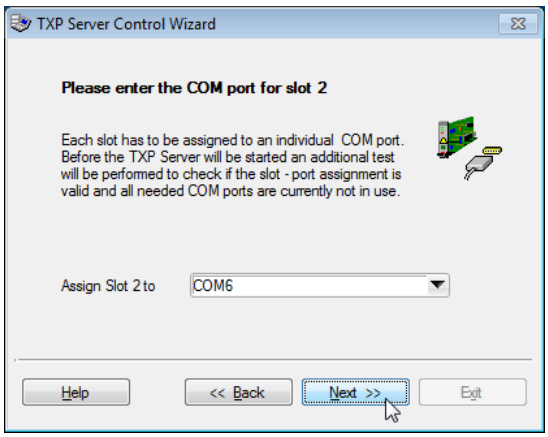
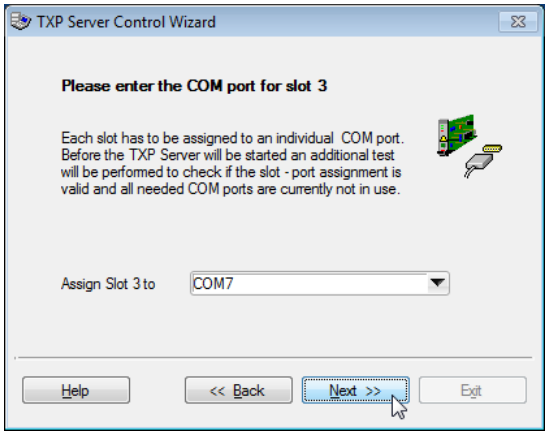
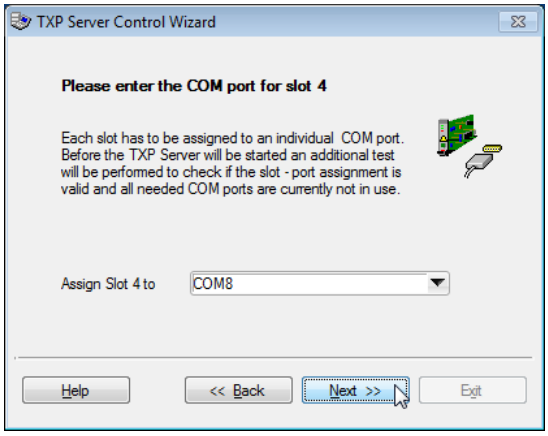
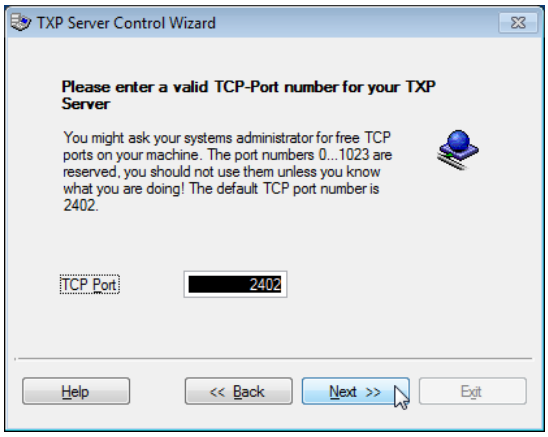
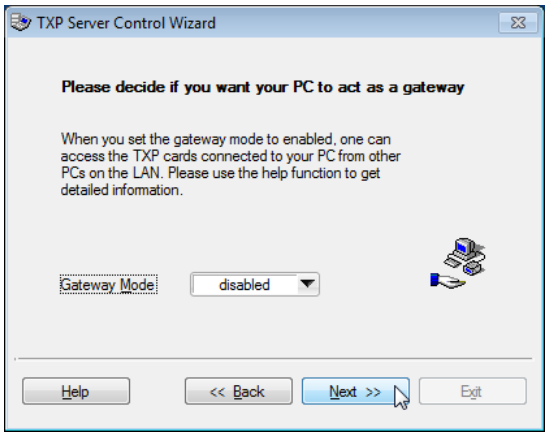




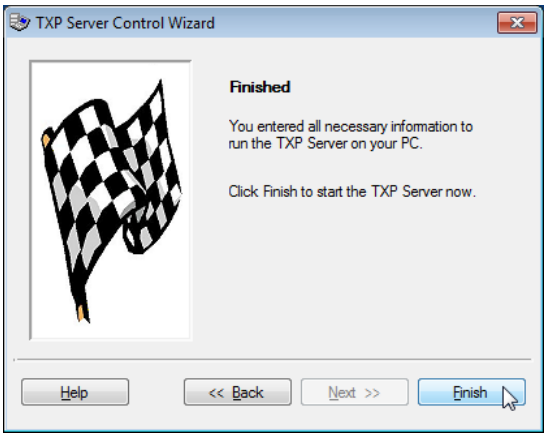




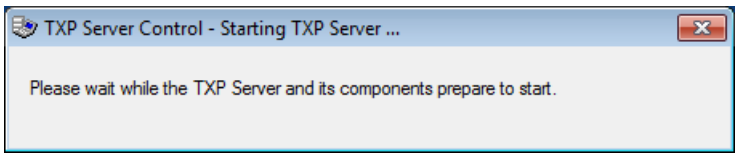




Note For the **Gateway Mode** please see next section.



Click "Finish" to start the TXP Server software.



In the task bar, the TXP Server icon appears, the TXP Server is running.

The TXP5004 is ready for operation now.

Note

Above procedure needs to be executed only once. Further connections of the TXP5004 to the PC will recall these setting, except other applications were installed, requiring COM ports or a different TXP5004 was used.

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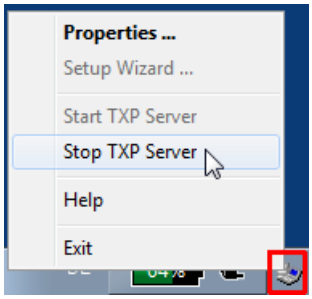
4.3 Gateway Mode

The PC that controls the TXP5004 via USB, can serve as a gateway to a local area network. This way, any other PC logged on to the same LAN can take over the control.

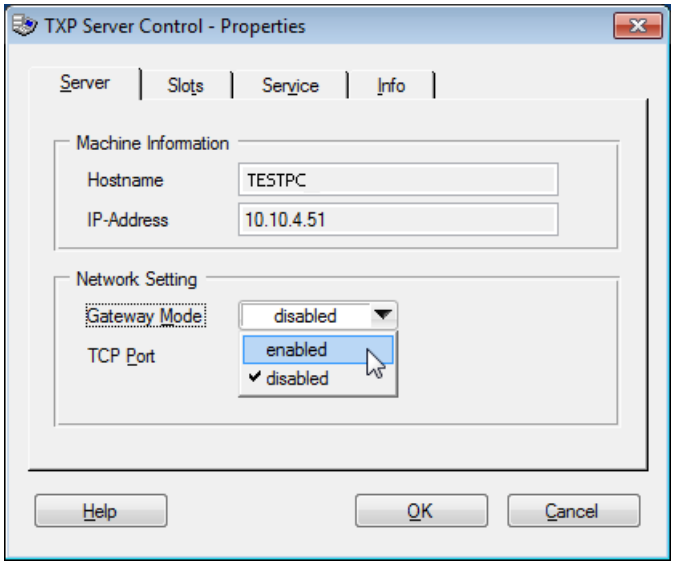
Therefore,

- the PC that controls the TXP5004 via USB, must be logged on the the LAN;
- the 2nd PC must be registered in the same network domain as the USB control PC (For details on network registering and logging in, please contact your administrator)
- the TXP software package is installed to the remote PC as well.

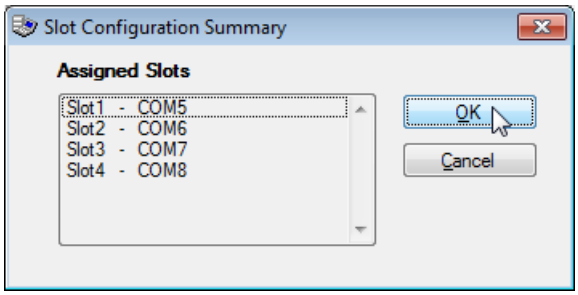
The gateway mode can be enabled only if the the TXP Server is stopped. The icon indicates this condition. Right click to this icon and select "Properties":



The TXP Server Control panel opens



Select "enabled" and remember the host name and/or IP address. Then click "OK". A summary of the assigned COM ports appears, click OK to continue:

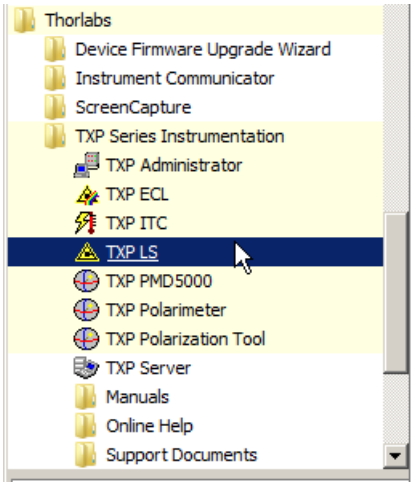


Start the TXP Server and wait, until it's icon in the task bar changes from to . The gateway is now enabled and active. From the remote PC now a TXP module GUI can be started.

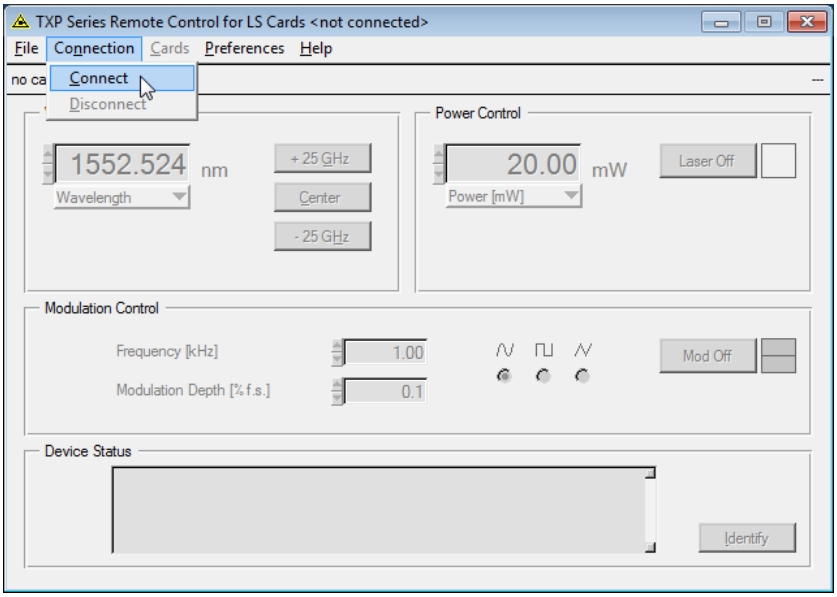
Example:

A TXP LS5 laser source is connected via USB to the control PC; the TXP server is running in gateway mode, as shown in the instruction above.

Select from Windows button -> Programs the TXP Polarimeter Software:



The TXP LS GUI starts up; click to "Connect" button:



and enter the host name (or the IP address) of the USB control PC into the appropriate box and click **OK**:

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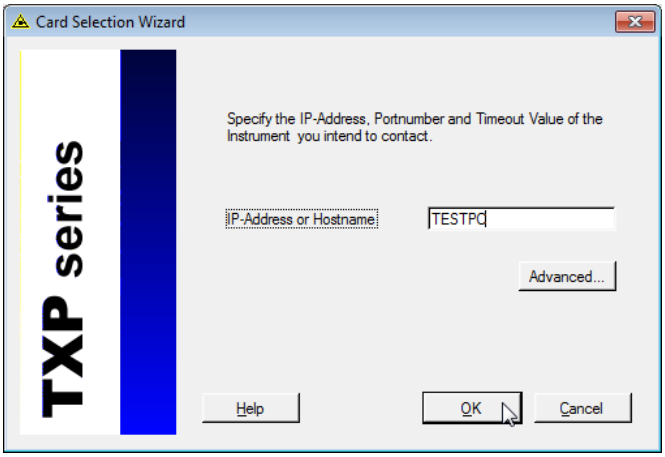
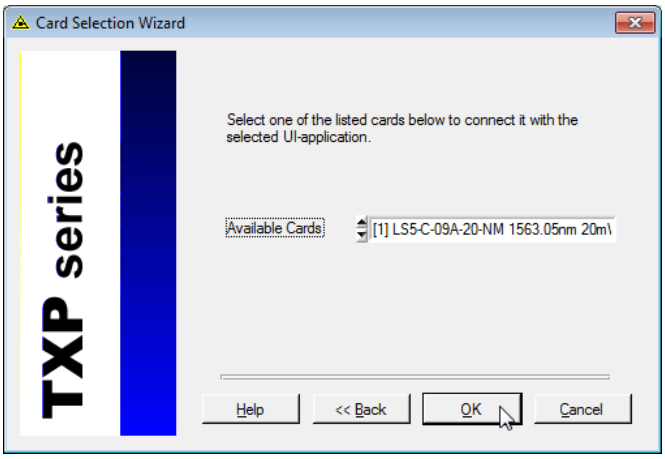
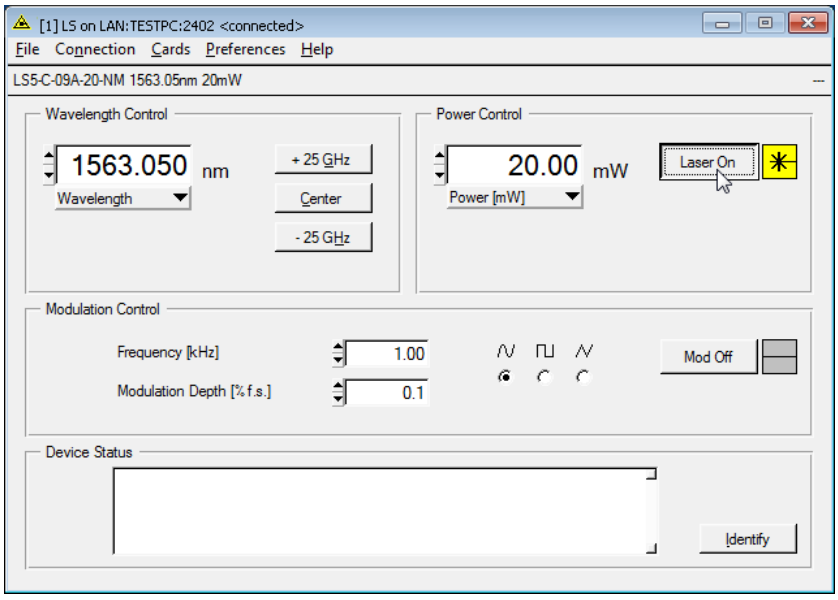


Then select the desired LS5 module and click **OK**:



The TXP LS GUI connects to the module and is ready for use:



5 Operating Instruction

5.1 Installing and Removing Modules

The TXP5004 and TXP modules are 'Hot-Swappable'. This means that the modules can be detached, exchanged or installed during normal operation of the TXP5004.

- Loosen the two to four mounting screws on top and below the ejector handle
- Push the red button of the ejector handle and flip down the black ejector handle. This pulls out the module from its internal plug.

You can now remove the module. If you do not insert another module, please close the empty slot with a blind module to maintain a proper cooling air flow inside the unit. Tighten the two to four screws.

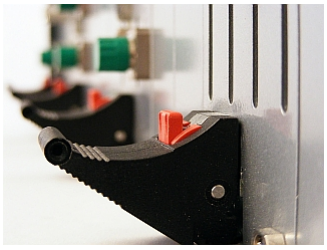
Detaching the module leads to an automatic disconnect, if the module was connected and operated by the control PC.

Note

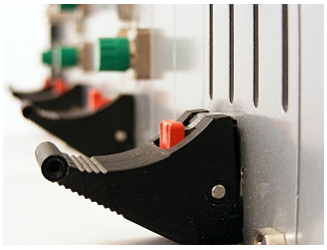
In order to maintain a proper air flow for internal cooling, unused TXP slots must be covered by blind modules!

Make sure, that

- the TXP5004 with inserted electronics module is switched on and connected to the PC via a USB2.0 cable.
- the TXP Server is started and running (see icon in the task bar).
- the ejector handle of the inserted module is in the very upright position:



Yes!



No!

Now, the modules can be operated. Please see the individual TXP module manuals for operation details.

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6 Maintenance and Service

Protect the TXP5004 from adverse weather conditions. The TXP5004 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 GmbH for return instructions.

Do not remove covers!

Protect the TXP5004 from adverse weather conditions. The TXP5004 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!

Cleaning

The unit can be cleaned with a cloth dampened with water. You can use a mild 75% Isopropyl Alcohol solution for more efficient cleaning.

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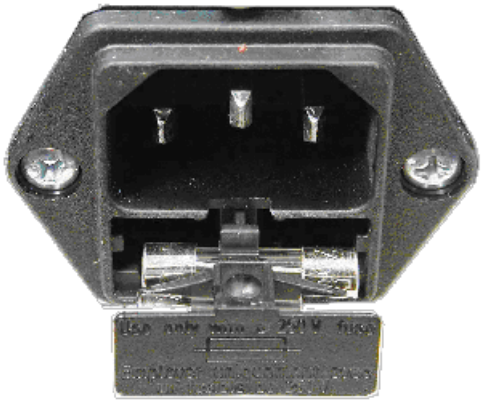
6.1 Replacing the Line Fuse

If the line fuse has blown due to line disturbance or other influences from the outside, it can be replaced easily without opening the unit.

Attention

To avoid fire hazard only the appropriate fuses must be used!

- Switch off the TXP5004 and remove the power cable from the mains jack. Look at the back of the unit.
- Open the cover of the fuse holder at the rear using a small screwdriver.



- Replace the defective fuse. An IEC 60127-2/V, 5 x 20 mm fuse with slow response and high breaking capacity is used. The fuse holder contains one spare fuse.

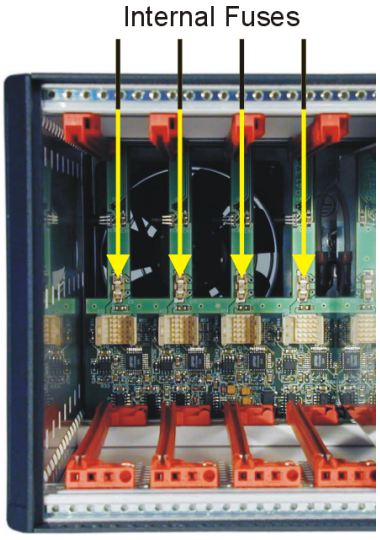
Attention

Fuse Type: T2H250V (2 A, 250 V; 5x20 mm), IEC60127-2/V

- Push back the fuse holder until it is locked in position again.
- Switch on the TXP5004. If the unit cannot be switched on even with the correct fuse inserted, please contact Thorlabs.

6.2 Replacing the Internal Fuses

Each module slot is protected by an individual internal fuse. These fuses are located on the backplane and can be accessed after removing all modules and blind plates from the slots:



The TXP5004 must be switched off. The fuse can be replaced using tweezers or a small gripper.

Note

Only **Littlefuse NANO2™ Slo-Blo™ R452 001** (1 A, slow response) must be used!

After fuse replacement, reinstall all modules, switch on the TXP5004 and check the correct function. If the fuse opens again there may be a fault on the corresponding module. Please contact Thorlabs.

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6.3 Troubleshooting

- **The TXP5004 does not work at all; the LED ON does not light up**
  - ➢ Check for proper power supply connection
  - ➢ Check if the line fuse is blown. See Replacing the Line Fuse.
  - ➢ Check if the mains switch is turned on
- **The TXP5004 works, but not the TXP module**
  - ➢ Is the module inserted correctly and has the ejector handle snapped into its position? Insert the module in the desired slot, flip the black ejector handle upwards until the red locking button clicks out and tighten all mounting screws properly.
  - ➢ The internal fuse of the corresponding slot might have blown. Exchange the corresponding fuse (see Replacing the Internal Fuses)
  - ➢ See the individual manual of the module for further troubleshooting.
- **The TXP5004 does not respond to the connected computer**
  - ➢ Check the TXP5004 connection to the PC (standard USB A-B cable) Check the used cable, try another USB port.
  - ➢ Is the software installed properly? See section Installing Software.
  - ➢ Is the USB port activated and set to USB-2 standard? Check the system settings of this USB port in the Device Manager.
  - ➢ Is the TXP Server started? Check for the "TXP Server Control' icon in the task bar:
    - o If there is no icon or , start the TXP Server from the desktop icon or from the Start menu.
    - o If there is the icon , right click to this icon and select "Start TXP Server"
  - ➢ The TXP Server cannot be started. Check if the Windows Firewall is active. See TXP Server configuration.
- **The TXP Server starts and reports "There is no COM port available"**
  - ➢ Did you connect your TXP5004 to a different USB port than before or are you using a different TXP5004? The COM ports are assigned to slots with a specific name on a specific USB port. If you change either the USB port or the TXP, the system needs to assign new COM ports to the found new hardware.
    - o Run the TXP Server Control Wizard anew.
    - o If this does not resolve the problem, try to disconnect existing COM ports from earlier assigned USB ports/TXP modules: Right-click on the server control symbol in the system tray and select 'Properties'. The TAB 'Slots' shows you the available COM ports and TXP slots. Mark the slots which are not needed at the moment and click 'Remove'. The COM assignment to this slot is released. With 'Add' you can now assign the available COM ports to your new slots.
  - ➢ You might have connected the TXP5004 via USB to the control PC prior to install software. In this case, the operating system assigned no driver or a wrong driver. This requires to uninstall current drivers and to re-install them. Follow the procedure as below:
    - o Do not disconnect your TXP5004.

- Open the Device Manager from Control panel, go to the entry **Ports (COM & LPT)** and expand it.
- Right-click to the entries that are related to TXP and/or marked with a **?**. Select the **Uninstall** option and check the box "Delete the driver software for this device". Repeat this for all 4 ports.
- Disconnect the TXP5004 from the USB port, reconnect it and make sure that the drivers are being installed now properly.

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7 Appendix

7.1 Technical Data

Specification	
Remote Control Port	USB 2.0
Chassis	1/3 19”, 3 U
Number of Module Slots	4
Max. Power Consumption per Slot	25 W
Max. Total Power Consumption (all 4 slots)	100 W
Power Supply	
Mains Voltage	100 V to 240 V ± 10%
Mains Frequency	50 to 60 Hz ± 5%
Mains Switch	Push-Button, On / Off
Maximum Power Consumption	150 VA
General	
Operating Temperature Range [1])	0 °C to +40 °C
Storage Temperature Range	-40 °C to +70 °C
Dimensions (W x H x D)	168 x 148 x 315 mm
Relative Humidity	Max. 90% up to 31°C, decreasing to 50% at 40 °C
Pollution Degree (indoor use only)	2
Operation Altitude	< 2000 m
Warm-up Time (typ.)	10 min
Weight (empty)	3 kg

[1]) non-condensing

All technical data are valid at 23 ± 5°C and 45 ± 15% rel. humidity (non condensing)

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7.2 Certifications and Compliances

Category	Standards or description	
EC Declaration of Conformity - EMC	Meets intent of Directive 2004/108/EC [1] for Electromagnetic Compatibility. Compliance was demonstrated to the following specifications as listed in the Official Journal of the European Communities:	
	EN 61326-1:2006	EMC requirements for Class A electrical equipment for measurement, control and laboratory use, including Class A Radiated and Conducted Emissions [2,3,4] and Immunity [2,3,5].
	IEC 61000-4-2	Electrostatic Discharge Immunity (Performance Criterion C)
	IEC 61000-4-3	Radiated RF Electromagnetic Field Immunity (Performance Criterion A)
	IEC 61000-4-4	Electrical Fast Transient / Burst Immunity (Performance Criterion C)
	IEC 61000-4-5	Power Line Surge Immunity (Performance Criterion C)
	IEC 61000-4-6	Conducted RF Immunity (Performance Criterion A)
	IEC 61000-4-11	Voltage Dips and Interruptions Immunity (Performance Criterion C)
	EN 61000-3-2	AC Power Line Harmonic Emissions
	EN 61000-3-3	Voltage Fluctuations and Flicker
Australia / New Zeeland Declaration of Conformity - EMC	Complies with the Radiocommunications Act and demonstrated per EMC Emission Standard [2,3,4]	
	AS/NZS 2064	Industrial, Scientific and Medical Equipment: 1992
FCC EMC Compliance	Emissions comply with the Class A Limits of FCC Code of Federal Regulations 47, Part 15, Subpart B [2,3,4].	
EC Declaration of Conformity - Low Voltage	Compliance was demonstrated to the following specification as listed in the Official Journal of the European Communities: Low Voltage Directive 2006/95/EC [6]	
	EN 61010-1/A2:1995	Safety Requirements for Electrical Equipment for Measurement, Control and Laboratory Use
U.S. Nationally Recognized Testing Laboratory Listing	UL3111-1 ANSI/ISA S82.01:1994	Standard for Electrical Measuring and Test Equipment Safety Standard for Electrical and Electronic Test, Measuring, Controlling and Related Equipment
Canadian Certification	CAN/CSA C22.2 No. 61010-1 3nd ed.	Safety Requirements for Electrical Equipment for Measurement, Control and Laboratory Use
Additional Compliance	IEC 61010-1:2010	Safety Requirements for Electrical Equipment for Measurement, Control and Laboratory Use
Equipment Type	Test and Measuring	
Safety Class	Class I equipment according to IEC 61010-1, Annex H, grounded product	

[1] Replaces 89/336/EEC.

[2] Compliance demonstrated using high-quality shielded interface cables shorter than or equal to 3 meters.

[3] Compliance demonstrated with various TX Series light source and electrical modules installed

[4] Emissions, which exceed the levels required by these standards, may occur when this equipment is connected to a test object.

[5] Minimum Immunity Test Requirement

[6] Replaces Low Voltage Directive 73/23/EEC, amended by93/68/EEC

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7.3 Warranty

Thorlabs GmbH warrants material and production of the TXP5004 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.

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7.4 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.

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7.5 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

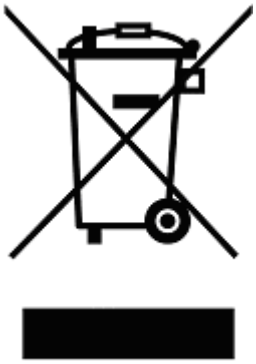
If you do not return an “end of life” unit to Thorlabs GmbH, you must hand it to a company specialized in waste recovery. Do not dispose of the unit in a litter bin or at a public waste disposal site.

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

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