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THORLABS

PAX5710IR2-T - June 2, 2017

Item # PAX5710IR2-T was discontinued on June 2, 2017. For informational purposes, this is a copy of the website content at that time and is valid only for the stated product.

POLARIMETER SYSTEMS, HIGH DYNAMIC RANGE, FREE-SPACE AND FIBER-COUPLED

- **High Dynamic Range of 70 dB**
- **Rotating Wave Plate Technology**
- **Four Wavelength Ranges**
- **Laptop PC Included**

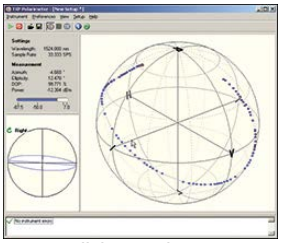
PAX5710IR1-T
Post, Post Holder, and Base Not Included

Hide Overview

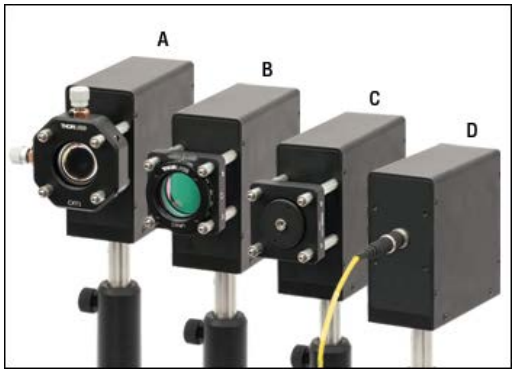
OVERVIEW

Features

- Two Types of Polarimeter Systems Available
  - Fiber-Coupled Polarimeter
    - Internal Sensor Head
    - Fiber-Based Measurement at a Fixed Wavelength Range
  - Free-Space Polarimeter
    - Interchangeable External Sensor Head
    - Free-Space and Fiber-Based Measurements Possible
    - Easy Integration into Optical Setups
    - Directly Accepts Ø11 mm Fiber Collimator (Included)
- Four Wavelength Ranges
  - 400 - 700 nm
  - 700 - 1000 nm
  - 1000 - 1350 nm
  - 1300 - 1700 nm



Click to Enlarge
PAX Polarimeter GUI



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The PAN5710 External Sensor Head in Four Configurations: A) CXY1 XY Translating Lens Mount secured with four ER1.5 Cage Assembly Rods, B) CRM1 Cage Rotation Mount with four ER1.5 rods, C) CP02 Cage Plate with the S1TM06 SM1-Threaded Lens Cell Adapter with four ER1.5 rods, and D) SM fiber with the included fiber collimator.

- External Exchangeable Measurement Heads
- High Dynamic Range of 70 dB
- Rotating Wave Plate Based
- Sampling Rate up to 333 Samples/s
- Excellent Accuracy
- Preconfigured Laptop PC and Fiber Collimator Included

Applications

- Free Space and In-Fiber Polarimetry
- Degree of Polarization (DOP) Measurements
- Extinction Ratio (ER) Measurements
- Component for a PDL / PMD Measurement System

Thorlabs' Fiber-Coupled and Free-Space Polarimeters are terminating, wave-plate-based modules for free-space and fiber-based measurements of the state of polarization (SOP). Their high dynamic range of 70 dB, broad wavelength range, and accuracy of ±0.2° on the Poincaré sphere opens a wide spectrum of application possibilities. These polarimeters are available with internal or external sensor heads and are fully compatible with Thorlabs' TXP5000 platform. Each PAX module ships with a preconfigured notebook for out-of-the-box plug & play operation.

All four Stokes values, which fully characterize a SOP, are provided either as analog output voltages or as digital values to the PC. An external trigger function allows synchronization of the PAX5700 Polarimeter with other devices. The PAX5710 offers an external sensor head, which can be used for free-space beams as well as for fiber-coupled measurements. A removable collimation package for a fiber connector input comes with each sensor head. The PAX5720 has an integrated non-removable collimation package for fiber-coupled measurements only.

Based on the Thorlabs TXP5000 Modular Test & Measurement System, the PAX Polarimeters offer additional features like USB and Ethernet ports, 'plug and play' combination with other modules, easy-to-use graphical user interfaces, and flexible configurations via LabVIEW™ and LabWindows/CVI™, which allows the user to write his or her own application.

Each measurement sensor is calibrated at different wavelength points. These base points are interpolated.

Please Note:
The included, preconfigured laptop is intended for sole use with the installed software to enable plug and play out-of-the-box operation. The PC is not specified and the model may change without notice. Thorlabs cannot provide any support for the PC except regarding the operation of this device. If you would prefer a PAX or PAN system without the PC, please contact Tech Support.

Hide Specs

SPECS

Fiber-Coupled Polarimeter Specifications

Item #	PAX5720VIS-T	PAX5720IR1-T	PAX5720IR2-T	PAX5720R3-T
Wavelength Range	400 - 700 nm	700 - 1000 nm	1000 - 1350 nm	1300 - 1700 nm
Maximum Measurement Rate	333 S/s			
SOP Accuracy	±0.25° on Poincaré Sphere			
SOP Resolution	0.01° on Poincaré Sphere			
DOP Accuracy	±0.5%			
DOP Resolution	0.0001			
Dynamic Range	-60 to 10 dBm			
Width	2 TXP Slots			
Optical Input Connector	FC/PC			
Warm Up Time for Rated Accuracy	<15 min			
Analog Interface (via Front Panel D-Sub)	5 Analog Outputs: s1, s2, s3, DOP, Power 1 Analog Input: Trigger			
Digital Interface	s1, s2, s3, Power (Watt/dBm), DOP, Azimuth, Ellipticity			
Analog Monitor Output	-2.5 to 2.5 V			

Operating Temperature Range	5 to 40 °C
Storage Temperature Range	-40 to 70 °C

Free-Space Polarimeter Specifications

Item #	PAX5710VIS-T	PAX5710IR1-T	PAX5710IR2-T	PAX5710R3-T
Wavelength Range	400 - 700 nm	700 - 1000 nm	1000 - 1350 nm	1300 - 1700 nm
Maximum Measurement Rate	333 S/s			
SOP Accuracy	±0.25° on Poincaré Sphere			
SOP Resolution	0.01° on Poincaré Sphere			
DOP Accuracy	±0.5%			
DOP Resolution	0.0001			
Dynamic Range	-60 to 10 dBm			
Free Space Aperture	Ø3 mm			
Free Space Input	Accepts Ø11 mm Collimator (Included)[a]			
Maximum Input Beam Divergence	2°			
Width	1 TXP Slot			
Warm Up Time for Rated Accuracy	<15 min			
Analog Interface (via Front Panel D-Sub)	5 Analog Outputs: s1, s2, s3, DOP, Power 1 Analog Input: Trigger			
Digital Interface	s1, s2, s3, Power (Watt/dBm), DOP, Azimuth, Ellipticity			
Analog Monitor Output	-2.5 to 2.5 V			
Operating Temperature Range	5 to 40 °C			
Storage Temperature Range	-40 to 70 °C			

a. PAX5710VIS-T includes an F230FC-A collimator, PAX5710IR1-T includes an F230FC-B collimator, and both PAX5710IR2-T and PAX5710R3-T include an F230FC-C collimator.

Note: All data are valid at 23 ±5°C and 45 ± 15% relative humidity.

Hide Comparison

COMPARISON

The table below compares key features of our PAX5700 series polarimeters, which are based on rotating wave plates, to our IPM5300 polarimeter, which uses a fiber Bragg grating. For more information on the IPM5300, please see the full web presentation.

Item #	PAX5700 Series	IPM5300
Wavelength Ranges	400 - 700 nm 700 - 1000 nm 1000 - 1350 nm 1300 - 1700 nm	1510 - 1640 nm
Power Range	1 nW to 10 mW (-60 dBm to 10 dBm), Depending on Operating Wavelength	1 µW to 32 mW (-30 to 15 dBm)
Dynamic Range	70 dBm	45 dBm
Accuracy DOP	±0.5% Over Wavelength Range	±0.25% @ Power = 0 ± 3 dBm Average Time >1 ms
Accuracy SOP	±0.25°	
Measurement Rate	Up to 333 Samples per Second	Up to 1 Megasample per Second
Optical Input	PAX5720: FC/PC Connector PAX5710: External Sensor with Ø3 mm Aperture	FC/APC Connector
Optical Output	None	FC/APC Connector
Analog Interfaces	s1, s2, s3, Power, DOP, Trigger	

Digital Interfaces	CVI/LabVIEW™	CVI/LabVIEW™
Applications	Polarimetry Extinction Ratio Measurements on PMF Expandable to PDL and PMD Measurements	Polarimetry Expandable to PDL and PMD Measurements
Module Type	Terminating Polarimeter with Fiber-Coupled or Free-Space Optical Input	In-Line Fiber-Based Polarimeter
Data Interface	USB/Ethernet	

Hide Software

SOFTWARE

Software Modules for the PAX Polarimeters

TXP Software

Version 3.1.5

Download this software if you use our other polarimeters or TXP series systems in addition to the PAX polarimeters.
Standard full TXP software packages: Applications, Drivers, and Firmware.

Software

OR

PAX Only Software

Version 3.0.22

Download this software if you only use the PAX polarimeters.
Standard PAX software packages: Applications and Drivers

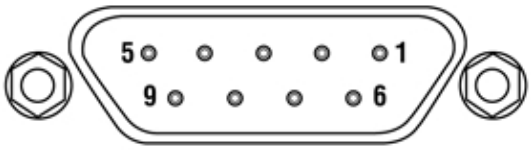
Software

Hide Pin Diagram

PIN DIAGRAM

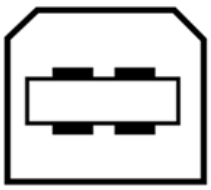
Analog Output and Trigger Input

D-Type Female



Computer Connection

USB Type B



USB Type B to Type A Cable Included

Pin	Name	I/O	Value	Function
1	Trigger	I	3.3/5 V	External Trigger-signal (0V=L, 3.3 ... 5 V=H) (for array mode)
2	AGND			Analog Ground
3	Power	O	-2.5 ... +2.5 V	Optical Power log. (-70 dBm ... +30 dBm)
4	S_3	O	-2.5 ... +2.5 V	Normalized Stokes Vector S_3 (-1 ... +1)
5	S_1	O	-2.5 ... +2.5 V	Normalized Stokes Vector S_1 (-1 ... +1)
6	DGND		-2.5 ... +2.5 V	Digital ground for Trigger
7	Analog In	I	-2.5 ... +2.5 V	Analog Control signal (not used here)
8	DOP	O	-2.5 ... +2.5 V	Degree of Polarization (0 ... 110%)

9	S_2	O	-2.5 ... +2.5 V	Normalized Stokes Vector S_2 (-1 ... +1)

Hide Shipping List

SHIPPING LIST

FIber-Coupled Polarimeter (PAX5720-T)

1. FC/PC Collimation Package to connect a fiber, Nonremovable
2. TXP 4 Slot Chassis with USB Control (TXP5004)
3. Preconfigured Laptop with Software & GUI Installed
4. USB Connection Cable
5. Software CD ROM
6. LabVIEW™ and LabWINDOWS™ /CVI Driver Set
7. Operating Manual

Free-Space Polarimeter (PAX5710-T)

1. External Sensor Head with 2 m Connection Cable
2. FC/PC Collimation Package to connect a fiber, Removable
3. TXP 4 Slot Chassis with USB Control (TXP5004)
4. Preconfigured Laptop with Software & GUI Installed
5. USB Connection Cable
6. Software CD ROM
7. LabVIEW™ and LabWINDOWS™ /CVI Driver Set
8. Operating Manual

Hide Fiber-Coupled Polarimeters

Fiber-Coupled Polarimeters

- Four Wavelength Ranges Available
- Internal Sensor Head
- Complete Bench Top Device Including Preconfigured Laptop PC

Thorlabs' Fiber-Coupled Polarimeters are designed for use solely with fiber optics. The mainframe has a permanent FC/PC fiber collimation package where a light source can be coupled in, typically using a single mode fiber optic patch cable. The four systems we offer are each designed for one of four wavelength ranges: 400 - 700 nm, 700 - 1000 nm, 1000 - 1350 nm, or 1300 - 1700 nm.

Part Number	Description	Price	Availability
PAX5720VIS-T	TXP Polarimeter Including PC with Internal Sensor, 400-700 nm	$8,420.00	Lead Time
PAX5720IR1-T	TXP Polarimeter Including PC with Internal Sensor, 700 - 1000 nm	$8,420.00	Lead Time
PAX5720IR2-T	TXP Polarimeter Including PC with Internal Sensor, 1000 - 1350 nm	$8,420.00	Lead Time
PAX5720IR3-T	TXP Polarimeter Including PC with Internal Sensor, 1300 - 1700 nm	$8,420.00	Today

Hide Free-Space Polarimeters

Free-Space Polarimeters

- Four Wavelength Ranges Available
- External Sensor Head
- Complete Benchtop Device Including Preconfigured Laptop PC

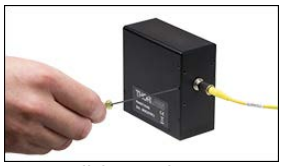
Thorlabs' Free-Space Polarimeters consist of three main parts: the mainframe, the readout card, and the measurement head. Each measurement head needs to be connected to a readout card. The readout card can be used for all four wavelength ranges, so only the sensor head needs to be changed. If a different wavelength range is desired, simply purchase the corresponding external sensor head (sold below) and connect it to the current readout card. If two or more external sensor heads are to be used simultaneously, an equal number of readout cards is required. The mainframe can hold up to four readout cards.

Part Number	Description	Price	Availability
PAX5710VIS-T	TXP Polarimeter Including PC with External Sensor, 400 - 700 nm	$8,270.00	Today
PAX5710IR1-T	TXP Polarimeter Including PC with External Sensor, 700 - 1000 nm	$8,270.00	Today
PAX5710IR2-T	TXP Polarimeter Including PC with External Sensor, 1000 - 1350 nm	$8,270.00	Lead Time
PAX5710IR3-T	TXP Polarimeter Including PC with External Sensor, 1300 - 1700 nm	$8,270.00	Lead Time

Hide External Sensor Heads

External Sensor Heads

- Free-Space Measurement Head
- Interchangeable
- Four Wavelength Ranges Available
- Ø11 mm Fiber Collimator Included



Click to Enlarge
Use a 0.05 hex to tighten the setscrew that holds the included fiber collimator in place (fiber patch cable not included).

These External Measurement Heads for the Free-Space Polarimeters above can be exchanged to switch to a different wavelength range without the need to purchase a completely new system. These external heads allow free-space and fiber-based measurements with easy integration in optical setups. Each external head includes an Ø11 mm fiber collimator. The collimator is held in place with a setscrew located on the side of the external head, which can be tightened with a 0.05 hex (see photo to the right).

Part Number	Description	Price	Availability
PAN5710VIS	PAX External Sensor Head, 400 - 700 nm	$3,661.00	Lead Time
PAN5710IR1	PAX External Sensor Head, 700 - 1000 nm	$3,661.00	Lead Time
PAN5710IR2	PAX External Sensor Head, 1000 - 1350 nm	$3,661.00	Lead Time
PAN5710IR3	PAX External Sensor Head, 1300 - 1700 nm	$3,661.00	Lead Time

Hide Catalog to Special

Catalog to Special

Part Number	Description	Price	Availability
PAX5710IR1	TXP Polarimeter Module with External Sensor, 700 - 1000 nm	$6,750.00	Lead Time
PAX5710IR2	TXP Polarimeter Module with External Sensor, 1000 - 1350 nm	$6,750.00	Lead Time
PAX5710IR3	TXP Polarimeter Module with External Sensor, 1350 - 1700 nm	$6,750.00	Lead Time
PAX5710VIS	TXP Polarimeter Module with External Sensor, 400 - 700 nm	$6,740.00	Lead Time
PAX5720IR1	TXP Polarimeter Module with Internal Sensor, 700 - 1000 nm	$6,750.00	Lead Time
PAX5720IR2	TXP Polarimeter Module with Internal Sensor, 1000 - 1350 nm	$6,750.00	Lead Time
PAX5720IR3	TXP Polarimeter Module with Internal Sensor, 1350 - 1700 nm	$6,750.00	Lead Time
PAX5720VIS	TXP Polarimeter Module with Internal Sensor, 400 - 700 nm	$6,740.00	Lead Time


PAX
TXP 5004