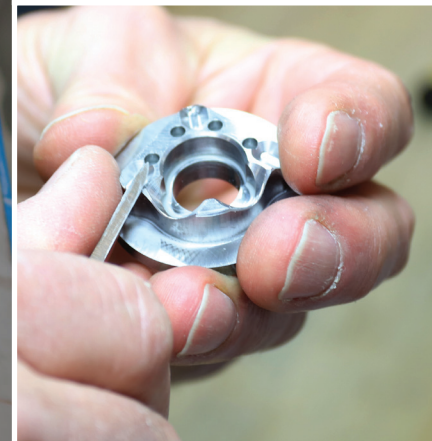
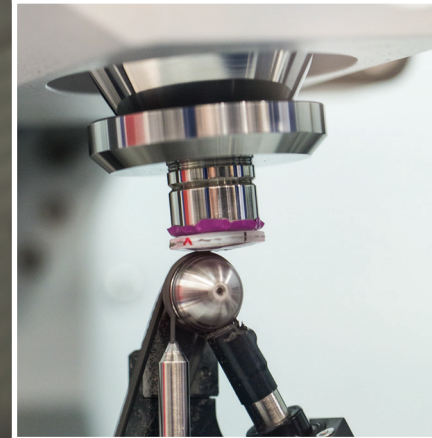
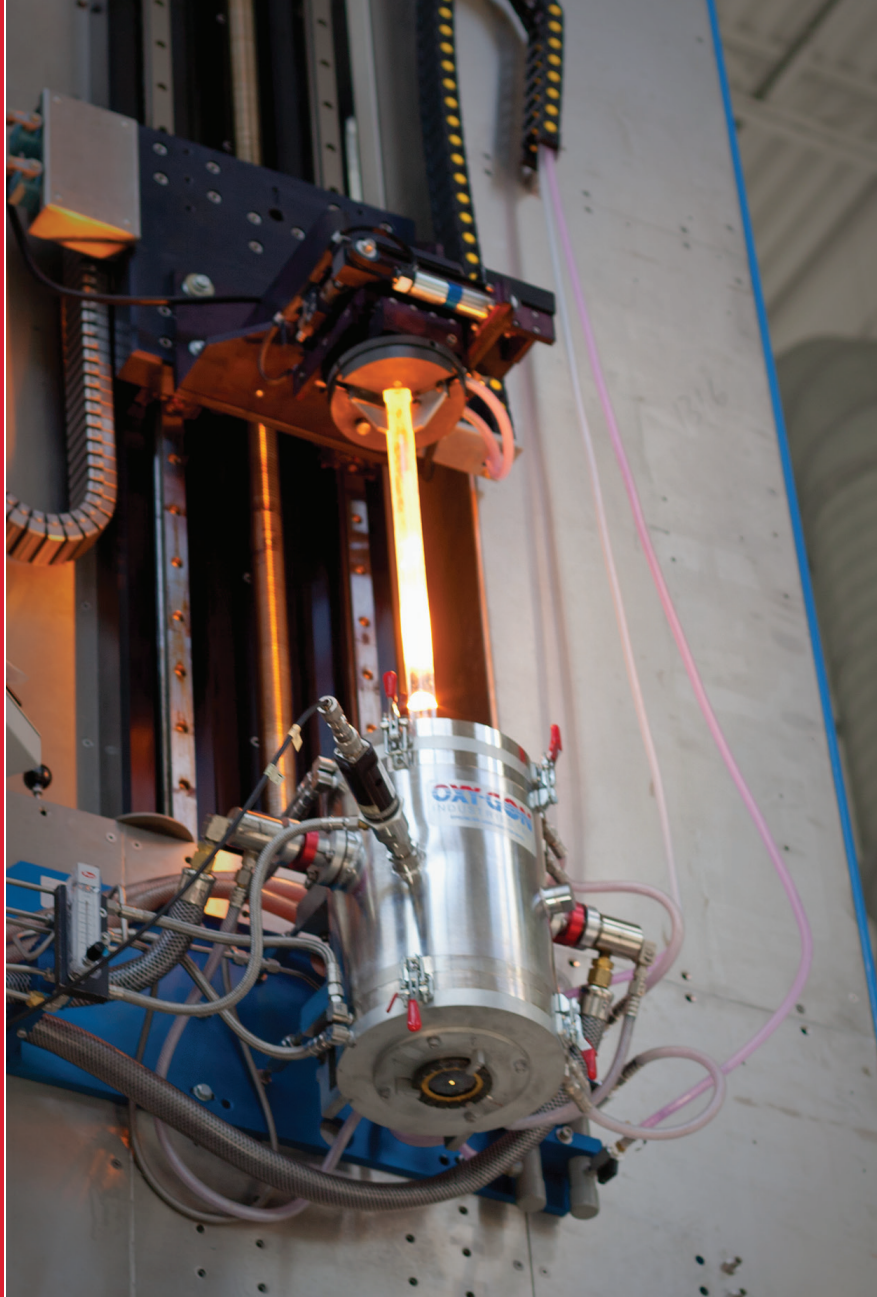


# OEM Solutions



## Your Concepts Realized

Through a combination of organic growth, acquisitions, and greenfield initiatives, Thorlabs has grown over its nearly 30 year history to provide one of the widest ranges of manufacturing services in the photonics industry. For OEM customers, we are committed to leveraging our extensive manufacturing capabilities to accelerate your production and reduce your time to market.

Thorlabs' ability to shape solutions to exact and demanding specifications extends across a comprehensive catalog of more than 20,000 products. Whether your need is volume quantities of an existing catalog item, a modified catalog item, or a tailored design, we invite you to contact us at [OEMSales@thorlabs.com](mailto:OEMSales@thorlabs.com) to discuss your needs.

**THORLABS**

# Letter from Our President

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Over the past three decades, Thorlabs has been privileged to play a role in the advancement of the photonic sciences. Throughout our existence, we've evolved from a small startup, machining a handful of basic optomechanical components in the early years, to a vibrant member of the photonics community releasing over 1,400 new items to our website annually. The growth of our portfolio can be attributed to a mix of organic product line extensions, greenfield initiatives into new technologies such as Optical Coherence Tomography (OCT), and a series of acquisitions that have added new manufacturing competencies at various locations around the globe. Today, Thorlabs is comprised of 17 manufacturing and design facilities in 9 countries.



Thorlabs' continual double-digit growth has allowed us to invest heavily in the infrastructure and capital equipment needed to manufacture the majority of the 20,000 photonics products that comprise our catalog. In addition, these in-house manufacturing capabilities give us the freedom to respond to the needs of our customers, whether they be for large quantities of an existing product or a low volume request for a modification to an existing stocked design.

Consequently, we are able to partner with you, not only during the concept phase when one traditionally buys a basket of items in small quantities, but also when you reach full production and need a partner capable of manufacturing quantities of select items that can be called off as needed. While Thorlabs has always been a price leader, we can realize additional economies of scale when provided with the ability to plan future production/deliveries. These cost savings, which we share with our OEM customers, are often significant. They arise from being able to integrate your OEM needs with our own internal production in a manner that ensures on-time deliveries at highly competitive prices.

Our product portfolio, as you probably know, contains one of the most extensive photonic tools selections in the world. What you might not know is that Thorlabs has added many components that are specifically designed to serve the OEM side of our customer base. Offering these component parts to a multitude of OEM customers further ensures economies of scale that reinforce our strength as a competitive OEM supplier.

Additionally, there is a customer focus that permeates our entire OEM Business Group, leading us to put into place processes that show a deep respect for the responsibility that comes with supplying a production facility. As an OEM supplier, we have built a number of additional elements that provide all important services, timed take-outs that are flexible, safety stock, and strict revision controls, all of which are designed to ensure there are no surprises.

We are committed to being a strong partner for your OEM needs, with a desire to be connected to our industry in a way that far exceeds what would be expected of a vendor. As our OEM business continues to grow, I personally invite you to contact me at any time to provide feedback on any of our products or services. It is a privilege to have my company's products serve as the building blocks within the systems and subsystems you produce.

Sincerely,

**Alex Cable**

President & Founder  
acable@thorlabs.com



# Company Overview

## Corporate Highlights

- ◆ Founded in 1989
- ◆ Facilities in 9 Countries
- ◆ Over 650,000 Square Feet of Manufacturing Space
- ◆ Employs Over 1,900 Individuals Worldwide
- ◆ Manufactures & Distributes Over 20,000 Products
- ◆ Over 1,000 OEM Accounts
- ◆ Certified ISO 9001:2015 Compliant
- ◆ ITAR-Capable Upon Request

## Industries Served

- ◆ Medical Device
- ◆ Life Science
- ◆ Laser Systems
- ◆ Machine Vision & Robotics
- ◆ Optical Metrology
- ◆ Optical Sensing
- ◆ Defense
- ◆ Aerospace

Thorlabs is an international manufacturer and distributor of quality photonics equipment. Founded in 1989, we seek to develop close relationships with our customers. The insight we've gained allows us to identify, enable, and accelerate key photonics technologies utilizing our wide variety of capabilities and services.

Thorlabs' Headquarters in  
Newton, NJ





# Optics & Optical Systems

OEM SOLUTIONS

Whether you are building assemblies from scratch with individual elements or looking for a preconfigured, out-of-the-box solution, our facilities are capable of producing optics and assemblies to fit your needs. The majority of our optics are shaped, finished, and assembled in-house, allowing our fabrication facilities to modify stock and create your ideal part. Optical surfaces can be enhanced with a variety of standard and custom thin film optical coatings in order to optimize transmission, reflection, polarization, or beam quality. All of our optics can be accompanied by Zemax design files to help further ease integration.

## Key Capabilities

- ◆ Individual Elements or Out-of-the-Box Solutions
- ◆ Modifiable Stock Shaped, Finished, & Assembled In-House
- ◆ Custom Coatings from the UV to the MIR to Optimize Performance
- ◆ Serialized Quality Reports with Accompanying Zemax Design Files Available

One of our opticians inspecting the finish of an aspheric lens after a run through our CNC polishing machines.



## A Selection of Our Products

All of these items are built in house and can be customized by our engineers for your application.



PBS252



GL15



SAHWP05M-700



AL50100



MPD2103-M01



IO-4-4500-WG



TC25FC-1064



LMH-50X-532



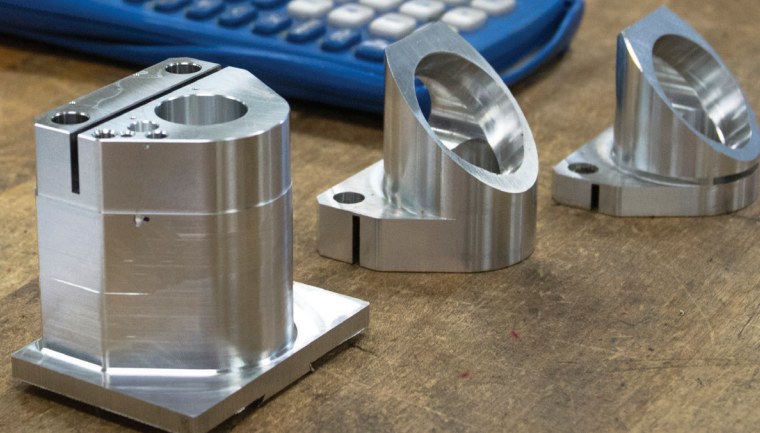
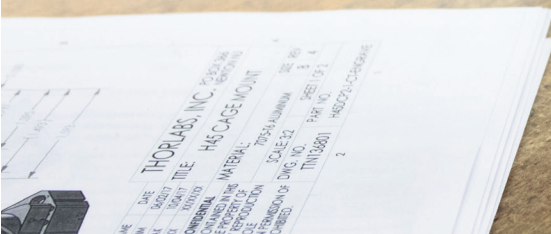
# Mechanics & Motion

## Key Capabilities

- ◆ Comprehensive, Cutting-Edge Machine Shop
- ◆ Parts Designed with Cross Compatibility Between Systems & Components in Mind
- ◆ Translation Stages with Travel Ranges from Less Than 1 Micrometer to Nearly 1 Meter
- ◆ Customizable Form Factors & Materials

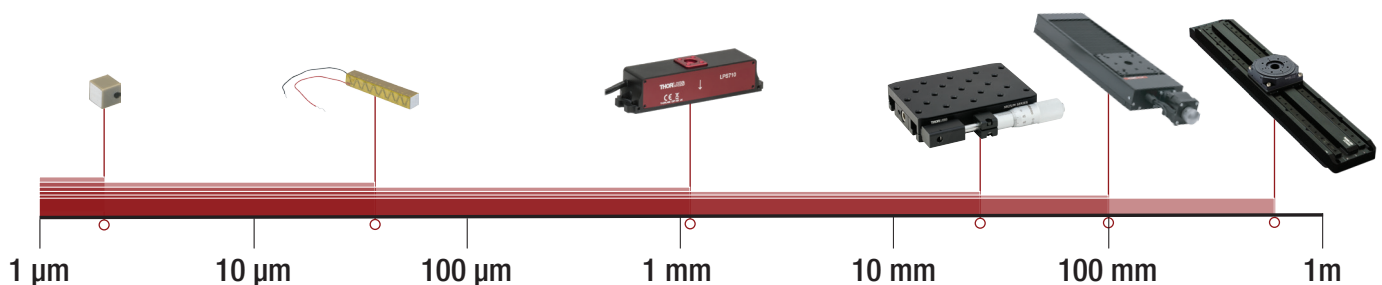
Mount and manipulate components of any size with our extensive line of optomechanical devices. With options from single-chip piezos to long-travel DC servo stages, we can provide travel ranges from fractions of micrometers to hundreds of millimeters. Our engineers design and build movement solutions to mount optics, translate assemblies, align fibers for coupling, and more, while keeping cross-compatibility in mind to easily create multi-axis configurations. Keeping the process in-house from design to delivery allows us to modify our existing stock or to build custom solutions with unique form-factors, application-specific materials, and matching control systems with software built for the device.

Prototype optical mounts in various stages of construction.



## Going the Distance

We can manufacture stages with travel ranges & motor types to fit your application.





# Fiber, Tools, & Components

Our fiber towers and assembly facilities are built to accommodate volume production with fast turnaround times. This allows us to adjust draw schedules and tower configurations to manufacture and ship many custom patch cables the same day they are ordered, letting you design, build, or repair your fiber optic systems quickly. Visit [thorlabs.com/CustomCable](http://thorlabs.com/CustomCable) to configure custom patch cables today.

Our facilities also fuse fibers for fiber couplers and wavelength division multiplexers (WDMs). Fiber-coupled sources can be protected from back reflections with our line of optical isolators. Support your system's construction with our collimators, FiberBenches, and FiberPorts.

## Fiber Types

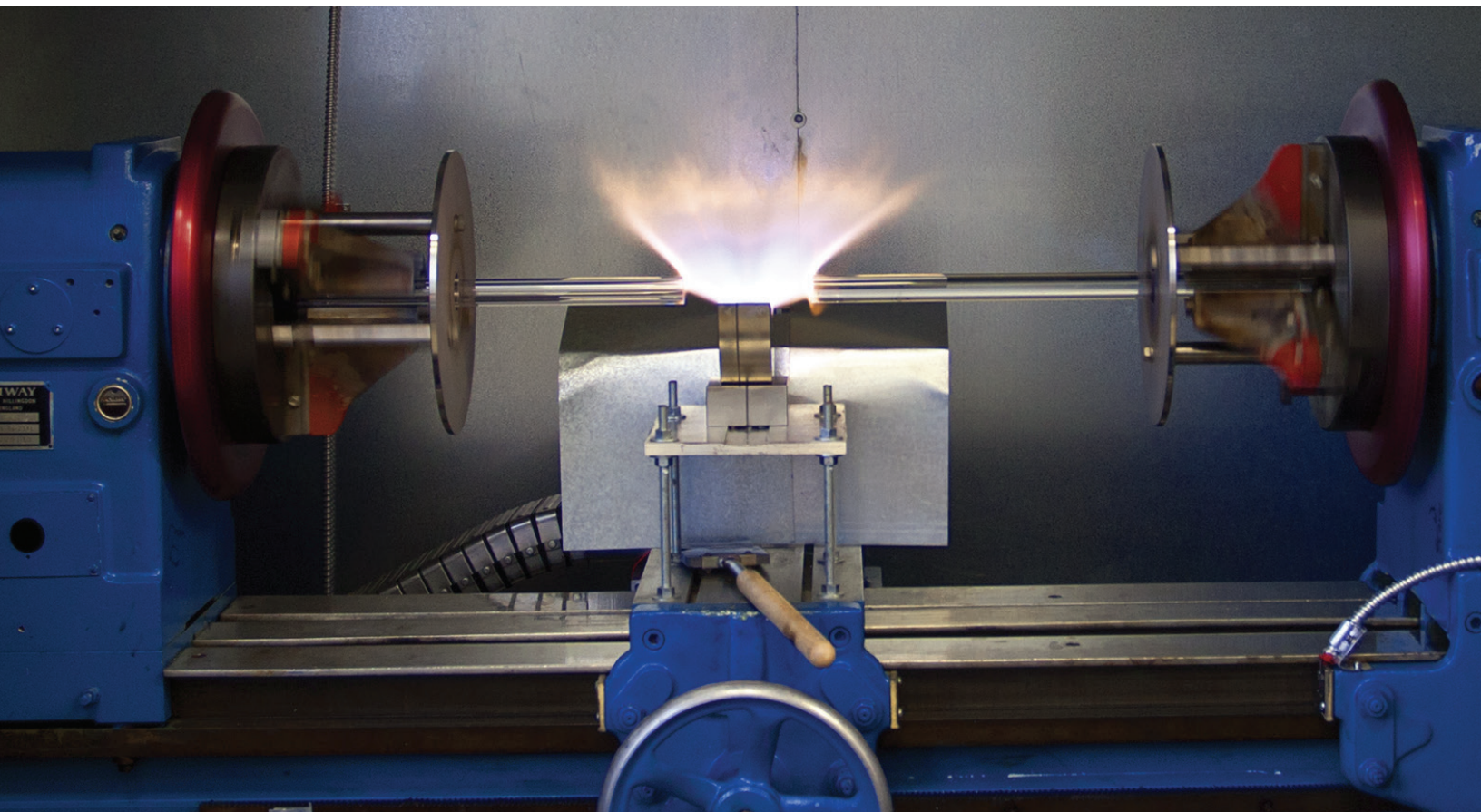
- ◆ Single Mode
- ◆ Multimode
- ◆ Polarization Maintaining
- ◆ Doped

## Fiber Connectors

- ◆ FC/PC or FC/APC
- ◆ Stainless Steel or Ceramic Ferrule
- ◆ Subscriber Connector (SC)
- ◆ Lucent Connector (LC)
- ◆ Straight Tip (ST)



A quartz handle is fused to a silica fiber preform to allow the mass to be held and pulled into a thin, fiber optic cable.





## Cameras & Detectors

Optimize data collection with our diverse and highly adaptable cameras, photodetectors, and thermal sensors. We can create devices with a variety of sensor sizes, sensitivities, wavelength ranges, resolutions, and speeds. Printed circuit boards can be modified to fit unique form factors, and I/O hardware can be adapted to accelerate integration into preexisting systems. Our detectors are based on a variety of popular semiconductor materials, like silicon, germanium, and InGaAs, among others. Our cameras come with support for popular third-party software, giving you an all-in-one platform to build the system you need.



### Key Capabilities

- ◆ Diverse Selection of Cameras, Photodetectors, & Thermal Sensors
- ◆ Customizable Sensor Sizes, Sensitivities, Wavelength Ranges, Resolutions, & Speeds
- ◆ Third-Party Software Support Available

**Top:** An electronics specialist mounting components to a circuit board. **Right:** Our cameras and detectors can be integrated with our motion control systems to create imaging solutions designed to fit your sample.





# Manufacturing

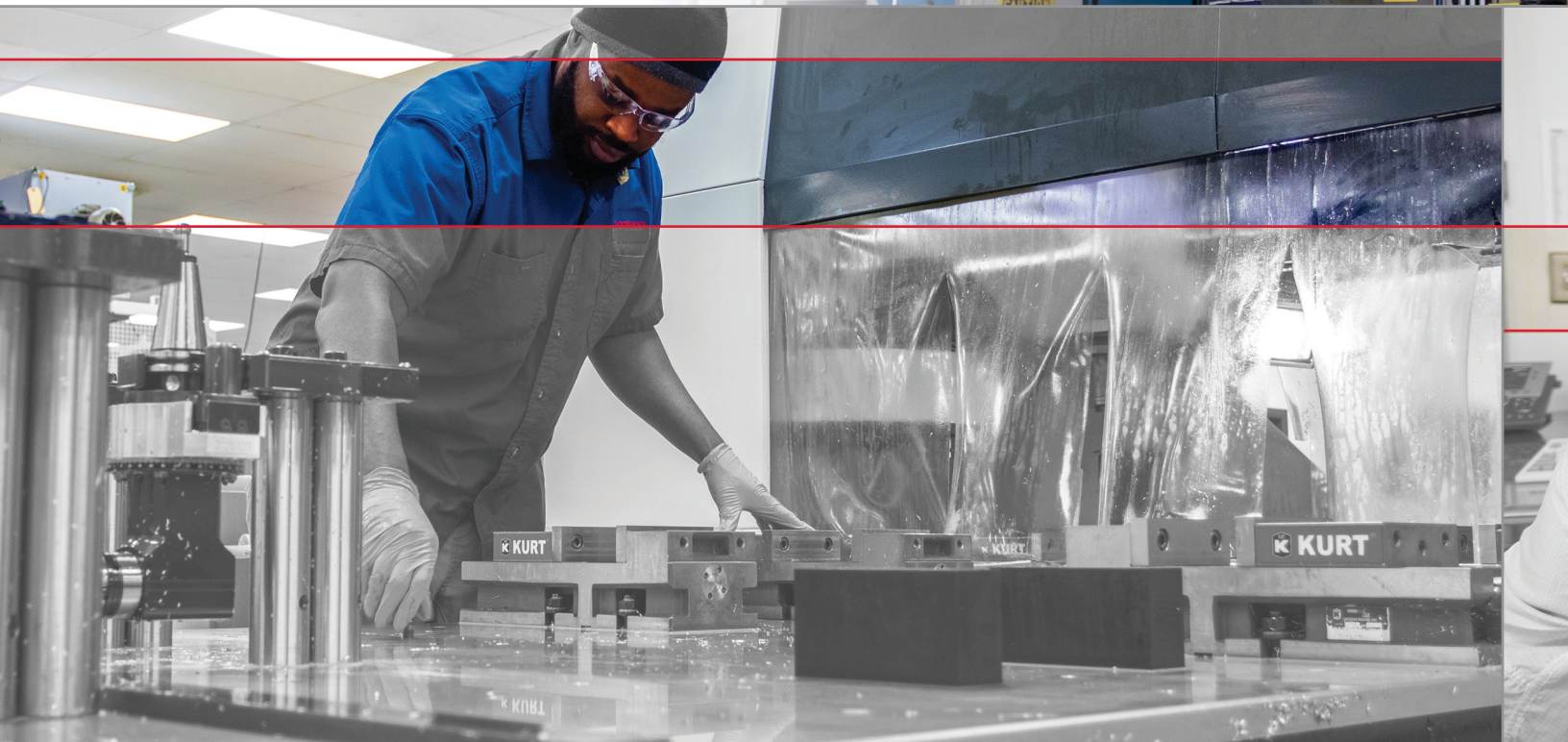
OEM SOLUTIONS

Thorlabs desires to bring our catalog production in house as much as possible, as doing so improves our control over quality, quantity, and customizability. Over our history, we have built vacuum deposition laboratories, metal and glass fabrication shops, fiber draw towers, electronic assembly clean rooms, and more, producing 92% of our catalog items in our own facilities.

We leverage these cultivated capabilities to bring our OEM customers a breadth of services unmatched in the photonics industry. Every Thorlabs location is staffed with technicians and engineers that will work with you to realize your production goals. This network of specialized production facilities collaborates to bring even the largest integrated systems together.

## Clockwise from Top:

Silica Fiber Draw Tower; Vacuum Chamber Used for Semiconductor Growth; Gantry Mill for Machining Long Mechanical Components



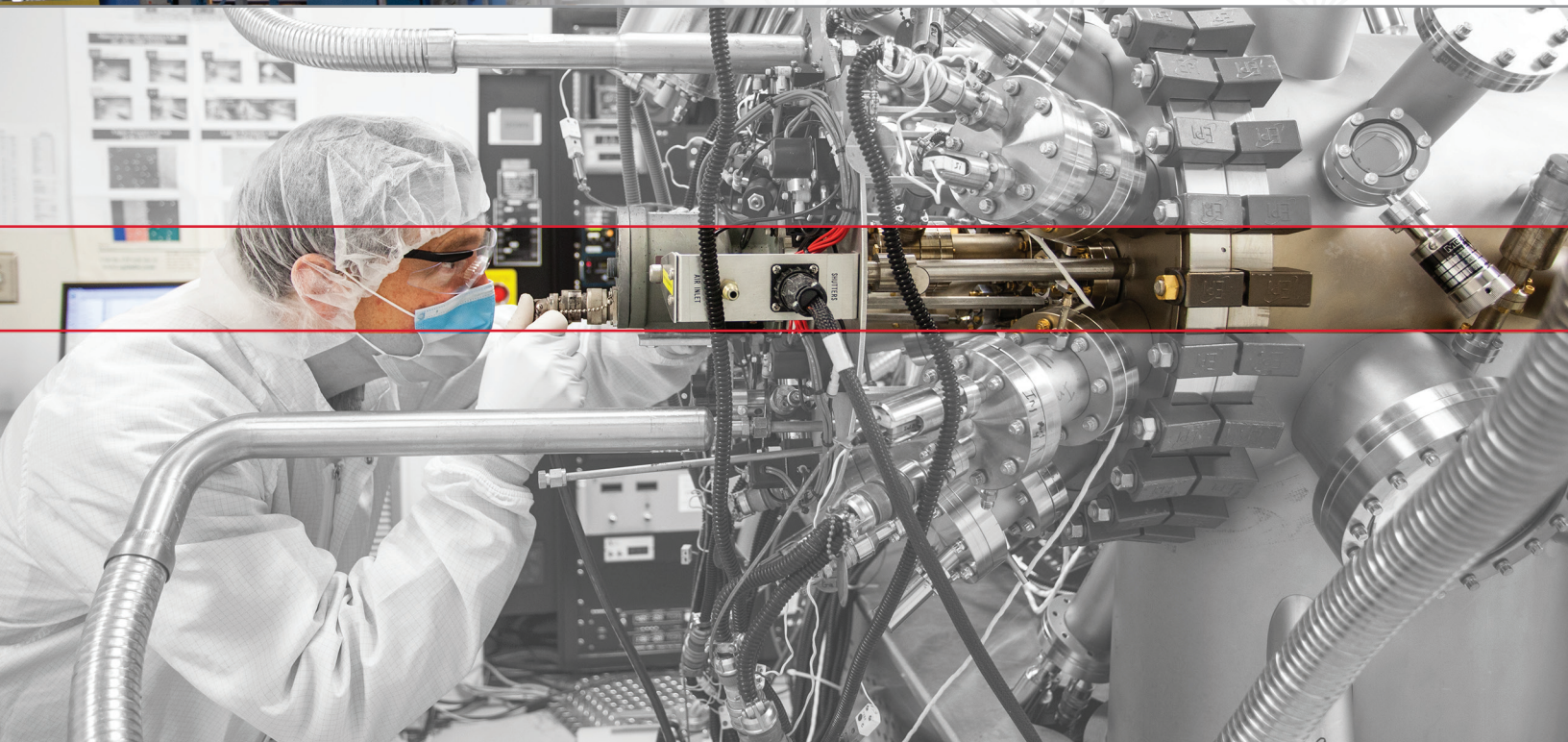




## Key Capabilities

- ◆ Single- or Multi-Element Optic Fabrication & Assembly
- ◆ Thin-Film Optical Coating Deposition
- ◆ Metal Milling for Component & System Construction
- ◆ Semiconductor Growth for Sources & Detectors
- ◆ Fiber Pulling, Fusing, & Assembly
- ◆ Circuit Board Design & Construction
- ◆ Embedded & Stand-Alone Controllers for Motorized Stages

*"quality, quantity,  
& customizability"*





# Our OEM Process

OEM SOLUTIONS

Contacting us by phone or by email will put you in touch with one of our Sales Engineers, who will discuss your project's goals and scope. When you choose to partner with us, this Sales Engineer will serve as your Thorlabs liaison and select a Project Manager that specializes in your field. Your Project Manager serves as your single point of contact during the design and manufacturing process, helping to define the project's specifications and conformities, create documentation for production, and build prototypes.

Your Project Manager will then work with our network of manufacturing facilities, from metal and glass fabricators

to software engineers, to design a process that will reliably and consistently deliver the volume of items necessary for your order. These facilities are controlled under an ISO 9001:2015 quality management system.

Once your Project Manager has a reliable production process set up and your product is ready to be manufactured, a Sales Coordinator will work with you to finalize your sale. This includes preparing supply agreements such as Kanban and blanket orders. Our Sales Coordinators will also work to set up order renewals and process change notifications.



Our OEM Team in Newton, NJ

*"enabling you  
to focus on  
your technology"*

## 1 Contact

### Sales Engineer

Discusses Project Scope  
& Goals



Contact any member of the OEM team to discuss new projects, product modifications, or schedule changes. Designs and processes can be augmented to ensure your application is operating exactly as desired.

*"We encounter unique and challenging projects across a variety of industries every day. The dynamic structure of our team allows us the flexibility to assign the appropriate resources to drive your projects to completion, enabling you to focus on your technology instead of your supply chain."*

**Michael Mohammadi**  
Director of OEM Sales  
mmohammadi@thorlabs.com



2

## Design

Chooses Project Manager Best Aligned to Project

### Project Manager

Finalizes Specifications and Creates Manufacturing Prints

3

## Manufacture

Ensures Fulfillment of Customer Expectations

Oversees Manufacturing Process

4

## Deliver

Determines Continued Product Development

Handles Technical Support for Project

### Sales Coordinator

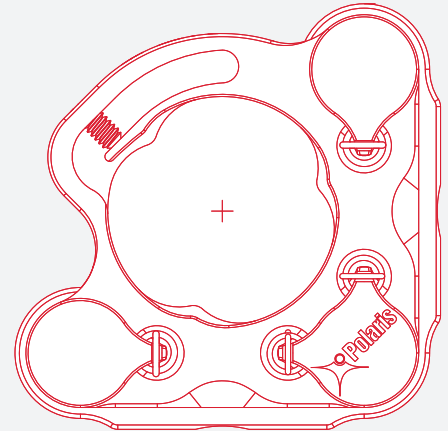
Creates Stocking Agreements Based on Process Volume

Finalizes Sales Invoices

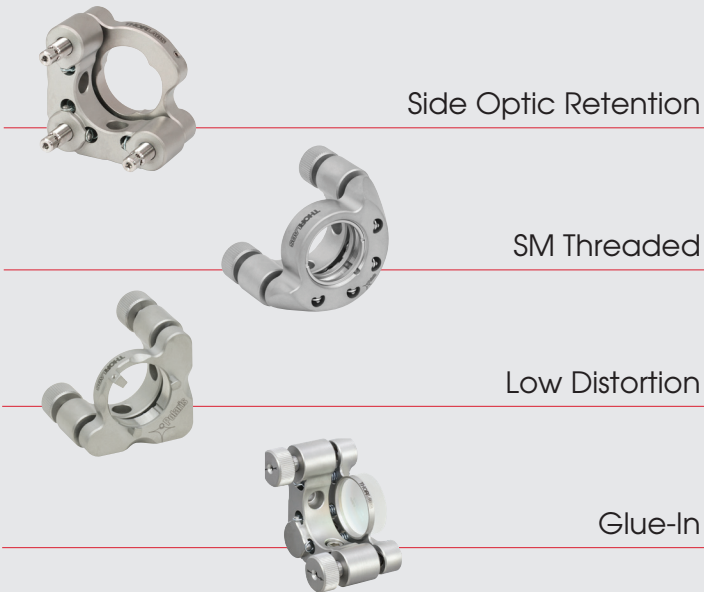


# Polaris® Mounts Highlight

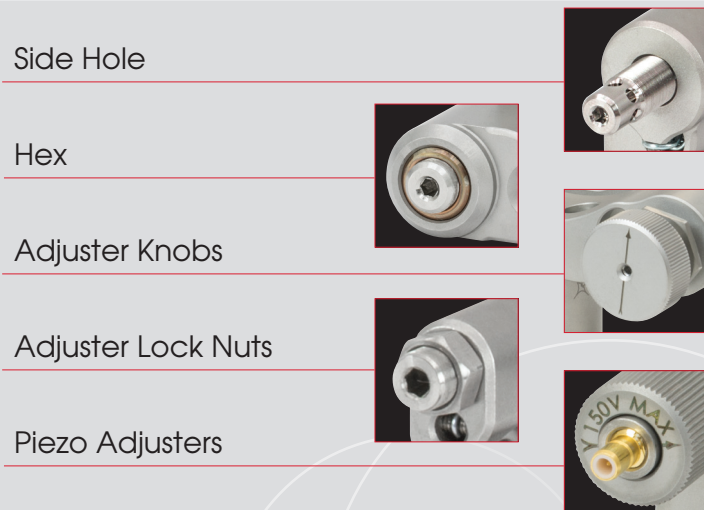
Our Polaris ultrastable mirror mounts are designed specifically to minimize misalignment due to several common factors, such as temperature fluctuations, crosstalk, drift, and backlash. All Polaris mounts are machined from stainless steel and then heat treated, resulting in extremely high thermal stability. Sapphire seats on each adjuster prevent wear, maintaining smooth adjustment and reliable, long-term performance. Standard Polaris mounts feature a variety of optic retention, adjuster, and size options. We can customize a mount with any combination of the three features, giving you an application-specific solution built from the highest quality materials and designs. To see our full offering of Polaris mounts and accessories, visit [www.thorlabs.com/Polaris](http://www.thorlabs.com/Polaris). Additional sizes are available upon request.



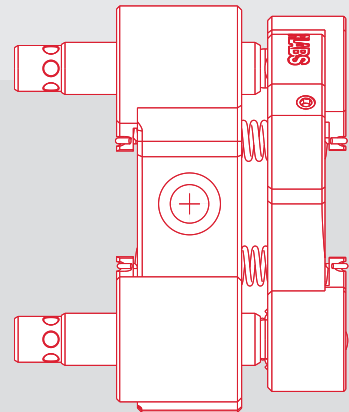
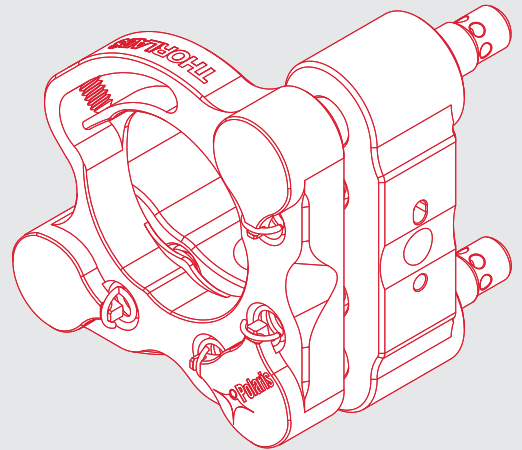
Optic Retention



Adjusters



Sizes





# Scientific Cameras Highlight

## Key Advantages

- ◆ High Quantum Efficiency & Low Read Noise
- ◆ Software-Selectable Pixel Clock Speed
- ◆ Support for MATLAB, ImageJ, µManager, LabVIEW, & MetaMorph
- ◆ All Models Supported by Full-Featured API / SDK
- ◆ Hermetically Sealed Fanless (Vibration-Free) TE-Cooled Camera Body Options

Our specialists develop challenging circuit designs, innovative optical and mechanical solutions, firmware, and software into camera platforms that can be used with a variety of imagers. Our unique and diverse skill base gives us the ability to customize low-noise, high-performance scientific cameras and interface devices that fit your needs. We provide a variety of standard camera offerings as well as cameras customized to fit almost any OEM system.

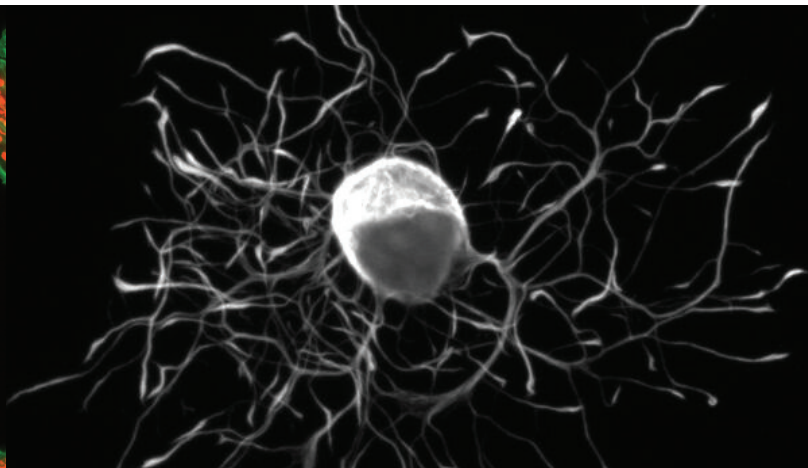
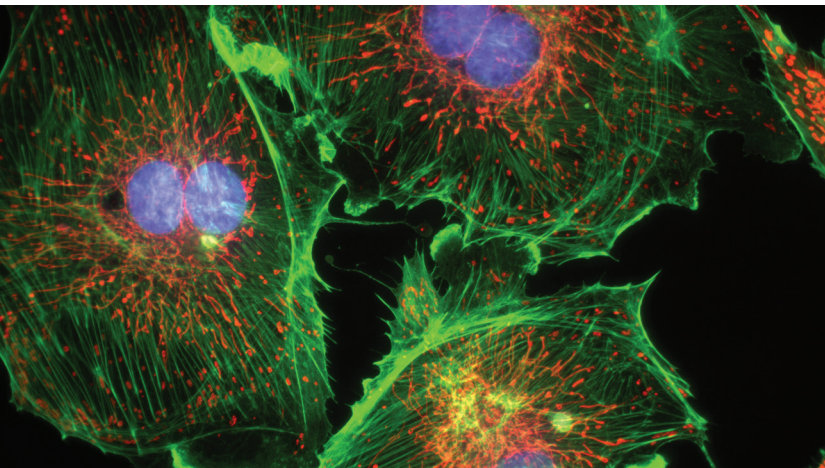
All cameras can be designed for low-light and/or high-speed imaging systems and tailored to meet stringent size, environmental, and packaging requirements. A full-featured and well-documented API, included with our cameras, makes it convenient to develop fully customized applications in an efficient manner, while also providing the ability to migrate through our product line without having to rewrite an application.



CS2100M-USB

**Left:** Merged triple emission fluorescence microscopy image of multi-labeled bovine pulmonary artery endothelial (BPAAE) cells.

**Right:** Fluorescence image of a rat neuron using 40X magnification.





# Piezo Chips & Actuators Highlight

OEM SOLUTIONS

We manufacture a large range of compact piezoelectric chips, stacks, and actuators that are ideal for many sensor electronics and industrial applications. These include chips with in-chip and on-stack insulation, discrete stacks fabricated from multiple individual chips bonded together, and co-fired stacks that are sintered as a single monolithic unit. We also offer bimorph benders, shear piezos, piezo devices with integrated strain gauges for closed-loop operation, and multi-axis positioners.

Our chips and stacks are available with square, circular, and ring cross sections. Cross-sectional dimensions can be varied from 0.7 mm to 85 mm, and our processing equipment can accommodate the manufacture of chips with thicknesses between 0.5 mm and 25 mm. Our piezoelectric devices are subjected to performance, accelerated lifetime, and alternating current testing.

## Key Capabilities

- ◆ Piezoelectric Chips, Stacks, & Amplified Actuators Available from Stock
- ◆ Partially Automated Production Line for Large-Volume, High-Quality Production
- ◆ Short Lead Times for Customized Parts
- ◆ Manufactured in a Large Range of Sizes & Form Factors

An amplified piezo actuator being inserted into its housing.



## A Selection of Our Products

All of these items are built in house & can be customized by our engineers for your application.



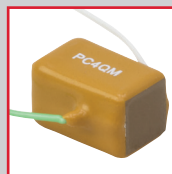
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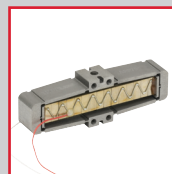
PA44LE



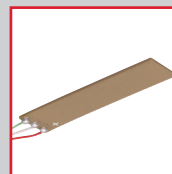
PK25LA2P2



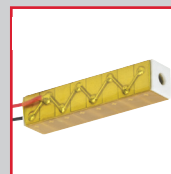
PC4QM



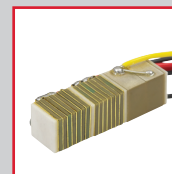
APF705



PB4NB2W



PK4FTH3P2



PN5FC3



# Elliptec™ Motion Control Highlight

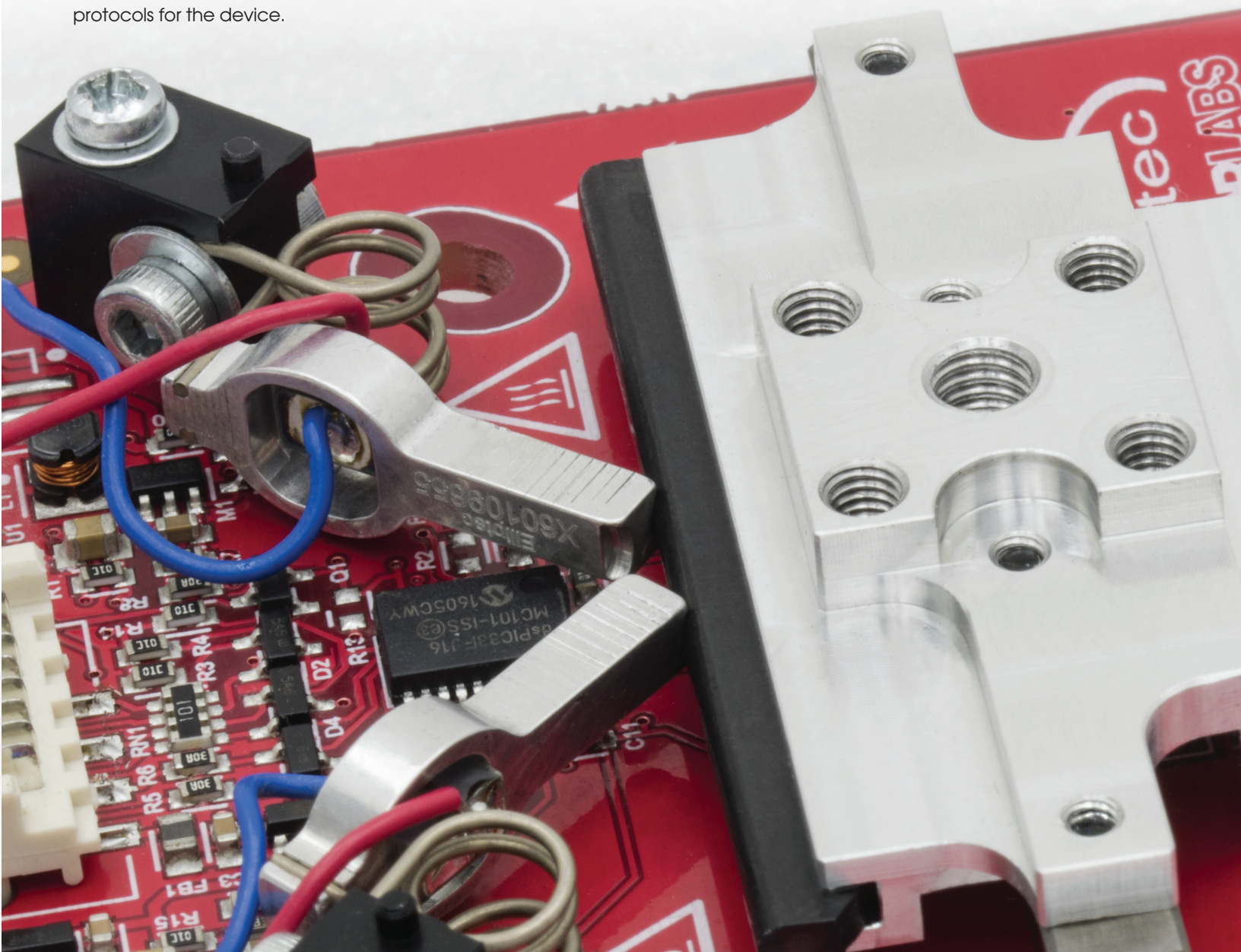
Our Elliptec motors provide fast, high-precision actuation in a compact and lightweight package. The motor is comprised of a piezoelectric element press fit into the aluminum resonator. Together, the piezoelectric element causes the resonator arm to vibrate in an elliptical motion with the motor's head moving at 350 mm/s (typical). This effect is the result of meticulous design, manufacturing, and quality control practices, and virtually eliminates inertial delay and backlash found in other motors.

Circuit boards controlling the piezoelectric elements are modeled in-house together with all of the unit's mechanical components, producing an integrated system able to take on application-specific form factors. The Elliptec motor is simple to run either with included control boards or through USB connection, requiring very little power. Programmers can create routines with the open-source communication protocols for the device.

## Key Advantages

- ◆ Gear-Free Design Eliminates Backlash
- ◆ Magnet-Free Design Improves Compatibility with Environments Sensitive to Electromagnetic Interference
- ◆ Lightweight (1.2 g) & Compact (8 mm x 4 mm x 20 mm) Motor Head
- ◆ Virtually Silent Operation
- ◆ Motion can be Stopped within Microseconds

Elliptec's resonant motor heads allow for fast, synchronized, bi-directional movement.





# Worldwide Support

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## Thorlabs, Inc.

Newton, New Jersey  
Phone: 1-973-300-3000  
Fax: 1-973-300-3600  
Catalog Sales:  
sales@thorlabs.com  
OEM Sales:  
OEMSales@thorlabs.com  
www.thorlabs.com

## Thorlabs Imaging Systems

Sterling, Virginia  
Phone: 1-703-651-1700  
Email: imagingsales@thorlabs.com

## Thorlabs Quantum Electronics (TQE)

Jessup, Maryland  
Phone: 240-456-7100  
Email: sales-TQE@thorlabs.com

## Thorlabs Scientific Imaging (TSI)

Austin, Texas  
Phone: 1-973-300-3000  
Email: sales.tsi@thorlabs.com

## Thorlabs Ultrafast Optoelectronics

Ann Arbor, Michigan  
Phone: 1-973-300-3000  
Email: sales@thorlabs.com

## Thorlabs Vytran Division

Morganville, New Jersey  
Phone: 1-973-300-3000  
Email: sales@thorlabs.com

## Thorlabs Canada

Phone: 1-973-300-3000  
Fax: 1-973-300-3600  
Email: sales@thorlabs.com

## Thorlabs Ltda, Brazil

Phone: +55 (16) 3413 7062  
Fax: +55 (16) 3413 7064  
Email: brasil@thorlabs.com

## Thorlabs SAS France

Phone: +33 (0) 970 444 844  
Fax: +33 (0) 825 744 800  
Catalog Sales:  
sales.fr@thorlabs.com  
OEM Sales:  
OEM.fr@thorlabs.com

## Thorlabs GmbH / Thorlabs Lübeck

Phone: +49 (0) 8131 5956-0  
Fax: + 49(0) 8131 5956-99  
Catalog Sales:  
europe@thorlabs.com  
OEM Sales:  
OEM.de@thorlabs.com

## Thorlabs Elliptec GmbH

Phone: +44 (0)1353 654440  
Fax: +44 (0) 1353 654444  
Email: sales.uk@thorlabs.com

## Thorlabs Sweden AB

Phone: +46 31 733 30 00  
Fax: +46 31 703 40 45  
Email: scandinavia@thorlabs.com

## Thorlabs Ltd.

Phone: +44 (0)1353 654440  
Fax: +44 (0)1353 654444  
Catalog Sales:  
sales.uk@thorlabs.com  
OEM Sales:  
OEM-uk@thorlabs.com

## Thorlabs Vytran Europe

Phone: +44 (0) 1392-445777  
Email: vytran.uk@thorlabs.com

## Thorlabs China Ltd.

Phone: +86 (0)21-60561122  
Fax: +86 (0)21-32513480  
Catalog Sales:  
chinasales@thorlabs.com  
OEM Sales:  
OEM-cn@thorlabs.com

## Thorlabs Japan

Phone: +81-3-6915-7701  
Fax: +81-3-6915-7716  
Email: sales@thorlabs.jp

*To speak with an OEM Specialist, email [OEMSales@thorlabs.com](mailto:OEMSales@thorlabs.com)*