

# Frequently asked questions

LensMechanix®

## Overview

### What is LensMechanix?

LensMechanix is an application for mechanical engineers who package optical systems in CAD software. It's currently available for SOLIDWORKS and Creo Parametric.

LensMechanix loads OpticStudio design files (including lenses, materials, coatings, surface radii, edges, wavelengths, clear apertures, location, sources, and detectors) into a CAD assembly. Mechanical engineers can design mechanical geometry in their CAD platform around the optical components, and assess the impact of mechanical components on the optical performance. Mechanical engineers can use LensMechanix to quickly identify where mechanical components are causing issues and make changes to them before manufacturing. LensMechanix uses the same ray trace engine that OpticStudio uses for simulation and analysis.

### Is LensMechanix a version of OpticStudio inside SOLIDWORKS or Creo?

No. LensMechanix is an independent product that is used for designing mechanical components for optical systems.

### Is LensMechanix part of OpticStudio?

No. While LensMechanix uses the same ray tracing engine as OpticStudio, LensMechanix is licensed separately as an application for mechanical engineers who package optical systems in CAD software. Mechanical engineers do not need OpticStudio on their computers to run LensMechanix.

### What are the key benefits of using LensMechanix?

LensMechanix simplifies the transition from optical design to mechanical design. It streamlines the communication and workflow between optical and mechanical engineers, reducing errors importing optical objects, allowing validation of the mechanical design, and enabling a full, virtual prototype.

LensMechanix uses the optical component data from OpticStudio to create the optical components as CAD parts with actual lens dimensions, eliminating the need for STEP, IGES, or STL files. The native CAD parts do not include sketches, but are fully usable and can be saved as Creo or SOLIDWORKS parts based on the platform you are using. You can still create drawings of the parts using the ISO 10110 functionality offered by LensMechanix. Mechanical engineers can build mechanical geometry from dimensionally accurate optical components, run ray traces, and perform surface power analyses. LensMechanix enables you to:

- Create a virtual prototype of your optomechanical design to assess its performance.
- Get accurate analysis results from Zemax's industry-leading ray tracing engine.
- Easily detect and correct mechanical geometry that impacts optical system performance—such as stray light contamination, image clipping, and image focus issues—before you build a physical prototype or send the complete design to optical engineers for final review.
- Build physical prototypes more accurately, so you avoid repeated prototypes and manufacturing mistakes.
- Improve your workflow and reduce development iterations, so you get to market faster.
- Reduce the stress and delays that come from repeated design iterations.

Zemax

## Functionality

### How does LensMechanix streamline workflows?

There are five ways LensMechanix streamlines your workflow.

It allows you to:

1. Load an OpticStudio file
2. Design using exact optical geometry
3. Apply a surface finish
4. Validate your designs
5. Generate ISO 10110 drawings

### Is it possible to design lenses in LensMechanix?

Yes, but it's discouraged because LensMechanix does not include optimization functionality for optical systems. The latest version of OpticStudio is the recommended software for designing lenses.

### Can I run ray traces in LensMechanix?

Yes. After LensMechanix loads an OpticStudio design file, you can run ray traces to compare the optical performance of the complete system with the original OpticStudio file. LensMechanix uses the same multi-threaded physics core used by OpticStudio to analyze and validate your complete product designs.

### Does LensMechanix work with both sequential and non-sequential designs?

Yes. LensMechanix loads both sequential and non-sequential designs. If a sequential file is loaded, LensMechanix automatically converts it to a non-sequential file using the same conversion tool as OpticStudio.

### Does LensMechanix work with reflective surfaces, scattering surfaces, or mirrors?

Yes. LensMechanix installs 11 standard material scatter profiles. You can also load your own scatter profile in an .isx or .bsdf file format. If your mechanical geometry does not have an assigned scatter profile, LensMechanix assumes it's a perfect reflective surface during a ray trace.

### Does LensMechanix work with off-axis systems?

Yes. LensMechanix loads off-axis systems that are designed in OpticStudio.

### Does LensMechanix account for thermal deformations?

No. LensMechanix accounts for changes in refractive indexes in different environmental conditions, but not thermal deformations.

### What analysis tools are included in LensMechanix?

- Full ray trace—Analyzes the performance of the optical system and the mechanical system
- Ray filtering—Creates ray filters that point to mechanical components causing stray light or image quality issues
- Surface power analysis—Analyzes the power incident on a surface
- Tolerancing—Provides optical elemental and positional tolerancing information in the CAD graphics area
- Ray scattering—Accounts for scattered rays due to optical and mechanical surface properties
- Power throughput—Measures the flux power lost due to mechanical components

## Workflow

### How does LensMechanix improve the workflow between optical engineers and mechanical engineers?

LensMechanix increases efficiency by:

- Streamlining the process of transferring data from OpticStudio to SOLIDWORKS or Creo by directly importing a complete OpticStudio file with all lens geometry into SOLIDWORKS or Creo.
- Making it possible for optical and mechanical engineers to work in their preferred environments and to share data without file format conversions. For example, mechanical engineers can send .zax files of their complete optomechanical systems to optical engineers for final validation in OpticStudio.
- Enabling mechanical engineers to easily discover and resolve any optical issues introduced by the mechanical geometry before building a physical prototype or sending the design to the optical engineer for final review.
- Enabling mechanical engineers to update the optical design loaded in the OpticStudio file when there is a change in the optical system. This makes it easier to identify what updates need to be made in the mechanical design to account for the changes.
- Reducing the back-and-forth development iterations that inevitably cause delays, tax team resources, and increase costs.

## Configuration and Compatibility

### What are the system requirements to run LensMechanix?

Windows 7 (64 bit) or later is required to run all versions of LensMechanix.

For SOLIDWORKS:

- [SOLIDWORKS 2016 or later](#)

For Creo:

- Creo 4.0
- [Creo Parametric \(Creo Direct is not supported\)](#)

### Do I need OpticStudio to use LensMechanix?

No. LensMechanix is a separate tool. The optical engineer can have OpticStudio on one computer while the mechanical engineer has LensMechanix on a separate computer.

### Does LensMechanix work with design files from earlier versions of OpticStudio?

Yes. LensMechanix works with design files from all versions of OpticStudio, including Zemax 13 and earlier. LensMechanix uses the most recent libraries and features of the latest version of OpticStudio, so there may be some incompatibilities when opening older OpticStudio (or Zemax files).

### Where do I get the allowable deltas for the optical performance?

You get the allowable delta from the engineer who created the optical design. LensMechanix automatically populates the Optical Performance Summary with default values of 1. You can change the allowable deltas directly in the Optical Performance Summary.

### Can files from other design programs besides OpticStudio files be loaded into LensMechanix?

No. LensMechanix loads only OpticStudio files. However, OpticStudio can convert Synopsys® Code V® files into OpticStudio files, which you can then load into LensMechanix.

### Does LensMechanix work with any CAD platforms other than SOLIDWORKS and Creo?

Not at this time. However, if you're using a different platform that you'd like to see supported by LensMechanix, please email our [Sales Team](#) to let us know.

As a workaround, you can use the 3D Interconnect tool in SOLIDWORKS 2017 or later to load parts and assemblies from other CAD packages. The parts are treated like SOLIDWORKS parts and work with LensMechanix. For more information about the 3D Interconnect tool, see [SOLIDWORKS 3D Interconnect](#).

### Does LensMechanix support multi-configuration designs?

Yes. LensMechanix uses the conversion tool from OpticStudio to convert sequential multi-configuration designs to non-sequential multi-configuration designs. Although not all operands can currently be converted, we encourage you to email our [Support Team](#) about which multi-configuration operands you'd like to be able to convert. All requests will be considered in the development of future LensMechanix releases.

### Does LensMechanix include tolerancing tools?

No. LensMechanix displays optical tolerances that are defined in OpticStudio, but does not currently have tools to dimension mechanical components.

### Can I create drawings of lenses in LensMechanix?

Yes. LensMechanix creates ISO 10110 drawings for standard and aspheric lenses. LensMechanix will automatically generate drawings with the ISO standard created in OpticStudio.

### Do other team members using SOLIDWORKS or Creo need LensMechanix to open an assembly that was created in LensMechanix?

No. SOLIDWORKS or Creo users can open an assembly with all components if they don't have LensMechanix. However, the optical components will be loaded as mechanical components and the user will not be able to view ray trace information.

## Licensing and pricing

### **Does my LensMechanix license work for both Creo and SOLIDWORKS?**

Yes, your license works for either CAD platform.

### **How can I try LensMechanix at no cost?**

You can try LensMechanix by [downloading a free trial](#). The two-week trial includes all product functionality and sample files.

### **How much does LensMechanix cost?**

LensMechanix is offered as an annual subscription of \$5,900 USD. Discounts are available for five or more seats. Deeper discounts are available for 10 or more seats. Network licenses are available for two or more seats.

### **What's included in the LensMechanix subscription?**

The annual subscription includes product enhancements, feature updates, and support for one year. In addition, [LensMechanix Productivity Assurance](#) is included to cover a loss of your license key.

### **Does LensMechanix require a hard-coded key like OpticStudio?**

No. LensMechanix uses a softkey license. It does not use hard-coded USB keys.

### **Are shared network licenses available for LensMechanix?**

Network licenses are available for organizations with two or more user seats. For information about how to install a network license, see the [Knowledgebase article](#).

## For more information

### **Is training available for LensMechanix?**

Yes. Online training is available. No knowledge of OpticStudio or LensMechanix is required. See the schedule on our [Training page](#).

Free onsite training is available when you purchase five or more seats of LensMechanix. Webinars, product videos, customer stories, and eGuides are also available at [Zemax.com/Learn](#).

### **Whom do I contact if I have questions?**

For questions, please email [Sales@Zemax.com](mailto:Sales@Zemax.com).