# ZEN Imaging Software

Faster. Easier to Use. More Universal.
The Software for All Systems.

**ZEISS**

# ZEN Shortens the Path to Your Goal

ZEN – ZEISS Efficient Navigation – is the single user interface you will see on all imaging systems from ZEISS. ZEN software leads you simply and quickly to the result. At all times you see which options the system is making available to you and which step is appropriate to take next. ZEN makes it easy to operate every imaging system from ZEISS correctly and intuitively. As a result you save time, reduce training and support costs, and get faster answers to your questions.



DR. HORST WOLFF
PRODUCT MANAGER

▶ Click here to view this video
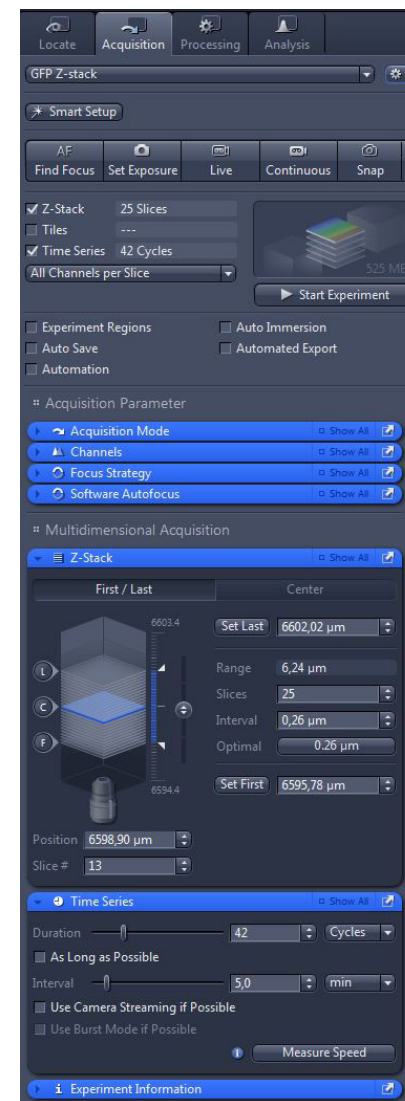
# Simpler. More Intelligent. More Integrated.

**ZEN: The Essentials Count –
Focus on What You Need**

ZEN controls all imaging systems from ZEISS, letting you operate all of your devices with the same convenient interface. ZEN arranges operating elements in a way that follows your workflow. Functions you use only rarely are hidden away, out of sight – but always there with a single click.

**Smart Setup: Select Fluorophore.
Acquire. Done.**

Smart Setup is the core of ZEN – your intelligent control centre. Select the dye for your sample from the database with more than 500 dyes and ZEN automatically applies all necessary settings for your imaging system. The innovative "Motifs" feature helps you to further optimize your imaging with a single click.

**A Secure Format for Important Data**

The security of your data gets top priority as ZEN stores each of your experiments with all its metadata. Using the data format .czi from ZEISS you can even process the huge amount of data you acquire with our fast 3D imaging systems. Alternatively, store your images as OME-TIFF, the image format specification of the Open Microscopy Environment including metadata, to facilitate cross-plattform image data exchange.
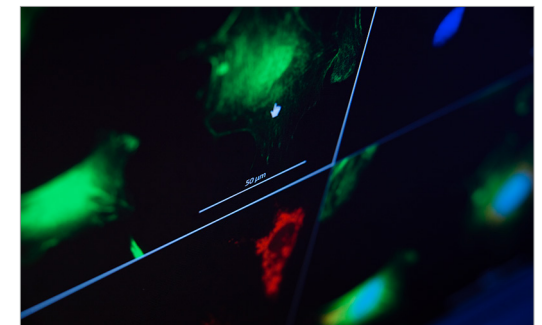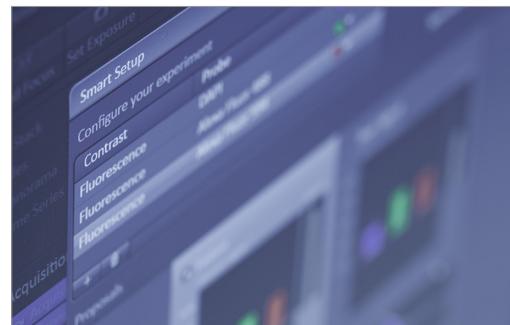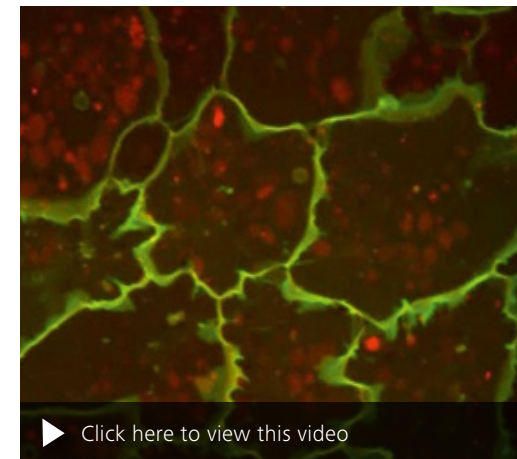
# ZEN at Work

- Image subcellular trafficking in 3D over time with maximum acquisition speed
- Visualize cytoskeletal dynamics with highest sensitivity
- Carry out photobleaching experiments
- Perform functional imaging of cellular signal transduction with high temporal resolution
- Perform confocal live cell imaging with highest sensitivity



▶ Click here to view this video

*Zebrafish blood*



▶ Click here to view this video

*Xenopus explant*



▶ Click here to view this video

*Drosophila embryo*
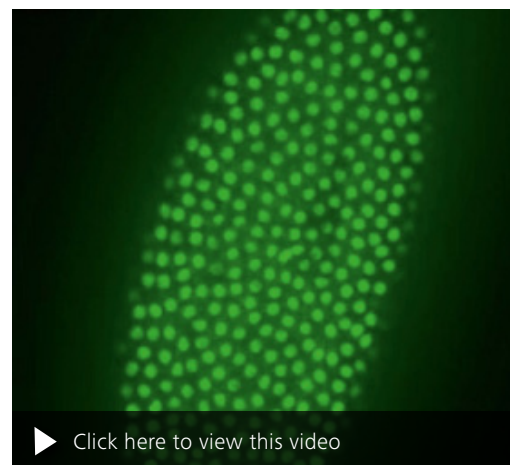


▶ Click here to view this video

*Tobacco cells*

# Your Flexible Choice of Components

**ZEN features the following module packages:**

| | |
|---|---|
| ZEN lite | Is the free basic version of the high-performance microscopy software ZEN. You do not need a license for ZEN lite, unless you want to extend this version with specific modules for your applications |
| ZEN desk | Supports you in your offline analyses. Extend this version with modules for image processing and analysis |
| ZEN pro | Controls all imaging systems except laser-based 3D systems |
| ZEN system | Is the software package for all imaging systems, including laser-based 3D imaging systems |

| Basic functionality | ZEN desk | ZEN pro | ZEN system |
|---|---|---|---|
| **User Interface and files** | Graphical user interface switchable light or dark design to adapt to ambient brightness* | | |
| | User interface with stepless scaling and zooming | | |
| | All functional elements can be displayed either in basic or advanced mode | | |
| | Configuration options for the graphical user interface: menu bars* and customized buttons*, saving of workspace configurations, definition of properties of standard graphic elements and application of functions to TFT soft keys* | | |
| | Image import (LSM, ZVI, BMP, TIF, JPG, GIF, PNG) and function to convert images (TIF, JPG, BMP) into CZI format | | |
| | Export to OME-TIFF-image format specification of the Open Microscopy Environment, including metadata, to facilitate cross-platform image data exchange | | |
| | Export into ZVI, BMP, GIF, JPG, PNG, TIFF, HDP image and AVI and WMF video formats | | |
| | Batch Export of images and videos | | |
| **Hardware Control** | | Full integration of ZEISS microscopes, cameras and accessories | |
| | | Interactive and automatic control of the motorized microscope components | |
| | | Transfer of information from encoded components into the software | |
| | | Reproducible acquisition with millisecond precision – Control of trigger board (analog/digital I/O card) for hardware control | |

* ZEN (blue edition) only

# Your Flexible Choice of Components

ZEN features the following module packages:

| Basic functionality | ZEN desk | ZEN pro | ZEN system |
|---|---|---|---|
| **Image Acquisition** | | Smart Setup function for fully automatic creation of experiments to acquire multichannel fluorescence and transmitted light images. "Motif" feature available to further optimize acquisition experiments for quality or speed | |
| | | Acquisition experiments can be configured, saved and reloaded. Reuse function from images automatically restores acquisition parameters | |
| | | Movie Recorder* enables fast and simple acquisition of movie clips through use of Start and Stop | |
| | | Sequence of acquisition dimensions can be selected (depending on active dimensions) | |
| | | Interactive graphical representation of the microscope light path | |
| | | Fully automatic assignment of geometric scalings for image acquisition. Manually created scaling supported for even higher accuracy | |
| | | Recording and saving of acquisition history* as metadata in CZI image format. This format has been developed to be as close as possible to the OME specification, Copyright 2002–2012 OME (Open Microscopy Environment) | |
| | | Automatic saving of acquired images in CZI (including metadata) to prevent image data loss | |
| **Analysis, Processing and Views** | Navigator window* | | |
| | Interactive measurement, Scale Bars and Text Annotations | | |
| | Management, visualization and printing of metadata and images | | |
| | Post-Processing of images: standard operations for image optimization: contrast, brightness, gamma, colors, smoothing, sharpening, geometric corrections | | |
| | Image file browser | | |
| | Up to three independent image containers, image comparison view | | |
| | Gallery view | | |
| | View for histogram measurement | | |
| | View for profile measurement | | |
| | 2.5D (pseudo-3D) view | | |
| | Info view for metadata, partially editable | | |
| | Functions for working with data tables: filtering and sorting of tables* | | |
| | Diagram view to display data in the form of histograms, line plots, bar and pie charts* or x/y scatter plots | | |
| | Image splitter function for synchronized comparison of up to 16 images | | |
| | Easy to use 3D Deconvolution (Nearest Neighbor, Regularized Inverse Filter, Fast Iterative) * | | |
| | Basic 3D Rendering view (powered by arivis®) | | |

* ZEN (blue edition) only

# Your Flexible Choice of Components

ZEN features the following module packages:

| Task | Module | ZEN provides: |
|---|---|---|
| Basic | ZEN | Detector Control, Axiocams and PMTs from ZEISS included, third party devices optionally available |
| | | Laser-/Lasermodule-Control |
| | | Microscope Control |
| | Macro Environment | Use a programming language to generate macros<br>ZEN (black edition): VBA, ZEN (blue edition): Python |
| | Basic 3D Deconvolution | Improve Z-stacks and restore 3D information with basic deconvolution algorithms |
| Acquisition | Multi Channel | Record different fluorescence and transmitted light images in independent channels |
| | Time Lapse | Record images over time |
| | Z Stack | Record Z-stacks with the help of a motorized focus drive |
| | Manual Extended Focus* | Acquire images manually and calculate a 2D image out of a Z-stack |
| | Autofocus | Determine the focus position of your specimen |
| | Tiles & Positions | Record exact, highly resolved images by automatically scanning pre-defined specimen areas<br>Produce images with the help of position lists. Configure tile regions and individual positions |
| | Panorama* | Manually acquire highly resolved overview images from individual 2D images |
| | Experiment Designer | Configure non-homogeneous imaging experiments |
| | ROI-HDR** | Acquire and display HDR image data with extended dynamic range, incl. illumination blanking |
| | Counting ** | Work with imaging and counting mode, including basic FCS data acquisition |

*   ZEN (blue edition) only
** ZEN (black edition) only

# Your Flexible Choice of Components

Select your modules according to your requirements

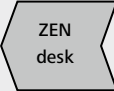| Task | Module | ZEN provides: |
|------|--------|---------------|
| Processing | Extended Focus | Calculate a 2D image out of a 3D Z-stack |
| | Deconvolution | Improve Z-stacks and restore 3D information with deconvolution algorithms, optionally with very fast graphics card (GPU) based processing |
| | 3Dxl Viewer – powered by arivis® | Render very large 3D image stacks using ray tracing |
| | Spectral Unmixing | Perform spectral unmixing of lambda stacks or multichannel images, via reference spectra or component analysis |
| | Colocalisation | Analyze colocalisation between two fluorescence channels quantitatively |
| Analysis | Measurement | Use extended interactive measurement tools |
| | Image Analysis | Use an assistant to create an automatic measurement program |
| | Advanced Processing & Analysis | Add Acquisition-feedback capability and hierarchical measurements to your Image Analysis |
| | FRAP Efficiency Analysis ** | Analyze acquired FRAP/FLAP or similar time series with bleach events, including mean ROI measurements ** |
| | FRET ** | Analyze FRET data with either sensitized emission or acceptor photobleaching method, including mean ROI measurement ** |
| | Dynamics | Analyze physiological time series data |
| | FCS for GaAsP ** | Analyze single molecules with GaAsP and APD detectors, FCS, spectral FCS and FCCS |
| | Enhanced FCS ** | Perform interactive and global fitting using extended and self defined fit models |
| | Photon Counting Histogram ** | Histogram of the photon counting populations for all FCS systems |
| | Image Correl. Spectro. RICS ** | Analyze single molecules with Raster Image Correlation Spectroscopy for LSM 880 with PMT or GaAsP detectors |
| | Confocal Topography | Analyze surface data and visualize measurement results |

\* ZEN (blue edition) only

\*\* ZEN (black edition) only

# Your Flexible Choice of Components

ZEN fits all your needs: depending on your microscope hardware the following ZEN packages are available.

| Product | Modules | ● Included in ZEN (blue edition) | ⬤ Included in ZEN (black edition) |
|---|---|---|---|
| | | ◉ Optional in ZEN (blue edition) | ◉ Optional in ZEN (black edition) |

**ZEN system**
Laser based **3D Imaging Systems**

Laser Control ⟩ Microscope Control ⟩ Detector Control* ⟩ ZEN system

| Measurement ● ⬤ | Image Analysis ● ⬤ | Advanced Processing & Analysis ◉ | Shuttle & Find ◉ ◉ | Confocal Topography ● | | |
|---|---|---|---|---|---|---|
| Deconvolution ◉ | Colocalisation ● ⬤ | 3Dxl Viewer ◉ | Spectral Unmixing ⬤ | Dynamics ◉ ◉ | FRAP Efficiency Analysis ◉ | FRET ◉ |
| Experiment Designer ◉ ◉ | Counting ⬤ | Macro Environment ◉ ◉ | ROI-HDR ◉ | Enhanced FCS ◉ | FCS for GaAsP and APD ◉ | Photon Count. Histogram ◉ | Image Correl. Spectro. RICS ◉ |
| Multi Channel ● ⬤ | Z Stack ● ⬤ | Time Lapse ● ⬤ | Tiles & Positions ◉ ◉ | Panorama ● | Autofocus ● ⬤ | Extended Focus ● ⬤ | Man. Ext. Focus ● |

**ZEN desk**
Offline tasks only

ZEN desk

| Measurement ● ⬤ | Image Analysis ● ⬤ | Advanced Processing & Analysis*** ◉ | Confocal Topography ● | |
|---|---|---|---|---|
| Deconvolution ◉ | Colocalisation ● ⬤ | 3Dxl Viewer ◉ ◉ | Spectral Unmixing ⬤ | Dynamics ◉ ◉ | FRAP Efficiency Analysis ◉ | FRET ◉ |
| Macro Environment ◉ ◉ | Enhanced FCS ◉ | FCS for GaAsP and APD ◉ | Photon Count. Histogram ◉ | Image Correl. Spectro. RICS ◉ |
| Tiles & Positions** ◉ | Extended Focus ● ⬤ | | | |

\*      Detectors from ZEISS (Axiocams, PMTs, etc.) included, 3rd party device control optionally available
\*\*    Only stitching and processing of existing data
\*\*\*  Requires "Image Analysis" to allow creation of Measurement Programs

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# Your Flexible Choice of Components

ZEN fits all your needs: depending on your microscope hardware the following ZEN packages are available.
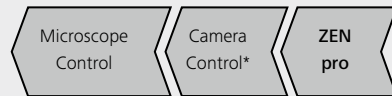
**Product**

**Modules**    ● Included in ZEN (blue edition)
               ◉ Optional in ZEN (blue edition)

**ZEN pro**
**Imaging Systems and Microscopes with Camera**

Microscope Control  〉 Camera Control*  〉 **ZEN pro**

| Measurement ● | Image Analysis ◉ | | Deconvolution ◉ | Colocalisation ◉ | 3Dxl Viewer ◉ | Experiment Designer ◉ | Advanced Processing & Analysis** ◉ |
|---|---|---|---|---|---|---|---|
| Multi Channel ● | Z Stack ◉ | Time Lapse ◉ | Tiles & Positions ◉ | Panorama ● | Autofocus ◉ | Extended Focus ◉ | Man. Ext. Focus ● |
| Macro Environment ◉ | Dynamics ◉ | | | | | | |

**ZEN lite**

Axiocam Control  〉 **ZEN lite**

| Measurement ◉ | Image Analysis ◉ |
|---|---|
| Multi Channel ◉ | Time Lapse ◉ | Panorama ● | Man. Ext. Focus ● |

\*     Axiocams included, other cameras optionally available
\*\*    Requires "Image Analysis" for creation of Measurement Programs

# Technical Specifications

Legend:
- ● Included in ZEN (blue edition)
- ◉ Optional in ZEN (blue edition)
- ● Included in ZEN (black edition)
- ◉ Optional in ZEN (black edition)

| Product / Option | | ZEN lite | ZEN desk | ZEN pro | ZEN system | ZEN desk | ZEN system |
|---|---|:---:|:---:|:---:|:---:|:---:|:---:|
| **Basis** | ZEN | ● | ● | ● | ● | ● | ● |
| **Tools** | Control of Axiocams | ● | | ● | ● | | ● |
| | PMT Control | | | | | | ● |
| | Other Cameras | | | ◉ | ◉ | | |
| | Laser- / Lasermodule-Control | | | | ● | | ● |
| | Microscope Control | | | ● | ● | | ● |
| | Basic 3D Deconvolution | | ● | ● | ● | | |
| | Macro Environment | | ◉ | ◉ | ◉ | ◉ | ◉ |
| **Acquisition** | Multi Channel | ◉ | | ● | ● | | ● |
| | Time Lapse | ◉ | | ◉ | ● | | ● |
| | Z Stack | | | ◉ | ● | | ● |
| | Manual Extended Focus | ● | | ● | ● | | |
| | Autofocus | | | ◉ | ● | | ● |
| | Tiles & Positions | | | ◉ | ◉ | ◉ * | ◉ |
| | Panorama | ● | | ● | ● | | |
| | Experiment Designer | | | ◉ | ◉ | ◉ | ◉ |
| | ROI-HDR | | | | | ◉ | ◉ |
| | Shuttle & Find | | | ◉ | ◉ | | ◉ |
| | Counting | | | | | ◉ | ◉ |
| **Processing** | Extended Focus | | ● | ◉ | ● | ● | ● |
| | Deconvolution | | ◉ | ◉ | ◉ | ◉ | ◉ |
| | 3Dxl Viewer, powered by arivis® | | ◉ | ◉ | ◉ | ◉ | ◉ |
| | Spectral Unmixing | | | | | ● | ● |
| | Colocalisation | | ◉ | ◉ | ● | ● | ● |

* Only stitching and processing of existing data

# Technical Specifications

● Included in ZEN (blue edition)
○ Optional in ZEN (blue edition)

● Included in ZEN (black edition)
○ Optional in ZEN (black edition)

| Product / Option | | ZEN lite | ZEN desk | ZEN pro | ZEN system | ZEN desk | ZEN system |
|---|---|---|---|---|---|---|---|
| **Tools** | Measurement | ○ | ● | ● | ● | ● | ● |
| | Image Analysis | ○ | ● | ○ | ● | ● | ● |
| | Advanced Processing & Analysis | | ○ | ○ | ○ | | |
| | FRAP Efficiency Analysis | | | | | ○ | ○ |
| | FRET | | | | | ○ | ○ |
| | Dynamics | | ○ | ○ | ○ | ○ | ○ |
| | Enhanced FCS | | | | | ○ | ○ |
| | FCS for GaAsP | | | | | ○ | ○ |
| | Photon Counting Histogram | | | | | ○ | ○ |
| | Image Correl. Spectro. RICS | | | | | ○ | ○ |
| | Confocal Topography | | ○ | | ○ | ○ | ○ |

# Count on Service in the True Sense of the Word

Because the ZEISS microscope system is one of your most important tools, we make sure it is always ready to perform. What's more, we'll see to it that you are employing all the options that get the best from your microscope. You can choose from a range of service products, each delivered by highly qualified ZEISS specialists who will support you long beyond the purchase of your system. Our aim is to enable you to experience those special moments that inspire your work.

**Repair. Maintain. Optimize.**

Attain maximum uptime with your microscope. A ZEISS Protect Service Agreement lets you budget for operating costs, all the while reducing costly downtime and achieving the best results through the improved performance of your system. Choose from service agreements designed to give you a range of options and control levels. We'll work with you to select the service program that addresses your system needs and usage requirements, in line with your organization's standard practices.

Our service on-demand also brings you distinct advantages. ZEISS service staff will analyze issues at hand and resolve them – whether using remote maintenance software or working on site.

**Enhance Your Microscope System.**

Your ZEISS microscope system is designed for a variety of updates: open interfaces allow you to maintain a high technological level at all times. As a result you'll work more efficiently now, while extending the productive lifetime of your microscope as new update possibilities come on stream.
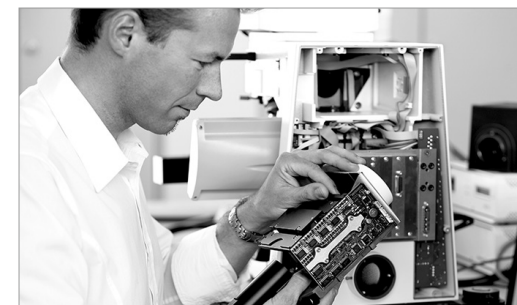
*Profit from the optimized performance of your microscope system with services from ZEISS – now and for years to come.*

**>> www.zeiss.com/microservice**

CTK

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