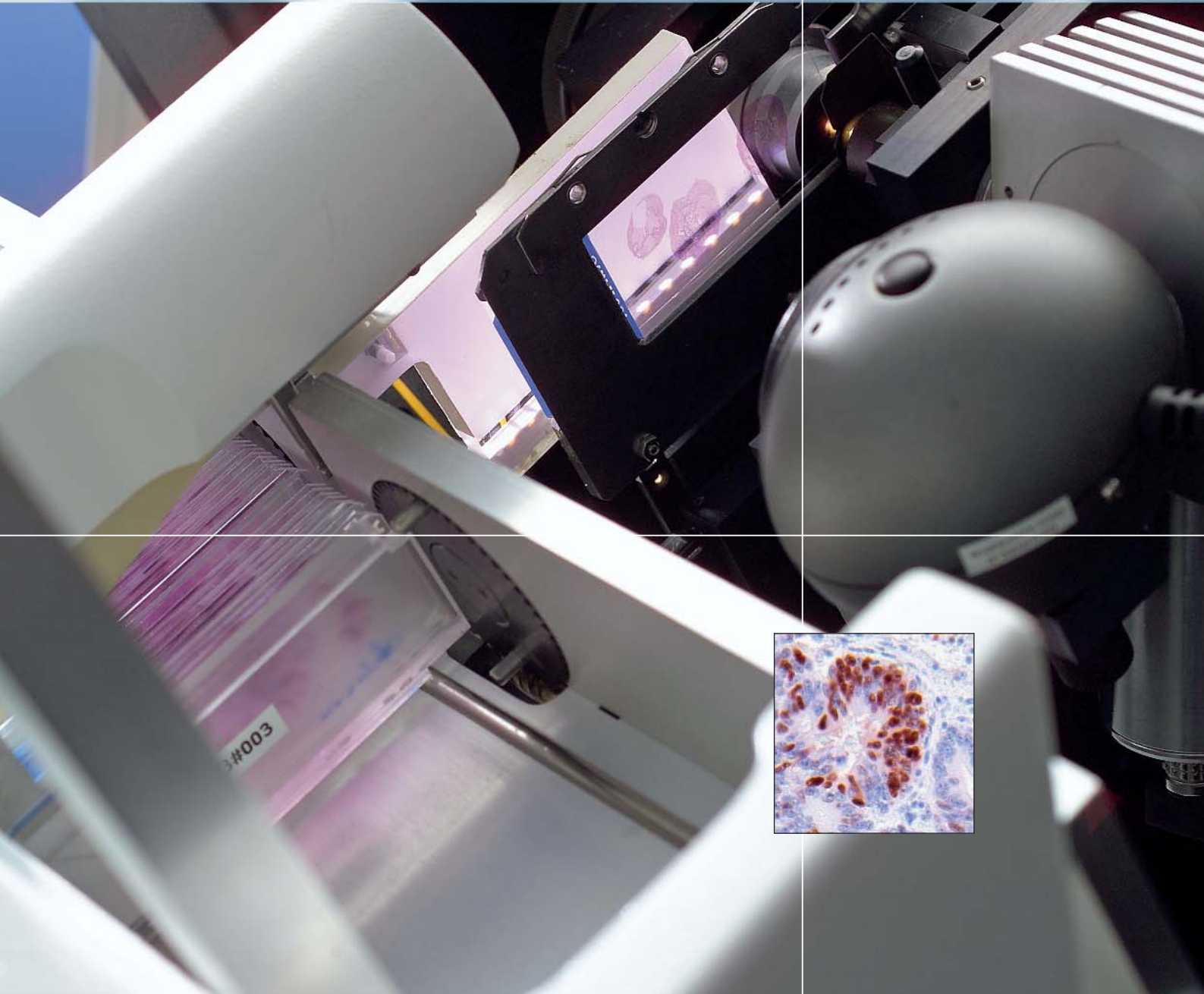


# MIRAX SCAN

The new way of  
looking at pathology



**Greater reliability. Greater efficiency.**  
**Virtual microscopy for research & analysis.**



We make it visible.

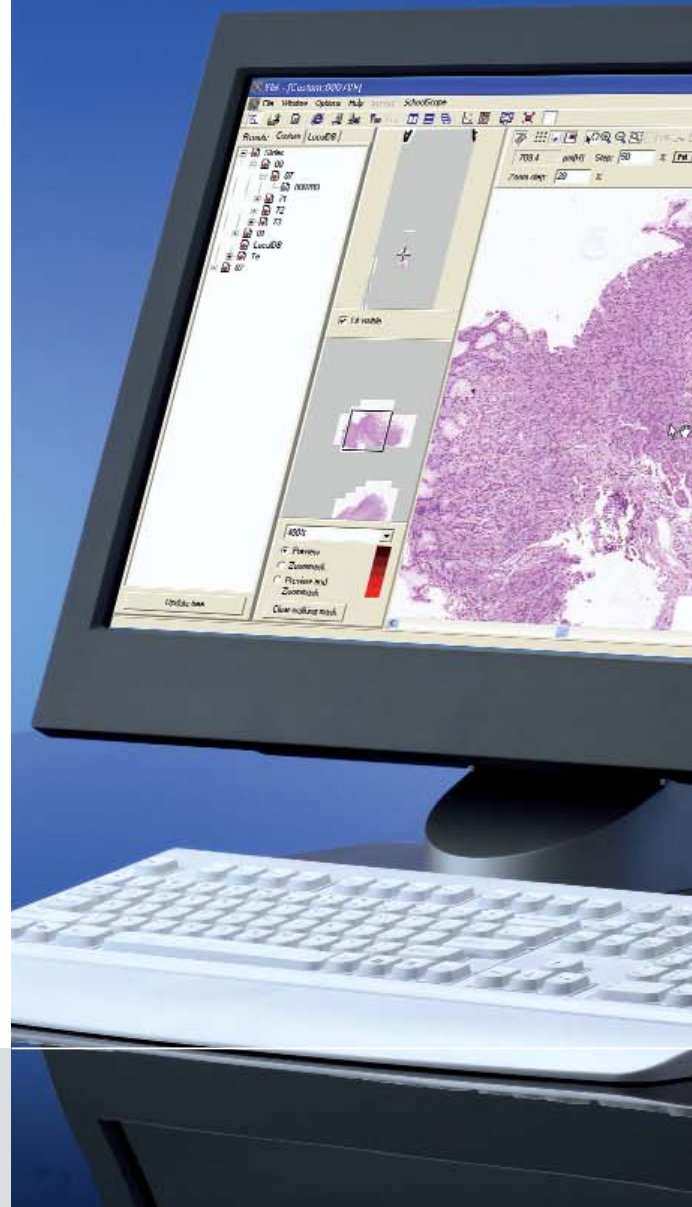
# Better. More efficient. Quality as the basis for success.

Pathologists are facing increasing demands for better quality and improved efficiency, no matter whether you work in laboratories at research service providers or in pharmaceutical companies. Today, a host of external factors impact on work processes in pathology; competition among institutions is strong. In pharmaceutical research, the requirements imposed by health authorities are becoming more stringent all the time, and laboratory standards more demanding. Added to this is the growing volume of work. High throughput is commonplace. Time is tight and former technology offers little relief.

With MIRAX SCAN, Carl Zeiss is presenting a fully automated system solution for digital pathology. MIRAX SCAN produces high-resolution digital data records for the entire sample, known as Virtual Slides, thereby improving your workflow with respect to quality and efficiency.

- State-of-the-art technology allows automated scanning in batch mode of up to 300 samples
- Spatial and temporal independence for your work through remote access to the digital data
- Ability to share your results quickly with your colleagues

Carl Zeiss offers the integrated system solution for digital pathology that allows you concentrating on the most important aspect: high quality evaluation with reduced efforts. Your best choice, MIRAX SCAN. The global solution from Carl Zeiss.



# MIRAX SCAN



# Available any time: Your samples become Virtual Slides

MIRAX SCAN is the system solution for digital pathology. It consists of a scanner, a high-resolution monitor, a high power PC and efficient software. The heart of MIRAX SCAN is the scanner, turning the specimen into Virtual Slides. Any time, from any place. And in brilliant quality, with the same optical resolution like with a standard microscope. The Virtual Slide will revolutionize your workflow.

## Greater flexibility

Viewing takes place directly on the screen. This can be in an entirely different location to the scanner. Data and results are communicated directly via internal networks or over the Internet. A big plus for quick communication.

## Greater comfort

Whole sections can be viewed. Several samples can be viewed simultaneously. Current and earlier sections can be compared directly and quickly. It is also possible to track the evaluation path on the section. And, this can be reviewed at any time.

## Short access times

All archive data can be accessed directly online on the network. This saves you time while you are viewing slides and when comparing different samples.

## Store and share

A big advantage of Virtual Slides: immunohistologic specimens are digitized before the samples bleach out. This allows to keep the same image quality over time. The Virtual Slide concludes the automated process from biopsy to digital archiving. This allows integrating pathology images into electronic laboratory information systems – an enabling step towards workflow automation in pathology.

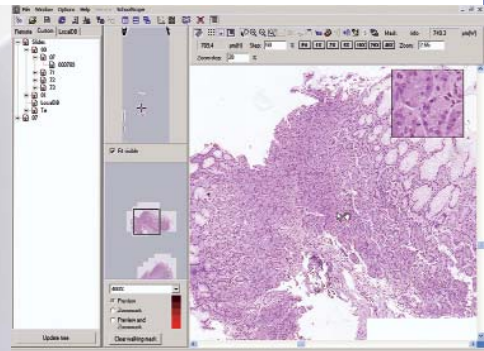
**Start MIRAX SCAN**



**Insert magazine and scanning**



**View slides on the screen**



# Virtual Slide

## Highest image quality, shortest scanning time: Up to 300 samples automatically

As soon as the sample sections are available, MIRAX SCAN performs routine steps for you. It generates Virtual Slides automatically in a cycle of up to 300 specimens. Continuously, even through the night. Highest performance optics from Carl Zeiss deliver excellent results: you can see your pathology on a high resolution monitor comfortably sitting at your desk – down to the details previously only visible under a standard microscope.

### Load and go

Simply insert a magazine with slides and select the samples to scan. For optimum results, samples similar in terms of staining technique and structure can be grouped into batches. The magazine

is then positioned automatically until the first sample is loaded. The sample area for scanning is determined automatically.

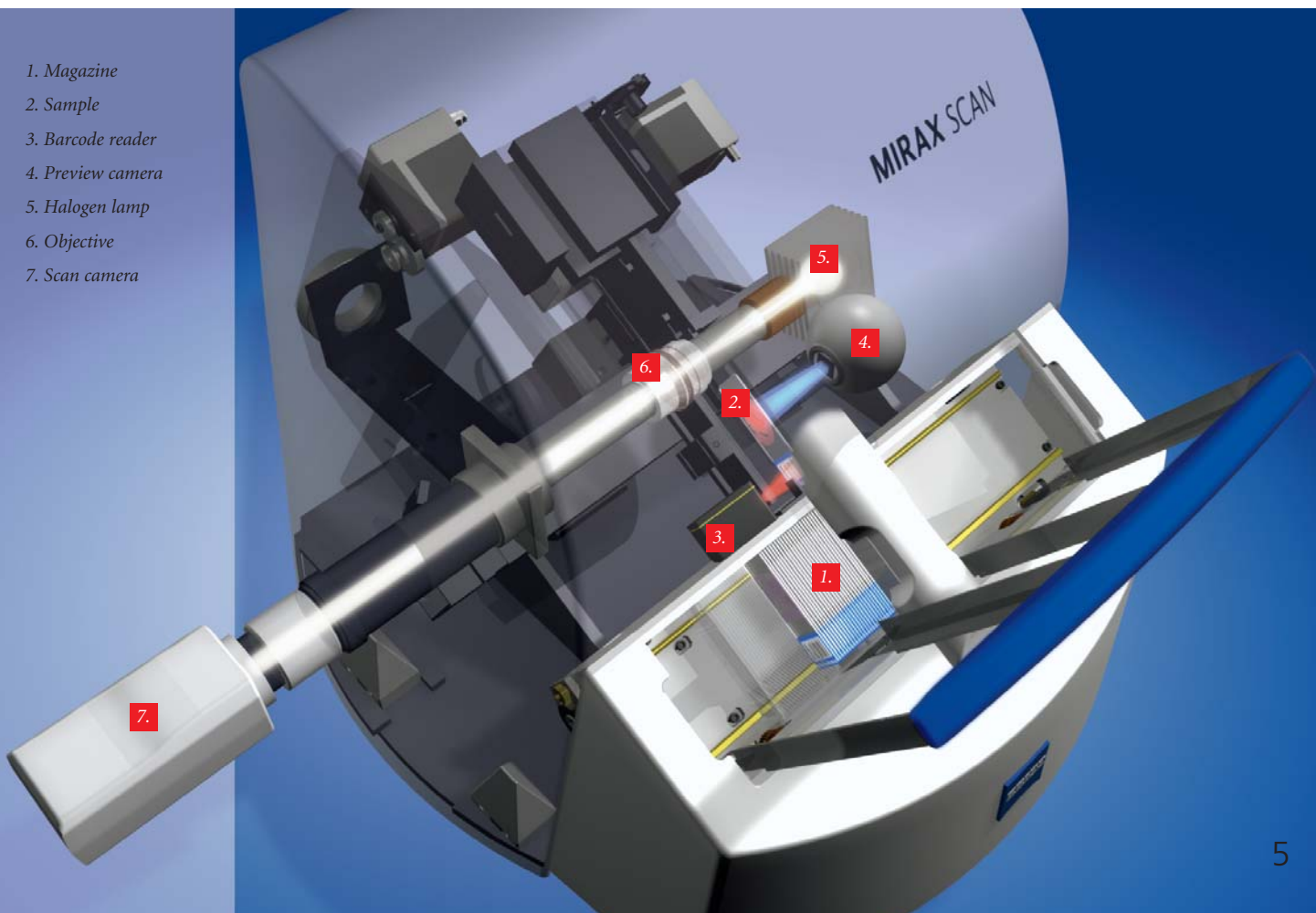
### Barcodes? Sure!

MIRAX SCAN can read barcodes in fully automatic mode. MIRAX SCAN reads 1D and 2D barcodes which helps preventing mistakes in sample allocation.

### From Specimen to Virtual Slide

The MIRAX SCAN software allows tracking the area that is being scanned on the monitor. Depending on the size of the specimen, scanning takes between 1 and 20 minutes.

1. Magazine
2. Sample
3. Barcode reader
4. Preview camera
5. Halogen lamp
6. Objective
7. Scan camera

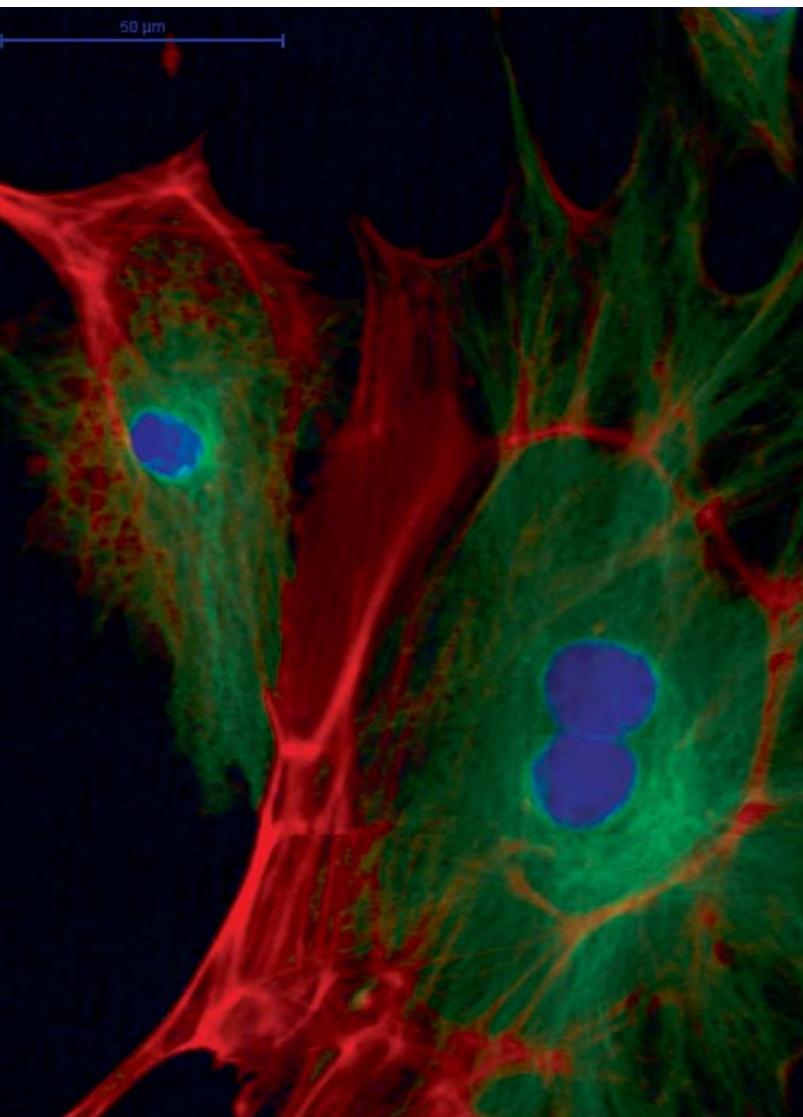


## Virtual Slides in multiple dimensions - Fluorescence scanning

Fluorescence labeling is widely used in research applications. It becomes more and more popular in routine, too. The advantage of fluorescent labels over color stains is their specificity, and the option to detect multiple markers in a single preparation. Uniquely, the MIRAX SCAN can be upgraded with a fluorescence module turning it into a high throughput automated fluorescence slide scanner. The hardware comprises a 10 position filter wheel and a fibre-coupled fluorescence illumination system with a lamp lifetime of over 1,500 hours. Lamp exchange can be done easily without any additional alignment.

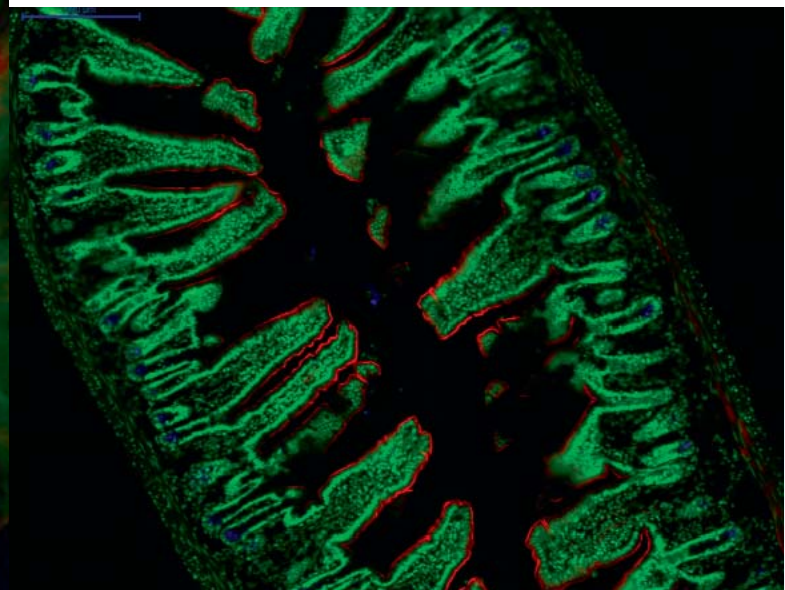
MIRAX SCAN uses the ZEISS fluorescent filter sets contained in filter cubes that can be exchanged by a single push and click movement. You can choose between an automated mode and a user-pre defined value mode for slide scanning. In the automated mode the scanner determines the focus values and the exposure times automatically.

The results can be displayed with the MIRAX Viewer software in the same manner as with brightfield images with all options for viewing and sharing the images.



*BPAE cells , stain: Texas Red, BODIPY green, DAPI  
Application: Research.*

*16 µm thick cryostat section  
Organ sample: mouse intestine, stain: Alexa Fluor 350, Sytox Green,  
blue fluorescent lectin  
Application: Research.*



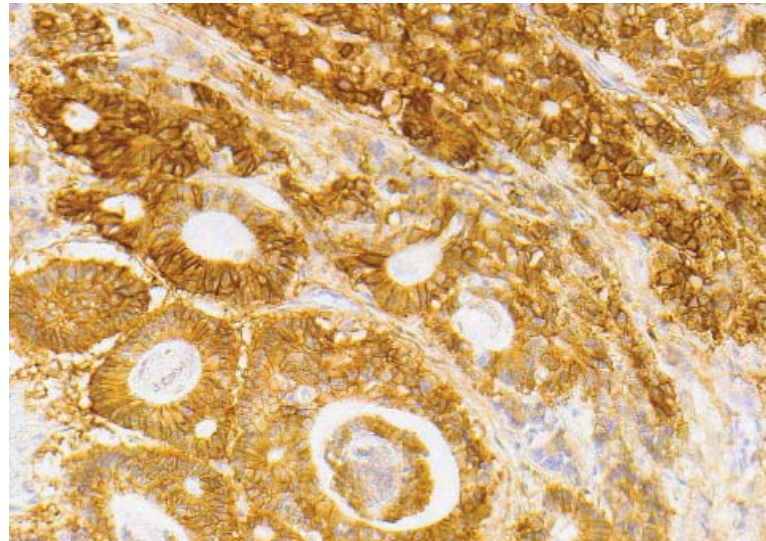
# Applications

## For routine research applications

MIRAX SCAN is very useful for standard sections and also for:

- very large samples, which can be viewed with ease on the large screen
- fast degrading samples (common in immunohistology, for example) bleach out on glass after only a few months. They can be archived as a file without limitation
- serial sections, which can be evaluated on the screen in parallel side by side.

MIRAX SCAN also processes thick sections in a large variety of staining and embedding techniques. These can be inserted on slides with glass or plastic cover slips.



6 µm thick paraffin section

Organ sample: Colon tumor (human), stain: Pharm-DX EGFR IHC

Application: Pharma research. EGFR-stained section of a colorectal tumor.

The central region of the tumor shows clearly visible membrane marking.

The application images on the right have been produced at the Central Hospital of the Ministry of the Interior, pathological department, Hungary, and at HistoGeneX in Belgium using MIRAX SCAN. They are printed by kind permission of P. Gombas, L. Andries and M. Kockx.

TMA example courtesy of Dr Isabel Garcia de la Fuente

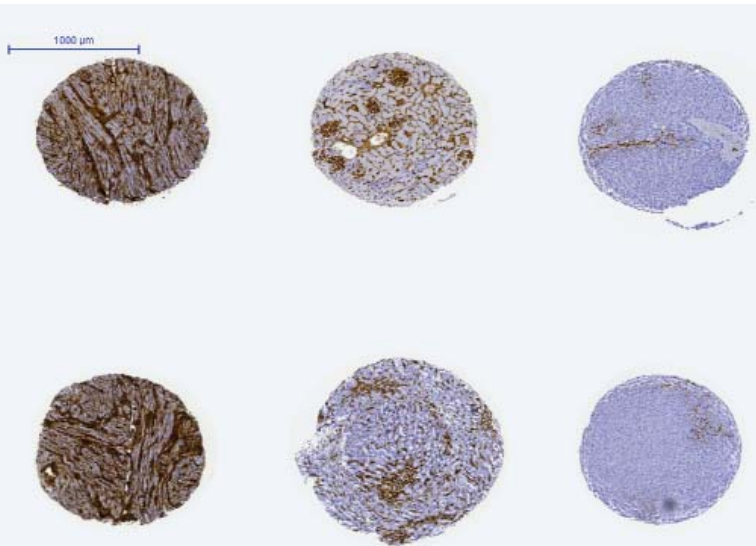
Institut de Recherche en Immunologie et en Cancérologie, Université de Montréal

DAB immunohistochemical staining of human cancer tissues.

10 µm thick paraffin section

Sample: human cancer tissues, stain: DAB

Application: Cancer research.

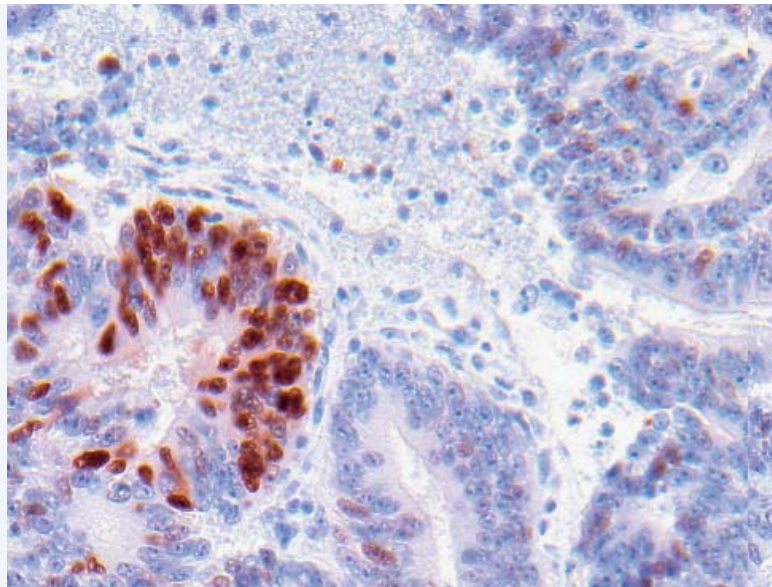


6 µm thick paraffin section

Organ sample: Colon tumor (human), stain: P53

Application: Cancer research.

Nuclear P53 marking in a cell cluster of a colon tumor.



## Intelligent and extendable - Applications driven software

Carl Zeiss offers several software modules. With MIRAX SCAN Control Software you direct the mode of operation and basic settings for scanning. MIRAX Viewer is the platform for work with the Virtual Slides: select the file, choose frame and magnification etc., mark and annotate your findings even while a scan process is running in parallel.

Additionally, optional modules of MIRAX Viewer are

- Teleconsulting for teleconsultations with colleagues or partners via IT networks
- TMA annotation for the processing of scanned tissue micro arrays

### MIRAX SCAN Control Software

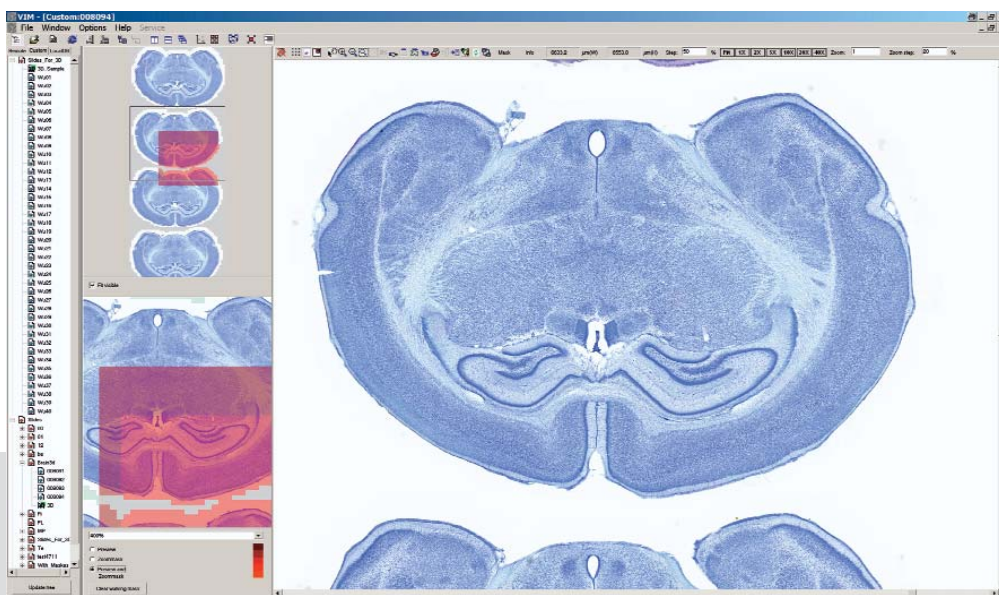
controls automatic operation of MIRAX SCAN. Decide which glass slides to be scanned scanned and turned into the Virtual Slides. Tune scanning parameters, such as the threshold value for the overview camera and fine and coarse focus controls for optimum results.

### Microscopy on screen

#### MIRAX Viewer

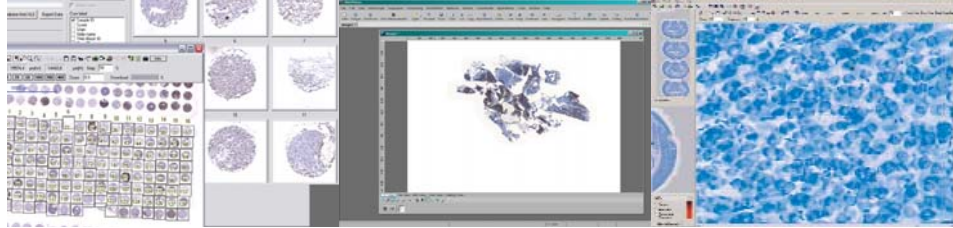
is the software you use to display the Virtual Slides individually or in groups. Thumbnail views enable better overview and easier navigation. Optionally an overlay mask shows areas have already been displayed. When viewing several samples simultaneously you have the option of viewing and moving images in parallel side by side, enabling you to view and evaluate the same region on several sections. The high resolution display monitor gives you a brilliant image that can be magnified digital uncovering the finest details. Zooming in and out with ease you never lose the overview.

### MIRAX Viewer



### Control Software





MIRAX Image exported to AxioVision

MIRAX Viewer Module TMA

MIRAX Viewer

## Optional modules for MIRAX Viewer

### Teleconsulting

#### Discuss with colleagues

With this module you can perform teleconsultations with colleagues or partners. It enables two or more researchers to share a Virtual Slide together using the standard TCP/IP protocol.

### Tissue Microarray (TMA)

#### High throughput histology

Tissue Microarrays (TMA) consists of paraffin blocks in which tens or even hundreds of cylindrical specimens (tissue cores) are assembled in array fashion. It enables high throughput microscopic studies on multiple tissue specimens – with less sample material and less reagent material – simply more efficient.

#### The TMA software module works with MIRAX Viewer.

It comprises

- an automated core finding procedure
- a gallery for arranging cores according to selectable criteria
- a configurable annotation tool
- Import and export of tissue information via Microsoft® Excel® tables

## Connectivity

### Options for sharing data

Images can be stored in compressed or uncompressed format. They can be linked to information management systems, or exported in standard formats. You will find import functions for Zeiss' renowned AxioVision image analysis software which provides a seamless import of Virtual Slides for further processing.

#### • Greater memory requirement

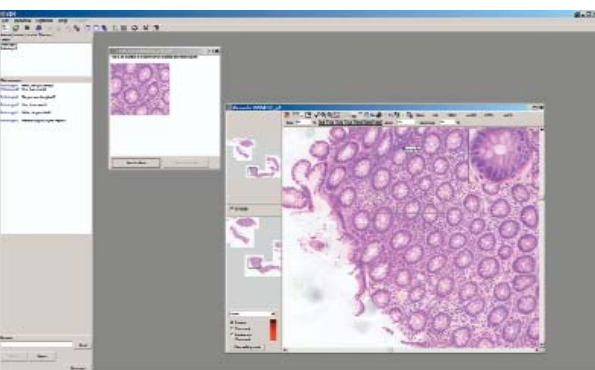
The amount of data that the specimens hold varies, according to size, between 100 MB and approx. 2 GB. Storage space is in demand.

#### • Individual IT solutions

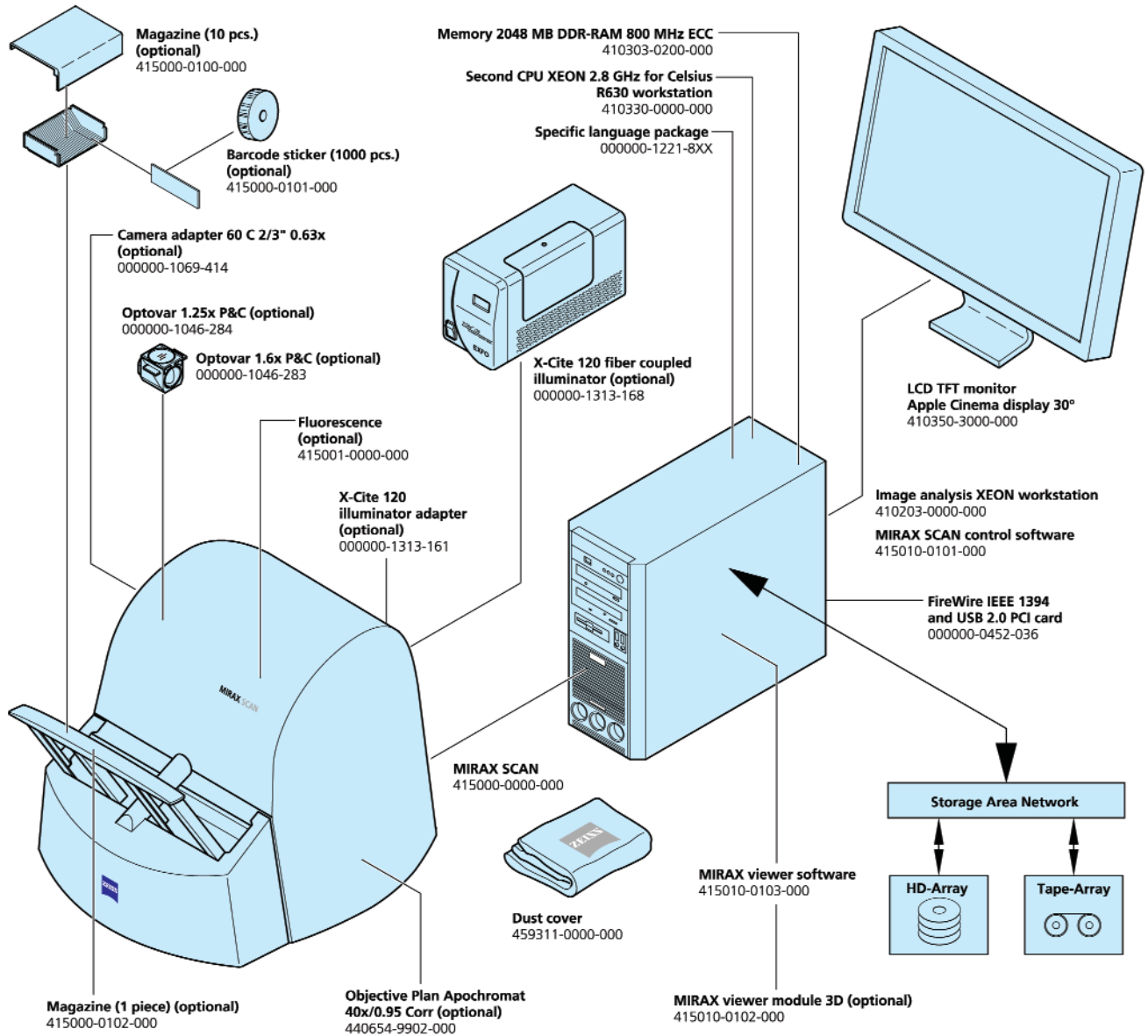
Scalable, transparent storage solutions consisting of hard disks and tape streamers are offered. Even large volumes of data remain immediately available at any time. All data, e.g. from the last half year can be accessed within milliseconds on the hard disk. Older archive data can be loaded from tape streamers into the MIRAX Viewer within a matter of seconds. Remote servers on local and wide area networks allow access to archived data as well.

Today there are several options of integrating your imaging equipment into the IT infrastructure. MIRAX follows international standards to ensure flexibility.

## Module Teleconsulting



## SINGLE USER SOLUTION



### Technical data\*

#### MIRAX SCAN

Dimensions: 29.2 x 17.8 x 20.9 " (width x height x depth)  
Weight: 55.2 lb  
Power: 50 W

#### Special monitor

LCD TFT color monitor  
Large screen (30" or better)

#### Image digitization

- 1/3-inch progressive scan IT CCD
- Pixel resolution with 20x objective: 0.23  $\mu$  with 1x adapter

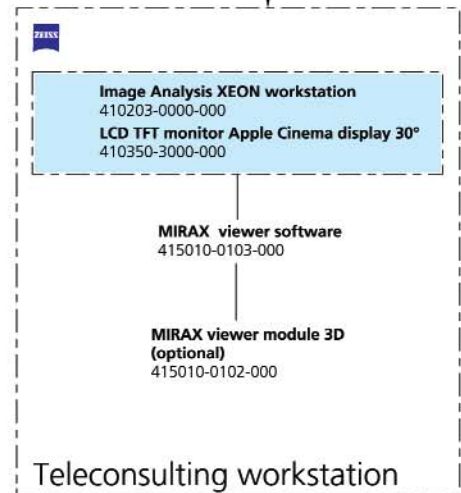
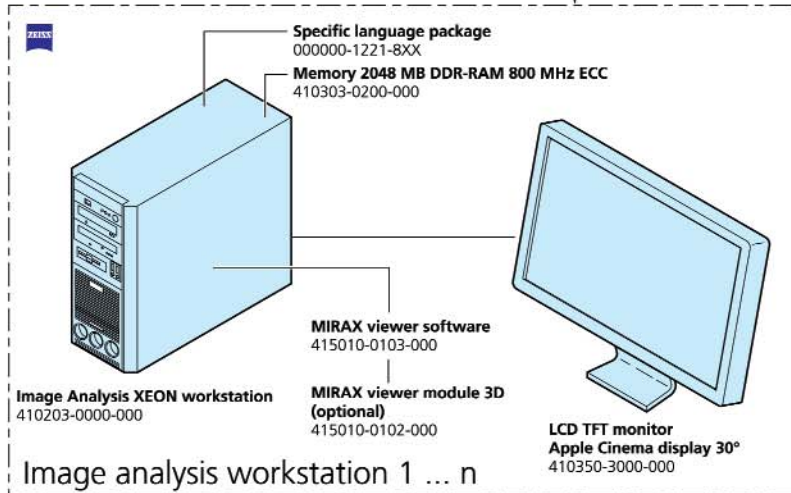
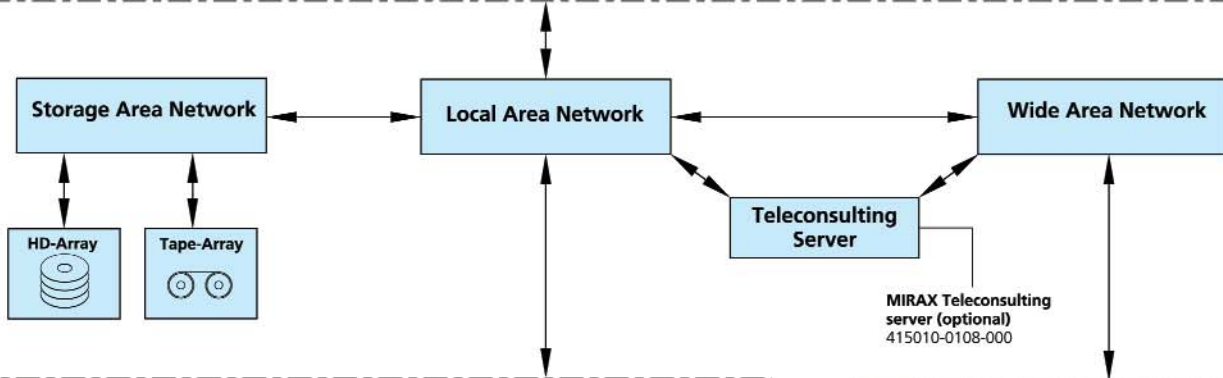
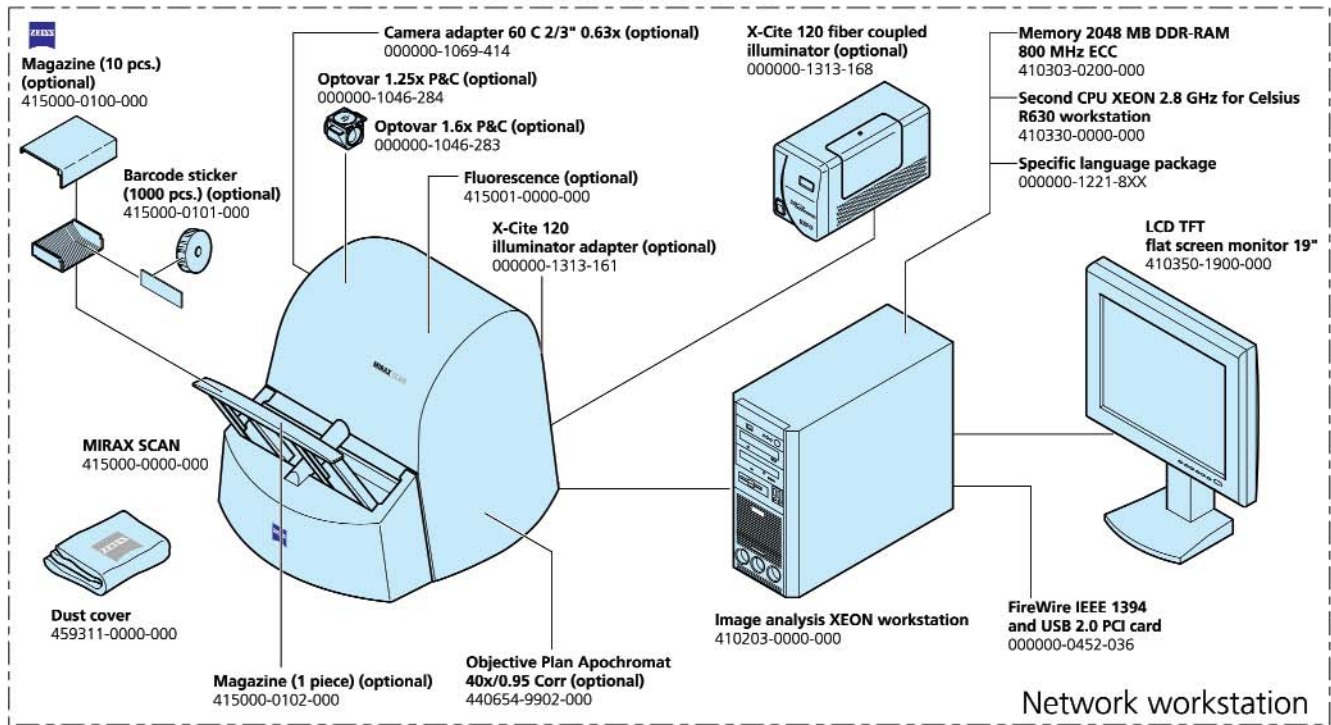
#### Dual processor PC

XEON 2.8 GHz dual processor workstation or better  
Memory: ample RAM and hard disk space

\*Subject to changes

# System Overview

## NETWORK SOLUTION



# All the benefits at a glance

# MIRAX SCAN

<b>Automation</b>	Automatic scanning and digitization of up to 300 slides
<b>Precision</b>	High performance optics and reliable mechanics from Carl Zeiss
<b>Image quality</b>	Same resolution as on a microscope, presented on high resolution flat screen
<b>Evaluation</b>	Parallel evaluation of current samples and comparison with archive images
<b>Communication</b>	Quick, location-independent exchange of digital data worldwide
<b>Long-term archiving</b>	Medium-term conversion of slide stores into purely digital data storage
<b>Quality improvement</b>	Further increase in reliability of findings due to quick receipt of expert opinions
<b>Investment reliability</b>	Carl Zeiss and partners for microscopy and digital archiving – worldwide

**Carl Zeiss**  
Light Microscopy

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