

Automated Fluorescence Microscope





For customized projects please contact us : info@simscop.com



Founded in Singapore in 2019, SIMSCOP Instruments has an excellent R&D team. The core members have decades of experience in optical technology and industry. They focus on the innovation and application of microscopy technology and have worked with Nanyang Technological University (NTU), National University of Singapore (NUS) and A-Star to jointly develop high-end microscopy systems. Our goal is to further promote the development of high-end microscopes and provide advanced microscopy solutions for users in life sciences, materials science, biomedicine and industry.



Line scan Confocal

Microscope

Spinning disk confocal microscope

Point scan confocal microscope **SIMSCOP Series Products**

Microscope Type	Spatial resolution nm	Vertical Depth µm	Speed fps	Laser nm	detector	Translation Stage	Pixel
Point scan confocal	~230	100	8fps 512 x 512 pixels	405 488 561 640	SiPM	Manual \ motorized XYZ	2048 x 2048
Line Scan Confocal Industry	~230	100	20fps 1024 x 1024 pixels	405	CCD	Manual \ motorized XYZ	1024 y 1024
Line Scan Confocal Research	150-200	600	50fps 1024 x 1024 pixels	405 488 561 640	sCMOS	motorized XYZ	1024 X 1024
Spinning disk confocal	~230	< 200	>100fps	405 488 561 640	sCMOS	motorized XYZ	2048 x 2048
Raman / Fluorescence -PL Confocal	> 200	< 100	10	532 785 1064	CMOS/ Spectrometer	motorized XY	1340 x 1340
Automated fluorescence	~230	50	>100fps	Three-channel LED	sCMOS	motorized XYZ	2048*2048
SIM	~100	50	13	400 - 750	sCMOS	motorized XYZ	1024 x 1024
Microscope Solutions	SIMSCOP In refer to the re	struments levant pag	provides a variety of higl es	h-end microscope solu	utions for industry	y and scientific resea	rch. Please

Note : Laser wavelengths available: 375nm/445nm/473nm/515nm/525nm/532nm/633nm/660nm/685nm/785nm/808nm

Product Introduction

The Automated fluorescence microscope provides higher precision and functionality than ordinary microscopes by integrating advanced motion control and automation technologies. It is suitable for high-end research laboratories and fields that require high-precision operations, such as nanotechnology, microscopic material research, etc.





Up-Auto-FM



Features and Benefits

- High-precision control : The Automated fluorescence microscope provides nanometer-level motion accuracy, including translation, rotation, and height adjustment.
- Automated : The system supports automated sample processing and data acquisition, including autofocus, autoscan, automatic objective lens switching and image stitching.
- **High stability:** The control system of the Automated fluorescence microscope is designed for high stability, which reduces vibration and error during movement and ensures image quality.
- Real-time Control : Provides real-time motion control and feedback,

In-Auto-FM

Application Areas

- Biomedical research
- Materials Science
- Semiconductors and microelectronics
- Nanotechnology
- Drug development

- allowing users to instantly adjust sample position and imaging conditions .
- Easy integration : The Automated fluorescence microscopy system can be seamlessly integrated with a variety of microscopes and imaging techniques (such as confocal microscopy .
- Flexibility- Four upgrade options are available: Automated Raman confocal microscope, Automated point / line scanning confocal microscope, and Automated spinning disk confocal microscope.



Automated upright fluorescence microscope





Automated inverted fluorescence microscope





Product Features

SIMSCOP Automated fluorescence microscope

Automated fluorescence module

Illuminator

- 3-channel LED (UV, blue, green)
- 3-channel LED (UV, white, red)
- 3mm light guide coupler

camera

- 12-megapixel global shutter CMOS
- 4-megapixel sCMOS
- Your choice of camera & confocal module

Tunbe lens & camera mount

- C-Mount
- F-Mount
- SM1 Thread
- Dual camera mount

Lighting and filtering module

• 3-channel LED epi-illuminator with two wavelength options

Objective mount

- Motorized 4-lens objective wheel
- Single objective quick change bracket

Secondary Infinity Port

(Optional)

Filter & Dichroic Set

- Motorized 6- Filter Cube Turret
- Fixed Single Filter Cube





covering a wide range of popular fluorophores

- Transmitted illuminator for brightfield and phase contrast imaging
- 3mm liquid light guide coupler supporting external laser and LED light engines
- Motorized six filter cube turret for versatility or single filter cube core for simplicity
- Filter wheel integration for additional flexibility and ultra-fast filter switching

Easy to integrate modules

- Additional port for easily adding lasers or spectrometers into the infinite optical path
- Simultaneous multi-channel imaging with available dual camera mount
- Rapid, accurate and repeatable focus from integrated high-speed focus drive
- Simplified sample loading with long travel objective lens retraction
- Motorized 4-position objective changer module

SIMSCOP Automated fluorescence microscope

Automated and high precision





Objective Turret

Motorized stage

• Type 1 :



- 50 mm up to 305 mm travel per axis
- Up to 12 µm accuracy; 2 µm repeatability; 85 mm/s speed
- Easily adjustable non-contact hall sensor limit switches
- Designed for use with an X-MCC2 Series stepper motor controller or any 2-phase stepper motor controller



- 130 x 100 mm or 250 x 100 mm travel options
- 1 nm resolution linear encoders provide 5 µm accuracy, 500 nm repeatability, and 50 nm minimum incremental move
- Ultra quiet linear motors provide 750 mm/s top speed and are maintenance free
- A microscopy platform module

	Sp	pecification	
Illuminator	There a Choice A Choice B - 38	are two wavelength options: A - 385 nm, 473 nm, 568 nm 85 nm , White Light (3000K) ,	625 nm
Field of view	Max diameter 25mn PlanApoch PlanApoch Plan Apoch Plan Apoch Plan Apoch	n PlanApochromat 4x - 2.7mr romat 10x - 1.20mm x 1.20m romat 20x - 0.67mm x 0.67m romat 40x - 0.33mm x 0.33m hromat 60x - 220µm x 220µm nromat 100x - 130µm x 130µr	ท x 2.7mm m m ก า
Detector	95 Pixel: 6.5µm x 6.5µ 13.3m Noise : 0. Compatible v	5%@600nm Peak QE Im Pixel Size , 2048 x 2048 R Im*13.3mm effective Area 2e- , Full-well Capacity 45ke- with water cooling and air coo	Resolution oling
Filter Cube Turret	Nu Filter o Filter cu	umber of filter cubes: 6 cube change time: 350ms be type: Zeiss Push & Click	
XY Stage Comparison	Drive Minimum incremental move XY Stage Repeatability Travel range 384- well scan time* 96- well scan time* Lifetime	Type 1 Stepper Motor < 0.45μm	Type 2 Linear Motors < 50 nm
Z- axis	Accuracy (unidire maximum stroke	ctional) 1.5um, repeatability < e 25mm , maximum speed 80	< 0.2µm, 00mm/s
Objective Turret	4 -position	objective lens motorized turre	ət
Focusing stage	Focus Sta Focus Stage N Focus Stage F	age Encoder Resolution 1nm /inimum Incremental Move 20 Repeatability repeatability < 0	0 nm .2μm
Filter Wheel	Adjacent	Optic Switching Time 37 ms	
Transparent Illumination System	Warm light LED LED kn Condenser: ultra-long working distar three-ho	, continuously adjustable brig ob-type brightness adjuster nce 72mm , numerical apertur ole phase contrast ring plate	htness, re NA=0.30 , equipped with
Software Features	Multicolor fluorescence localization stitching , image analysis , im	on processing, Z-stack data p naging data management , 3D	processing , large image D imaging rendering

* Fastest time to scan a single plate, pausing for 25 μs at each well to simulate single channel image acquisition. Full scan times will vary depending on imaging requirements.

Professional Software

UI Design

SIMSCOP Automated fluorescence microscope software interface





Function panel

激光通道			坐标
DAPI-405nm	1		54093

坐标 "	n (T)	
54093.99	56572.56	19791.0
X坐标	Y坐标	Z坐标
100.0	1.00	
XY步进	Z步进	
2 🔻	2 - 5	Z
物镜转轮	滤光片转轮	
自动对焦	复位	

		坐标	um	
扫描	存储图片	54093.99	9 56572.56	19791.0
50.00	自动曝光(ms)	X坐标	Y坐标	Z坐标
		100.0	1.00	
	2048x2048(Normal)	XY步进	Z步进	
	□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□	. 2 · ·	2 🔻 🖌	Z
	模式	物镜转轮	滤光片转轮	
	None	自动对焦	复位	
物镜组合	10x 70.25	4Dx 70.65	60x /1.10	100*
物镜组合 //0.13 对焦设置	10x /0.25	40x 70.65	60× /1.10	100*
物镜组合 /0.13 対焦设置 FirstCount	10x 10.25 20x 10.45 SeccondCount Cro	+Dx 70.65	60× /1.10	100× /1.40



LED

XYZ motorized stage settings

image acquisition settings



Multi-channel acquisition panel

Introduction of SIMSCOP Automated fluorescence microscope software

Automated fluorescence microscope software is an application developed for the fully automated fluorescence microscope system. The system integrates hardware components such as the motorized objective wheel, LED light, camera, and fully automated motor stage to achieve high-resolution 3D sample imaging and precise focal plane acquisition. The software allows users to perform fast, efficient, and non-invasive 3D imaging and positioning of samples, which is suitable for various research fields.

Key Features

- 1. Fluorescence imaging: By controlling the LED light source and camera, high-quality imaging is achieved to obtain the three-dimensional structural information of the sample.
- 2. Image acquisition: supports high-speed image acquisition, supports large-image stitching, and captures changes in dynamic processes.
- 3. Image processing: Provide image processing functions such as denoising, enhancement, pseudo color, etc. to optimize image quality.
- 4. Three-dimensional reconstruction: Reconstruction and visualization of three-dimensional sample structure is achieved through multi-level imaging data.
- 5. Real-time preview: allows users to observe sample imaging in real time, adjust parameters and obtain results in a timely manner.
- 6. Data storage and export: Supports storage of collected images and data, and exporting them into common image formats and data formats.



Large imaging stitching example

Advanced Upgrade Option

Automated Inverted Raman and Confocal Microscopes

Combining the fully automated microscope system with confocal microscopy technology can achieve more accurate and feature-rich microscopic observations. Combining the advantages of these two can achieve significant improvements in many aspects.

Automated inverted Raman confocal microscope



Product advantages:

- Optimized for biological users with multiple fluorescence channels
- Can be connected to multi-channel laser light source or imaging camera
- Users can use multiple cameras for fluorescence imaging acquisition and image integration
- Single-point spectra/Raman signals can be collected while collecting fluorescence images
- Users can freely add multiple modules

application

- Biology and Life Sciences
- Materials Science
- Graphene and carbon nanotubes
- Nanomaterials
- catalyst
- semiconductor
- Pharmaceutical Quality

Control

Automated inverted spinning disk confocal microscope



Product advantages

- Compatible with any upright or inverted microscope with a camera port.
- With the perfect match with pinhole size and high light throughput, the SpinDisk Basic can be coupled with LED and LASER light source.
- Custom-designed lenses are optimized to perform with a wide range of wavelengths from UV to near NIR to use a large variety of fluorophores

Automated inverted spot / line scan confocal microscope



Point Scan products

- Multi-channel imaging
- Higher acquisition speed (8FPS)
- Flexible choice of lasers and

detectors

Suitable for SIPM and PMT detectors

Line Scan Products

- High-speed acquisition (50fps@1024x1000 pixels) •
- Multicolor fluorescence (up to 4 channels) •
- Deep imaging module (maximum depth: 600µm)
- High sensitivity
 - Large field of view (60X: 0.36mm, 40X: 0.54mm)

Automated fluorescence microscopy for sample scanning



BPAE cell scanning. Zeiss 10x EC Epiplan, 50mm/s, analog gain 8x, illumination @ 385nm



Microfluidic droplet generator. Zeiss 5x N-Achroplan , scan time 1.5s

Example of large image stitching using Automated fluorescence microscopy



Auto-FM -20X -0.5NA-405/488/525- Multi-color fusion and large image stitching of mouse intestinal tissue embedded slice samples - the full image size is 1.8mmX1.25mm and is stitched from 56 partial images

Combining artificial intelligence and automated fluorescence microscopy

Artificial intelligence and automated widefield fluorescence microscopy are a powerful combination. Together, these technologies form a feedback loop where AI image enhancement reveals more meaningful information from widefield images, eliminating the need for traditional super-resolution imaging systems, while automated image acquisition makes it possible to train and deploy AIbased image analysis models.

Combined advantages:

- Super-resolution imaging ٠
- AI Image Enhancement •
- Maximizing throughput •
- Achieving consistency ۲
- Maximize versatility ullet



The AI-enhanced image on the right shows enhanced detail and resolution, as well as reduced noise





SIMSCOP Automated fluorescence microscope supports near-infrared and ultraviolet imaging

Simscop's Automated fluorescence microscope can easily support infrared and ultraviolet imaging by providing specific objective lenses and cameras upon request . It is suitable for biomedical and semiconductor microelectronics inspection and research fields.



Left: Biomedicine

Right: Semiconductors and microelectronics