



MP-series – Multi-photon Microscope

Turn-key, Flexible, Multimodal, Compact

The MP-series multi-photon multimodal imaging platform is based on a modular concept. We offer three standard models where each can be upgraded with various options and accessories, to completely maximize the utility.

This offers every user the unique flexibility to design a multi-photon microscope tailored to their specific need and budget.

	MP-1040	MP-920F	MP-Tune
Fixed wavelength: 1040 nm	✓	✓	✓
Fixed 2 nd wavelength: 920 nm (others upon request)	Optional	✓	X
Tunable 2 nd wavelength: 740 - 1250 nm	X	X	✓
Resonant - galvo-galvo scanning module	Optional	Optional	Optional
Single-photon fluorescence modality	Optional	Optional	Optional
Brightfield Epi-modality	Optional	Optional	Optional

Basic Versions MP-series

Laser source: Built-in femtosecond laser	MP-1040	MP-920F	MP-Tune
Fixed wavelength: 1040 nm All parameters @sample: 80 MHz (40 MHz*), >600 mW, <130 fs (using Nikon 16x objective)	✓	✓	✓
Fixed 2nd wavelength: 920 nm All parameters @sample: 80 MHz, >200 mW@920 nm & >500 mW @1040 nm, <130 fs (using Nikon 16x objective)	X	✓	X
Tunable 2nd wavelength: 740 - 1250 nm 80 MHz, >200 mW / output, <150 fs @sample (using Nikon 16x objective)	X	X	✓

MPI Signal Detection	
Epi-detection	Two ultrasensitive GaAsP PMTs, non-cooled, spectral response 380 nm - 720 nm, dark count rate <5000/s included. (up to 4 PMTs optional)*
Collection Optics	12° collection angle
Transimpedance amplifiers (TIA)	Filter bandwidth & gain separately configured and controlled through software.

Controller	
Umbilical	Non-detachable umbilical between controller and scanhead, >2.0 m in length.
Embodiment	Stand-alone controller with handles and wheels.
Cooling	No chiller, fully aircooled
Power	Single phase, 85 - 240 VAC, 10 A max (max 800 W total power consumption).
Built-in PC hardware	ATX gaming board, AMD Ryzen 9 3900X, 64 GB RAM DDR4, 500 GB SSD NVMe, 4 TB HDD, Quadro RTX 4000 GPU.
Display	31", Ultra HD 4K, <5ms, 100% REC 709, 100% sRGB
Keyboard and mouse	Included, QWERTY (or QERTZ)
Weight scanhead	10 kg
Weight controller	30 kg
Size scanhead	50 cm x 40 cm x 15 cm (WxHxD).
Operating environment	18°C - 28°C. Extended operating conditions available.*
Storage temperature	-15°C to +50°C
Humidity	10% - 90% (non condensing).
Noise level	<70 dBa.
Altitude	2500 m max.

Cockpit	
Auxilliary control device	Main functions of the system can be controlled via auxilliary interface to gain quick and direct access to individual settings and controls.

(I) Modality MPI: Multi-photon Fluorescence Imaging	
Motorized laser power control	0.5 % - 100 %
Laser polarization	Linear
Scan path	Resonant* - Galvo-Galvo Scanner
Scan speed	1.6 fps at 512 x 512 Pixels 0.1 fps at 2048 x 2048 Pixels Pixel dwell time: 0.8 to 32 μs Speed depends on scan angles & dwell time
Field of view (FOV)	20 mm Diagonal Square (Max) at the intermediate image plane. Typically 0.9 mm x 0.9 mm by using a Nikon 16x N16XLWD-PF objective.
Beam diameter @ objective back aperture plane	20 mm
Point spread function	Depending on installed objective.
Scan zoom (digitally via ScanImage)	1x to 99x
Scan resolution	Up to 2048 x 2048 Pixels (Both bi- and unidirectional).

Objectives	
Turret	3-positions, motorized & software controlled.
Objectives	Nikon 16x N16XLWD-PF objective included. System requires infinity corrected, matched to 200 mm tube lens.
Turret threading	M34 x 1.0

Software	
ScanImage Prof. V2020 or higher	Laser scanning
Chromogazer™	System Monitoring & Modality Change
MS Windows™ 10 64-bit Prof.	PC Operating System
ImageJ (Fiji)	Image post-processing
Matlab	Scanimage and house-written acquisition scripts
µManager	ImageJ plugin for single-photon fluorescence acquisition

* Optional, please enquire.

Options / Accessories

	MP-1040	MP-920F	MP-Tune
Resonant Galvo-Galvo	✓	✓	✓
Single-photon fluorescence	✓	✓	✓
Brightfield Epi-modality	✓	✓	✓
Piezo z-Stage (PFOC)	✓	✓	✓
Linear polarization (motorized rotation)	✓	✗	✗
SPF filter set change (motorized)	✓	✓	✓
Additional PMT channel (incl. TIA)	✓	✓	✓
Motion control system	✓	✓	✓
XYZ linear translation scanhead movement, >100mm travel range each, joystick	✓	✓	✓
Inverted configuration	✓	✓	✓
Fixture for inverted configuration (without sample mounting and positioning)	✓	✓	✓

(II) Modality SPF: Single-photon Fluorescence Imaging

Excitation lightsource for single-photon / linear fluorescence imaging	Fully integrated 8 channel cw light source for DAPI, CFP, FITC, YFP, TRITC, mCherry, Cy5 and Cy7 (395 nm, 438 nm, 475 nm, 511 nm, 555 nm, 575 nm, 635 nm, 747 nm), >150 mW / color @sample. TTL / USB external access* <20 ms switching time. Excitation filters installed.
Filter set	Dichroic and emission filter sets individually optimized for 5+4 channels included. Both filter sets manually changeable.
Single-photon fluorescence camera	sCMOS monochrome, 6.5 µm pixel size, readout noise 2.1 med e-, quantum efficiency up to 80 %, spectral range 370 nm - 1100 nm, dark current (typ.) 15 e- / pixel / s.

(III) Modality BFI: Brightfield Epi Imaging

Illumination	White light. Built-in 8-channel cw light source mimics broadband white light illumination characteristics via pre-defined settings.
Filter set	50% transmission & reflection dichroic for homogenous light transmission.
Brightfield camera	CMOS 5.1MP, 2/3", 3,45 x 3,45 µm pixel size, color, 2448 x 2048, 35 fps, global shutter.

Motion Control

Microscope Body (Scanhead) Motion	Free-moving scanhead, translation and rotation in all directions. Various motion solutions available*.
Piezo Objective Scanner	Not included. Various piezo objective scanners can be integrated*.

Software

Widefield Imaging (single-photon fluorescence & brightfield)	Pre-installed & configured µManager
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Resonant Galvo-Galvo

Resonant Galvo-Galvo (single region scanning)	1.6 fps at 512 x 512 Pixels 0.1 fps at 2048 x 2048 Pixels Pixel dwell time: 0.8 to 32 µs Speed depends on scan angles & dwell time
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Motorized Modality I, II & III Change

Switching between operation mode modality I to III is motorized via Chromogazer™ software. Objective positions on turret can be selected individually and used for each modality. Manual fluorescence filter set change required (motorized as an option)*, depending on installed filters.

PMTs

The base version contains 2 PMTs in Epi-direction. Additional PMTs can be installed. Four PMTs can be controlled and operated simultaneously by ScanImage at a given time.

Service Packages and Warranty

- Installation and training at customer site
- Free training at PI factory
- System upgrade after purchase
- Standard warranty 24 months included in base price. Additional 12 months extended warranty available.*

* Optional, please enquire.

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