



Nikon A1RMP+ Multiphoton Confocal Microscope

Input/output Port	3 laser input ports 4 signal output ports (for 4-PMT detector, spectral detector, VAAS, optional detector*1)
Laser for Confocal Microscopy	
Compatible Laser	Laser diode 405 nm, 440/445 nm, Ar laser (457 nm/488nm/514 nm,), Solid-state laser 488 nm, 561/594 nm, G-HeNe laser 543 nm, Laser diode 638/640 nm
Modulation	Method: AOTF (Acousto-Optical Tunable Filter) or AOM (Acousto-Optical Modulator) device Control: power control for each wavelength, return mask, ROI exposure control
Laser Unit	Standard: 4-laser module A or 3-laser module EX Optional: 3-laser module EX (when 4-laser module is chosen as standard laser unit)
Laser for Multiphoton Microscopy	
Compatible Laser	Mai Tai HP/eHP DeepSee (Newport Corp.) Chameleon Vision II (Coherent Inc.)
Modulation	Method: AOM (Acousto-Optical Modulator) device Control: power control, return mask, ROI exposure control
Incident Optics	700-1000 nm, auto alignment
Standard 4-Channel Detector	
Wavelength	400-750 nm (400-650 nm for multiphoton observation)
Detector	4 PMT
Filter Cube	6 filter cubes commonly used for a microscope mountable on each of three filter wheels

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Recommended wavelengths for multiphoton/confocal observation: 450/50, 482/35, 515/30, 525/50, 540/30, 550/49, 585/65, 595/50, 700/75

Diascopic Detector

Wavelength	440-645 nm
Detector	PMT

NDD for Multiphoton Microscopy

Wavelength	400-650 nm
Detector	4 PMT
Filter Cube	Filter cubes commonly used for a microscope Recommended filter sets for multiphoton: 492SP, 525/50, 575/25, 692/53, DM458, DM495, DM511, DM560, DM593
Detector Type	Episcopic NDD (for Ni-E/FN1/Ti-E) Diascopic NDD (for Ni-E) Episcopic GaAsP NDD (for FN1)
Unmixing	Channel unmixing
Image Bit Depth	4096 gray intensity levels (12 bit)

Scanning Head

Scanning	FOV: Square inscribed in a $\varnothing 18$ mm circle Standard image acquisition Scanner: non-resonant scanner x2 Pixel size: max. 4096 x 4096 pixels Scanning speed Standard Mode: 2 fps (512 x 512 pixels, bi-direction), max. 24 fps (512 x 32 pixels bi-direction)
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	<p>Fast Mode: 10fps (512 x 512 pixels, bi-direction), max. 130fps (512 x 32 pixels, bi-direction)*2</p> <p>Zoom: 1-1000x continuously variable</p> <p>Scanning mode: X-Y, X-T, X-Z, XY rotation, Free line</p> <p>High-speed image acquisition</p> <p>Scanner: resonant scanner (X-axis, resonance frequency 7.8 kHz), non-resonant scanner (Y-axis)</p> <p>Pixel size: max. 512 x 512 pixels</p> <p>Scanning speed: 30 fps (512 x 512 pixels) to 420 fps (512 x 32 pixels), 15,600 lines/sec (line speed)</p> <p>Zoom: 7 steps (1x, 1.5x, 2x, 3x, 4x, 6x, 8x)</p> <p>Scanning mode: X-Y, X-T, X-Z</p> <p>Acquisition method: Standard image acquisition, High-speed image acquisition, Simultaneous photo activation and image acquisition</p>
Dichroic Mirror	<p>Low-angle incidence method</p> <p>Position: 8</p> <p>Standard filter: 405/488, 405/488/561, 405/488/561/638, 400-457/514/IR, 405/488/543/638, BS20/80, IR, 405/488/561/IR</p>
Pinhole	12-256 μm variable (1st image plane)
Wavelength Detection Range	400 nm-750 nm (400 nm-650 nm with multiphoton microscopy)
Number of Channels	32 channels
Spectral Image Acquisition Speed	4 fps (256 x 256 pixels), 1000 lps
Wavelength Resolution	<p>80nm (2.5 nm), 192nm (6 nm), 320nm (10 nm)</p> <p>Wavelength range variable in 0.25 nm steps</p>
Unmixing	High-speed unmixing, Precision unmixing
Compatible Microscopes	<p>ECLIPSE Ti-E inverted microscope</p> <p>ECLIPSE FN1 fixed stage microscope</p> <p>ECLIPSE Ni-E upright microscope (focusing nosepiece type and focusing stage type)</p>

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Z Step	Ti-E: 0.025 μ m, FN1 stepping motor: 0.05 μ m, Ni-E: 0.025 μ m
Option	Motorized XY stage (for Ti-E/Ni-E), High-speed Z stage (for Ti-E), High-speed piezo objective-positioning system (for FN1/Ni-E), VAAS

Software

Display/Image Generation	2D analysis, 3D volume rendering/orthogonal, 4D analysis, spectral unmixing
Image Format	JP2, JPG, TIFF, BMP, GIF, PNG, ND2, JFF, JTF, AVI, ICS/IDS
Application	FRAP, FLIP, FRET, photo activation, three-dimensional time-lapse imaging, multipoint time-lapse imaging, colocalization
OS	Microsoft Windows® 7 Professional 64-bit SP1 (Japanese version /English version)
CPU	Intel Xeon X5672 (3.20 GHz/8 MB/1333 MHz Quad Core)
Memory	12 GB
Hard Disk	SAS (15,000 rpm), 300 GB x2, RAID 0 configuration
Data Transfer	Dedicated data transfer I/F
Monitor	1600 x 1200 or higher resolution, dual monitor configuration recommended
Vibration Isolated Table	1800 (W) x 1500 (D) mm recommended, or 1500 (W) x 1500 (D) mm

*1 Third-party detector for FCS/FCCS/FLIM

*2 Fast mode is compatible with zoom 8-1000x and scanning modes X-Y and X-T. It is not compatible with Rotation, Free line, Crop, ROI, Spectral Imaging, Stimulation, CLEM and FLIM

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