Molecular Devices

Sole Source Specification for GenePix® 4400A Microarray Scanner

From the industry-leader in performance, the GenePix® 4400A scanner from Molecular Devices is the only scanner available today that provides:

Features & Benefits

Mechanical performance

- Six-point motorized slide holder: Straightens slides to avoid non-planar slide irregularities, motor controlled soft-touch closing avoids slide breakage
- Automated single slide loading mechanism, eliminates user interaction in proper slide positioning,
- Robotic implementation: System readiness for integration with external slide-feeder system.
- Vibration-free lens movement: highest accuracy yields unparalleled performance in scanning smallest features in a densely packed microarray pattern.
- Distortion-free imaging: Perfectly straight images
- Reliable image uniformity: less than +/- 4% across the entire slide, maximum confidence with image data.
- Perfectly aligned images: high-performance mechanics ensures a pixel shift of less than +/-1 pixel in x- and y-direction, eliminating the need for post-capture image registration or virtual image alignment.
- High tolerance motors for reliability and lifetime in high duty-cycle usage environments

Optics & Image acquisition

- Ultra-high optical resolution: Contrast Transfer Function (CTF) better than 50%
- High speed scanning at 4 minutes per channel at 10 µm resolution (full scan area, 22 x 72mm)
- Sequential channel scanning: negligible fluorophore cross-talk
- Expanded focal range: Non-confocal technology provides 64µm depth of focus, ideal for thick specimens and alternate substrates. Non-confocal optics offer superior detection sensitivity over confocal and CCD-based scanners
- Improved fluorescence sensitivity: Measured 0.1 fluor/µm^2 with SNR >3
- Optimal dynamic range: 4 orders of magnitude linear detection maintaining a SNR >3
- Maximum resolution of 2.5 µm; user-selectable resolution from 2.5 µm to 100 µm
- Smallest feature size: Detect features as small as 10 microns
- Fast previewing: 20 µm resolution overview for balancing channels
- Selective rescanning: repeat single scans while maintaining acceptable acquisitions, reduce scanning time and unnecessary exposure to lasers
- Array quality control: check spot presence in unhybridized or pre-processed slides

Offices in Brazil | China | Germany | Japan | Korea | United Kingdom | United States

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Lasers & Filters

- CircuLasers: High-quality fiber coupled red laser delivers accurate beam diameter
- Up to four solid-state or compact gas lasers for multispectral imaging with up to four fluorophores in one experiment; choose from 50 or more commercially available fluorophores
- Internally installed lasers; no external lasers, power supplies or cooling systems required
- Continuously adjustable laser power and PMT voltage: maximum sensitivity and flexibility in optimizing dynamic range
- Automated PMT gain balancing: automated assessment of optimal scanning sensitivity settings to maximize dynamic range
- Laser standby mode for extended laser life
- Laser intensity stabilization: inherent laser power fluctuations are circuitry corrected
- Easy access to emission filter wheel: rapidly install filters, revised design for heavy duty usage
- Maximum filter flexibility: 16-position emission filter wheel, select from over 20 filters from Molecular Devices, or use other commercially-available standard catalog filters

Barcode reading

- Integrated 1D and 2D hardware barcode reader: read and record all barcode types
- Software algorithm for barcode reading: backup for reliable barcode acquisition

Electronics

- 16-bit image digitization: higher dynamic range and SNR than any CCD-based system
- Low electronic noise digitization: Industry leading SNR, performance and sensitivity
- USB connection: Plug-and-play communication with computer

Options

- Upgradeable to up to four lasers, decide later what lasers to add
- Upgradeable with fully automated SL50 Slide Loader

Integrated software features

- Complete bundle of GenePix Pro microarray acquisition and data processing software included
- Multiple scan areas: independent image acquisition and analysis of multiplexed arrays on one slide
- Automated workflow: software controlled scanning automatically finds the optimal hardware settings and performs subsequent image acquisition and analysis
- Multi-user mode: maintaining separate settings and results files for multi-user groups
- One-touch calibration standards: maintain consistent scanner performance over time
- Activity and Hardware Diagnostics logs: track scanner operations and performance
- Integrated Internet Explorer functionality: powerful scripting engine and web access to public repositories and databases
- Automation protocols and scripts included: no need to buy separate software modules for automation functionality
- Non-proprietary GenePix Pro industry-standard file formats: GenePix Array List (GAL), GenePix Results (GPR), and MAGE-ML document format
- Enhanced image output and export options: single-image, multi-image TIFF and JPEG formats
- Seamless transfer of results to Acuity®: statistical analysis and clustering software with data archiving

Specifications

- Sample type: Standard microscope slides (1” × 3”, 25 × 75 mm, 26 × 76 mm)
- Maximum scan area: 22 × 72 mm
- Excitation: 532 nm, 635 nm, 488 nm solid-state lasers, 594 gas-laser
- Scan time: 4 minutes per channel, full scan area, 10 µm resolution
- Pixel resolution: Adjustable from 2.5 to 100 µm
- Digital resolution: 16-bit
- Dynamic range: Four orders of magnitude at S/N = 3
- Detection limit: 0.1 fluor/µm2 (Alexa 488, Cy3, Cy3.5, Cy5) at S/N = 3
- Maximum S:N (PMT): 10,000:1
- Images: Single- or multi-image TIFF
- Interface: USB (cable included)
- Power supply: 110 / 220V Universal power supply
- Dimensions: 43 cm W × 65 cm D × 34 cm H (16.9” × 25.6” ×13.4”)