Molecular Devices

GenePix 4100A Microarray Scanner

AFFORDABLE, HIGH-QUALITY IMAGING FOR TWO-COLOR MICROARRAYS

- COMPACT, AFFORDABLE AND EASY-TO-USE
- SUPERIOR IMAGING ACCURACY
- OUTSTANDING REPRODUCIBILITY
- FLEXIBLE FLUOROPHORE COLLECTION
- FULLY-INTEGRATED WITH GENEPIX PRO IMAGE ANALYSIS SOFTWARE

Eliminate the inconvenience of waiting to use a scanner in a core facility or a neighbor's lab. High-performance microarray scanning is now more affordable than ever. The GenePix® 4100A Microarray Scanner from Molecular Devices has all the quality, sensitivity, reliability and ease-of-use of more expensive scanners, but in a price range and bench top footprint that makes it ideal for individual lab use.

HIGH-RESOLUTION ACQUISITION, AUTOMATED PMT BALANCING

The GenePix 4100A Scanner acquires data at user-selectable resolutions between 5–100 microns, allowing optimization of image resolution and file size for each experiment. The GenePix 4100A Scanner alleviates time-consuming and confusing hardware setup by automatically choosing photomultiplier gain values, for fast and easy optimization of signal intensity and channel balance.

DYNAMIC LASER POWER MONITORING

Laser power in the GenePix 4100A Scanner is dynamically monitored for each pixel during scanning to ensure constant signal output. High-quality lasers, coupled with exclusive intensity correction circuitry, guarantee that all pixels in the image have equal effective exposure. Correction for minor fluctuations, inherent to all lasers, offers yet another contribution to maximum signal-to-noise ratio. All of these features ensure high data reproducibility, preventing costly experimental reruns.

INCREASED FLUOROPHORE FLEXIBILITY WITH 8-POSITION FILTER WHEEL

The optical design of the GenePix 4100A Scanner incorporates an eight-position emission filter wheel (Figure 1), with standard red and green filters included. Up to six additional filters can be installed, providing additional flexibility to explore alternative dyes. By using an empty position in the filter wheel or a neutral density filter, reflectance imaging may also be performed with the 635 nm of the scanner, allowing users to check spot morphology in unlabeled DNA arrays, as part of a quality control routine.

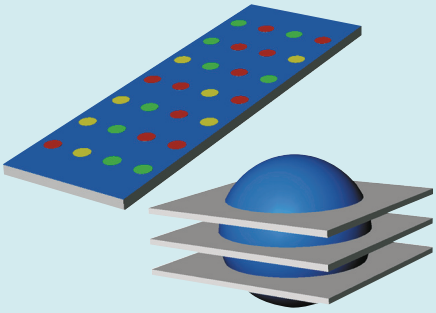
NON-CONFOCAL OPTICAL DESIGN

The non-confocal optics of the GenePix 4100 Scanner are designed specifically for microarray

Flexible Filters (Figure 1)

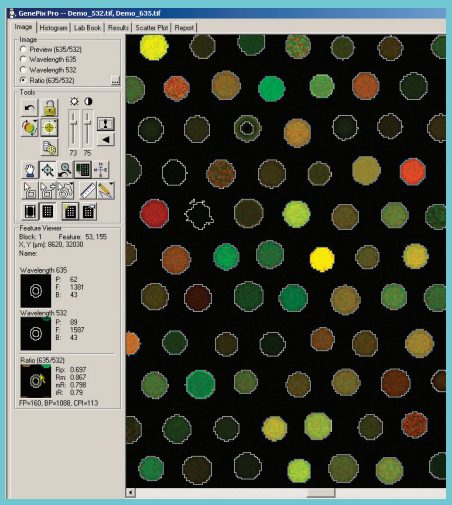
The GenePix 4100A Microarray Scanner features an 8-position emission filter wheel. Two standard filters are included, with additional filter options available.

Non-Confocal Optics (Figure 2)



The non-confocal optical path in GenePix 4100A Scanners is designed specifically for microarrays. Confocal optics do not benefit microarray imaging, because the primary source of background is in the same plane of focus as the sample (left). Confocal imaging is primarily beneficial for rejecting out-of-plane background when scanning a thick sample (right).

Integrated Software (Figure 3)



The GenePix 4100A Scanner is closely integrated with GenePix Pro Software, which is used both for scanner control and image analysis.

imaging. Other scanners utilize confocal technology for imaging thin sections of a thick sample, as with tissue samples, which provides no benefit in microarray imaging. This is because the primary source of background is non-specific hybridization in the same plane of focus as the sample. (See Figure 2.)

In addition, most microarray slides are not held to tight flatness specifications. As the surface of the slide varies, the narrow depth of field of confocal systems may fluctuate in and out of the optimal plane of focus. The wider depth of field used in GenePix Scanners allows light collection from the entire array surface, while rejecting stray light from other sources.

INTEGRATED HARDWARE AND SOFTWARE

The GenePix 4100A Microarray Scanner and GenePix Pro Microarray Analysis Software have been designed to work together as a complete integrated platform. (See Figure 3.) The seamless communication between scanner and software ensures unmatched efficiency for data acquisition and analysis, as well as for real-time scanner performance monitoring. Optional .® Microarray Informatics Software completes the package, offering database storage, clustering algorithms, advanced statistics and visualizations.

TECHNICAL SPECIFICATIONS

Performance Specifications

Sample type:	Standard microscope slides (1" x 3", 25 x 75 mm or 26 x 76 mm)
Scan area:	Adjustable, 22 x 72 mm max.
Excitation:	532 nm solid-state laser 635 nm diode laser
Laser settings:	Fixed 100% power
Emission filters:	8-position filter wheel, 2 standard filters included (optimized for Cy3 and Cy5 or spectrally similar dyes)
Detection:	1 photomultiplier (PMT), automatic and manual gain adjustment
Focus:	Fixed at slide surface
Optics:	Non-confocal
Scanning method:	Sequential
Scan time:	6.5 minutes per channel, 10 µm resolution, full scan area
Pixel resolution:	5 µm max., adjustable from 5 to 100 µm
Digital resolution:	16-bit
Dynamic range:	Four orders of magnitude at SNR > 3
Image type:	Single- or multi-image TIFF
Barcode reading:	Image-based barcode reader

General Specifications

Dimensions (in.):	14.2 (W) x 11.7 (H) x 14.2 (D)
Dimensions (cm):	36 (W) x 30 (H) x 36 (D)
Power supply:	110/220V universal
Weight:	40 lbs. (18 kg)

Computer requirements available on our web site at http://www.moleculardevices.com/pages/software/gn_genepix_pro.html

ORDERING INFORMATION

GenePix 4100A Microarray Scanner

- → GenePix 4100A Scanner
- → GenePix Pro Image Analysis Software
- → Acuity Microarray Informatics Software (optional)

SALES OFFICES

- → North America +1-800-635-5577
- → UK +44-118-944-8000
- → Germany +49-89-9605-880

Check our web site for a current listing of our worldwide distributors.
www.moleculardevices.com

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