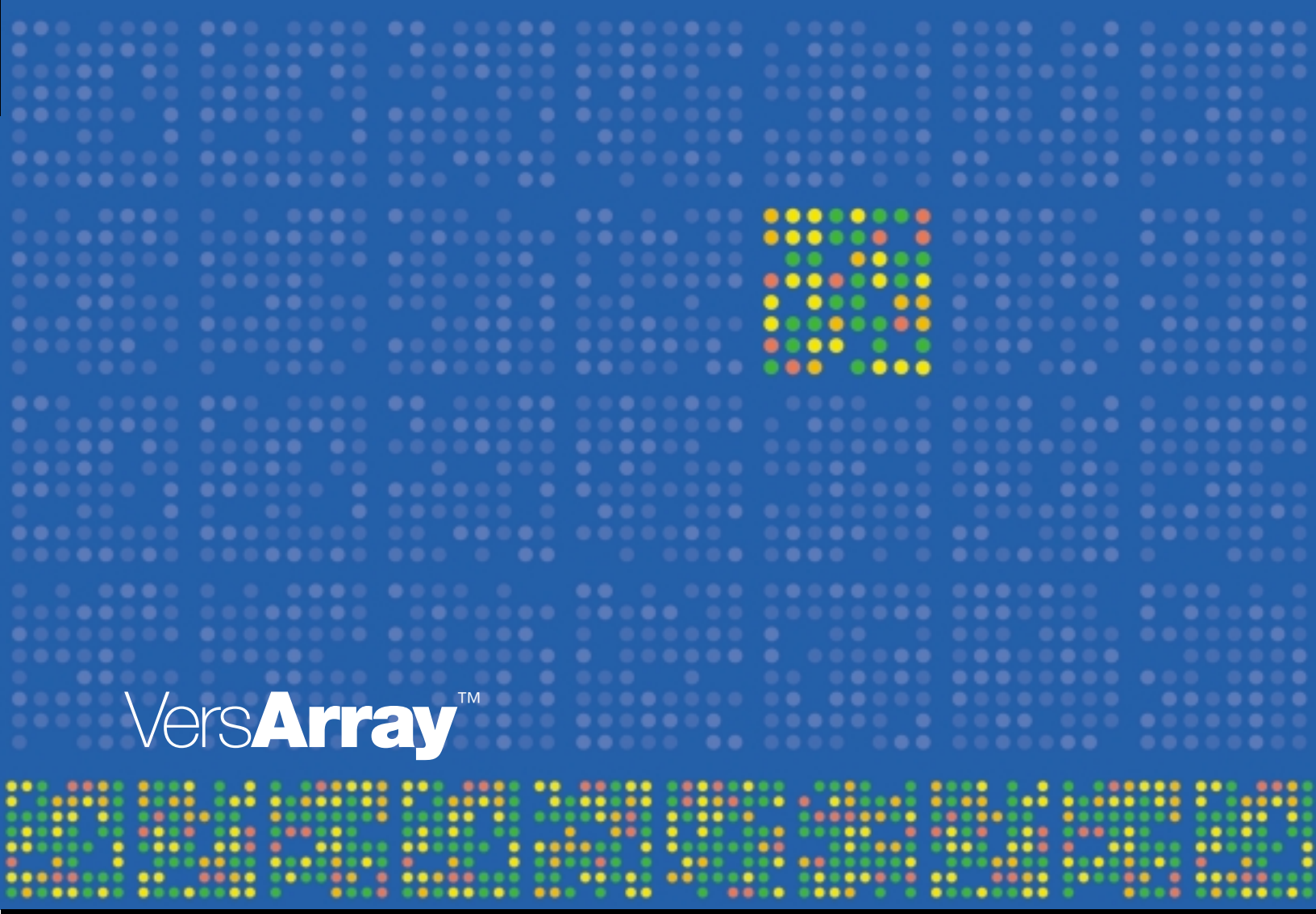


VersArray™

Microarray Systems

BIO-RAD

VersArray

A Powerful New Family of Microarray Systems

VersArray ChipReader™ systems
Sophisticated microarray scanners with superb sensitivity and real-time acquisition analysis, for high productivity and image integrity; read two fluorophores simultaneously or independently

VersArray ChipWriter™ Pro systems
Reliable, high-precision microarrayers capable of printing DNA, protein, and other biological samples with a spotting speed of one print per second

VersArray ChipWriter™ Compact system
An easy-to-use, high-performance DNA spotting system ideal for custom runs or when space is a limiting factor

VersArray™ colony picker and arrayer systems
Robotic platforms specially suited for generating high-density colony arrays for synthetic genetic array (SGA) analysis

VersArray™ analyzer software
State-of-the-art software with powerful microarray analysis tools

Bio-Rad's suite of imaging systems is now complete with the introduction of the exciting new VersArray instruments for the creation, imaging, and analysis of DNA and colony microarrays.

VersArray ChipReader™ Systems

High Sensitivity

VersArray ChipReader systems are highly sensitive laser confocal systems designed for rapid imaging of DNA, protein, tissue, or cellular microarrays. These are advanced scanners that meet your expectations, differentiating between a response and background, and optimizing the signal on the bottom as well as the top end of the sensitivity range. Your results will show low background, enhanced detection of weak signals, and virtually no photobleaching.

New Adaptable Dynamic Range (ADR) Technology

A proprietary simultaneous-sequential scanning process allows analysis of image quality in real time, with feedback provided about the effects of laser and photomultiplier tube adjustment on the signal-to-noise ratio and dynamic range. This feedback increases productivity and minimizes the number of scans, ensuring the integrity of the dyes, decreasing photobleaching, and reducing degradation of the array on the slide over time.

Flexibility in a Compact Size

The VersArray ChipReader has the smallest footprint of any microarray scanner, and it comes with its own high-performance PC and monitor for "plug and play" capability. Three models are available, each offering adjustable scanning resolution. State-of-the-art VersArray analyzer software is included with purchase of any VersArray ChipReader system.

Highest Efficiency and Repeatable Accuracy

- Highest light collection efficiency available
- Lower laser power to excite the bottom end of the range without saturating the top end
- High-efficiency matched optics systems — each channel's laser and photomultiplier tube are independently controlled

Flexibility and Ease of Use

- Preset hardware controls for basic operation; full control over all operational parameters for advanced users
- Modular slide holder uses a variety of slide types and sizes, including glass, nylon, plastic, ceramic, and silicon substrates
- Can read coverslipped or wet slides
- Automated functions such as Autofocus and Rescan provide unparalleled control and ease of use
- Installation and training by Bio-Rad's technical professionals

VersArray™ Analyzer Software

VersArray analyzer software is a powerful tool for spot finding, gridding, and image analysis for microarrays.

See back page for more information.

Why Resolution Matters

- Increases sensitivity for weak or damaged substrates
- Increases data confidence in high density arrays, smaller spots, or in areas of limited background
- The 3 µm system is ideally suited to image high-precision arrays produced by the VersArray ChipWriter™ Pro or Compact systems

Base Level of Resolution	Range
3 µm system	3–24 µm, adjustable in 3 µm intervals
5 µm system	5–40 µm, adjustable in 5 µm intervals
10 µm system	10–80 µm, adjustable in 10 µm intervals

Laser	Dye	Excitation Peak	Emission Peak
635 nm	BODIPY 630/650	625	640
	Alexa Fluor 633	632	647
	Cy5	649	670
	Alexa Fluor 647	650	668
	BODIPY 650/665	651	660
	Alexa Fluor 660	660	690
	Cy5.5	675	694
	Alexa Fluor 680	680	700
532 nm	Alexa Fluor 532	531	554
	POPO-3	534	570
	PO-PRO-3	539	567
	Cy3	550	570
	Alexa Fluor 546	553	573
	Alexa Fluor 555	555	565
	Alexa Fluor 568	578	603
	Cy3.5	581	596

Specifications

Chip size	25 x 75 mm (1 x 3") or other similar sizes and depths
Scan area	Up to 22 x 65 mm (0.87 x 2.56"); user-defined area
Read time	Approximately 8 min per slide at 10 µm resolution
Read sequence	Simultaneous or independent
Dynamic range	16 bits per pixel; linear detection over entire range
Data storage	16-bit TIFF
Number of lasers	2 standard
Excitation wavelengths	532 nm and 635 nm (standard)
Laser power	10 mW each channel; independently controlled from 0–100%
Detection	2 photomultiplier tubes
Dimensions	23 x 28 x 30 cm (9 x 11 x 12"; W x D x H)
Electrical	90/260 V, 50/60 Hz, 150 W (autosensing power supply)
Minimum computer requirements	Windows NT operating system, CD-RW, 15" flat-screen monitor, barcode reader, VersArray analyzer software
3 µm model	1.5 GB RAM, 1100 MHz processor, 40 GB hard drive
5 µm model	1.0 GB RAM, 1100 MHz processor, 20 GB hard drive
10 µm model	384 MB RAM, 800 MHz processor, 20 GB hard drive

VersArray ChipWriter™ Pro Systems

Accuracy and Repeatability for Better Data

The VersArray ChipWriter Pro creates arrays with superior accuracy and precision, utilizing the highest quality robotics and pins. Grids are aligned and consistent, so you spend minimal time on spot finding and gridding during image analysis. Equally important is the quality of the spots. TeleChem Stealth series pins ensure that intensity data are highly consistent, so that you can have greater confidence in your results.

Whether generating high-density arrays of >81,000 spots or custom runs of <1,000 genes per slide, the VersArray ChipWriter Pro is extremely efficient and productive. It is capable of printing 40 slides of the entire yeast genome (approximately 6,200 genes) in about 3 hours.

Reliability for Peace of Mind

The VersArray ChipWriter Pro is unmatched in reliability, making it a true walk-away system for unattended overnight runs. Reliability is more than a convenience — it can save thousands of dollars in equipment repairs, time, and lost materials. Your samples and materials are protected throughout each run within the system's monitored environmental chamber.

Versatility for Today and Tomorrow

The VersArray ChipWriter Pro easily adapts into a macroarrayer or, with optional modules, will also function as a liquid transfer system or colony picking instrument. In addition, it is the only instrument of its kind to provide open source code on the robotics along with an easy-to-use graphical user interface, giving you greater performance options for challenging runs.

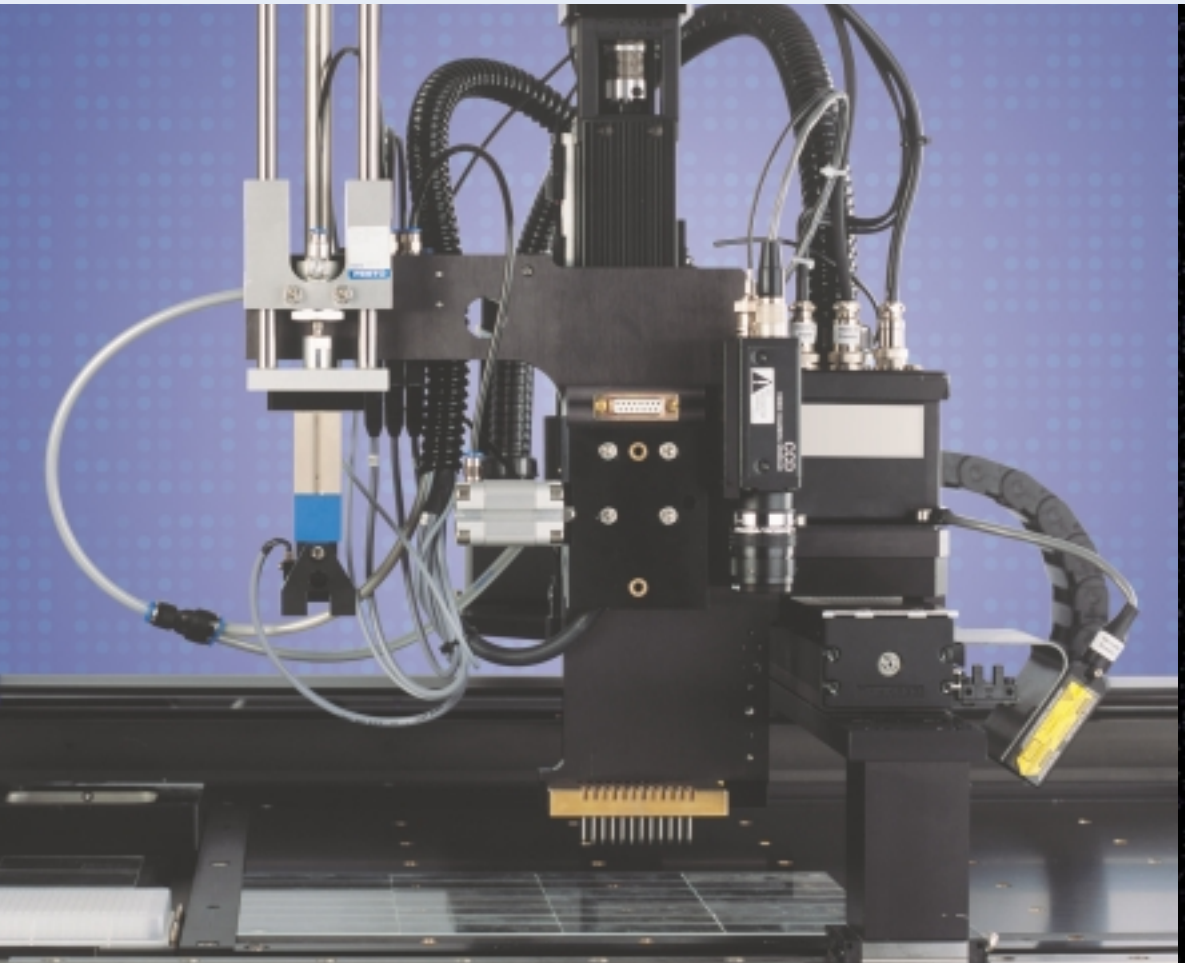
Features

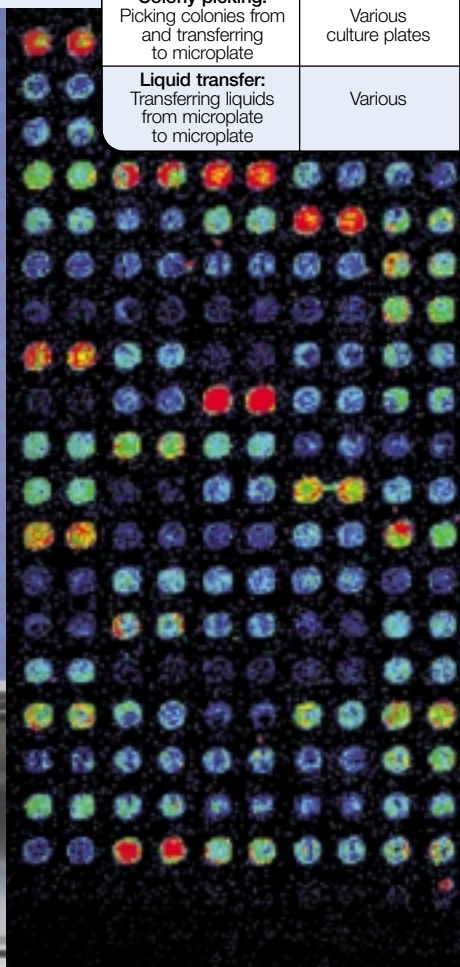
- 126-slide capacity with up to 32 source plates
- High-density printing to nearly 82,000 spots per slide
- Flexibility to select spotting pattern and speed, type and number of source plates, and membranes or slides

Specifications

Slide capacity	Up to 126 slides per run on a variety of different size substrates including glass, matrix, ceramics, metals, and membranes
Spots	Typical 90–105 µm on 140–150 µm centers (user-defined)
Pins	Up to 48 TeleChem SMP3 Stealth quill pins or solid pins
Type of source plates	Up to 32 in stacker, 96- or 384-well microplates
Robotic specifications	1.22 µm (x, y axis) and 0.24 µm (z axis) resolution, 3 µm printhead repeatability
Liquid handling tools	Two 4-channel disposable-tip pipets (0.2–10 µl and 10–250 µl)
Environmental chamber	Fully enclosed, humidity controlled, positive air pressure, HEPA filter
Dimensions	130 x 102 x 130 cm (52 x 41 x 52"; W x D x H)
Minimum computer requirements	Pentium PC with Windows NT or 2000 operating system and 15" monitor

Application	Sample Types
Microarraying: Transferrring sample from microplate to slide	DNA, proteins, oligonucleotides
Macroarraying/ gridding: Transferring samples from microplate to membrane	DNA, proteins, oligonucleotides
Colony picking: Picking colonies from and transferring to microplate	Various culture plates
Liquid transfer: Transferring liquids from microplate to microplate	Various





VersArray ChipWriter™ Compact System

Accuracy and Reliability in a Small Space

The VersArray ChipWriter Compact is a high-quality DNA array spotting system offering outstanding performance comparable to most currently available larger systems. The system is ideal if you require a smaller arrayer for custom runs or to fit in a limited space.

This compact system is very easy to use. Simply connect it to your computer, define an array process, and run the application. You can even define a wash and dry procedure based on your application needs.

The VersArray ChipWriter Compact is fully compatible with most microarray scanners, including the VersArray ChipReader systems. Contact your local Bio-Rad representative to discuss how custom bundled systems can help you meet your microarraying compatibility and budget needs.

Versatility for Custom Spotting and Gridding

The VersArray ChipWriter Compact is available as a microarray slide spotting system, a membrane gridding system, or both. The microarray slide spotting configuration allows the use of up to 48 pins in a printhead, meaning that 20 slides of the entire yeast genome can be spotted with 48 pins in less than 4 hours. And when you want to change the configuration from microarray spotting to membrane gridding, it'll take less than 10 minutes.

ChipWriter Pro	ChipWriter Compact
Yes	Yes
Yes	Yes
Optional	No
Optional	No

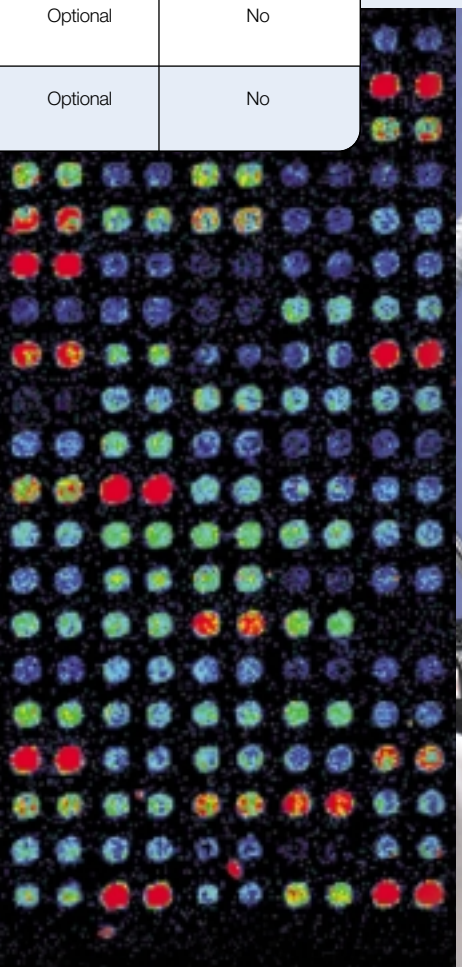
The easy-to-use graphical user interface lets you program the robot to match your spotting needs and substrates, vary pin dwell time in the well, and adjust the axis speed.

Features

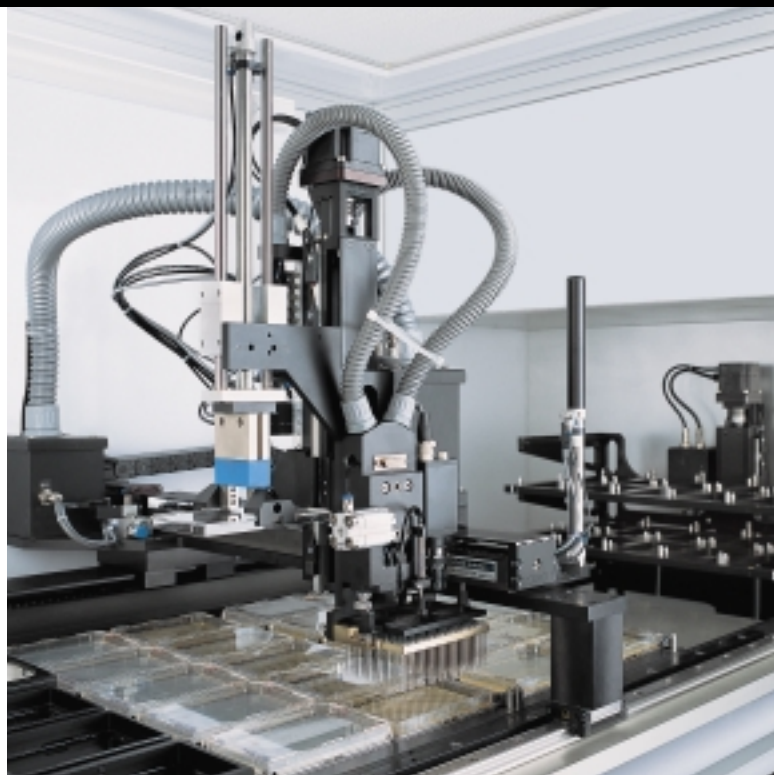
- Arrays cDNA, DNA, and other biochemical samples from 96- or 384-well source plates onto either glass slides or membranes
- Microarray spotting configuration allows printing >57,000 spots per slide
- Membrane gridding configuration can print nearly 25,000 spots per membrane using 48 pins
- Small footprint for maximum convenience and high productivity in small areas

Specifications

Slide capacity	Up to 24 slides (including 4 blot slides)
Spots	>57,000 with 150 µm spacing, approx. 100 µm diameter
Pins	Up to 48 TeleChem Stealth SMP3 pins
Type of source plates	96-, 384-, or 1,536-well microplates
Environmental chamber	Fully enclosed, humidity controlled, positive air pressure, HEPA filter
Dimensions	60 x 87 x 67 cm (24 x 35 x 27"; W x D x H)
Minimum computer requirements	Pentium III processor, 500 MHz, 128 MB RAM, 6 GB hard drive, Windows 2000 operating system, 1 free serial port



VersArray™ Colony Picker and Arrayer Systems



VersArray colony picker and arrayer systems are revolutionary robotic systems that let you easily and efficiently perform colony arraying/gridding, or replicating of high-density colony arrays for the unique application of synthetic genetic array (SGA)* analysis. The systems are available in two versions, one for colony arraying and one for colony picking and arraying. Both versions can be expanded with a liquid transfer module for added functionality.

Unique Colony Arraying/Gridding Capability

The VersArray colony arrayer forms an ordered matrix of colonies on a gel plate that can then be screened for the impact of virtually any genetic or chemical interaction. This new SGA methodology can be applied to array-based functional genomic or proteomic analysis, including mutation analysis and yeast two-hybrid screening. Over 23,000 colonies/hr can be arrayed utilizing the 768-pin replicator head.

Added Versatility With the Colony Picking Version

The VersArray colony picker and arrayer provides added functionality in one instrument. The colony picker uses a sophisticated image acquisition system to prioritize, pick, and inoculate over 9,000 colonies during an unattended run, freeing you to use your research time on other tasks.

Either system can be easily transformed to provide liquid handling capabilities. As a liquid handling robot, it can replicate or rearray 0.2–250 µl from 96- or 384-well plates to 96- or 384-well plates. And like the VersArray ChipWriter Pro system, it is unmatched in reliability and completely contained within an environmental chamber that protects your samples and materials.

Features

- 96-, 384-, and 768-pin replicator heads
- Optional 4-level elevator for improved capacity
- Replicates or rearrays from microplate to microplate or membrane

* Tong AHY et al., Science 294, 2364–2368 (2001)

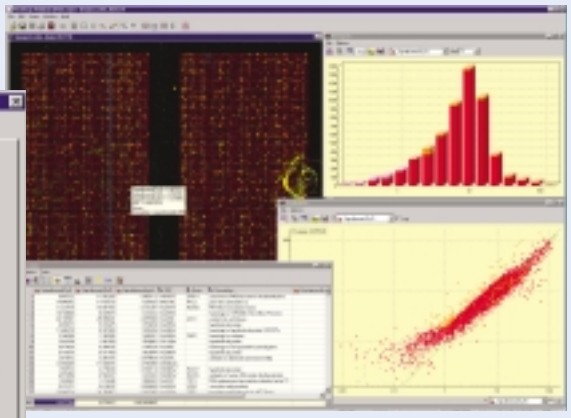
Specifications

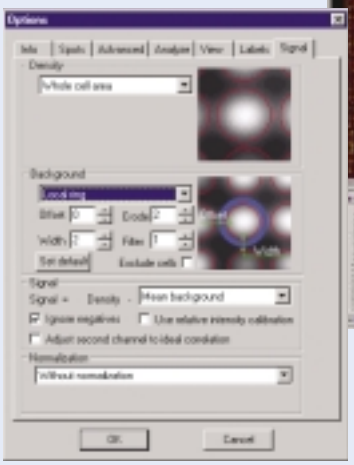
Robotic performance	Encoder resolution 1.22 µm (x, y axis), 0.24 µm (z axis), with 3 µm repeatability
Arraying throughput	>23,000 colonies/hr (1 min wash cycle — variable)
Pin cleaning	Wash station (with or without pump), sonicator, and air drying unit
Replicator head types	96, 384, 768 pins, 0.5 or 1.0 mm
Colony picking head	High-speed head with 16 indexable pins
Gridding tools	96- or 384-pin heads with 0.5 or 1 mm pins
Liquid handling tools	Two 4-channel disposable-tip pipets (0.2–10 µl and 10–250 µl)
Gripper assembly	For plate or lid transfer with up/down motion unit
Stacker module	32 shallow-plate capacity arranged in 8-plate stacks
Environmental chamber	Fully enclosed, humidity controlled, positive air pressure, HEPA filter
Dimensions	127 x 102 x 143 cm (51 x 41 x 57"; W x D x H)

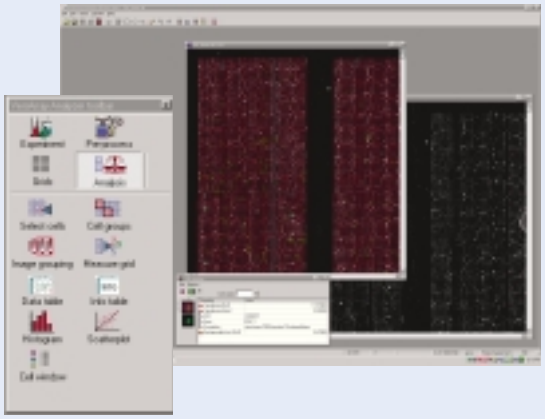
Application	Colony Arrayer	Colony Picker and Arrayer
Arraying: Transferring sample from microplate to gel	Yes	Yes
Replication: Transferring sample from gel to gel	Yes	Yes
Macroarraying/gridding: Transferring sample from microplate to membrane	Yes	Yes
Colony picking: Picking colonies from gel and transferring to microplate	Optional	Yes
Liquid transfer/replication: Transferring liquids from microplate to microplate	Optional	Optional

VersArray™ Analyzer Software

VersArray analyzer software contains algorithms that facilitate the visualization and quantitation of microarray data. This powerful tool can analyze microarrays that use any label, format, or dimension.







Features

- Spot finding and gridding wizard
- Automatic rotation, grid, subgrid, and spot finding in method development
- Automatic alignment of grid, subgrid, and spots with applied template
- Background subtraction
- Image optimization tools
- Web integration
- Gene expression or ratio analysis (e.g., Cy3/Cy5), typing, or sequencing

Ordering Information

Catalog #	Description
169-0001	VersArray ChipReader 10 µm System
169-0002	VersArray ChipReader 5 µm System
169-0003	VersArray ChipReader 3 µm System
169-0004	VersArray ChipWriter Compact System, 110/120 V
169-0005	VersArray ChipWriter Compact System, 220/240 V
169-0006	VersArray ChipWriter Pro System, 110/120 V
169-0007	VersArray ChipWriter Pro System With Picking Capabilities, 110/120 V
169-0008	VersArray ChipWriter Pro System, 220/240 V
169-0009	VersArray ChipWriter Pro System With Picking Capabilities, 220/240 V
169-0010	VersArray Colony Arrayer System, 110/120 V
169-0011	VersArray Colony Picker and Arrayer System, 110/120 V
169-0012	VersArray Colony Arrayer System, 220/240 V
169-0013	VersArray Colony Picker and Arrayer System, 220/240 V
170-7430	VersArray Analyzer Software

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