



Data Sheet

■ Affymetrix GeneChip® Scanner 3000 7G

The Affymetrix GeneChip® Scanner 3000 was specifically designed to incorporate future technological advancements as GeneChip technology continues to advance. The GeneChip Scanner 3000 has now evolved to support the requirements of new and emerging applications for tiling, all-exon, Mendel 500K SNP, and the ParAllele MIP assay for custom genotyping with the enhanced capability of 7G. The “7G” refers to the 7th generation of the GeneChip® technology platform. When configured as part of a MegAllele™ System, the GeneChip Scanner 3000 7G is calibrated for the additional scanning features to support the ParAllele Molecular Inversion Probe (MIP) Technology highly multiplexed assay for Custom Genotyping.

Discover the benefits of the GeneChip Scanner 3000 7G:

- Designed for future system evolution.
- Compact size for better space utilization.
- Higher resolution scanning at pixelations from 2.5 μm down to 0.51 μm , automatically determined by array type.
- Optimal image uniformity and collection efficiency across entire scan area with patented Flying Objective™ technology.
- Auto-Set laser power eliminates effects due to laser drift and reduces scanner-to-scanner variability.
- Automatic arc correction—scanner firmware dynamically checks and adjusts for changes in residual arc correction and x-linearity.
- QC Toolbox Software Kit—now incorporated as a standard feature, QC Toolbox provides a tool to verify scanner performance for internal QA requirements as well as the ability to recalibrate the scanner if needed.
- AutoLoader-compatible for walk-away automation.

Introduction

The GeneChip® Scanner 3000 7G combines advanced design improvements with high-resolution scanning and automation to dramatically improve efficiency in genetic analysis for gene expression and DNA analysis applications, including the ParAllele MIP technology highly multiplexed assay for custom genotyping.

When the GeneChip Scanner 3000 7G is used in conjunction with the new AutoLoader, it provides complete walk-away freedom for scanning your arrays. As with all GeneChip Scanner 3000 instruments, the GeneChip Scanner 3000 7G fits easily into a benchtop environment. Because it uses a solid-state laser, there is no need for an external laser power supply or a special cooling system under the bench.

The superior performance and enhanced capabilities of the GeneChip Scanner 3000 7G offer more accurate gridding and more consistent scanner-to-scanner performance, improving data integrity and data sharing between researchers.

Pathway to Future Innovation

The GeneChip Scanner 3000 7G has demonstrated complete concordance with experimental data produced by previous GeneChip Scanner 3000 models. This confirms a seamless transition for GeneChip platform users who wish to compare data generated from prior models. In addition, this next-generation scanner has been designed to accommodate future advancements in GeneChip technology to meet the needs of emerging applications.

Patented Flying Objective™ Means Fast, Consistent Scanning

The GeneChip Scanner 3000 7G's unique design guarantees consistent optical excitation and emission paths for optimal image uniformity across the entire scan area. High collection efficiency allows a single scan pass and faster scanning times. The GeneChip Scanner 3000 7G with an improved autofocus algorithm is up to 30 percent faster than the GeneChip Scanner 3000 when scanning a standard-size (49-format) array such as the GeneChip® Human Genome U133A array at 2.5 μm pixelation.

Maximize Data Quality, Efficiency, and Reliability

AUTOMATIC ARC CORRECTION

- Dynamic correction of residual arc correction error and changes in x-linearity on a scan-by-scan basis.
- Provides superior scanner stability and data consistency.

ULTRA-LOW NOISE FRONT END

- Ultra-low noise, high-speed, analog-to-digital conversion is implemented on printed circuit boards designed to deliver the lowest noise performance possible.
- Fluorescence signal dynamic range is enhanced by a high-speed data acquisition system delivering a full 16 bits of data precision.

AUTO-ZERO SUBSYSTEM

- A new auto-zero subsystem ensures exceptionally low electronic background, while providing the widest dynamic range for GeneChip array scanning.

AUTO-SET LASER POWER

- Excitation laser power is accurately set for every scan, for exceptional long-term stability.
- Scanner-to-scanner consistency is improved by eliminating gain drift due to aging laser and optics components.
- Periodic checks and laser power adjustments are no longer required.

OPTICAL-MECHANICAL

- Multi-axis, closed-loop position control, for improved geometric scanning accuracy ensures unparalleled gridding accuracy.
- Spot size is 50 percent smaller than the previous scanner (3.5 μm , measured at the $1/e^2$ points).
- Resolution has been extended down to a pixelation of 0.51 μm enabling scanning of next-generation high-density GeneChip brand arrays.
- Optical design optimized to scan at multiple wavelengths from a single excitation wavelength.
- Photo bleaching is 70 percent less than the GeneArray® 2500 scanner.

SOLID-STATE GREEN LASER

- Features highly reliable, solid-state, self-contained, diode-pumped, frequency-doubled YAG laser.
- Eliminates need for separate laser power supply, eliminating clutter and extra wiring.
- Eliminates need for multi-instrument laboratories to install expensive heat removal ducts.

QC TOOLBOX SOFTWARE KIT

- Integrated software tool, provides user with verification of scanner performance and calibration parameters with pass/fail criteria. Calibration arrays provided for recalibration, if needed.
- Provides report for QA and regulatory requirements. (For research use only)
- Verifies scanner firmware version and can update scanner firmware automatically with user permission.

AUTOMATION-READY

- GeneChip® AutoLoader-ready—Designed to accept the GeneChip AutoLoader.* The AutoLoader is an environmentally controlled sample carousel that automatically loads up to 48 arrays, offering complete walk-away freedom from scanning. Additionally, the GeneChip AutoLoader provides:
 - Temperature-controlled environment to maintain long-term stability and integrity for up to 16 hours.
 - 48-array removable carousel for unattended loading and unloading of experiments.
 - Improved ease-of-use.
 - Integrated experiment and sample tracking.

GeneChip® Scanner 3000 7G Offers Space Savings and Improved Reliability

RELIABILITY

- Includes a sample-transport system that has been designed to operate in environments running 10,000 scans per year.
- Includes the same space-saving advantages of the previous model GeneChip Scanner 3000.
- Features manual microarray extraction.

ELECTRICAL

- No dedicated or special power requirements.
 - Conforms to the following standards for Electromagnetic Conformity for Class A Industrial, Scientific, and Medical equipment for use in Industrial environments: EN 61326-1, EN 55011, EN 61000-3-2, EN 61000-3-3, FCC Part 15
 - Certified by UL and TÜV America to the following Product Safety standards for Electrical Equipment for Measurement, Control, and Laboratory Use: UL 61010A-1 Class OGTK and OGTK7, EN 61010-1, EN 60825-1
 - Tested to EN61326-1 EMC/ESD standard for industrial environments.

FOOTPRINT

- With a footprint of 13"W x 22"D x 18"H (33 cm x 56 cm x 46 cm), the GeneChip Scanner 3000 requires less than half the bench space of the earlier GeneArray 2500 scanner.

WEIGHT

- Weighing in at approximately 70 pounds (31.8 kg), the GeneChip Scanner 3000 is less than one-third the weight of the GeneArray 2500 scanner. When used with the GeneChip AutoLoader, the combination weighs approximately 100 pounds (45.5 kg).

CORRELATION COEFFICIENTS

Comparison of correlation coefficients of signal values between the GeneChip Scanner 3000 and the GeneChip Scanner 3000 7G typically > 0.99, demonstrating excellent correlation when comparing scanned images of the same array.

NOTE: GeneChip Scanner 3000 7G is not meant to be used in diagnostic procedures and does not replace the GeneChip Scanner 3000 Dx.

Specifications

Scan Rate:	Typical times: 5 minutes for a 49-format array at 2.5 μm pixelation and 10.5 minutes at 1.56 μm pixelation
Sensitivity:	<0.5 chromophore equivalents/ μm^2 (CPSM) at a signal-to-noise ratio of 2:1 at wavelengths appropriate to R-Phycoerythrin
Excitation:	532 nm, 200 μW
Emission Filters:	570 nm, Long-Pass; 565 nm, 605 nm, 655 nm and 705 nm, Long-Pass; 20 nm wide band-pass filters
Detector:	Meshless Photomultiplier Tube, Red Enhanced
Displayed/Saved Dynamic Range:	16-bit, (65535:1)
Software:	Affymetrix GeneChip® Operating Software v1.3
Dimensions:	13"W x 22"D x 18"H (33 cm x 56 cm x 46 cm) Additional 18" (46 cm) in height clearance required for AutoLoader, if present. (36"/92 cm total).
Weight:	~70 lbs (31.8 kg), ~100 lbs (45.5 kg) with AutoLoader
Power:	Voltage: 100-240 V, Current: 4-2 A, Frequency: 50-60 Hz
PC Provided with System:	Processor — Minimum Precision Dual Xeon, Processor 3.0 GHz Memory — 2.0 GB Hard Drive — Dual 250 GB Operating System — Windows® XP NIC — Designed with pre-installed specialized controller boards to control GeneChip Scanner or Fluidics Station DVD — DVD + RW/R - 8X Max DVD Re-writeable drive Video Monitor — 20" Flat Screen LCD Monitor
Warranty:	One-year limited coverage

* For more detailed information about the GeneChip AutoLoader, please see the AutoLoader Data Sheet.

Ordering Information

GeneChip® Scanner 3000 7G

- 00-0211** GeneChip® Scanner 3000 7G with Workstation
- 00-0212** GeneChip® Scanner 3000 7G System, North America
- 00-0213** GeneChip® Scanner 3000 7G System, International
- 00-0217** GeneChip® Scanner 3000 7G System with AutoLoader, North America
- 00-0218** GeneChip® Scanner 3000 7G System with AutoLoader, International
- 00-0215** GeneChip® Scanner 3000 7G with AutoLoader

Affymetrix GeneChip® Scanner 3000 Field Upgrades

- 00-0214** GeneArray® 2500 to GeneChip® Scanner 3000 7G Upgrade
- 00-0205** GeneChip® Scanner 3000 7G Field Upgrade
- 00-0090** GeneChip® AutoLoader with External Barcode Reader—GeneChip® Scanner 3000 S/N 501
- 00-0129** GeneChip® AutoLoader with External Barcode Reader—GeneChip® Scanner 3000 S/N 502

MegAllele™ Systems

- 00-0185** GeneChip® Scanner 3000 MegAllele™ System, North America
- 00-0186** GeneChip® Scanner 3000 MegAllele™ System, International

MegAllele™ Field Upgrades

- 00-0183** GeneChip® Scanner 3000 MegAllele™ Genotyping Upgrade for 6G
- 00-0206** GeneChip® Scanner 3000 MegAllele™ Genotyping Upgrade for S/N \leq 502
- 00-0223** GeneChip® Scanner 3000 MegAllele™ Genotyping Upgrade for \geq 547

To Order

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