DataSheet

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GeneChip® Scanner 3000 7G

Combining advanced technology with user-friendly features for present and future GeneChip® microarray scanning needs

Introduction

GeneChip® Scanner 3000 7G combines advanced design improvements with high-resolution scanning and automation to dramatically improve efficiency in gene expression and genetic analysis applications. When used with GeneChip® AutoLoader, GeneChip Scanner 3000 7G provides complete walk-away freedom for scanning your arrays. As with all GeneChip® Scanner 3000 instruments, GeneChip Scanner 3000 7G fits easily into a benchtop environment. Its solid-state laser eliminates the need for an external laser power supply or a special cooling system under the bench.

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

Highlights

- Compact size for better space utilization.
- Higher resolution scanning from 0.51–2.5 µm pixelations, automatically selected by array type.
- Optimal image uniformity and collection efficiency across entire scan area with patented Flying Objective™ technology.
- No laser drift and reduced scanner-to-scanner variability.
- Automatic adjustment of residual arc correction and x-linearity.
- GeneChip AutoLoader-compatible for complete walk-away scanning of up to 48 arrays at a time.
- Excellent signal correlation (>0.99) with previous GeneChip 3000 Scanner models.

Pathway to future innovation

Comparison of data from GeneChip Scanner 3000 7G and previous GeneChip Scanner 3000 models demonstrates complete concordance, making a seamless transition for GeneChip platform users to compare data generated from prior models. In addition, the scanner design will accommodate future advancements in GeneChip® technology to meet the needs of emerging applications.

Patented Flying Objective technology means fast, consistent scanning

The unique design of GeneChip Scanner 3000 7G 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. GeneChip Scanner 3000 7G with an improved autofocus algorithm is up to 30% faster than GeneChip Scanner 3000 when scanning a standard-size (49-format) array, such as GeneChip® Human Genome U133A Array, at 2.5 µm pixelation.

GeneChip Scanner 3000 7G hardware features

Automatic ARC Correction

- Offers 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

- 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 sub system

- 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% 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 arrays.
- Optical design is optimized to scan at multiple wavelengths from a single excitation wavelength.
- Photo-bleaching is 70% less than previous generation scanners.

Solid-state green laser

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

Automation-ready

- Accepts GeneChip AutoLoader,* which provides the following:
  - Temperature-controlled environment to maintain long-term stability and integrity for up to 16 hours.
  - Removable 48-array 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 can operate in environments running 10,000 scans per year.

Footprint

- Requires less than half the bench space of the previous generation scanner.

Weight

- GeneChip Scanner 3000 7G (minus GeneChip AutoLoader) is less than one-third the weight of the previous generation scanner.

GeneChip Scanner 3000 7G safety information

Electrical

- Requires no dedicated or special power setups.
- Conforms to the following standards for Electromagnetic Conformity for Class A Industrial, Scientific, and Medical equipment for use in Industrial environments: EN 61326-1, CISPR 11, EN 55011, EN 61000-3-2, EN 61000-3-3, FCC Part 15.
- Certified by TÜV SÜD America to the following Product Safety standards for Electrical Equipment for Measurement, Control, and Laboratory Use: IEC/EN 61010-1, CAN/CSA-C22.2 No. 61010-1, UL 61010-1, IEC/EN 61010-2-081, CAN/CSA-C22.2 No. 61010-2-081.

*Please see the GeneChip AutoLoader data sheet (P/N 701945) for more detailed information.

Optical

- Complies with 21 CFR 1040.10 and 1040.11 for Laser Products, except for deviations pursuant to Laser Notice No. 50.
- Certified by TÜV SÜD America to the following Product Safety standards for Class 1 Laser Product: IEC/EN 60825-1.

Specifications	
Scan time	5–45 minutes per cartridge, depending on array type
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, 10 mW maximum
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, (65,535:1)
Software	GeneChip® Command Console® Software (AGCC) v4.1.2 or higher
Dimensions	13"W x 22"D x 23"H (33 cm x 56 cm x 58 cm). Additional 8" (20 cm) in height clearance required for AutoLoader, if present. (31"/79 cm total).
Weight	~70 lbs (31.8 kg), ~105 lbs (47.6 kg) with AutoLoader
Power	Voltage: 100–240 V, Current: 4–2 A, Frequency: 50-60 Hz
PC provided with system	Dell™ Precision T5600XL Workstation **Processor:** Intel® Xeon® Processor E5-2620 **Memory:** 8.0 GB **Hard drive:** Dual 900 GB **Operating system:** Windows® 7 Professional 64-bit **NIC:** Designed with pre-installed specialized controller boards to control GeneChip Scanner or Fluidics Station **DVD:** 8X Max DVD-R drive and 16X Max DVD +/– Re-writable drive **Video monitor:** 20" Flat Screen LCD Monitor
Warranty	One-year limited coverage

Ordering information

Part number	Product	Description
00-0213		GeneChip® Scanner 3000 7G System
00-0362		GeneChip® Scanner 3000 7G Whole Genome Association System
00-0186		GeneChip® Scanner 3000 7G Plus Targeted Genotyping System
00-0218		GeneChip® Scanner 3000 7G System with AutoLoader
00-0210		GeneChip® Scanner 3000 7G

GeneChip Scanner 3000 7G is For Research Use Only. Not for use in diagnostic procedures and does not replace the GeneChip Scanner 3000Dx v.2.

NOTE: GeneChip Scanner 3000 7G is **For Research Use Only. Not for use in diagnostic procedures**.

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