

Automated array processing with the GeneTitan® family of instruments

The first to deliver hands-free automation



Key benefits:

- **Easy** – Designed for operators with minimal microarray experience
- **Flexible** – Supports gene expression and genotyping studies on 16-, 24-, and 96-format array plates
- **Accurate** – Delivers high-quality, consistent data every time
- **Efficient** – Condenses hands-on processing time to as little as 30 minutes, images an array in less than five minutes, and operates unattended overnight
- **Robust** – Has fewer moving parts so it's easily maintained and rarely requires IT support
- **Scalable** – Meets both medium- and high-throughput needs
- **Adaptable** – Creates flexible workflows and sample registration via Affymetrix® GeneChip® Command Console® (AGCC) Software

Introduction

Traditional microarray formats require a labor-intensive, manual handling process. Currently, the only way to scale up throughput is to add manpower and instrumentation, which results in higher costs, higher data variability, and increased chance of error.

Affymetrix is the first to deliver a better solution: The GeneTitan family of instruments. The GeneTitan and GeneTitan Multi-Channel (MC) Instruments maximize data reproducibility and laboratory productivity by minimizing user intervention.

By combining a hybridization oven, fluidics processing, and state-of-the-art imaging device, both instruments process multiple samples under identical conditions and with minimal operator intervention. Processing multiple samples with this unique degree of hands-free automation means your data will be consistently reproducible, your lab will be more productive, and you can spend less time acquiring and managing data and have more time for science.

Features

Processing GeneChip® Array cartridges requires three separate instruments with manual interventions between each. Now, all of that is accomplished with array plates and a single bench-top instrument that seamlessly integrates hybridization, washing, and imaging.

The operator simply loads the array plates, hybridization-ready target, and reagents into the instrument's motorized drawers and presses "start." It's that easy. The instrument manages all processing and plate transfers, providing a fully hands-free workflow. Depending on the assay, GeneTitan® Instruments can also run unattended from hybridization through data acquisition.

Hybridization oven

The hybridization oven simultaneously incubates up to two array plates, supporting the needs of both medium- and high-throughput studies. The oven delivers a temperature uniformity of $\pm 1^\circ$ Celsius from the set point, which ensures optimal hybridization. The plates are automatically loaded by a plate gripper when the oven reaches the proper temperature, then automatically moved for washing and staining when hybridization is complete, for unattended overnight operation.

Fluidics

The advanced fluidics washes and stains the arrays. Clean dry air (CDA)—air without moisture, oils, particles, etc.—moves wash buffers through the instrument between reagent bottles and array plates. Using CDA minimizes the number of moving

parts required to create a highly robust instrument that is easy and cost-effective to maintain. In the final step, the plate gripper automatically moves the arrays to the imaging device.

Imaging

A high-intensity excitation source—an internal LED in the GeneTitan Instrument and an external 300W xenon lamp in the GeneTitan MC Instrument—provides stable, efficient, and uniform illumination to the array, optimizing exposure time to minimize photobleaching effects and maximize throughput. The imaging device, with custom-designed optics, CCD camera, and high-performance excitation source, not only captures images with ideal clarity to deliver highly precise analyses, but also delivers uniform and reproducible data to support standardization of microarray information within and across studies and labs.

Software

AGCC Software supports flexible instrument control workflows, enabling the operator to optimize scheduling of the instrument and to stop/restart it between steps. It also records parameter, protocol, and array histories and can be integrated with library information management systems (LIMS) to further increase lab efficiency. User error is largely eliminated between the external barcode reader, which tracks sample information, and the software, which provides standard templates for array registrations. Finally, AGCC can automatically notify one or more individuals via email of any changes in the status of the instrument, providing true walk-away automation.



Specifications

	GeneTitan® Instrument	GeneTitan® MC Instrument
Supported applications	Expression	Expression and genotyping
Weight	309 lb (140 kg)	325 lb (147.4 kg)
Instrument dimensions	55" W x 33" D x 26" H (139.7 cm W x 83.82 cm D x 66 cm H)	55" W x 33" D x 26" H (139.7 cm W x 83.82 cm D x 66 cm H) External xenon arc lamp system: 10.5" W x 9.5" D x 10" H (26.7 cm W x 24.1 cm D x 25.4 cm H) External shutter controller: 2.88" W x 0.66" D x 3.88" H (7.32 cm W x 1.68 cm D x 9.86 cm H)
Illumination	520 nm internal high-intensity LED	200–700 nm output range, 300W external xenon lamp, warranted for 500 hr
Imaging optics	Diffraction-limited imaging optics for fluorescence emission; wavelength range 570–610 nm	Dual-excitation and emission filters with ability to expand to four filters Excitation filter: 1. 531 nm ± 20 nm 2. 609 nm ± 20 nm Emission filter: 1. 593 nm ± 20 nm 2. 676 nm ± 20 nm
Pixelation	1.0 µm	0.667 µm
Current	3.7–2.2A	6.2–2.6A
Voltage	100–240V (±10%)	
Frequency	50–60 Hz	
Pneumatics	Oil-free, clean, dry, regulated air supply with an air flow rate of 34 L/min (1.2 CFM) at 70 psi to operate the Fluidics Station	

GeneTitan® Instrument & GeneTitan® MC Instrument	
GeneChip® HT Array Plate processing	
Throughput	Two GeneChip® Array Plates per day
Hybridization oven temperature	37.0°C–70.0°C in 0.1°C increments; temperature uniformity of ±1°C from set point temperature
Wash B temperature	Ambient room temperature to 60.0°C in 0.1°C increments with ±1° accuracy
Imaging time	Less than five minutes per array
Work environment	
Clearance	12" (15.24 cm) in rear and on left side
Temperature	5°C–23.9°C (41°F–75°F)
Humidity	Maximum relative humidity 80% for temperatures up to 75.2°F (24°C); minimum humidity 30 ± 7% relative humidity
Pollution degree	2 environment
Altitude	<2,000m
Warranty	One year parts and labor
Electrical supply	Provide voltage, frequency, or power rating per unit label; circuit breaker
Main supply voltage fluctuations	Not to exceed ±10% of the nominal supply voltage
Site preparation	Refer to site prep guide for additional information on operating requirements

Ordering information

Part number	Description
00-0372	<p>GeneTitan® MC Instrument, North America/Japan (110V)</p> <p>Includes:</p> <ul style="list-style-type: none"> ▪ Complete GeneTitan MC Instrument with integrated hybridization oven, fluidics processing, and imaging device ▪ Computer workstation with monitor ▪ External barcode reader ▪ Uninterruptible power supply for 110V ▪ GeneChip® Command Console® Software
00-0373	<p>GeneTitan® MC Instrument, International (220V)</p> <p>Includes:</p> <ul style="list-style-type: none"> ▪ Complete GeneTitan MC Instrument with integrated hybridization oven, fluidics processing, and imaging device ▪ Computer workstation with monitor ▪ External barcode reader ▪ Uninterruptible power supply for 220V ▪ GeneChip® Command Console® Software
00-0371	<p>GeneTitan® MC Upgrade from GeneTitan™ Instrument</p> <p>Includes:</p> <ul style="list-style-type: none"> ▪ Multi-channel imaging device for upgrading GeneTitan Single-Channel Instrument ▪ Computer workstation ▪ GeneChip® Command Console® Software
00-0360	<p>GeneTitan® Instrument, North America/Japan (110V)</p> <p>Includes:</p> <ul style="list-style-type: none"> ▪ Complete GeneTitan Instrument with integrated hybridization oven, fluidics processing, and imaging device ▪ Computer workstation with monitor ▪ External barcode reader ▪ Uninterruptible power supply for 110V ▪ GeneChip® Command Console® Software
00-0363	<p>GeneTitan® Instrument, International (220V)</p> <p>Includes:</p> <ul style="list-style-type: none"> ▪ Complete GeneTitan Instrument with integrated hybridization oven, fluidics processing, and imaging device ▪ Computer workstation with monitor ▪ External barcode reader ▪ Uninterruptible power supply for 220V ▪ GeneChip® Command Console® Software

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