Galatek

Integrated Chemical Synthesis System



Automated Parallel Small Molecule Synthesis with a Dual-Chamber Design

PORTFOLIO INTRODUCTION

Galatek's Integrated Chemical Synthesis System automates the complete workflow for high-throughput chemical synthesis and reaction screening for early-stage drug discovery labs. Designed to streamline complex, step-heavy procedures, the System features a partitioned dual-chamber design that segregates compound feeding from reaction processing. This enables end-to-end automation - from precise solid-liquid dispensing and capping/decapping, to barcode scanning and constant-temperature shaking under inert gas protection. By replacing manual steps, the system enhances experimental reproducibility, improves data quality, and accelerates lead optimization.

APPLICATIONS

Where Galatek helps

- High-Throughput Parallel Synthesis & Screening
- Reaction Condition & Route Optimization (DOE)
- Catalyst, Solvent, & Substrate Screening
- Crystallization & Polymorph Research
- High-Throughput Formulation Research
- Novel Chemical & Advanced Materials Discovery

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FEATURES

- **Precise Dispensing & Handling:** High-stability XYZ rail controls liquid pipetting and self-developed solid powder module operations across all stations
- **High Throughput Parallel Processing:** Independently controlled constant-temperature shakers support 24/7 uninterrupted reaction workflows. Compatible with 2 synthesis systems – 8mL and 40mL
- **Fast and Reliable Execution:** Rapidly executes automated feeding across all parallel reaction vessels, optical barcode tracking and pre/post-reaction status imaging
- **Inert Atmosphere Control:** Integrated inert gas protection across loading, feeding, and reaction zones enables safe handling of anhydrous and oxygen-free radicals
- **Software:** Software draws on internal experimental data to guide setup and optimization, and automation handles execution. Results feed back into the platform, building a growing dataset for future use

System Design: Feeding vs Reaction Capabilities

Unlike traditional sequential synthesis - where reactions are run one after another - parallel synthesis, enabled by a dual-chamber architecture, allows researchers to test and optimize many variables concurrently.

	Feeding Chamber	Reaction Chamber
Primary Role	Automated Sample Prep & Reagent Handling	High-Throughput Parallel Reaction Execution
Core Modules	Multi-channel solid powder dispensing, 3-channel liquid pipetting, capping/decapping station, oscillation, and barcode scanning	XYZ robotic transfer, 9 individually controlled constant-temperature shakers (5°C to 150°C), and high-resolution optical imaging
Environmental Control	Configurable N2 inert gas protection for air/moisture-sensitive loading	Enclosed, inert atmosphere maintaining stable thermal conditions during continuous shaking
Throughput & Capacity	24/7 continuous reagent & substrate feeding	108 simultaneous reactions (up to 200 reactions/day)

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PRODUCT PARAMETERS

Category	Item	Specification
Basic Parameters	Dimensions (L×W×H)	3.255 m × 1.0 m × 1.07 m (+0.9 mm for the base rack)
	Power Supply	Voltage: 220 VAC; Frequency: 50 Hz; Rated power: 10 kW
	Operating Environment	Temperature: 5–40°C, Humidity: 20%–80% RH (non-condensing)
	Weight	1,000 kg
Reaction System	Constant-Temperature Shaker	Temperature range: 5°C–150°C; supports up to 9 shakers with individually controlled temperatures
Feeding System	Solids Dispensing	Weighing range: 5 mg - 220g; Precision ±0.5 mg (customized ranges available)
	Pipetting Performance	Precision: 1 μL <4%, 10 μL <3.5%, 100 μL <0.75%, 1000 μL <0.75% Accuracy: 1 μL <4%, 10 μL <2.5%, 100 μL <2.0%, 1000 μL <1.0%
Automation & Tracking	Rail Positioning Precision	±0.1 mm
	Imaging System	High-resolution pre- and post-reaction status imaging
	Barcode Scanning Module	Optional; compatible with standard 1D and 2D barcodes

Whether accelerating early-stage lead discovery, reaction optimization, or complex library screening, Galatek's Integrated Chemical Synthesis System is engineered to adapt as your chemistry programs scale. Each workstation is backed by Galatek's application expertise and integration support, ensuring that automation delivers not just high throughput, but reproducible, high-quality data from day one.

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