About

The ThermoFisher Laboratory Automation System (LAS) serves as the cornerstone technology for the Living Biofoundry, enabling execution of automated customized synthetic biology and workflows at >500 samples-per-week. The LAS is equipped with over of over 10 functional instrumental components, including: a state-of-the-art SpinnakerTM microplate robot, automated incubators, reagent dispensers, thermal cyclers, plate sealer, and carousels/racks that are seamlessly integrated through the MOMENTUM application programming interface that is fully-compatible with laboratory information management systems (LIMS).

Equipment Available

Thermo Scientific Multidrop Combi

About
The Multidrop Combi is an automatic, programmable, eight-channel microplate bulk reagent dispenser for microvolume dispensing. It can dispense 1 to 8 different reagents from external liquid reservoirs into different rows and can be used in several applications, for example, in drug discovery/highthroughput screening, genomic, proteomic and cell-based assays, and ELISA. It has a volume range of 0.5 to 2500 µl for 96-well plates of heights 5-50 mm.

User Notes
Before Use: Place the dispensing cassette tubes in proper position. Ensure that the waste containers are not full.
After Use: Flush out the tubing with deionized distilled water. Empty out waste containers, disposing of the contents as appropriate. Place the dispensing cassette tubes in rest position. For more information please read:

multidrop_combi.pdf

BioTek ELx405 Microplate Washer

About

The BioTek ELx405 is the first deep well plate washer that aspirates and dispenses into 96- and 384-well deep well and standard height microplates. It is a versatile, high-performance laboratory instrument designed for automated washing of microplates, supporting a wide range of applications such as ELISA, cell-based assays, immunoassays, etc.

Key Features:

Plate Compatibility: Washes 384-well and 96- well microplates in addition to 24-well and 96-well deep well plates (up to 50 mm in height)

Washing Technology:

Utilizes a patented Dual-Action™ manifold, enabling independent control of dispense and aspiration for precise washing, overfill washing, and overflow protection. Low-flow rates and 20° angled dispensing are available, making it especially suitable for gentle washing of adherent cell-based assays.

Fluid Handling:

Internal positive displacement pump for accurate fluid delivery, supporting volumes from 50 to 3000 µL/well. Optional buffer switching allows for up to four different wash buffers to be used automatically in a single protocol.

User Notes

Before Use: Ensure that the waste containers are not full.
After Use: Flush out washer with deionized water. Empty out waste containers, disposing of the contents as appropriate. For more information please read:

elx405cleaning.pdf

Automated Thermal Cycler

About

The Automated Thermal cycler (ATC) is capable of performing PCRs (polymerase chain reactions) at a high-throughput scale. The Thermo Fisher Applied Biosystems Automated Thermal Cycler (ATC) is a compact, robust, and highly integrable PCR instrument designed specifically for automated and high-throughput laboratory workflows. It is engineered to deliver reliable, hands-free PCR amplification, supporting both 96-well and 384-well plate formats, and is optimized for seamless integration with robotic liquid handling systems.

Key Features

Flexible Plate and Volume Compatibility

Supports 96-well (0.2 mL) and 384-well (0.02 mL) formats.

PCR volume range:

96-well: 10–100 µL for full-skirted plates; 20–100 µL for half-skirted plates 384-well: 5–20 µL for full-skirted plates Compatible with ANSI/SBS-standard plates.

Performance and Temperature Control

Thermal range: 0°C to 105°C, supporting a wide variety of PCR protocols. Temperature accuracy: ±0.25°C (35°C to 99.9°C). Temperature uniformity: ≤0.5°C (20 seconds after reaching 95°C). Maximum block ramp rates: 3.5°C/sec (96-well), 2.8°C/sec (384-well); maximum sample ramp rates: 1.8°C/sec (96-well), 1.6°C/sec (384-well).

Automation and Software Integration

SiLA Rapid Integration™ standard-compatible software allows straightforward connection to major robotic platforms.

Prewritten APIs and free desktop software enable both stand-alone operation and full robotic integration, including simulation modes for legacy Applied Biosystems 9700 systems.

Other features include:

1. Automated lid critical for hands-free operation
2. Automated plate ejectors to ensure consistent plate positioning
3. Heated cover to protect the plate nest, minimizing evaporation and enabling thermal contact

Reference documentation

momentum_6.1_training_module_4_v3_spinnaker_advanced.pdf

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