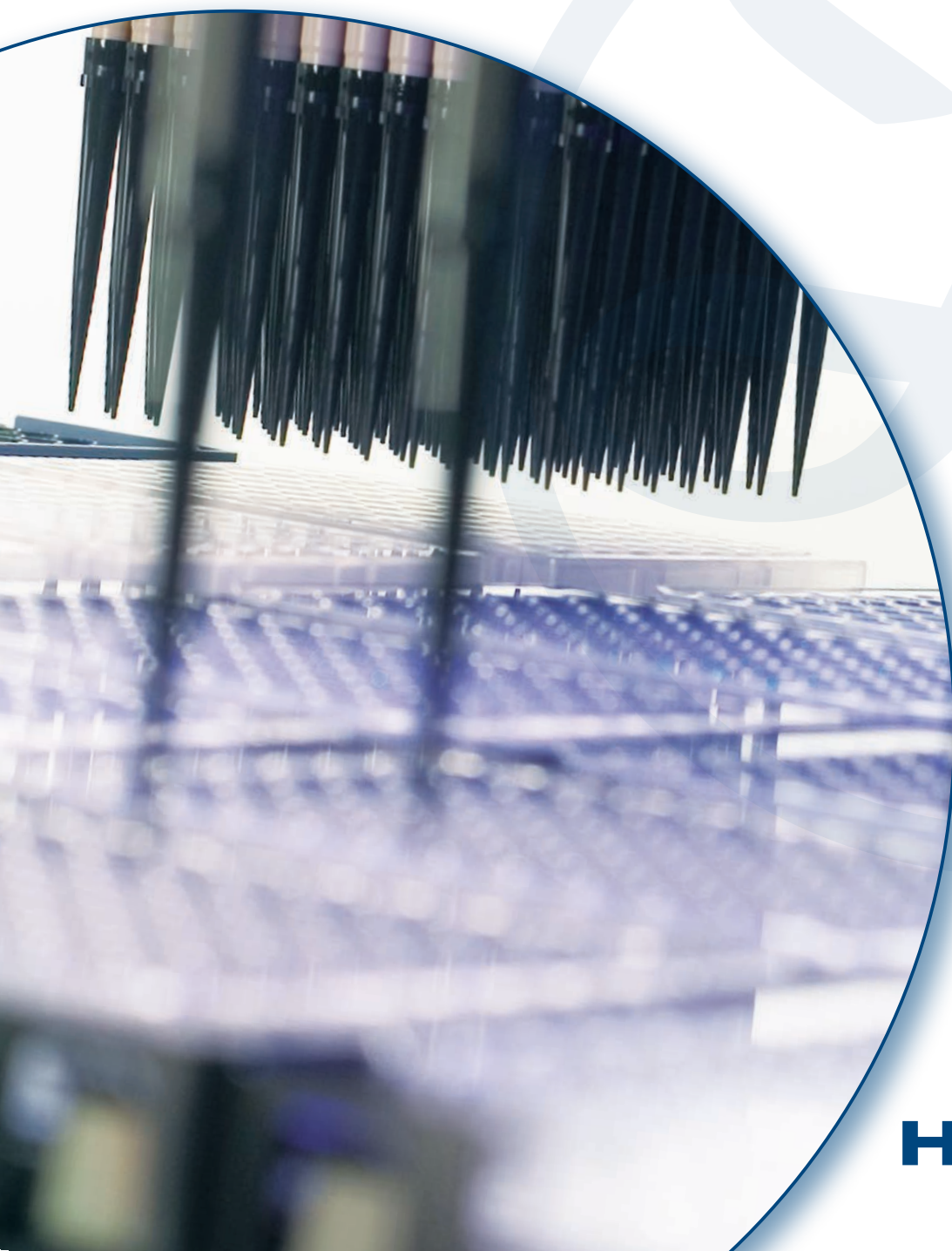


Microlab STAR Line

Laboratory Automation Platform



HAMILTON 

Expertise

Over 60 years of experience in liquid handling

Innovative Technologies

For almost 60 years Hamilton products have successfully served researchers in laboratories all over the world. Playing a key role in the early days of laboratory automation, Hamilton Robotics introduced the world's first semi-automated diluter in 1970, followed by the first fully automated sample preparation workstation in 1980. To this day Hamilton continues to lead the industry in innovative robotic liquid handling with the Microlab® STAR™ Line.

Commitment to Support

Customer satisfaction has the highest value at Hamilton. All across the world Hamilton is able to supply highly qualified support by local service and application engineers. These engineers are trained and certified by Hamilton's headquarters in Bonaduz, Switzerland and Reno, USA and supported by local subsidiaries or partners.



Production 1950



Production 2013



“

Hamilton has repeatedly demonstrated to be a reliable and committed partner. We relied on Hamilton to automate our sensitive stem cells culture right from the start. Working with Hamilton's staff feels like being in one team, speaking the same language and having the same goals.

Prof. Oliver Brüstle

University of Bonn and Life&Brain GmbH, Germany

”

1947 Clark Hamilton develops the first microliter syringe

1955 Founding of Hamilton Company, USA

1966 Founding of Hamilton Company, Bonaduz AG

1971 Digital Diluter



1974 Established R & D in Bonaduz

1977 Founding of subsidiary Hamilton Germany

1980 Microlab 2000



1987 Microlab AT

1988 Founding of subsidiary Hamilton GB

1992 Microlab F.A.M.E

1994 Microlab 4000

1999 Founding of Hamilton France

2000 Microlab STAR – 1st Series



2004 Founding of Hamilton Italy

2005 Founding of Hamilton China

2007 Opening of Hamilton Storage Technologies



2008 Microlab NIMBUS



2011 Founding of Hamilton Nordic

2012 Hamilton VANTAGE

Hamilton Milestones

Product Milestones

Innovation

The benchmark for precision and reliability

STAR Line uses air displacement and the unique CO-RE technology. These innovations provide unrivalled features to maximize sample care and integrity.

- ▶ Air displacement pipetting
- ▶ CO-RE technology
- ▶ Total aspiration and dispense monitoring (TADM)
- ▶ Anti-droplet control (ADC)
- ▶ Dynamic liquid classification (DLC)
- ▶ Dual liquid level detection (dLL D)

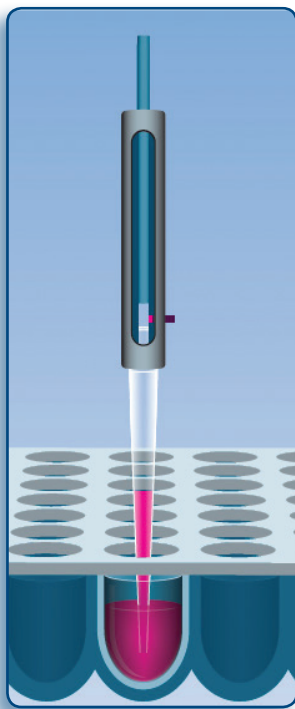
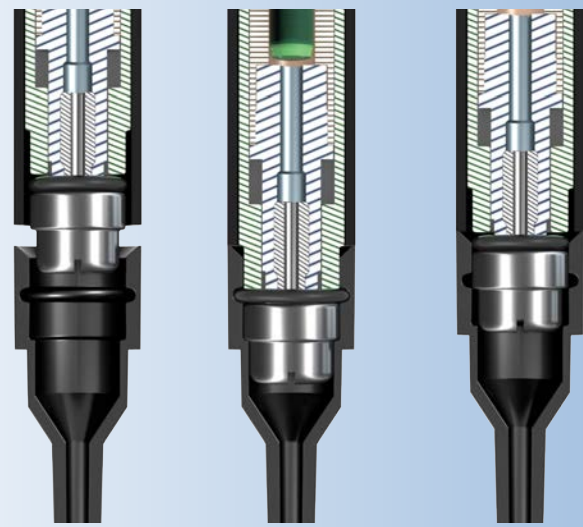
Hamilton STAR systems were our natural first choice. The innovative pipetting control prevented contamination in our cellular assays and provided accuracy and reliability in the biochemistry experiments.

Dr. Luke Alderwick, Ph.D
Director of the Birmingham Drug Discovery Facility (BDDF),
University of Birmingham, United Kingdom



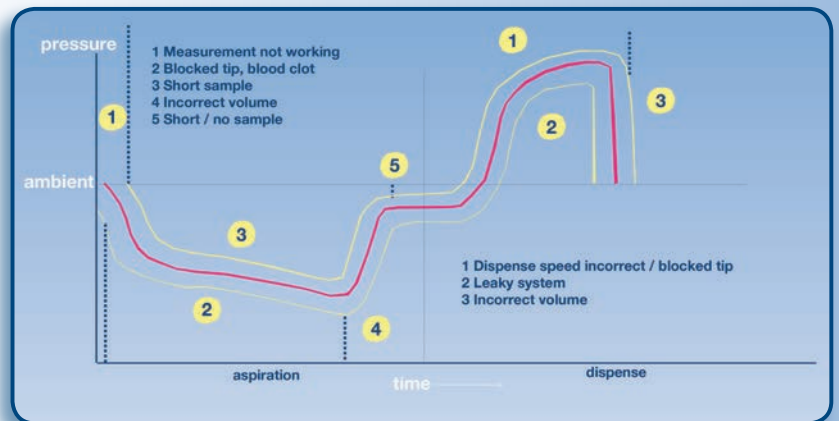
CO-RE Technology

The CO-RE PerfectTouch system attaches disposable tips, steel washable needles or transportation tools to the pipetting channels with a stable lock-and-key fit. The system requires no vertical force for attachment and ejection, thus improving the overall system performance along with versatility and modularity.



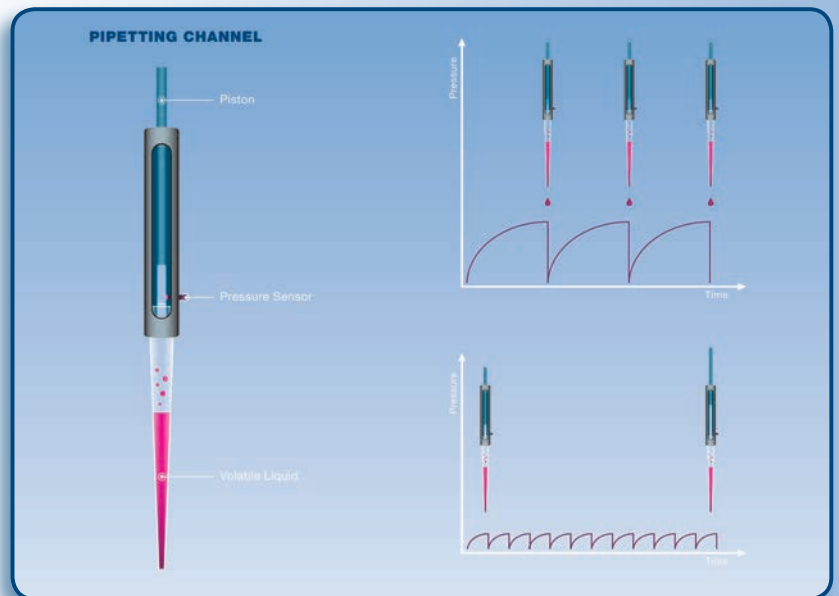
Air Displacement Pipetting

Air Displacement works analogue to a hand held pipette and offers all benefits that come with system liquid free pipetting.



Total Aspiration and Dispense Monitoring (TADM)

TADM is a real-time monitoring feature that verifies and reports any error that could occur during all pipetting steps.



Anti-Droplet Control (ADC)

ADC compensates pressure changes in the channels when pipetting volatile solvents and therefore allowing pipetting of any kind of liquid with out dripping.

Safety

Complete process control and traceability

From sample loading, identification to processing, the STAR Line system controls every action taken and ensures pro-active error handling for maximum safety.

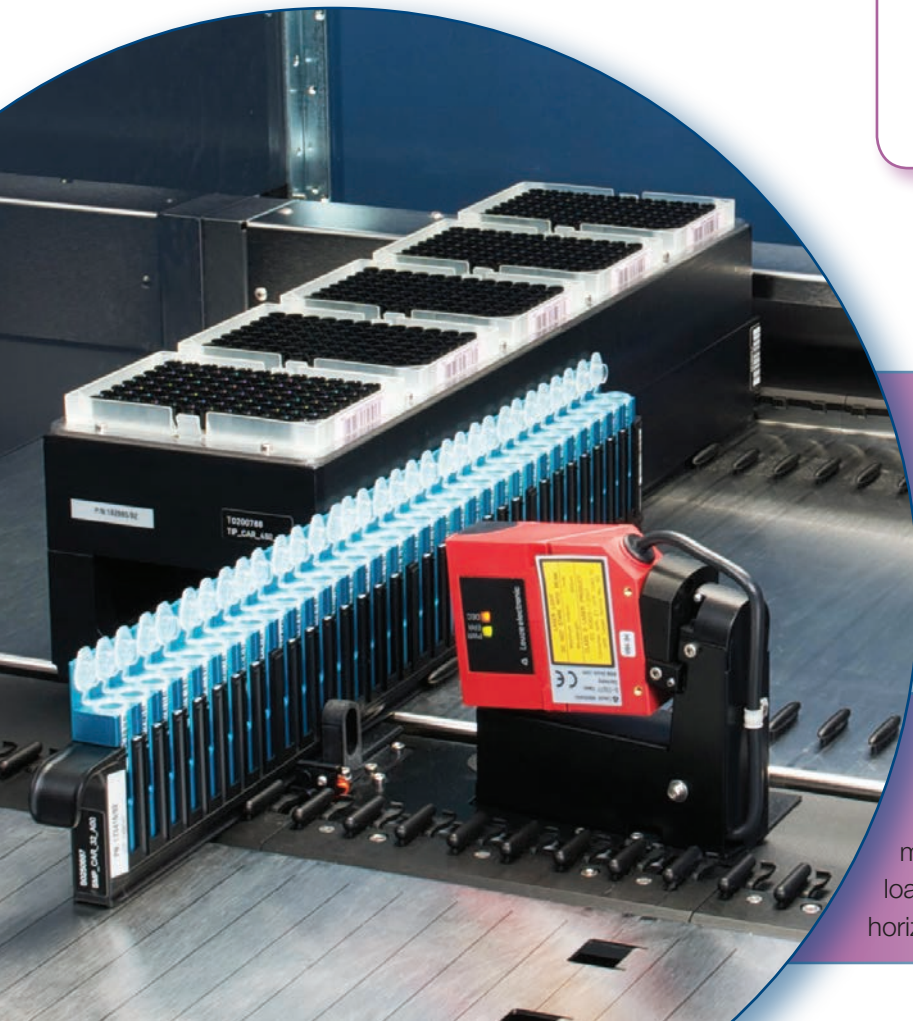
- ▶ Autoload system / Automated 1D barcode reading
- ▶ Automated 2D barcode reading
- ▶ STARwatch diagnostics
- ▶ Teaching needle
- ▶ CCD camera monitoring
- ▶ Tip type detection



Hamilton could offer a unique solution for our needs, with focus on process robustness and sample safety. Every step of the protocol is monitored and traced, from the initial setup carried out by the operator prior to start, to sample identification during the whole run. This gives us complete confidence in our results and the sample integrity.

Prof. Per Knappskog

Head R&D, Haukeland University Hospital, Bergen, Norway



Autoload System

Allows for simplified loading of all labware needed for the protocol, by automatic loading of carriers into the pipetting area of the system and monitors correct placing on deck.

Automated 1D Barcode Reading

The scanner moves to the loading position and reads 1D barcodes from sample tubes, microplates and carriers while being automatically loaded into the system. It can read vertically and horizontally.

Automated 2D Barcode Reading

With a high performance industrial camera and superior software, all common rack and tube 2D codes are decoded and identified in a very short time. Integrated in a space saving carrier, the deck layout is optimized.



STARwatch Diagnostics

STARwatch continuously monitors the condition of the Instrument. The captured data is automatically analyzed, and when a critical pattern is recognized, the service organization is immediately informed to provide a pro-active intervention.



Automatic Channel Verification

This walk-away application allows for automatic verification of volume, tightness and accurate coupling between pipetting channel and tips, needles or tools. It can be automatically performed whenever the system is not in use.

Tip Type Detection

The system automatically detects the size of disposable tips placed on deck, thus eliminating the risks associated with misplacement, mechanical collision or inconsistencies within the pipetting procedure programmed into the method.

CCD Camera Monitoring

A high-resolution industrial camera can be moved over the whole deck area. The camera takes images and Hamilton's proprietary software analyzes them. This feature can be used for applications like colony counting and picking, color change recognition, blood fraction separation, sample card analysis or compound solubility.



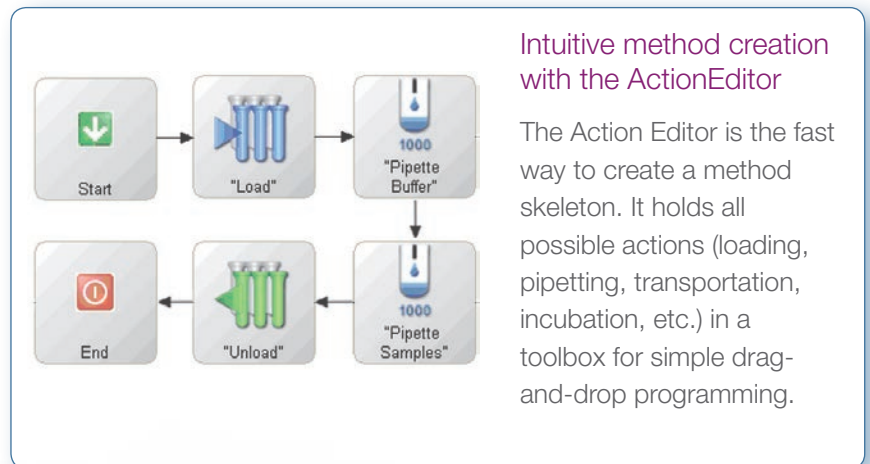
Intuitive

Simplified, flexible workflow

Intuitive VENUS Software Suite

Hamiltons' VENUS software offers basic or advanced programming, without limiting your imagination or compromising your requirements. Intuitive editors provide full control over every aspect of your method.

- ▶ **SuperSimpleMethods:** pre-programmed methods to execute the most common lab routines (copy plates, add buffer, serial dilution, etc.) with the least possible user interaction – plug and play
- ▶ **SmartSteps:** pre-programmed software modules that can be combined to a ready-to-use method
- ▶ **StepTemplates:** a skeleton of commonly used assay steps such as serial dilution, vacuum steps, stacked tip handling and more
- ▶ **3D animation of the deck** for outstanding presentation of your decklayout



Flexible Configurations

Air displacement offers the easiest way of pipetting automation: simply switch on your system and start running your method, there's no need for any specific preparation step. The technology was invented to be applied to independent pipetting channels as well as multiprobe heads. The immediate benefits of this technology are:

- ▶ Easily set up any application by sharing liquid classes between independent pipetting channels and multiprobe heads
- ▶ Unique consumables concept enables usage of the same tips for pipetting volumes from 0.5 up to 1000µl on single channels and the CO-RE 96 Probe Head
- ▶ Every tip rack can be simultaneously reached by all pipetting tools to achieve the highest deck layout optimization
- ▶ Easy format change to 96-wells by using Rocket tips* on the CO-RE 384 Probe Head

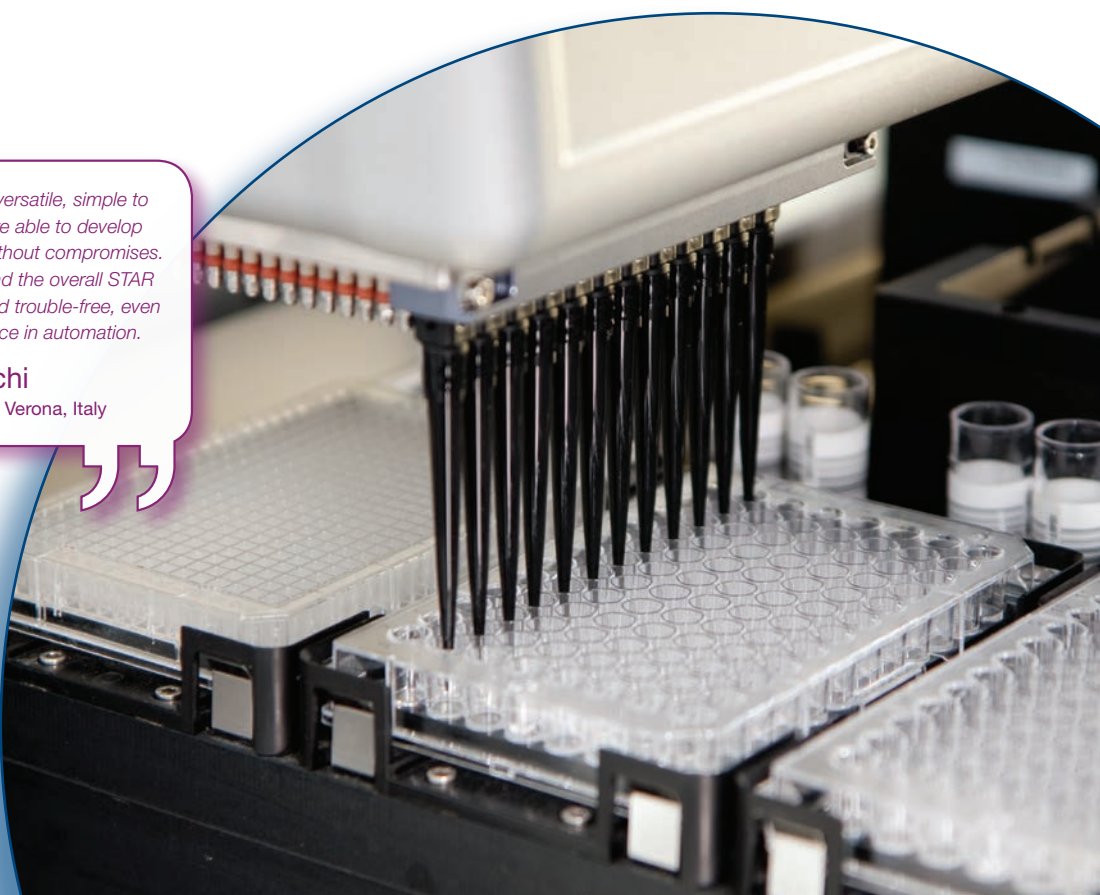
*Adapters that combines 4 channels of the CO-RE 384 Probe Head into one output



The VENUS software is extremely versatile, simple to program and easy to use. We were able to develop methods according to our needs, without compromises. The air displacement technology and the overall STAR concept makes daily use intuitive and trouble-free, even for operators with limited experience in automation.

Dr. Marco Michi

Technology Supervisor, Aptuit, Verona, Italy



Flexibility

Delivering future proof automation

No Compromises: STARlet, STAR or STARplus

Depending on your throughput and integration requirements you can select out of three different platform sizes. All deck sizes use the same advanced technologies and features to serve your specific application needs.



The flexibility of the Hamilton STARlet in terms of implementation of various protocols for nucleic acids extractions was a key consideration in selecting Hamilton. We are now pleased to use different protocols for our panel of applications in molecular biology (HRM, Allelic discrimination, MLPA, PCR, QPCR, sequencing, southern blot...).

Dr. Valérie Capraro, Ph.D
Director Molecular Biology Division,
Centre Hospitalier Universitaire de Liège, Belgium

Easy On-Deck Transportation with CO-RE Gripper

The CO-RE Gripper can be picked up by two independent channels during a run. With this tool the channels can transfer plates on the deck.

Advanced Transportation and Integration with iSWAP

The articulating robotic arm with plate gripper reaches out on both sides of the deck, for end-to-end automated solutions and more walk-away time (e.g., place a plate in a reader).



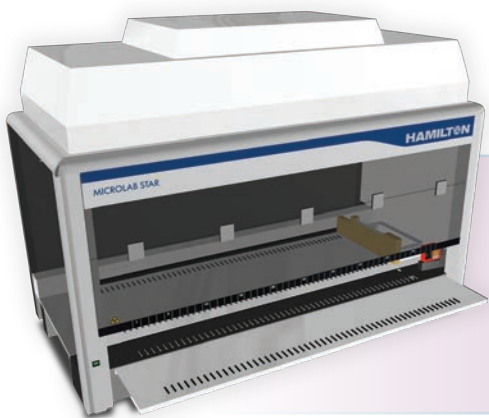
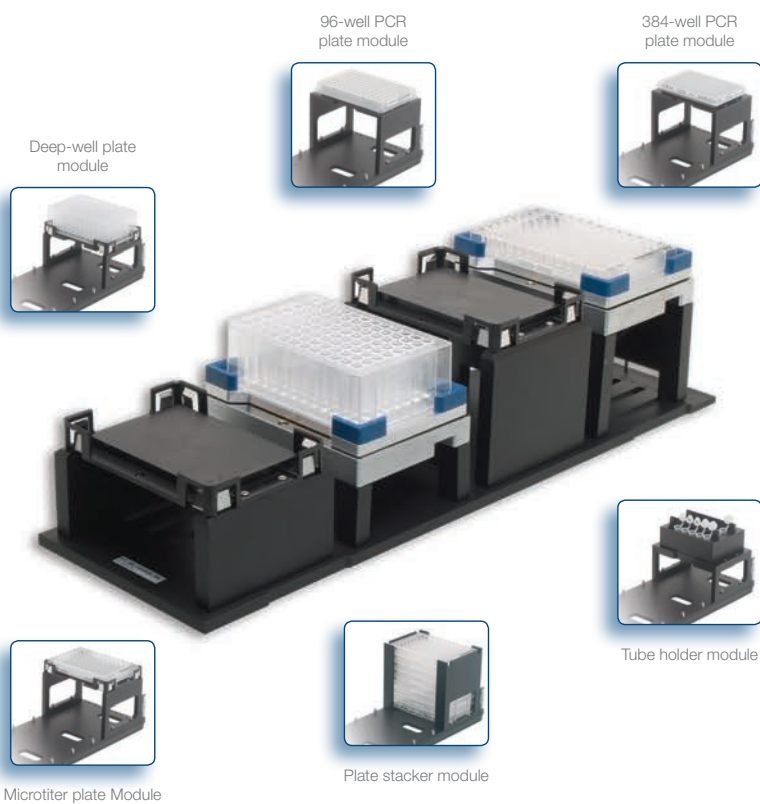
Ultimate Flexibility for Integrations with RackRunner

The Hamilton RackRunner is a fast and reliable robot used to integrate several devices such as Hamilton STAR liquid handling workstations, Hamilton Storage Technologies' automated storage systems, DeCappers, or third party equipment such as hotels, incubators, and plate readers. There are different versions of the RackRunner from 80cm up to 8m to meet all kinds of integration requirements.



MultiFlex System

A base carrier plate offers flexible placing of a broad range of different modules for all common labware: Microtiter plates, deep-well plates, 96-or 384-well PCR plates, plate-, petri dish- or tip-stackers, tube holders, reagent troughs, tilt modules, heating and cooling modules and many more options...



HEPA Filter Hood

Takes in room air, HEPA filters it and supplies it to the inside of the STAR Line instrument. Optionally Hepa Filter hoods are available with UV lights.

Wide range of applications

automating multiple applications for the biological and analytical sciences

Genomics

- ▶ DNA/RNA extraction
- ▶ Sample normalization
- ▶ PCR and qPCR set-up and purification
- ▶ Automated colony picking
- ▶ NGS sample preparation
- ▶ Cycle sequencing set-up and purification

Drug discovery

- ▶ ADMET
- ▶ Solubility assays
- ▶ PAMPA
- ▶ Cytotoxicity assays
- ▶ Cytocrome p450
- ▶ Screening assays
- ▶ High throughput and content screening assays

Diagnostics

- ▶ ELISA processing
- ▶ Blood grouping
- ▶ Pooling

Cellomics

- ▶ Cell culture maintenance
- ▶ Cell based assays
- ▶ Automated 3D cell cultures
- ▶ Clone picking

Proteomics

- ▶ Protein crystallization
- ▶ In-gel digestion
- ▶ MALDI TOF spotting
- ▶ Protein precipitation
- ▶ Protein purification
- ▶ Biomarker detection
- ▶ LC/MS sample preparation

Forensics

- ▶ Sample lysis
- ▶ DNA/RNA extraction
- ▶ Quantification
- ▶ Normalisation
- ▶ STR profiling

Biobanking

- ▶ Sample preparation
- ▶ Blood fraction separation
- ▶ DNA/RNA purification
- ▶ Long term sample storage

... and much more

Wherever you are, whatever your market or application area ...

... Hamilton Robotics have the solution

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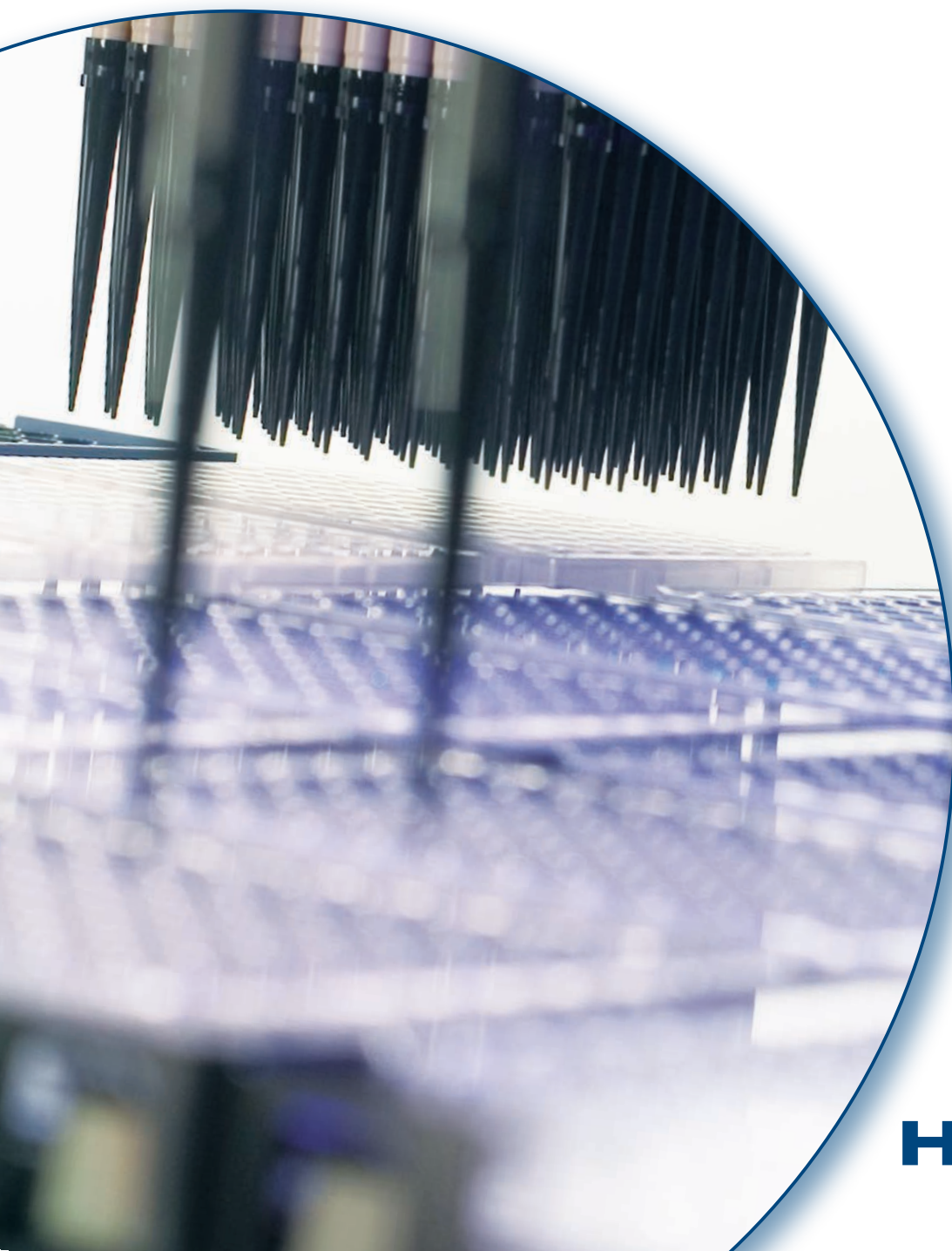
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Laboratory Automation Platform



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