



Lynx

Liquid Handling Robotic Workstation

dynamicdevices

Lynx from dynamicdevices

with Revolutionary



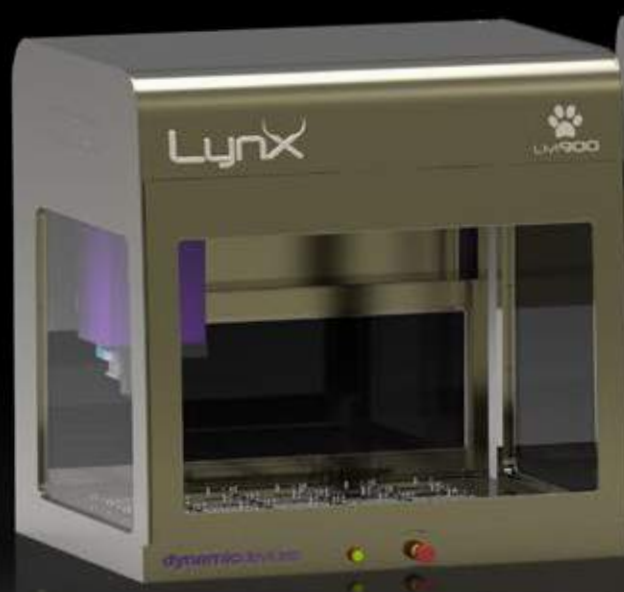
Volume
Verified
Pipetting
Technology



The **Lynx Series Liquid Handling Robotic Platform** represents the first configurable liquid handling robotic platform that offers a 96 & 8 channel pipetting tool with **Volume Verified Pipetting (VVP)**.

Our **VVP** implements real-time liquid handling with volumetric reporting through the use of in-line flow sensors that directly measure the volume of liquid being aspirated/dispensed in the tip.

Combinations with our standard spreadable 8 tip and **96 / 384** channel syringe based pipetting tools, linear motion technology, microplate gripper tools, machine vision error handling and bar code scanning, the most powerful liquid handling robot can be configured to fit just about any laboratory automation application.



LM900

Lynx LM900
Liquid Handling Robot
40" x 36" x 40" (LxWxH)
30 microplate positions



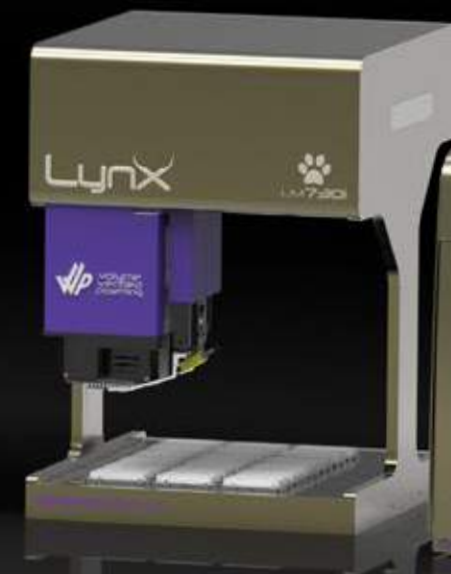
LM1200

Lynx LM1200
Liquid Handling Robot
52" x 36" x 40" (LxWxH)
42 microplate positions



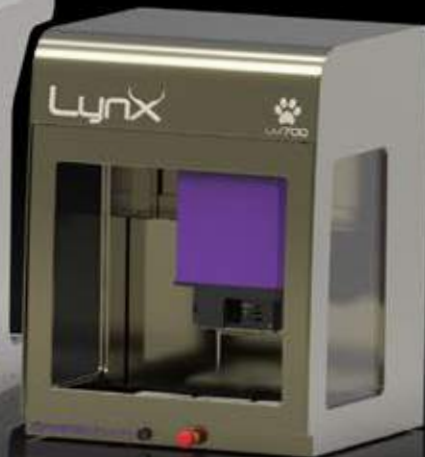
LM1800

Lynx LM1800
Liquid Handling Robot
75" x 36" x 40" (LxWxH)
66 microplate positions



LM730i

Lynx LM730i
Liquid Handling Robot
28" x 32" x 40" (LxWxH)
18 microplate positions



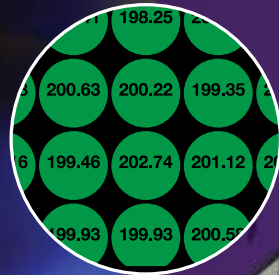
LM700

Lynx LM700
Liquid Handling Robot
28" x 26" x 26" (LxWxH)
12 microplate positions

Our Revolutionary VVP Pipetting Technology Changes Everything

Volume Verified Pipetting technology from Dynamic Devices validates liquid transfers, with full liquid handling diagnostics and volumetric sample tracking.

Combinations with our standard spreadable 8 tip and 96 / 384 channel syringe based pipetting tools, linear motion technology, microplate gripper tools, machine vision error handling and bar code scanning, the most powerful liquid handling robot can be configured to fit just about any laboratory automation application.



Real Time Transfer Validation & Visualization

With VVP Pipetting Tools, real-time closed-loop monitoring displays actual pipette volumes as they occur. A color based visualization screen allows the operator to confirm the success of each sequential step as it is executed.



Multi-Channel Tools: 96 or 8 Independent Volumes

With VVP's independent control and monitoring of each channel, whether in 8 or 96 format, different volumes may be independently aspirated and dispensed. Applications like DNA Normalization and Compound Dissolution are accomplished within an entire 96 well plate in one transfer.



Eliminate Liquid Classes

With VVP's real-time closed-loop monitoring, it is no longer necessary to painstakingly create 'liquid classes' for every liquid type and volume range. The VVP directly generates the volumetric flow of the liquid entering the tip, without the need to establish liquid class parameters. There are no requirements for pre-set, pre-defined or pre-calibrated settings to pipette your protocols. Simply provide a target volume and the system monitors the actual flow of the liquid into the tip over time until the target volume is achieved.



Volumetric Reporting

With every liquid transfer being monitored and tracked, Method Manager control software allows the operator to 'save' each pipetting sequence's volumetric data to an output file. Protocols are accomplished with full sample and pipetting tracking, an important feature for applications like Genomic Testing or Forensics.

VVP Operating Principle

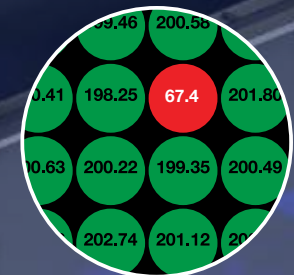
Aspiration and dispense of the liquid sample is driven by the precise control of vacuum and positive pressure. A volumetric liquid transfer is accomplished in each channel by the coupling of a solenoid valve to a silicon chip based MEMS flow sensor in a closed loop real time environment, where the actual flow rate of a liquid is monitored. This allows liquids with different physical properties to flow into/exit the tip while automatically accommodating for temperature and viscosity differences.



- ✓ Volumetric based pipetting
- ✓ Full pipetting liquid diagnostics
- ✓ Full pipetting sample & data tracking
- ✓ Independent volumes in each channel
- ✓ Efficient column/row liquid handling for dilution methods
- ✓ 96 & 8 VVP tools available
- ✓ Steel mandrel tip loading, reducing wear parts
- ✓ Award winning technology

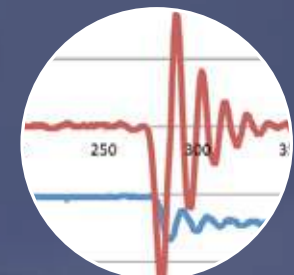
Real Time Clot/Clog Detection & Correction

During an aspiration step all channels are monitored with millisecond sampling. Any particulate that interrupts the average flow rate within a channel triggers that independent channel to immediately cease the aspiration prior to that tip becoming permanently clogged, while all other tips continue their aspiration. After all the tips have completed their aspiration, all of the successful tips are held firm to allow the clogged tip(s) to enter a blowout / retry aspiration loop. This loop is repeated until all samples are either successfully aspirated or the number of user specified repeats are reached. The error-reporting file is then generated according to the established parameters.



Tracking Error Diagnostics

The Short Sample diagnostics technology is employed to verify that no air is aspirated as the Tip Tracking function is utilized. If the sample is aspirated faster than the tip tracks down, the Tracking Error is trapped for the individual channel(s).



Short Sample Diagnostics

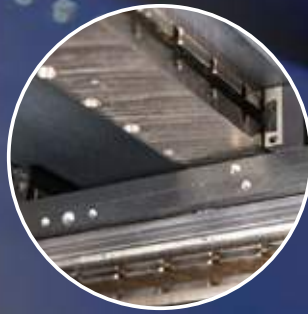
Short sample or Air-In-Sample diagnostics is established by the monitoring of all channels with millisecond sampling analyzing the flow rate of the liquid into each tip. Any disruption of the samples flow rate by air entering a channel traps Short Sample Error. The end user may predetermine how to handle this Short Sample Error, including an on-the-fly retry of the aspiration, dispense all samples back to the source well, or transfer the volume and report the actual 'short' volume transferred.

VVP Liquid Level Detection & Residual Volume

VVP technology also provides Liquid Level Detection (LLD) for each channel utilizing clear tips in both the 96 & 8 channel pipetting tools. The system creates an outward flow of air and monitors this airflow until a solid meniscus is detected. The Residual Volume within the well is then calculated based on the vertical height of the tip at the contact point with the solid meniscus and the well volume parameters.

Absolute Positioning with Linear Magnetic Motors & Encoders

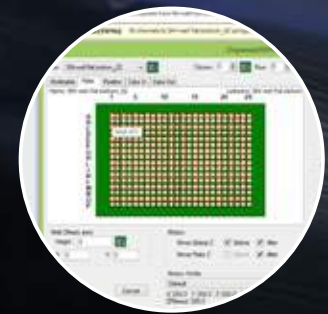
Linear motors and encoders provide superior positional accuracy, precision and repeatability to the mechanical rotation-to-translation mechanisms such as racks & pinions or belts & pulleys commonly found in laboratory liquid handling instruments. In addition, linear motors and encoders provide increased speeds reduced maintenance and on the pipetting tool positional encoding.



Advanced Motion Controls

The Lynx offers the latest linear drives and advanced motion controls commanding highly precise positioning and repeatability with virtually no maintenance. The per motion axis modular architecture includes a solo high flex cable with a single connector containing both the power and communications, providing simplicity and reliability.

Why Choose the Lynx LM Series Liquid Handling Robotic Platform?



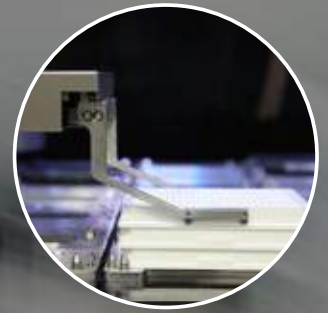
Simplified Programming with Method Manager 4.0

Method Manager 4.0 provides an intuitive and simplified way to program your methods, import files, export your pipetting data, and manage pipetting diagnostics and error handling routines.



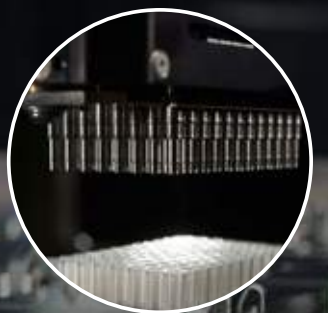
Supreme Flexibility with an Unrestricted Worktable

Each Lynx worktable position includes an SBS compliant microplate footprint that provides organizational flexibility with any combination of plates, tips or disposables. The superior strength in the instrument chassis and vertical drive allows the Lynx to load 96 or 384 tips from any of the possible 66 worktable locations. This flexibility, combined with a complete disposable tip line each available in an SBS free standing tip box, provides a flexible yet highly functional worktable.



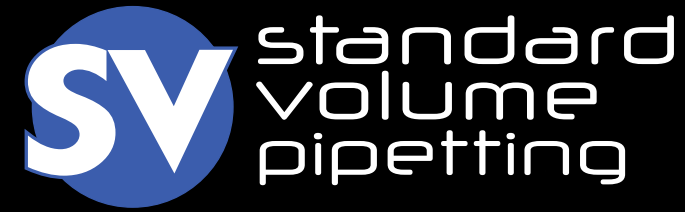
Open Design For Flexible Integration

Microplate gripper options give the Lynx flexible integration capabilities from simple pipette head grippers to 6 axis SCARA robots that can reach off deck to incorporate other peripherals. The open chassis design allows integration from all 4 sides, as well as horizontal conveyor options and vertical incorporation through the worktable.



Low Maintenance Solid Mandrel Tip Loading

The Solid Mandrel (SM) tip adapters for the loading of disposable pipette tips has abolished the need for maintaining high maintenance components like rubber O-rings and tip seals. The SM tip loading eliminates the need for a 3 or 6-month preventive maintenance service by excluding the highest maintenance component on the robot.



The versatility of any liquid handling platform is dependent upon the availability of the pipetting tools and combinations as well as the possible configurations with platform sizes and transportation options. The Lynx Series of Liquid Handlers offers the most diverse configurations of pipetting tools: Two Volume Verified Pipetting tools, one with 96 independent channels (96 VVP) and one with 8 independent channels (f8 VVP), along with our standard syringe based pipetting tools with 96 (96 SV) or 384 (384 SV) channels.

The Lynx's high precision 96 & 384 Standard Volume (SV) syringe based pipetting tools allow the precise and rapid transfer of samples across 96, 384 or 1536 well microplates. Using our syringe based pipetting technology, developed over the past two decades, the Lynx provides a highly economical resource in which to facilitate same volume liquid transfers across rows, columns or entire 96, 384 or 1536 well plates.

- ✓ 96 & 8 Channel VVP tools available
- ✓ Pipette columns or rows for dilution methods
- ✓ Uses clear tips for multichannel LLD
- ✓ SM – Solid Mandrel tip loading technology
- ✓ Volumetric transfers
- ✓ Independent volumes for each channel
- ✓ Full pipetting data tracking
- ✓ Full pipetting liquid diagnostics

- ✓ Syringe based pipetting tools
- ✓ Identical volume in each channel
- ✓ Interchangeable 96 & 384 pipetting core inserts
- ✓ Efficient solution for most liquid handling applications
- ✓ SM – Solid Mandrel tip loading technology
- ✓ Tip pickup for single well, row or column
- ✓ Custom pipetting core inserts available



96 VVP Pipetting Tool

With the flagship 96 VVP Pipetting Tool, 96 independent volumes of 96 different liquids can be transferred without the need for calibration. Accomplish applications like DNA Normalization and Compound Dissolution on an entire plate in a single dispense. In addition, activate pipetting diagnostics for challenged samples in each individual tip. Pipette complex samples like whole blood and plant seed homogenates with clot/clog detection and on-the-fly correction.



24 VVP Pipetting Tool

Our new 24 VVP Pipetting Tool allows 24 5mL disposable tips may be used for different 'large volume' transfers. Now accomplish applications like liquid biopsy DNA magnetic bead purification on an entire plate in a single dispense. By implementing the ClickBio extraction blocks, 'plate processing' of these larger format sample matrixes is now possible. In addition, pipetting diagnostics for challenged samples, like whole blood and plant/seed homogenates, have clot/clog detection and correction for validated human serum methods.



Fixed-8 VVP Pipetting Tool

The Lynx's entry-level VVP tool (f8) transfers 8 independent volumes of liquid with verified volume reporting and full pipetting diagnostics. For samples within microplate format you can now validate your transfers with our fixed-8 tip VVP Pipetting Tool. By eliminating the independent spreading and Z axis capabilities, multiple axis control is reduced, providing a highly economical yet functional VVP pipetting tool.



96 SV Syringe Pipetting Tool

Our 96 SV Pipetting Tool allows the transfer of wells, rows, columns or entire 96 well plates across 96, 384 or even 1536 well plates. In this SV syringe based design, identical volumes are transferred in every channel. The dual disposable tip mandrel design provides options for low and high volume configurations. With replaceable CORE insert pipetting blocks, the 96 SV syringe pipetting tool is the most economical for high throughput liquid handling.



384 SV Syringe Pipetting Tool

With the high loading force required to load 384 simultaneous tips, the Lynx is specifically engineered to load these tips from any worktable position. No specific loading areas or specialty tip loading tools required. Simply place the 384 tip box(es) in any microplate position and run your method with the versatility you expect from your Lynx LM Series Workstation.



Dual Arm Configurations

With the capability of having two pipetting arms with any combination of available 96 or 384 pipetting tools, the increased throughput and efficiency possible in a single platform makes the Lynx one of the most versatile and configurable liquid handling workstations in today's market.

VVP Pipetting Specifications

Sample Viscosity:	0.5 to 10 cP	Precision:		Accuracy:	
Operating Temperature:	10 to 40 C	2 to 5 uL	< 8% CV	2 to 5 uL	< 8% CV
Volume Range:	0.5 uL to 1 mL	6 to 50 uL	< 3% CV	6 to 50 uL	< 3% CV
Typical dispensing speed up to	450 uL/s	51 to 1250 uL	< 2% CV	51 to 1250 uL	< 2% CV

Pipetting specifications based on using optimized tip size and surface dispensing for smaller volume range transfers.

384 SV Pipetting Specifications

Precision:		Accuracy:	
1 to 5 uL	< 4% CV	1 to 5 uL	< 5% CV
6 to 70 uL	< 3% CV	6 to 70 uL	< 4% CV

Pipetting specifications based on using optimized tip size and surface dispensing for smaller volume range transfers.

96 SV Pipetting Specifications

Precision:		Accuracy:	
1 to 5 uL	< 4% CV	1 to 5 uL	< 5% CV
6 to 50 uL	< 3% CV	6 to 50 uL	< 3% CV
51 to 1250 uL	< 2% CV	51 to 1250 uL	< 2% CV

Lynx Platform Integration & Plate Movement

The Lynx LM Series is designed to be flexible and fast. Configurations can be rapidly deployed and integrated into any system or application. With a broad array of gripper tools, the Lynx provides easy movement of microplates around, off and on the worktable. The LM Series in combination with Method Manager control software allows the Lynx to easily integrate into fully automated systems.

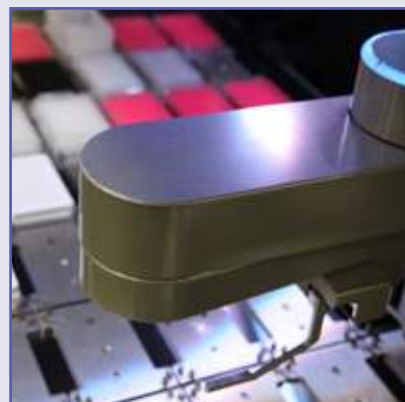
Platform Life Science Applications

Dynamic Devices delivers complete solutions for many standard applications. Throughout our long history in laboratory automation, we have configured a multitude of customized systems that met individual laboratory requirements for throughput, capacity, sample delivery, and capital budget. These automated systems are typically delivered to the customer site fully integrated for the defined assay protocols. Users can operate the systems with minimal training.



Lynx Head Gripper

- De-stack tips and microplates
- Remove microplate covers
- Move empty tip boxes to waste
- Attaches directly to Pipetting Arms



Internal Robotic Gripper

- 6-Axis Robot w Absolute Encoding
- Reaches off deck
- Move empty tip boxes to waste
- Load third party peripherals



Vision Scanning Option

- 1D & 2D Scanning
- Vision system enabled
- Full sample tracking



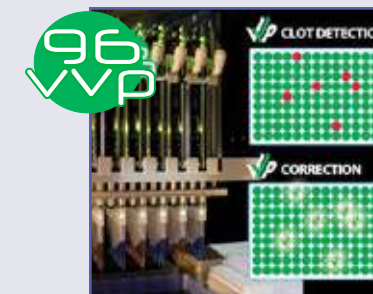
DNA Purification Magnetic Bead Purification

Using an in-deck magnet lifting option, 2-6 plates of DNA may be purified without the use of a gripper tool. The 96SV pipetting tool simply transfers samples, washing buffer and elution buffer directly to the PCR plate in a static position for easy use.



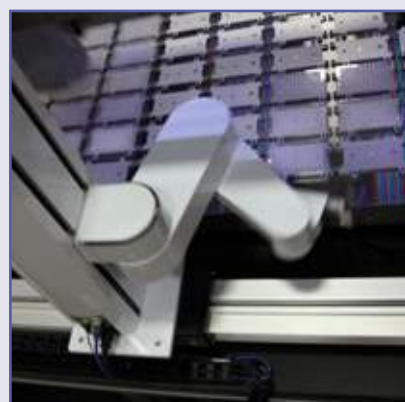
DNA Normalization/ Compound Dissolution

Using worklist files from a concentration or compound weight, individual wells may be diluted with different volumes using all 96 channels.



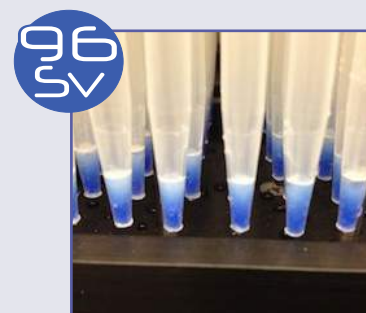
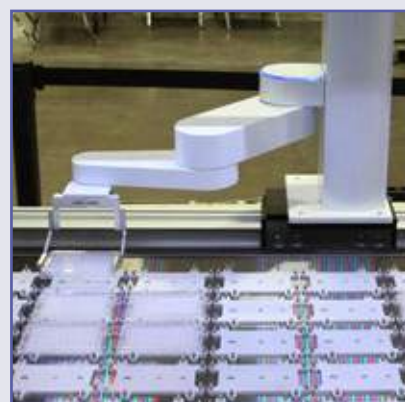
Plant/Seed/Blood Transfers Clog Detection & Correction

Using the 96 VVP pipetting tool with clog/clog detection active, challenging samples are aspirated with individual channel diagnostics. If a clog/clot starts to interfere with the liquid aspiration, that individual tip is halted until the rest of the tips finish and then the system will clear and respire the erred channel.



Frame & Cabinet Mounted Gripper

- Place systems back to back to optimize lab space
- Access under deck, behind and to each side of the pipetting platform
- Combine with integration cabinet for a complete solution
- Load readers, washers and incubators to complete screening and ELISA assays
- Load sealers and thermocyclers for PCR methods
- Load storage incubators for cell maintenance and cell assay systems



DNA & Protein SPE Purification

Using the 96SV pipetting tool, DNA and protein purification may be carried out in PhyTip solid phase extraction tips. On-deck accessories include a tip drying station and refillable reagent trough system.



Cell Maintenance & Distribution

Using either our 96 or 384 pipetting tool, cell lines may be maintained when in combination with system incubators. Tasks like media swapping for cell feeding and high throughput cell distribution for cell assays are accomplished easily and quickly.



Large Volume DNA Mag Bead Extraction

As automation simplifies DNA purification from larger volumes the volume ranges of most mainstream automation systems. Dynamic Devices introduces its 24 channel extraction tool with 5mL pipetting tips in conjunction with Click-Bio's large volume extraction block technology.

Lynx Features

- 96 & 8 Volume Verified Pipetting Tools
- Standard 96 & 384 Pipetting Tools
- Microplate Gripper Tools
- Bar Code / Vision Scanning
- Flexible Deck Configurations
- Multi-size Platforms
- Easy Method Programming
- Air Displacement Pipetting
- Uses Clear Disposable Tips
- Linear Motor Positional Accuracy

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