


MANTIS

Mantis is a low dead-volume, non-contact liquid dispenser. This precise, compact, robotic device accepts pipette or tube inputs.

Clean - The fluid path of the Mantis is both disposable and washable

Low Dead Volume - A pipette tip can input directly into the Mantis' chip to cut dead volumes down to 6 μL

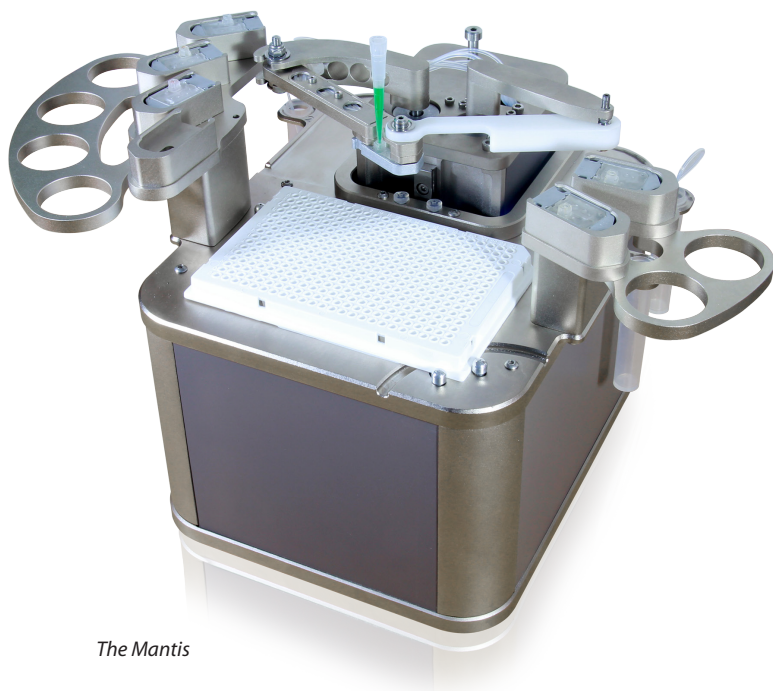
Flexible - Dispenses up to 6 reagents automatically with optional chip changer and can accept most SBS plates as well as deep well blocks

Reliable - Dispenses using our robust, non-contact micro-diaphragm pump technology via positive displacement with no risk of clogging even with difficult to dispense reagents

Chemical Compatibility - Wide variety of chips are available for dispense needs including perfluoroelastomer for aggressive solvents, as well as molecular biology grade chips free of detectable DNA, DNase, RNase and Protease

Applications

- » Assay Development
- » PCR Setup
- » Cell Dispensing
- » Repetitive Pipetting
- » Precious Reagent Dispensing

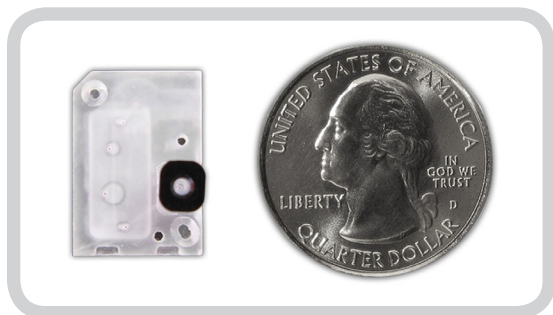


The Mantis

Replaceable Chip

The chip on the Mantis attaches using magnets, allowing fast and easy replacement. The entire fluid path of a Mantis is disposable to eliminate cross-contamination risks. Replacement chips are available at a very low cost. For precious reagents, a pipette tip can be used as a direct input to the microfluidic chip of the Mantis to significantly cut down on waste. Using this method, dead volumes can be reduced to 6 μL .

This technology can reliably dispense beads, cells, proteins, enzymes, nucleic acids and highly concentrated salts.



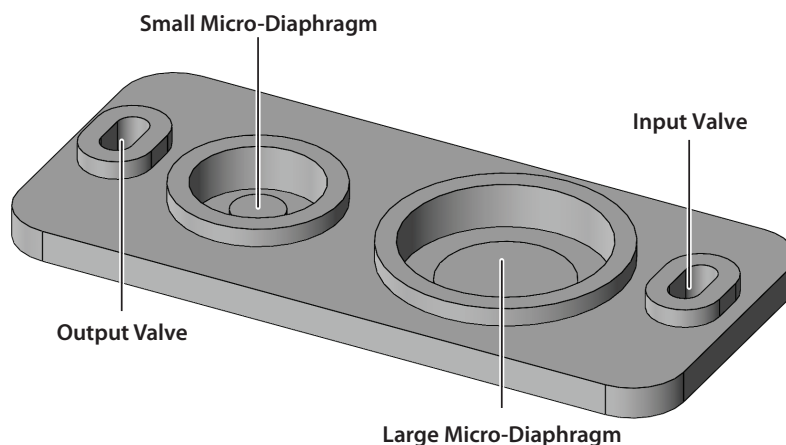
Size Comparison of the Mantis Chip



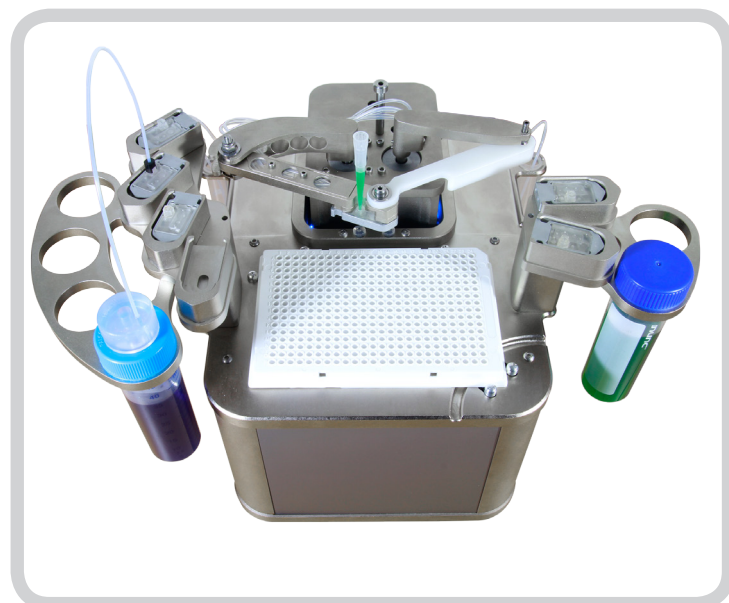
The Mantis Chip is Easily Removeable/Replaceable

Micro-Diaphragm Pump Technology

At the core of the Mantis is a patented microfluidic valve cluster that can measure and dispense discrete volumes of liquid using positive displacement. This valve cluster has two micro-diaphragms (100 nL and 500 nL) that can fill and dispense as fast as 10 times per second. This proven technology is both incredibly precise and viscosity independent.



The Patented Microfluidic Valve Cluster Used by the Mantis



A Full Six Chips and Six Ingredients are Ready to Dispense with the Automatic Chip Changing Option



The Mantis Dispensing into a Deep Well Block

Optional Automatic Chip Changer

Using the optional chip changer, the Mantis can dispense up to 6 reagents automatically. This allows complex protocols to be saved and dispensed without user intervention. Reagents can be delivered to the chip using a tube or a pipette tip.

The Mantis is fully robot-accessible from both sides, and has a .net API to allow for integration with your automation systems.

Plate Formats and Speed

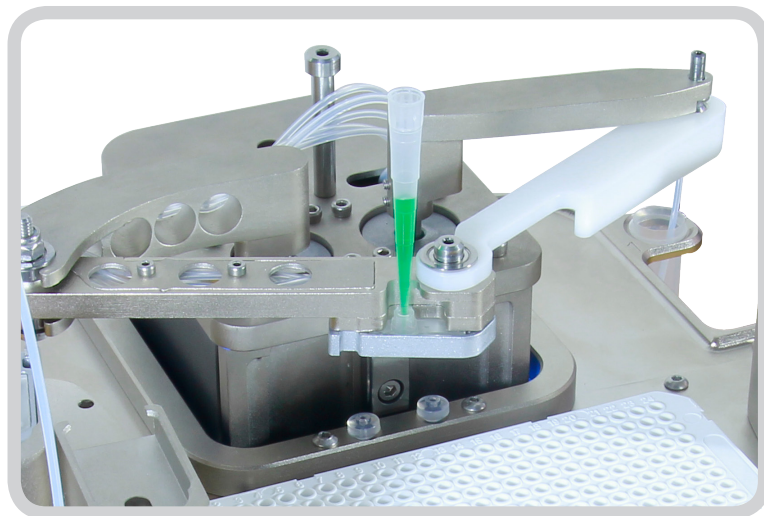
Mantis can accept almost any SBS plate up to 1536 wells. Microplates can be used up to a maximum height of 24 mm.

Optional Continuous Flow Dispensing

The Mantis can be set up to dispense using continuous flow where a pressurized bottle is used to dispense liquids at a steady dispense speed, as opposed to pumping via the micro-diaphragms as described above. This dispensing allows for filling 7 times faster (at a rate of 150 $\mu\text{L}/\text{second}$) which is ideal for filling deep well blocks.

Dispense Rate Example

- » 100 nL per well to 96-well plate = 25 seconds
- » 5 μL per well to 384-well plate = 2.5 minutes
- » 20 μL per well to 384-well plate = 7.5 minutes



Direct Pipette Tip Dispenses Cut Dead Volumes Down to 6 μ L

Precious Reagent Dispensing

Using a pipette tip input, the Mantis can be used for precious reagents with an exceptionally low dead volume of 6 μ L, greatly reducing the cost of materials and lowering the minimum volume required for dispenses.

Mantis Integration with Formulator

The Mantis pairs perfectly with the Formulator and Rock Maker software as a low dead volume (6 μ L vs. the Formulator's 7 mL) option for dispensing precious reagents without adding complex steps to your crystallization experiment workflow.

Optional Integrated Ingredient Holders

The Mantis can be fitted with ingredient holders that allow ingredients in Falcon tubes to sit safely during the dispense with no need for additional racks or risk of tipping/spilling.

Dual Wash Stations

The dual wash stations built into the Mantis allow for easy sterilization during dispenses. Typically one station will contain bleach or ethanol for sterilization, and the second station will contain water for an additional rinse of the dispense nozzle.



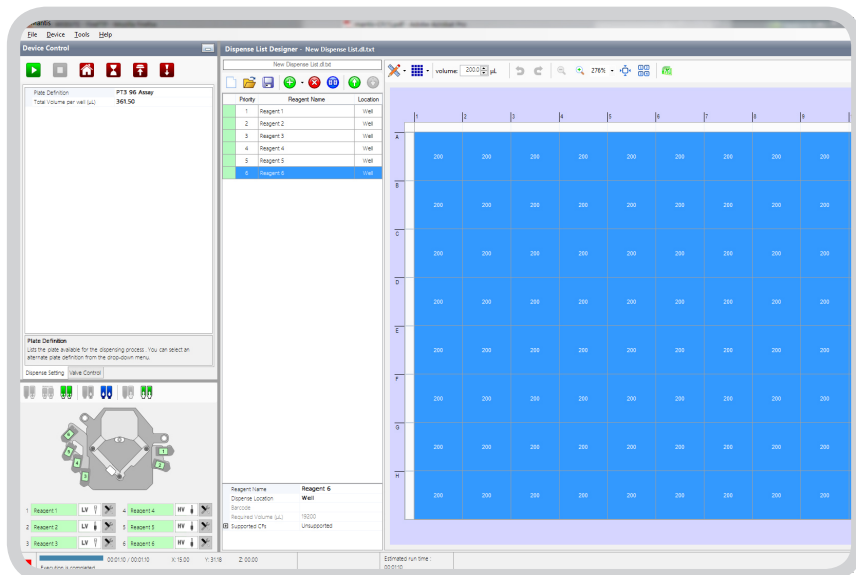
Dual Wash Stations

Powerful Software

The Mantis' software provides a straightforward, user-friendly way to design and execute the most complicated dispenses. The control software lets you visually lay out a microplate dispense easily. The software gives the user complete control of the pressure settings during Mantis dispenses using the continuous flow option. This allows for the dispensing of more difficult reagents.

Using the software, the Mantis can be set up for gradients and backfilling.

The powerful Mantis software can easily import from .txt files. With onboard Microsoft Excel integration, a user can quickly jump from the Mantis software to directly edit Excel spreadsheets.



Mantis Software Set to Dispense 6 Reagents

Mantis Chip Specifications

Part Number	Diaphragm Vol.	Min Volume	Max Volume	Pulses Per Second	Dead Volume	CV's
MCLS5*	0.1 μ L, 0.5 μ L	0.1 μ L	∞	@ 0.1 μ L = 10, At 0.5 μ L = 7	6 μ L	<3% at 0.1 μ L
MCHS5*	1 μ L, 5 μ L	1 μ L	∞	@ 1 μ L = 10, At 5 μ L = 4	15 μ L	<3% at 1 μ L
MCHP2* (Solvent Compatible)	1 μ L, 5 μ L	1 μ L	∞	@ 1 μ L = 5, At 5 μ L = 4	15 μ L	<5% at 1 μ L

* These chips are also available graded for molecular biology use. See below.

Molecular Biology Grade Chips

The manufacturing processes Formulatrix follows are certified to produce Molecular Biology Grade Mantis chips free of detectable DNA, DNase, RNase and Protease. Low volume and high volume chips are available.

Mantis Chemical Compatibility

Diaphragm Material	Ethanol	High Concentration Salts	5%DMSO	100%DMSO	Acetonitrile
Silicone	✓	✓	✓		
Perfluoroelastomer	✓	✓	✓	✓	✓

Specifications

Dimensions

Width: 337 mm max (smaller without ACC or ingredient holders)

Height Full Extension: 273 mm (not including pipette tip input)

Height No Extension: 172 mm (not including pipette tip input)

Depth: 218 mm (212 mm without ingredient holders)

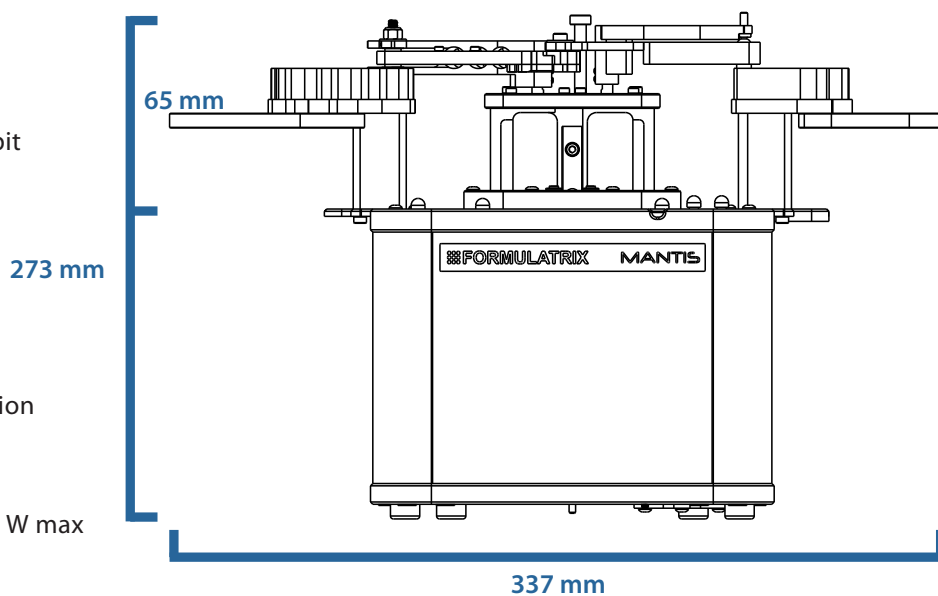
Weight: Appx. 11.5 lbs

Computer Requirements

- » Computer OS:
 - Windows XP Home Edition SP3 32-bit
 - Windows 7 Home Basic 64-bit
 - Windows Vista 32-bit
- » One open USB port
- » Dual Core 1 GHz processor
- » 1 GB RAM
- » 1 GB of Hard Drive space
- » 768 pixels vertical min. screen resolution

Electrical Requirements

- » 110-240 V, 50-60 Hz, 50 W typical, 100 W max



Mantis Displayed at Maximum Head Height, with ACC, and Ingredient Holders