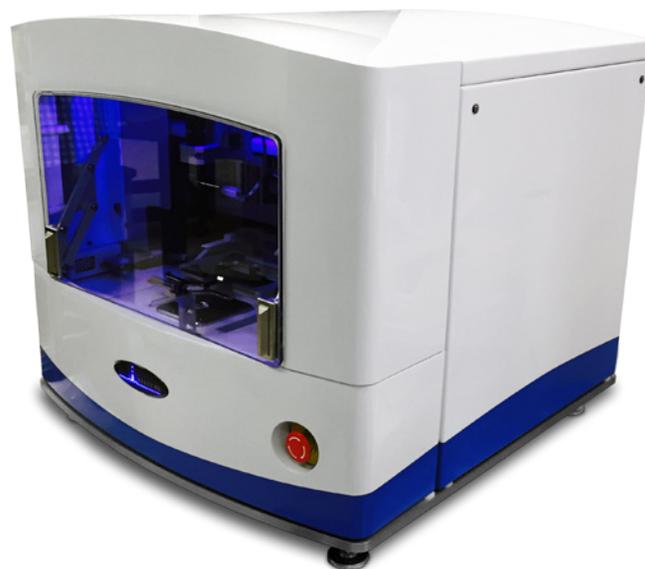


EDC BIOSYSTEMS GEN 5 ACOUSTIC TRANSFER SYSTEM



KEY BENEFITS

- Precise nanoliter dispensing without expensive consumables or wash solvents
- Compatible with off-the-shelf source plates for low operating costs
- Reproducible and accurate transfer of up to 10 μ L of commonly used reagents
- Variable Drop Volume dispensing addresses a wide range of applications
- Easily integrated into automated workflows

PRECISE ACOUSTIC LIQUID DISPENSING FOR ALL YOUR APPLICATIONS

The Gen 5 Acoustic Transfer System (Gen 5) is the fifth generation acoustic dispenser from EDC Biosystems, Inc. The Gen 5 uses acoustic energy to precisely transfer nanoliters of liquid from a source to destination microplate. Unlike traditional tip-based systems, acoustic dispensing transfers liquid without any physical contact; eliminating wash steps, cross contamination between transfers, propagation of pipetting errors, unnecessary transfer steps and the cost of purchasing and disposing of pipet tips. In addition to being able to dispense compounds, the Gen 5 uses a gentle low energy acoustic signal allowing proteins, DNA and live cells to be transferred without damage. Volumes from 1nL to 10 μ L are accurately and reproducibly transferred which makes the Gen 5 an ideal system for microplate reformatting, cherry picking of hits, preparation of assay-ready microplates, and preparation of microplates

for dose response assays. The Gen 5 supports miniaturization of PCR, cell based and other assays. The Gen 5 comes integration and automation ready, and is easily integrated into automated workflows or with other laboratory instrumentation.

PRECISE AND ACCURATE DISPENSES EVERY TIME

Transfer liquids without pipette tips or pin tools, acoustic dispensing uses a pulse of ultrasound to transfer a droplet of liquid from a source to destination microplate. To do this, the Gen 5's acoustic transducer sends an acoustic pulse through the sample from below the well. The sound reflects off the liquid surface and the transducer below

the well “listens” for the reflected signal (Figure 2, A). By measuring the time from transmission of the pulse to when the reflected signal is received, the Gen 5’s Real-Time Sensing and Focusing Technology calculates the acoustic power needed to eject a small droplet, positions the acoustic transducer below the source well, and fires an acoustic signal aimed close to the liquid surface. The acoustic energy causes a droplet (e.g., 1 nL to up to 25 nL) to shoot upwards from the source well to a well of an inverted destination microplate (Figure 2, B). By repeating this process multiple times, the Gen 5 can transfer up to 10 μ L of any commonly used reagent. To evaluate the precision and accuracy of dispensing liquids with the Gen 5, one-

to-one transfers of 90%/10% DMSO/water and phosphate buffered saline (PBS) were performed using a 10nL drop size. Both solutions had a flourescein concentration of 0.25 μ m. Dispense volumes were 200 nL and 100nL for 384-well low-dead volume and 1536-well microplates, respectively. The coefficient of variation (CV) of the transfers were $\leq 5\%$ (Figure 3) and dispense accuracy averaged 101.40% \pm 0.03% (Figure 4) for both solutions and microplates. With the ability to reproducibly transfer from 1 nL to 10 μ L, the Gen 5 simplifies the miniaturization of assays to reduce your assay costs (Figure 5).

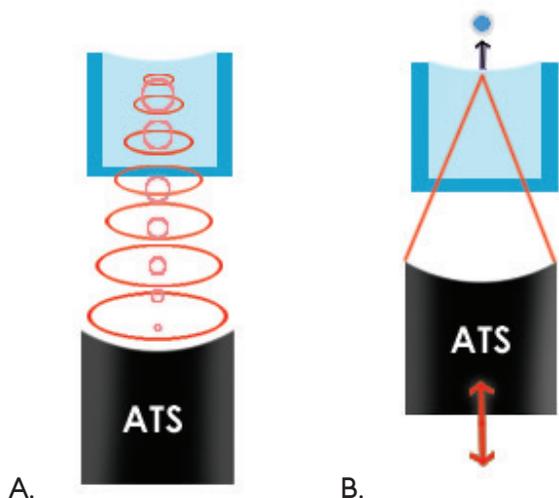


Figure 2. Transferring liquid using acoustic energy. A. A transducer sends an acoustic pulse through the liquid sample and listens for the reflected sound from the liquid surface. B. Real-Time Sensing and Focusing Technology calculates the energy needed and fires an acoustic signal upwards to eject a droplet

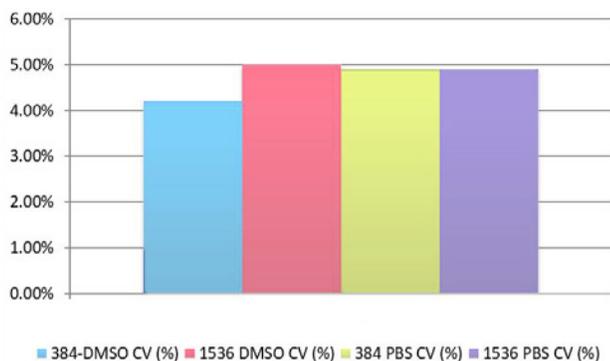


Figure 3. Dispense reproducibility was measured by dispensing 90%/10% DMSO/water and PBS solutions to 384-well low-dead volume and 1536-well microplates. Flourescein concentration in both solutions was 0.25 μ m. The CVs for the transfers were $\leq 5\%$ for both solutions and microplates.

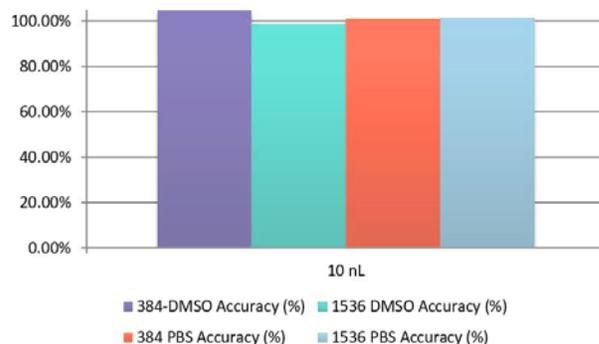


Figure 4. Dispense accuracy was measured by dispensing 90%/10% DMSO/water and PBS solutions to 384-well low-dead volume and 1536-well microplates. Flourescein concentration in both solutions was 0.25 μ m. The average dispense accuracy for both solutions and microplates was 101.40% \pm 0.03%.

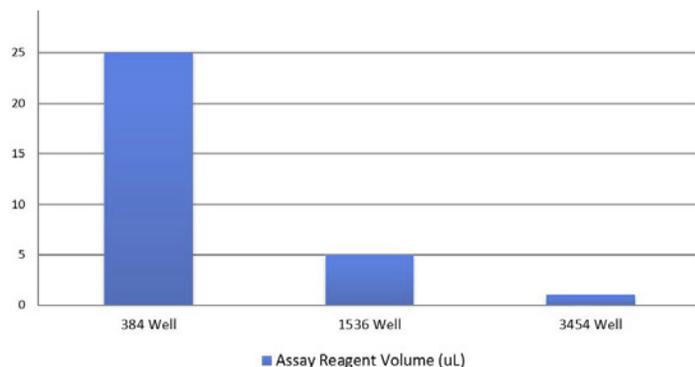


Figure 5. Reduce your costs by miniaturizing your assays. By transferring your assays from 384-well to 1536-well or 1536-well to 3456-well microplates, there is a 5x reduction in reagent usage.

SUPERIOR USABILITY AND STREAMLINED OPERATION

Like the Gen 4 Plus Acoustic Transfer System (Gen 4), the Gen 5 does not require an external vacuum source or

chiller; simplifying the installation and maintenance of the instrument. With the Gen 5 you'll never need to change the destination gripper; no matter which destination microplate your assay uses. With the addition of Auto-Gapping, the system automatically sets the optimal distance between the source and destination microplates for dispensing. Changing the source microplate type on the Gen 4 sometimes required manual adjustment of the Basin and Wiper. With the Gen 5, this is handled automatically which simplifies system set-up and integration into automated workflows. Both features streamline the usability of the Gen 5 and ensure the system is always configured for optimal performance.

THE GEN 5, A SINGLE PLATFORM THAT WORKS THE WAY YOU DO

The Gen 5 supports 96-well to 384-well source and destination microplates and streamlines the transfer, miniaturization and optimization of assays. Off-the-shelf source microplates from a variety of manufacturers like, Aurora, Greiner, Corning and others are compatible with the system, so you're never locked into purchasing expensive plates from a single manufacturer. For specialized non-microplate based applications, e.g., spotting microarrays, matrix assisted laser desorption/ionization targets, etc., custom plate holders can be used without changing the destination microplate gripper. Whether you are dispensing aqueous buffers, DMSO, glycerol solutions, organic solvents, suspensions or supernatants, the Gen 5 accurately and reproducibly dispenses reagents and samples for your assays. Unlike other systems with a fixed droplet size, The Gen 5's Variable Drop Volume dispensing capability allows users to optimize drop volumes from 1 nL to up to 25 nL and use multiple drop sizes for a transfer. By using smaller drops to prepare microplates for concentration critical assays like dose response curves, while simultaneously using larger drops to maximize throughput, the Gen 5 handles a wide range of applications so you never need to worry about outgrowing its capabilities.

FLEXIBLE SOFTWARE TO MANAGE YOUR DISPENSES

Using the Gen 5 it is possible to dispense from any well on a source microplate to any well on a destination microplate, allowing for the generation of custom libraries, cherry picking, and microplates for dose response assays, synergy screening, potentiator assays, etc. Included with every Gen 5 is a version of Transfer Track Lite, a graphical transfer mapping software that simplifies the process of developing worklists and procedures for liquid transfers between microplates. Transfer Track Lite ensures key and important information like sample ID, experimental concentrations

and transfer volumes are easily accessible (Figure 6). By upgrading to the full version of Transfer Track, users can access the software's intuitive Wizard to simplify setting-up the Gen 5 and managing complex sample mapping experiments (e.g., serial dilutions). Whether importing a file from your LIMS, a user defined list of samples, or selecting samples on-the-fly to transfer, Transfer Track Lite automatically generates a worklist and manages the transfer of samples for your Gen 5.



Figure 6. Transfer Track Lite user interface. Key information about your samples are easily accessed via menus, pop-up windows and smart incorporation of colors.

MULTIPLE APPLICATIONS, ONE SYSTEM

Expand your capabilities with the Gen 5 and reliably dispense ultra-low volumes of any commonly used reagent accurately and reproducibly with acoustic energy. By eliminating costly pipette tips (Figure 7) and miniaturizing your assays, the Gen 5 will have a positive impact on your assay costs. The system was designed to support a broad range of throughput and applications in a single platform. Whether you're miniaturizing your assays, preparing microplates for concentration critical assays, or reformatting plates for high throughput screening, the

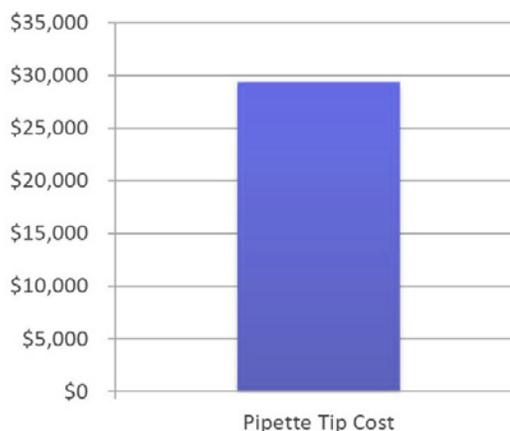


Figure 7. Pipette tip cost¹ to dispense a 200K compound library to 384-well microplates using a conventional liquid handler.

Gen 5 can handle all your applications. The system uses off-the-shelf microplates from a variety of manufacturers to keep operating costs low and allows you to select the best source plate for your application. Push your science to the next level, the flexibility of the Gen 5 will support your acoustic liquid dispensing needs today and tomorrow.

GEN 5 ACOUSTIC TRANSFER SYSTEM SPECIFICATIONS

Volume Transfer Range:	1nL – 10 μ L ²
Dispense Drop Size:	1 nL -25 nL
Transfer Precision:	CV<10%
Operating System:	Windows 7
System Software:	ATS Version 9 and Calibration Utility Software
Sample Management Software:	Transfer Track Lite
Reagent Compatibility:	Compatible with organic solvents such as DMSO, acetonitrile, etc. and aqueous reagents used in genomics, proteomics, cell and biochemical assays including those containing proteins, peptides, DNA, primers, mastermixes, etc.
Source Plates:	Approved off-the-shelf microplates from Greiner, Aurora, Corning, and others
Destination Plates:	Compatible with ANSI-compliant SBS-standard microplates, any density up to 3456-well format. Compatible with some non-standard destination formats including micro-array slides and MALDI target plates
Integration:	Can be integrated with automation systems using Biosero's Green Button Go Automation and Scheduling Software or other third party integration software
Air:	Clean-dry-air, 80 psi, 2 CFM
Coupling Fluid:	Distilled water (400 mL)
Power:	110 VAC, 50/60 Hz or 230 VAC, 50 Hz
Temperature:	20°C to 25°C
Size:	27.8 in. (71 cm) x 28.4 in. (72 cm) x 23.7 in. (60 cm) (WxDxH)
Weight:	254 lbs (115 kg)

1. Assumes a pipette tip cost of \$0.15 per dispense
2. Transfer volumes >10 μ L are possible with increased transfer times

