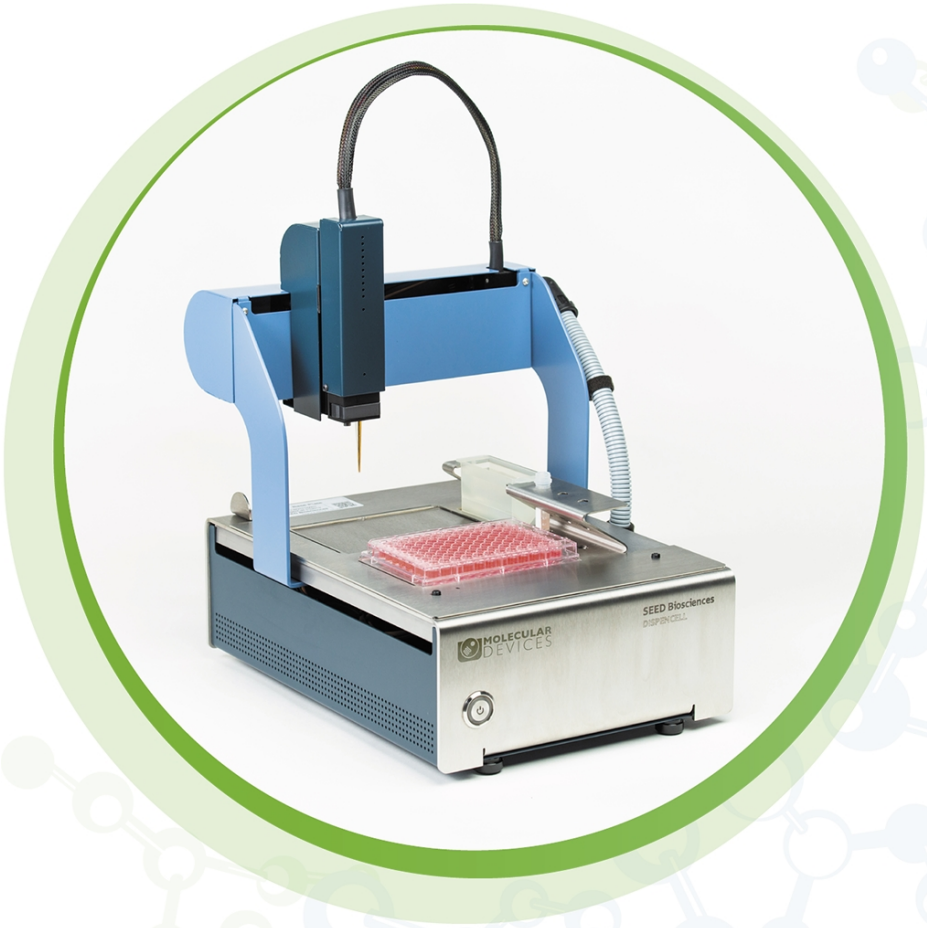

DispenCell

Single Cell Dispenser

User Guide

5306400 C
March 2024

MOLECULAR DEVICES

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Contents

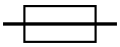
About This Guide

Before you use the DispenCell™ Single Cell Dispenser, read the Safety Information on page 7 and all other information in this user guide, including any safety and operating instructions. Pay special attention to all warnings displayed on the instrument. Failure to read and follow these guidelines could lead to improper or incorrect usage and damage to the instrument. Improper use could also cause severe personal injury, death, unpredictable results, instrument malfunction, and premature wear to components shortening the lifetime of the instrument. Such actions may void your warranty. Keep the user manual and any other safety and operating instructions provided with the instrument in a safe place accessible to all users for future reference.

Safety Information

Symbols on the Instrument

Each safety label on the instrument contains an alert symbol that indicates a type of potential safety hazard.

Symbol	Indication
	Read and understand user guide before you use this equipment
	Potential electrical-shock hazard from a high-voltage source. All safety instructions must be read and understood before proceeding with the installation, maintenance, and servicing of all modules.
	Risk of electrical shock, do not open.
	Indoor use only.
	Waste Electrical and Electronic Equipment (WEEE) Directive of the European Union compliant.
	Location of a fuse.
	DC Current.
	The instrument or disposable manufacture date.
	cURus certification.
	cBVus IEC61010 (NRTL) from Bureau Veritas certification.
	Compliance with Chinese RoHS Pollution Control Requirements.
	European technology conformity.
	California Proposition 65 requires businesses to warn Californians about significant exposures to chemicals that cause cancer, birth defects, or other reproductive harm.

Warnings and Precautions

The instrument is designed for safe use when installed correctly and operated by trained personnel following general safety practices and the instructions in this user manual. Any use of the instrument other than that described in this manual may result in danger to the user. The guidelines in this section explain the potential risk associated with using this instrument and provide important supplemental safety information to minimize the risks. Follow the instructions carefully to protect yourself, others, and the equipment from potential hazards and create a safe work environment. Use this instrument only as specified to avoid damage to equipment and injury to personnel. Always follow local working area safety instructions and laboratory policies, standards for health, safety, and prevention of accidents. Contact the local authorities governing electrical power supply, building constructions, maintenance, or safety for more information about the safe installation and operation of the instrument.

Do not use the instrument if:

- It has been opened or disassembled
- It has been dropped or damaged
- It has damaged or broken parts
- It has a damaged power cable
- If an object has entered into the instrument

Hazard Levels

Signal words are used to identify safety and property damage messages. The following signal words are used throughout this user manual.

- **WARNING!** indicates a potentially hazardous situation, which, if not avoided, could result in death or severe injury.
- **CAUTION!** indicates a potentially hazardous situation, which, if not avoided, may result in minor or moderate injury. It may also be used to alert against unsafe practices.
- **NOTICE** addresses practices or information unrelated to personal injury but may lead to property damage.

Moving Parts Safety

WARNING! During instrument operations there is a pinch hazard between the extremity of the DispenTip and the instrument work surface. Do not place your hands on the instrument during the dispensing process or at any time the instrument is moving.

Electrical Shock and Fire Hazard

WARNING! Electrical Shock Hazard. Do not remove the covers. Removing the covers might cause injury or malfunctioning of the system. The covers need not be removed for routine maintenance or operation of the system. Only authorized personnel are allowed to remove any cover of the instrument. Never push a foreign object through an opening into the instrument. Ensure that the correct protective earth (grounding) is connected to the main power outlet. The instrument is equipped with a three-wire electrical plug, do not try to insert the plug into a non-grounded power outlet. Do not use any other cables than provided with DispenCell.

In case of failure and for emergency stop, the mains power supply plug shall be unplugged. Keep the power plug accessible at all times.

This instrument is protected by a fuse with the following characteristics: 250v, 10A, Type T, format 5 x 20.

WARNING! Fire Hazard. Do not use the instrument in areas classified as hazardous locations, for example, in oxygen-laden environments. If flames or smoke appear, immediately switch off the power supply, unplug the instrument from the electrical outlet, and contact support.moleculardevices.com/.

WARNING! Electrical Shock and Fire Hazard. Do not allow liquids to enter the interior of the instrument. Protect the instrument against accidental spillages and splashes. Clean up spillages immediately. Do not operate the instrument if liquids have entered the instrument. Do not use the instrument in a wet and damp location. Avoid areas with high humidity or condensation. Before cleaning, unplug the instrument.

Biological Safety

This instrument is primarily designed for use with nonpathogenic samples in biosafety level 1 environments (BSL-1) or lower.

WARNING! Samples containing infectious agents. If you use infectious agents with this instrument, handle such samples with the greatest care following the required safety regulations. The responsible body (e.g., laboratory manager) must take the necessary precautions to ensure that the surrounding workplace is safe and that the instrument operators are suitably trained and not exposed to hazardous levels of infectious agents as defined in the applicable Materials Safety Data Sheets (MSDS) or other regulatory documents. Disposal of wastes must be in accordance with all national, state, and local health and safety regulations and laws.

Contamination infection may lead to severe personal injury depending on the biological material used. All clinical samples must be considered potentially infectious. If bio-hazardous material is or has been used, the operator must choose and wear personal safety equipment as indicated in the warnings and precautions for the particular substance. The above safety precaution also accounts for any hazardous chemical, including toxic or corrosive chemicals, acidic or radioactive substances that may be present in the sample.

WARNING! Waste disposal. Waste containers may contain hazardous chemicals or infectious agents from the process. Such wastes must be collected and disposed of properly in accordance with the local safety regulations. Refer to your local safety regulations for proper disposal procedures.

Chemicals

WARNING! Hazardous chemicals. If you use hazardous chemicals or chemicals which become hazardous after completing the protocol run, follow the required safety regulations. Always wear safety glasses, gloves, and a lab coat. The responsible body (e.g., laboratory manager) must take the necessary precautions to ensure that the surrounding workplace is safe and that the instrument operators are not exposed to hazardous levels of toxic substances (chemical or biological) as defined in the applicable Materials Safety Data Sheets (MSDS) or other regulatory documents. Disposal of wastes must be in accordance with all national, state, and local health and safety regulations and laws.

If hazardous material has been used or spilled, care must be taken to decontaminate the instrument thoroughly. It is strictly prohibited to continue to handle contaminated accessories or parts of the instrument. All liquid and solid waste must be considered hazardous and must therefore be handled taking universal laboratory precautions. Waste disposal must be in accordance with any local regulations.

Servicing and Transportation

Improper or incorrect servicing or repair of the instrument can cause hazards to users, lead to unpredictable results, cause instrument malfunctions or damage, as well as premature wear and tear and reduced life of the instrument. It may also void your warranty. Do not service the instrument yourself. Servicing and repair must be performed by qualified service personnel.

Using unauthorized parts can cause malfunctions of the instrument and impair results. Molecular Devices does not honor any warranty or accept any responsibility for instrument failure or damages resulting from the use of inappropriate parts.

The instrument should be transported with care in packaging specified by Molecular Devices. Internal damage can occur if the instrument is subjected to excessive vibration or is dropped. If you have questions regarding proper decontamination or shipment, contact Molecular Devices technical support for assistance.

Disposal

Dispose of your end-of-life product in accordance with the applicable “Waste of Electrical and Electronic Equipment” (WEEE) and hazardous waste disposal legislation, which may differ by country or region. Electrical and electronic equipment may contain hazardous substances which may have a serious detrimental effect on the environment and/or human health. That is why all equipment must be specifically collected and treated by designated waste facility centers and by qualified WEEE compliance schemes. By ensuring that you dispose of your unwanted electrical and electronic equipment according to the applicable WEEE and hazardous waste disposal legislation, you are helping to preserve our natural resources and protect human health.

Chapter 1: General Information

System Overview

The DispenCell is a low-pressure cell dispenser. Molecular Devices offers a fast, gentle, and traceable solution for single cell dispensing. Intuitive and user-friendly, it does not require extensive maintenance or specific calibration. Compact and flexible, the DispenCell easily integrates in an existing workflow and is designed to be operated on a simple bench or under a biosafety cabinet. The DispenCell can hold two plates on its base plate and supports different plate models and formats.

The technology is impedance-based, thus extremely gentle with cells, preserving their viability and integrity for optimal outgrowth. The DispenCell uses a sterile disposable sensing tip (DispenTip) to sense and record the passage of every cell that flows through the DispenTip aperture.

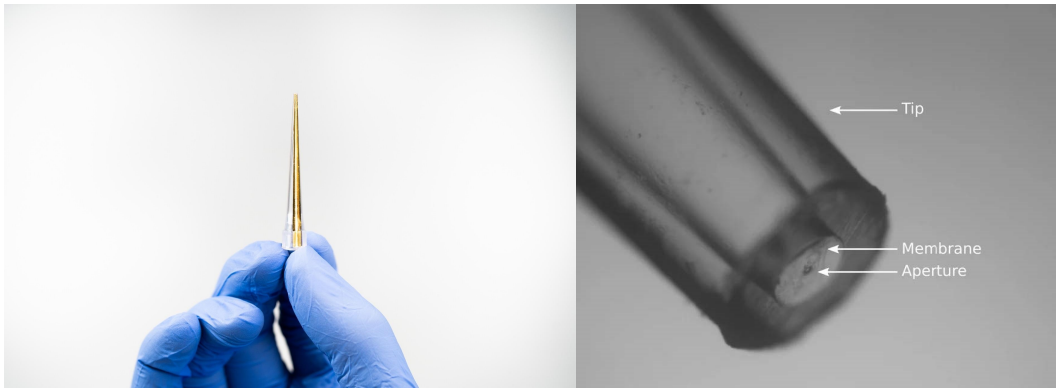


Figure 1-1: The DispenTip Used for Impedance Based Single-Cell Isolation

Signal Generation

As a single cell passes through the 30 µm DispenTip aperture to flow into the well, it leaves an electrical signature that appears as a unique impedance peak, whereas multiple peaks result from doublets or multiple cells. Cell debris are excluded by filtering out low impedance signals, and cell aggregates are detected by tagging the impedance signals with a high amplitude peak. At the end of the experiment, the impedance measurement of every well of the plate is processed by the DispenCell analysis software. Wells that do not meet the single-cell quality control criteria are rejected by the automated analysis and display in red.

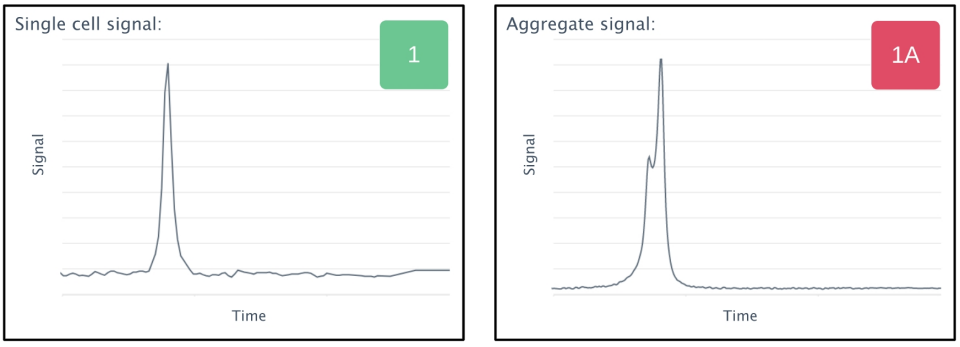


Figure 1-2: Impedance Signature Used for Single-Cell Detection

Instrument and Consumables Description

The whole system solution consists of the following:

- DispenCell, the automated cell dispenser
- DispenCell-driver, the operating software
- DispenCell-analyzer, the analysis software
- DispenKit, a single-use kit that contains the disposable consumables
- DispenMe, the buffer used for the cell sample preparation (Refrigerate upon arrival)

Components Included in the Delivery

The DispenCell package contains the following:

- 1 x DispenCell
- 1 x Base plate
- 1 x Power supply for the DispenCell
- 1 x USB type A-B
- 1 x mini PC (NUC) without screen, mouse, or keyboard
- 1 x Power supply for the mini PC (NUC)

Note: All required software is installed on the provided computer.

- 1 x Hub USB 4x type A
- Troubleshooting toolkit

DispenKit Content

The DispenKit package contains the following:

- 1 x DispenTip, the single-use sensing tip

Note: DispenTip is packaged in a plastic holder packed in a sterile pouch. Use gloves to manipulate it.

- 1 x single-use cell strainer (20 µm mesh size), to remove aggregates during the cell sample preparation.

DispenMe Content

The DispenMe package contains the following:

- 5 x tubes that contain 135 µL of the methylcellulose-based solution (serum-free, animal component-free, glutamine-free) to be mixed with the cell sample before the cell dispensing. Refrigerate upon arrival.

Separate Components for Sample Preparation

The following components are for sample preparation:

- Pack of 96 wide bore mixing tips, sterile
- Pack of 4 washing units, sterile

Dropper With Training Beads

The following components are for the training beads protocol:

- The reference sample is a ~0.5 mL solution of 10 µm non-fluorescent polystyrene beads at 1.5×10^5 beads/mL concentration in phosphate buffer saline (PBS) with 0.5% Tween-20 and 0.2% Erythrosine B. Store in a refrigerator.

Chapter 2: Installation Procedures

Incorrect installation or the operation of a damaged instrument may lead to the exposure of mechanical hazards, electric shock, the spread of fire, explosion, or biohazard. Read through the following instructions carefully before you install the DispenCell. Before you open the transportation box, check for any visible external damage to the box. Check to see if the shock and position indicators suggest incorrect transportation of the instrument. Before you operate the DispenCell for the first time, carefully read this user guide and contact a Molecular Devices representative for training.

DispenCell is to be used only with the provided power supply model MEANWELL GSM160A12-R7B and provided main supply cord in order to guarantee safe operation.

Site Requirements

Read the instructions in the Safety Information on page 7 and ensure that your site is adequately prepared before you install the DispenCell. If there is any damage, do not use the instrument and contact technical support. See Obtaining Support on page 53.

The instrument is intended for indoor use only and in the following environmental conditions:

- Altitude up to 2,000 m (6,562 ft)
- Temperature 5°C to 40°C (41°F and 104°F)
- Maximum relative humidity 80% for temperatures up to 31°C (87.8°F) decreasing linearly to 50% relative humidity at 40°C (104°F)
- Pollution degree 2
- Electromagnetic environment of domestic class (max 3V/m, according to IEC61000-4-3)

The input voltage external power supply specifications:

- 100 - 240 V~, 50/60 Hz
- Accepts 10% voltage fluctuation
- Transient overvoltages cat. 2
- Temporary overvoltage.

Take special care while handling liquids.

Unpacking

To unpack the instrument:

1. Take everything out of the box except the DispenCell. Verify that all components are present. See Components Included in the Delivery on page 12.
2. Use two hands to gently lift the DispenCell by the base out of the box.

CAUTION! Do not hold the DispenCell by the top part of the instrument.

Figure 2-1: How to Lift the DispenCell Out of the Transport Box

Note: Place the instrument on a stable support otherwise, the instrument can fall, which may cause serious bodily harm and/or severe damage to the instrument.

3. You can use the DispenCell on a bench or in a biosafety cabinet. Leave enough space next to the DispenCell for the mini PC (NUC). If you place the instrument in a biosafety cabinet, you can use a trolley for the mini PC (NUC). You need three electrical outlets for the DispenCell, the mini PC (NUC), and the screen.
4. Remove the black protective foam around the pipetting head.

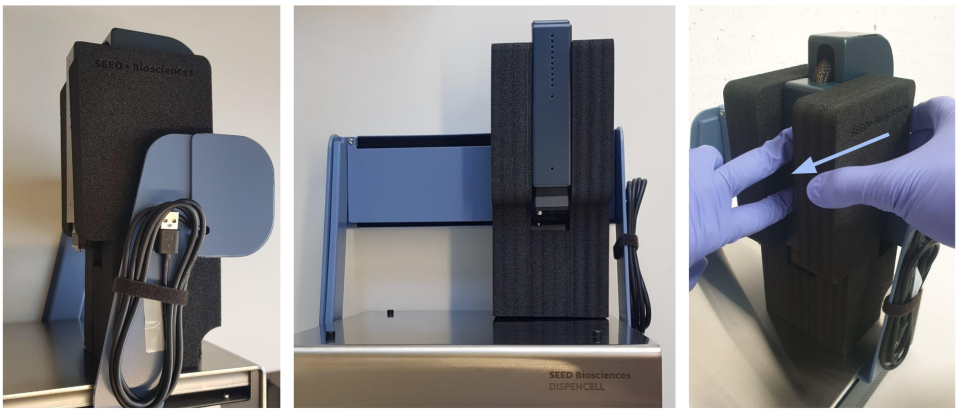


Figure 2-2: Side View of the Protected Pipetting Head (left)
Front View of the Protected Pipetting Head (center)
Removal of the Black Protective Foam (right)

5. Remove the strap that holds the USB cable on the right side of the DispenCell.

6. Assemble the Base plate.

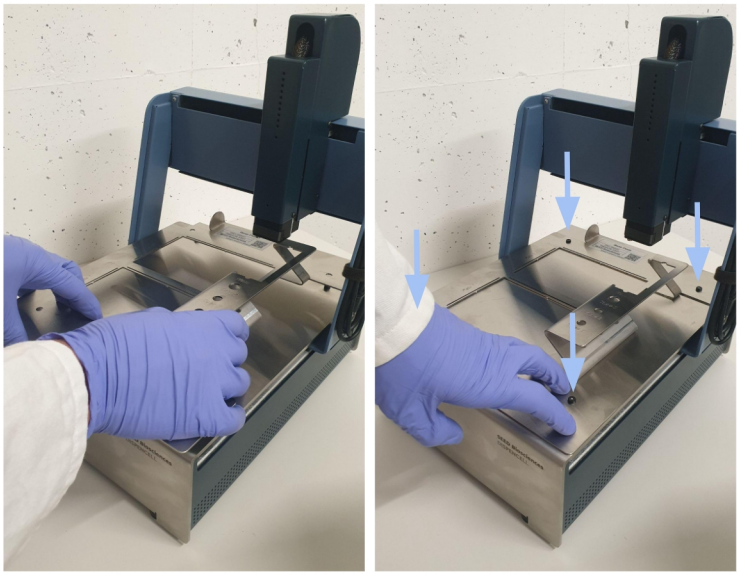


**Figure 2-3: Placement of the Base Plate on Top of the DispenCell (left)
Clipping of the Base Plate (right)**

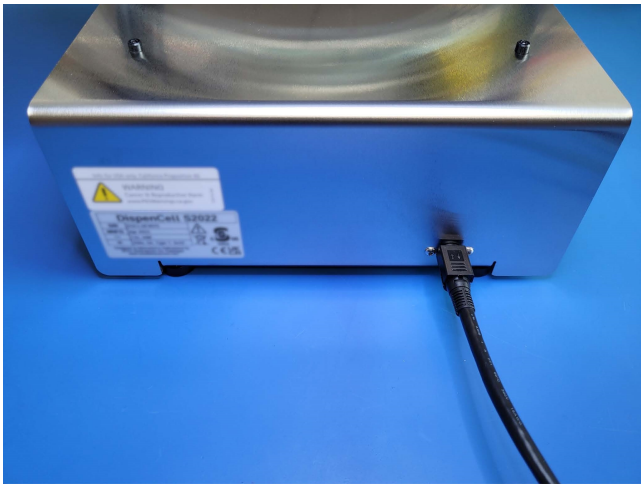
7. Place the mini PC (NUC) close to the DispenCell so that you can connect the USB cables afterward.
8. Place a screen, keyboard, and mouse next to the mini PC (NUC).

DispenCell and Mini-PC (NUC) Installation

To install the DispenCell and mini PC (NUC):

1. Insert the DispenCell power cord into the power supply port on the rear panel of the instrument.

Note: The flat side of the cord must be facing upward.



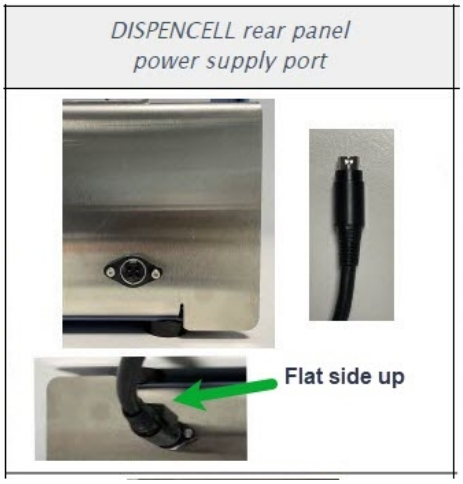


Figure 2-4: DispenCell Power Supply Port

2. Insert the other end of the power cord into a properly grounded wall outlet or UPS.

3. Insert one end of the USB B cable into the USB port on the side of the DispenCell.

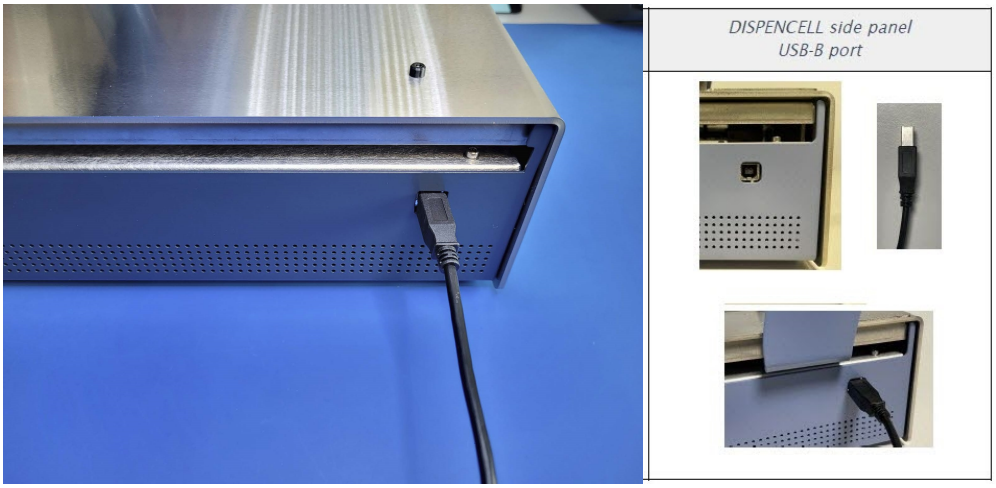


Figure 2-5: DispenCell USB B Side Port

4. Insert the other end of the USB B cable into the USB B port on the rear of the NUC.

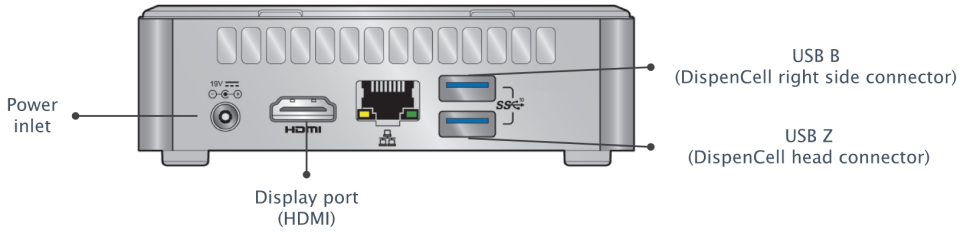


Figure 2-6: NUC Rear Panel Ports

5. Insert the mini PC (NUC) power cord into the power inlet on the rear of the NUC, and then insert the other end of the power cord into a properly grounded wall outlet or UPS.
6. Plug the computer screen into a properly grounded wall outlet or a UPS.
7. Use the HDMI cable that came with the computer screen to connect the computer screen to the HDMI display port on the rear of the NUC.
8. Insert one end of the USB Z cable into the top of the DispenCell head and insert the other end into the USB Z port on the rear of the NUC.

Figure 2-7: DispenCell Head with USB Z Cable Attached

9. Connect the provided USB hub to the USB port located on the front panel of the NUC.
10. Connect the computer mouse and the computer keyboard to the USB hub.

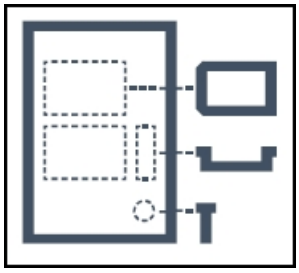
Chapter 3: Training Beads Protocol

Single-cell experiments can be challenging. Use the training beads as a reference sample to mimic a cell sample to practice the mixing step of sample preparation in the DispenMe buffer and to familiarize yourself with the DispenCell software before you dispense your cells sample.

Running the Training Beads Protocol

To run the training beads protocol:

1. Fill the plates with PBS (200 µL per well for 96-well plates, 50 µL per well for 384-well plates).
2. Fill the wash unit with 25 mL of PBS.
3. Label the plates to ensure traceability.
4. Install the DispenTip firmly in the pipetting head. Make sure that the golden strip is facing you. See DispenTip Installation on page 22.
5. Align the DispenTip to the alignment mark. See DispenTip Alignment on page 25.
6. Place each of the components in their designated location on the DispenCell.



7. Make sure that the plate is correctly oriented on the DispenCell.

8. Remove the plate cover before the dispense.
9. Use a tabletop centrifuge to quickly spin a DispenMe tube down, then place it vertically and wait at least 10 min to allow the DispenMe buffer to reach room temperature.
10. Mix the dropper by gentle inversion or very gentle vortexing.

> **Note:** After you open the dropper screw cap, the plastic protection of the tip might not stay in the screw cap and needs to be removed by hand.

11. Hold the dropper upside down vertically and add one drop in the DispenMe tube (~15 µL per drop, leading to a final concentration in the DispenMe buffer of ~1.5 x 10^4 beads/mL).
12. Use the wide bore 200 µL tip (furnished in box of 96), to mix the beads homogeneously into the viscous buffer by pipetting up and down at least 20x.
13. Make sure to avoid bubbles. If bubbles are created, flick the tube downwards.
14. In the software, select the plate type and name.
15. Set Loading Time: **60 seconds**.

16. Set Wash Cycles: **5**.
17. Set Threshold: **150 Ohm**.
18. Dispense in the wells of the plate.
19. Open the DispenCell-Analyser.
20. Select the data source folder.
21. Click **Analyse** and select **Results**.

Chapter 4: Cell Dispensing

Click the following link to view information regarding the operation of the DispenCell:

DispenCell: A simple single-cell dispensing solution

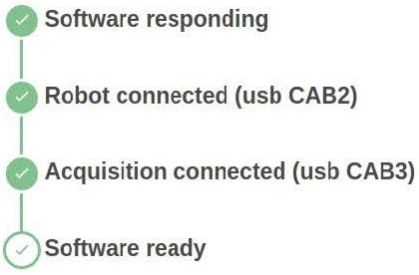
DispenCell and DispenCell-Driver Startup

To start the DispenCell and DispenCell-driver:

1. Verify that all cables are connected. See DispenCell and Mini-PC (NUC) Installation on page 16.
2. To turn on the DispenCell, push the **ON** button on the front left side of the instrument. You will hear the hum of the pumps.
3. Switch on the mini-computer (NUC) and the screen.
4. Log on to the account: *seedbiosciences* with the password: *dispencell*.

> **Note:** If you enter incorrect login credentials more than 5 times, the mini-computer (NUC) will remain locked for 30 minutes. Exit the login action and wait 30 minutes before you attempt to log in again.

5. To open the DispenCell-driver software, click the icon located on the upper left side of the screen. The software might take a few minutes to initialize, for each step the red X changes to green check and then the Start button displays.



> **Note:** When you operate the DispenCell for the first time after shipment, run a Hardware Self-Check and send the output at support.moleculardevices.com/ to ensure that the DispenCell is operating as attended.

6. Click **Start** to begin the DispenCell initialization. The pipetting head moves to the back right and then to the front left of the instrument.

Setting Up for the Dispense

DispenTip Installation

Click the following link to view DispenTip installation information:

DispenTip installation information

This video tutorial is also available in the DispenCell driver software by clicking on the camera icon located at the top-right of the window.

At this point, the pipetting head of the DispenCell moves to the front left side of the instrument to help you to position the DispenTip more easily.

To install the DispenTip:

1. Open the sterile pouch that contains the DispenTip.
2. Under sterile conditions, take the white plastic holder that contains the DispenTip and carefully lift the cap.

Note: Do not touch the DispenTip with your gloves. Touch and manipulate the DispenTip by touching the white plastic holder.

3. Release the instrument robot head from its magnetic support with one hand (Figure 3.1 and Figure 3.2).

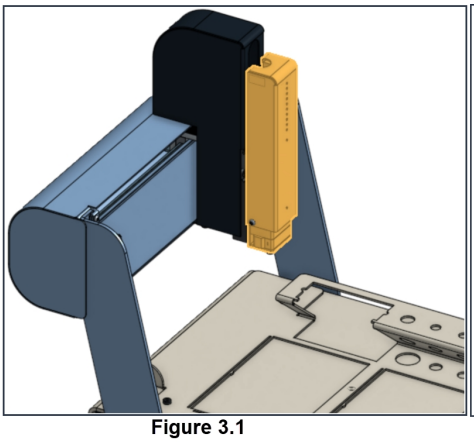


Figure 3.1

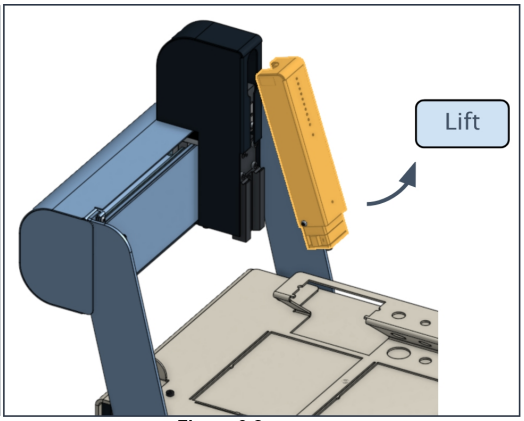


Figure 3.2

4. Use a finger to press the lever on the left lower part of the robot head to open the connecting piece before you insert the DispenTip (Figure 3.3).

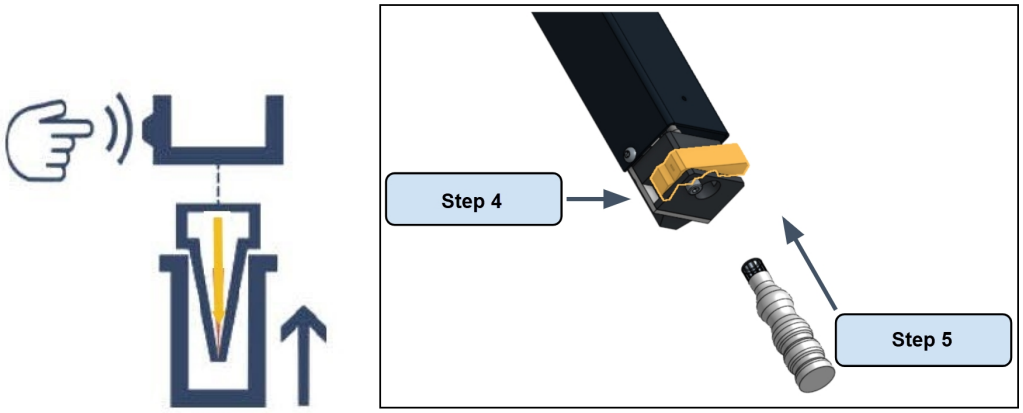


Figure 3.3

Note: Do not apply strength on the sheath that links the pipetting head to the instrument. Pressure can damage the cables and tubing inside.

5. With your other hand, take the DispenTip by the white plastic holder, position the golden strip towards the front of the instrument, and then press firmly to connect the DispenTip to the robot head. If you do not firmly insert the DispenTip, it will be ejected.
6. Release the lever and remove the white plastic holder (Figure 3.4 and Figure 3.5).

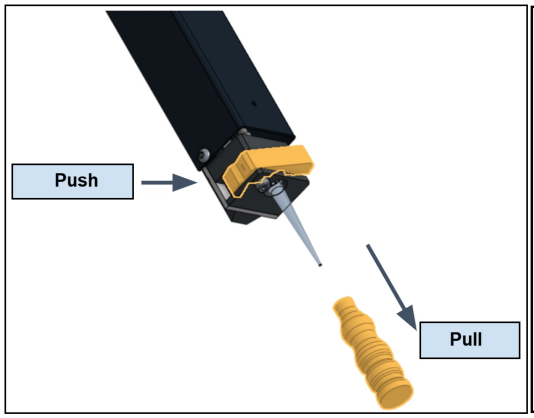


Figure 3.4

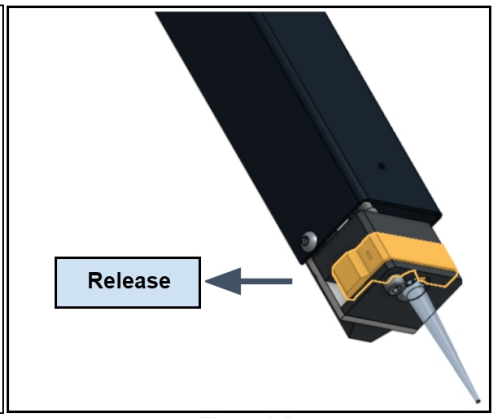


Figure 3.5

7. Place the robot head back on the instrument magnetic support (Figure 3-6) and click **Done**.

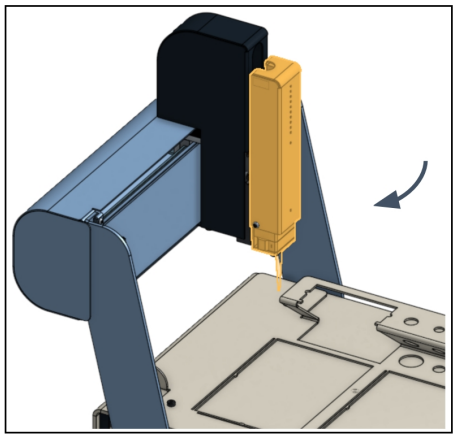


Figure 3.6

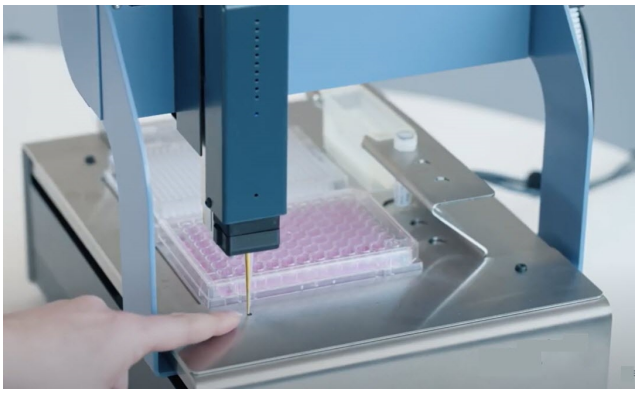
8. Check the orientation of the DispenTip. If the golden strip of the DispenTip does not face the front side of the instrument, click **Previous** and repeat the previous steps.

Note: If the golden strip on the DispenTip does not face the front of the instrument, you need to reorient the DispenTip. To remove the DispenTip, insert it back into the white plastic holder, press the lever, and then use your fingers to pull on the top part of the DispenTip.

9. Click **Done**.

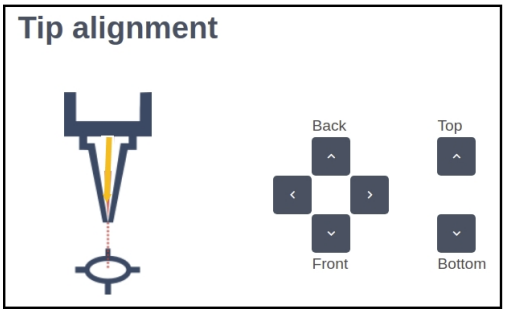
DispenTip Alignment

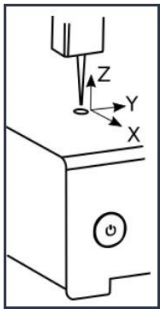
The DispenCell pipetting head moves close to the alignment pin.



To align the DispenTip:

1. Use the Back, Front, Right, and Left arrows on the screen to align the DispenTip on top of the alignment pin. The DispenTip movement is set to 0.5 mm / 0.02 inch increments. You can modify this value to coarser or finer increments.





Note: The increment value should not exceed 1 mm / 0.04 inch to avoid reaching the limit of the axis.

2. The height position of the DispenTip is set approximately 2 mm / 0.08 inch higher than the alignment pin. You can use advanced mode to adjust the height.

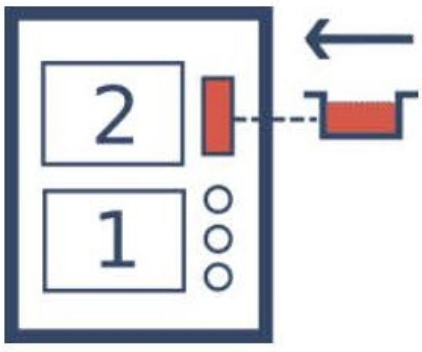
Note: Be careful when you change the height position; if the DispenTip hits a hard surface, it can damage the sensor.

3. Once the alignment is done, click **Next**. The pipetting head moves to the back right of the instrument.

Wash Installation

To prepare the wash:

1. Fill the washing unit (furnished in packs of 4) with 25 mL of sterile PBS 1x.
2. Place the washing unit on the tray as indicated.



3. Click **Next**.

Choose the Plate Type

The DispenCell can accommodate two plates. Contact us at support.moleculardevices.com/ to add your plate references to the drop-down list.

To choose a plate type:

1. Click **Plate Model** to choose the reference of the plate. The default name is yyyy-mm-dd-hh-mm.
2. Click **Plate Label** to change the plate name. Do not use special characters or spaces. Use a barcode reader for automated naming.

> **Note:** The label of the plate needs to match the label you use in the DispenCell driver software; this is crucial for traceability.

3. Click **Next**.

Use the top-right button to activate the second plate.

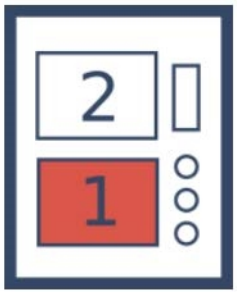
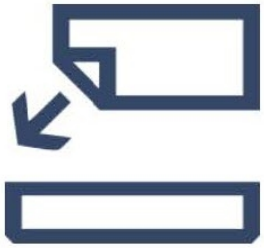


Plate Placement

To place multiple plates:

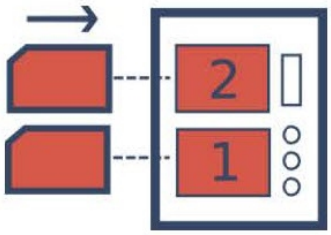
1. Control the labeling of the plate to ensure the traceability.



2. Fill the wells of the plate with the liquid medium (e.g., 200 µL in each well of 96-well plates or 50 µL in each well of 384-well plates).
3. To promote the growth of the dispensed cells, incubate the plate for at least 15 min in the CO_2 incubator at 37 °C / 98.6 °F before dispensing.

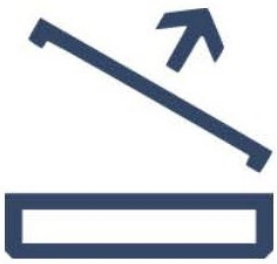
Note: The liquid medium you use to fill the plate needs to be conductive.

4. Place the plate in position 1.



5. Orient the plate with well A1 in the top-left.

6. Remove the plate cover.



7. Click **Next**.

Cell Sample Preparation

Click the following link for information regarding the cell sample preparation:

Cell Sample Preparation

Note: Make sure to go through every step of the protocol. Cell filtration and sample mixing are critical steps for correct cell dispensing.

Molecular Devices provides training beads to mimic a cell sample. Use this reference sample to practice the mixing step of sample preparation in the DispenMe buffer and to familiarize yourself with the DispenCell software before you dispense your cell sample. The dropper contains 10 µm non-fluorescent polystyrene beads at a 1.5 x 10^5 beads/mL concentration. See Training Beads Protocol on page 19.

1. Remove the DispenMe tubes from the refrigerator and then use a tabletop centrifuge to quickly spin them down before you place them vertically. Wait at least 10 minutes to allow the tubes to reach room temperature.

   Note: Do not warm the DispenMe at 37°C / 98.6 °F.

2. Use the strainer (20 µm mesh size) provided in the DispenKit to remove the potential cell aggregates in the sample to prevent the clogging of the DispenTip.
   a. Place the cell strainer on a tube (5 mL or 13-15 mL).
   b. Prime the cell strainer with 500 µL of culture medium.
   c. Place the cell strainer on a new tube (5 mL or 13-15mL).
   d. Filter at least 1 mL of the cell suspension.

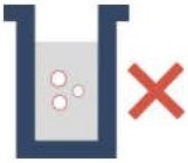
3. Check cell concentration, viability, cell size distribution, proportion of cell debris, and proportion of aggregates with your routine protocol and adjust the total cell concentration (live + dead) to 1.5 x 10^5 cells/mL with fresh culture media.

   Note: If the media contains debris, use a 0.45 µm filter to filter the culture media. A cell viability below 90% may compromise the results of the experiment.

4. Add 15 µL of the strained cell suspension at 1.5 x 10^5 cells/mL in the DispenMe tube (final concentration: 1.5 x 10^4 cells/mL).
5. Use the wide bore 200 µL tip (furnished in box of 96), to mix the cells into the viscous buffer by pipetting up and down 30 times.

Note: Avoid the generation of air bubbles. Bubbles interfere with the impedance measurement.

6. If air bubbles are created during the mixing with the pipette, make a quick downward movement of the tube to remove the air bubbles from the viscous buffer.

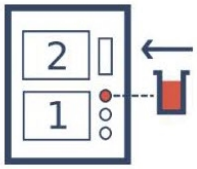


7. Click **Next**.

Loading

To load cell samples:

1. Select the sample tube to use (0.5 mL by default in position 3). You can use lower volume tubes for low cell number applications.
2. Place the cell sample in the correspondent position on the DispenCell tube rack.



Note: For low cell number applications, Molecular Devices provides a custom configuration to use tubes with lower volume.

3. Open the cap from the sample tube to allow the sample to load into the DispenTip.

4. Adjust the loading time according to the type and the number of plates to process and the target number of cells per well.

Recommended Loading Times for Single-Cell Dispensing in Each Well

Plate	Recommended Loading Time
1 x 96-well plate	60 seconds
2 x 96-well plate	120 seconds
1 x 384-well plate	240 seconds

Note: Do not load the sample in the DispenTip for more than 240 seconds. If you need to dispense more volume, first dispense the totality of the sample loaded in the DispenTip and then reload.

5. Wait for the histogram generation (activated by default) to perform a 30 second analysis of the sample to generate some preliminary values of the impedance signal distribution of the sample.
6. Click **Done** and then click **Load** to load the cell sample in the DispenTip.

Note: Control “Live values” during the loading, the pressure should be between -150 and -100 mbar, and impedance should be between 30,000 and 50,000 ohms. If this is not the case, see the following table.

Impedance Live Value and Meaning

Impedance value [ohm]	Meaning
30,000 - 50,000	Normal range
< 30,000	The DispenTip may be inserted incorrectly. Reposition the DispenTip in the pipetting head. If the same value appears, change the DispenTip. See DispenTip Installation on page 22.
> 50,000	The DispenTip might be clogged. Retry loading. If the same value appears, change the DispenTip. Make sure the cell sample is correctly strained.
0	No acquisition of the impedance. At the end of the loading, leave the DispenTip on the instrument and restart the mini-computer (NUC) and the DispenCell. Resume at the loading step in the software and proceed with a 5 second loading.
Saturation	See Troubleshooting on page 41.

7. If histogram generation is enabled, the DispenCell measures approximately 20 events to generate and plot indicative values about the sample. The following metrics are estimated:
   - The Tcc (average time between two events) expresses the concentration of the sample.
   - The PFR indicates the percentage of wells that contain a single cell.
   - The total time to dispense one single-cell in every well of the plate.

Note: If the results are outside the 2 to 5 seconds Tcc range, the sample might not be thoroughly mixed or at the recommended cell concentration.

With a low Tcc, the time required for the dispense decreases and the number of wells with supernumerary cells increases. Cell dispensing can be performed, but the single cell efficiency might be lower.

With a high Tcc, the time required for the dispense increases, and the number of wells with supernumerary cells decreases. Cell dispensing can be performed, but you may need to reload the sample in order to have enough sample to dispense the full plate.

Wash

Perform a washing step of five cycles in the washing unit filled with PBS 1x to clean the external surface of the DispenTip from the viscous solution.

- Click **Wash** to initiate the washing of the external surface of the DispenTip.

Starting and Monitoring the Cell Dispense

Select a dispense mode:

- Select **Cell Count** mode to specify the number of cells to dispense per well.
- Select **Dilution** mode to dispense a fixed volume per well expressed in seconds with the parameter **Dispense Time** (flow rate: ~40 nL/s).

Cell Detection Parameters

The Cell Count mode requires a thresholding to filter out the cell debris signals from the detection of the cell to have a correct triggering during the dispense. You can modify the threshold in the post-treatment analysis, if necessary.

Note: The threshold does not influence the recorded impedance signal but affects the count of cell events and therefore the accuracy of the dispense.

The threshold is specific to a cell line and to the liquid medium in the plate and needs to be determined experimentally. For most mammalian cells bigger than 10 µm, the recommended threshold is 200 ohms.

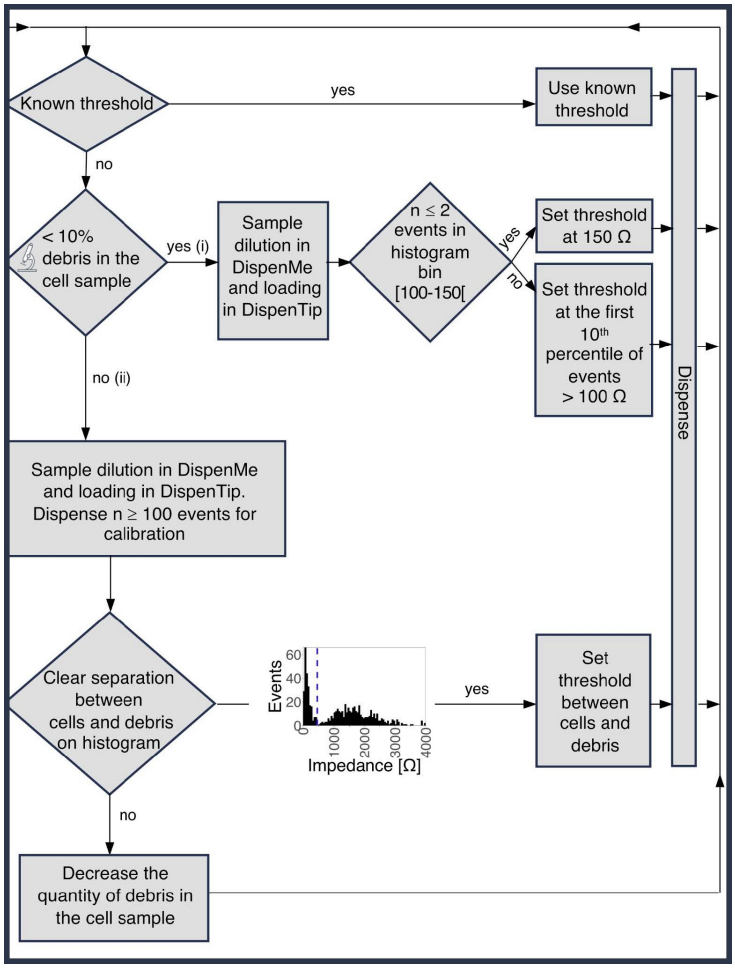


Figure 4-1: Guidelines to define the threshold between noise/debris and cells.

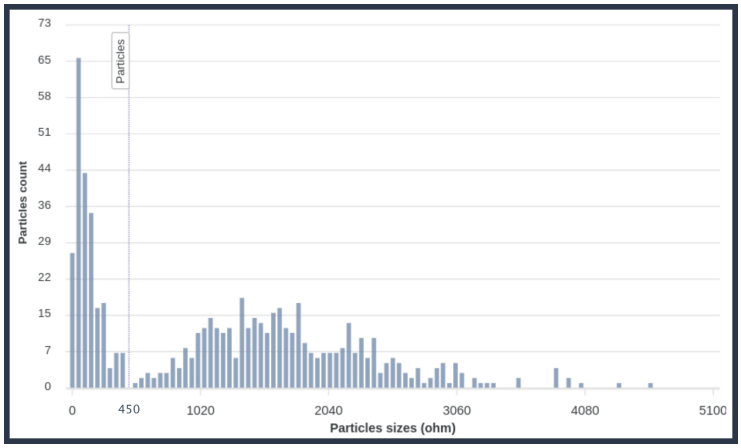


Figure 4-2: Distribution of the impedance signal (in ohm) of >400 cell events obtained with a HEK-293 cell sample. The Particles Threshold to distinguish cell-debris from cells is set at 450 ohms.

Note: Write down the cell detection threshold you use.

To set detection parameters:

- In the **Cell Count** field, enter **1** for single cell dispensing or enter the number of cells to dispense per well.

Cell Dispensing

To set cell dispensing parameters:

1. If you load two plates, select the plate position.
2. Select the wells into which to dispense. Click on the first well and then click on the last well of your selection. The software selects the wells in between.
3. Click **Dispense** to start the dispensing process.

> **Note:** Control “Live values”, the pressure should be between 10 and 20 mbar.

Right-click on the well already dispensed to check the impedance signal. The software saves the data in the folder /home/seed_biosciences/dispencell/data.

> **Note:** If DispenTip is left at rest for several minutes in between dispensing, go back to the Wash step and do a cycle of wash before you resume the dispense. See Wash on page 31.

End of Dispense

After the sample dispenses in the plate, several options are available:

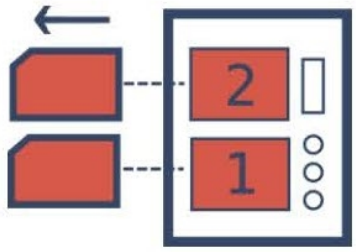
- Change Tip - To use another sample.
- Change Plate - To dispense in a new plate.
- Reload Sample - To load the sample again in the DispenTip, if the loaded volume in the DispenTip is not enough to continue the dispense.
- Change Detection Settings - To modify the parameters of the dispensing. See Cell Detection Parameters on page 31.
- Finish - To end the experiment.

> **Note:** After you click Finish, you cannot modify the file with new dispensing data.

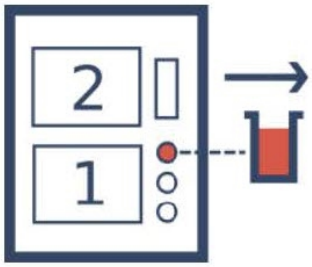
Shut Down

To shut down after you are done with the dispensing:

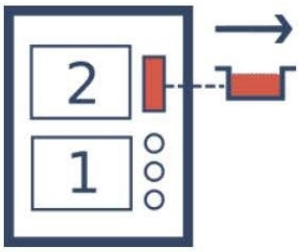
1. Cover the plates and gently unclip the plates from the DispenCell. Store the plates.



2. Close the cell sample tube you used for the loading and remove it from the DispenCell.



3. Remove the wash unit carefully to avoid any liquid spill on the DispenCell.



4. With one hand, release the robot pipetting head from the magnetic support. Press the lever on the left lower part of the pipetting head to open the connecting piece and pull on the top part of the DispenTip to remove the DispenTip.

CAUTION! Do not pull the DispenTip without pressing on the lever. This can damage the connector of the pipetting head.

5. Quit the DispenCell-driver software and turn off the DispenCell.

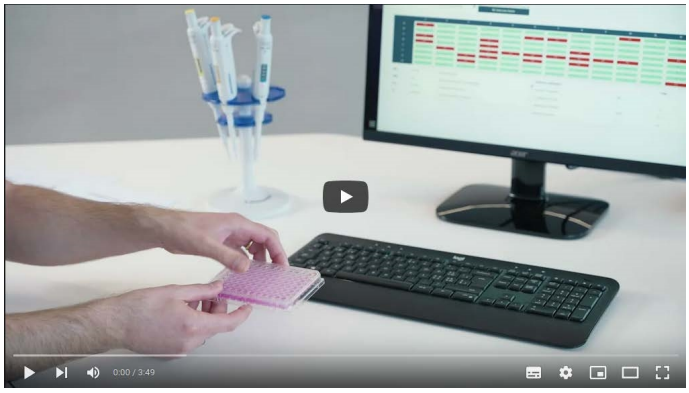
Chapter 5: Analysis

5

Results Visualization

Click the following link for information regarding the analysis of your results using the analysis software:

Results Visualization



To visualize the results of the experiments, open the DispenCell-Analyzer on the mini-computer (NUC) or your personal computer.

1. Click on the upper left side of the screen to open the DispenCell-Analyzer software.
2. Select the data source folder: **/home/seed_biosciences/dispencell/data**.

> **Note:** If the DispenCell-Analyzer software was open while dispensing, click in the top-right of the screen to refresh the plate list.

3. Click Analyse to analyze the experiment.
4. Click Results to display the results of the experiment.

Three panels display:

- The histogram of the particle-size distribution
- The detection parameters
- The representation of the results on the plate

To analyze results:

1. Click **Edit** in the detection parameters panel.
2. In the **Particle Threshold** field, enter the value you used for the dispensing of this plate and then click **Save**.
3. In the panel that represents the results on the map of the plate, right-click on wells to visualize the impedance signals and control the automatic cell detection. See Impedance Signal Interpretation on page 37.

Automatic Analysis

The DispenCell-Analyzer analyzes the impedance signal in every well. The automated analysis updates when you change the detection parameters to refine the results.

Note: When you perform a routine experiment, you should control the automatic analysis that the DispenCell-Analyzer software performs.

Thresholding

The DispenCell-Analyzer software uses two thresholds, Particle Threshold and Aggregate Threshold, to post-process the acquired impedance signals during the dispense of the plate to exclude the wells that do not meet the quality criteria.

You must optimize the thresholding values for every experimental condition (cell line and medium or buffer used in the plate). The definition of the ranges of impedance signals that correspond to the cell debris, the cells, and the cell aggregates can be optimized by comparing the measured events' impedance to the microscopic observation of the plate. Use the protocol for monoclonality assessment with Calcein-AM dye.

By default, the software uses the Particle Threshold you set for the cell dispense to distinguish the cell debris from the impedance signal of the cell. Change the Particle Threshold to update the automatic cell detection.

- If the Particle Threshold is too low, lower impedance signals are considered as cells which leads to an increase of the excluded well because tagged as containing a supernumerary cell count, some detected events being noise or cell debris.
- If the Particle Threshold is too high, the lowest impedance signals considered as cells during the dispense are ignored which leads to an increase of the excluded well because tagged as empty, some ignore events being small cells.

By default, the software does not apply an Aggregate Threshold to distinguish the cells from the impedance signal of the aggregate. Change the Aggregate Threshold to update the automatic cell detection.

Lower the Aggregate Threshold to exclude more wells with the highest impedance signals because these cells are considered to contain an aggregate (some of the excluded events being large cells). Use the microscopic observation of the cell sample before dispensing to quantify the proportion of aggregates (cell doublet, cell clumps) to define the Aggregate Threshold. For example, if the cell sample contains 5% of aggregates, 5% of the highest impedance signals should be excluded by setting the Aggregate Threshold accordingly.

Impedance Signal Interpretation

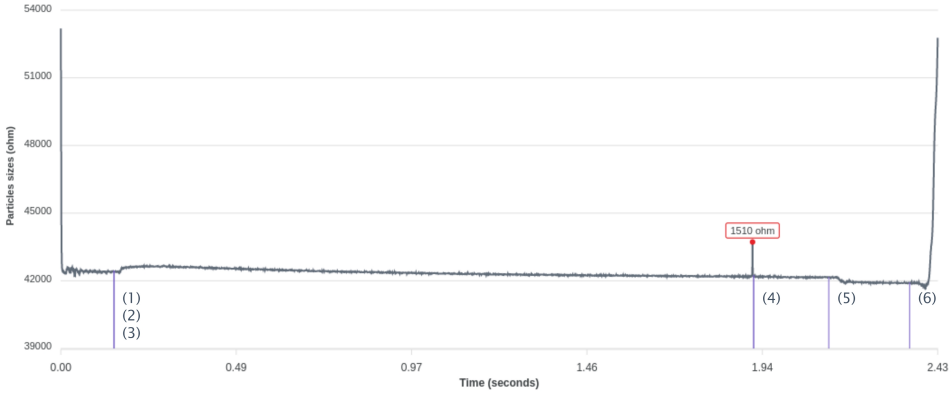


Figure 5-1: Typical Impedance Signal Obtained With a Single-Cell Dispense into a Well Over Time

The impedance signal measure is composed of different phases:

1. The moving of the DispenTip on top of the well
2. The DispenTip entering the well
3. The activation of the pump to reach the dispensing pressure
4. The peak detection window ended by the cell detection or by reaching the Timeout
5. The inactivation of the pump to reach atmospheric pressure
6. The exiting of the well

In the well charts, select **Config** -> **Other** -> **Show Events** to display the different phases on the impedance signal.

Reporting

The DispenCell-Analyzer report provides immediate and traceable proof of clonality. Analyze the impedance signal in each well to control the automatic analysis.

You can create a monoclonality report for each experiment. Click **Actions** in the upper right corner to export the data to .pdf or .csv files.

- The .pdf report contains the particle size distribution, the map of the plate with the result per well, and the particle detection setting.
- The plate_results.csv file contains the map of the plate with the result per well.
- The detected_events.csv contains the impedance values of all the events detected per well.
- The dispense_events.csv contains the time of the event triggering the end of the well dispense.
- The single_cells.csv contains the coordinates of the well dispensed with a single cell.

To visualize the impedance signal of the individual wells, right-click on the plate map on each well.

To zoom on the impedance signal, drag and drop using the right mouse button.

To export the measure of the impedance that displays to different formats (.svg, .png, and .csv), click **Save**.

If necessary, click **Actions** in the upper right corner to correct the automatic analysis.

Note: Do not save the report file in the folder that contains the raw impedance data.

Do not service the equipment yourself. Service shall be carried out only by trained experts authorized by Molecular Devices. An improperly serviced instrument may lead to severe personal injury or death by exposure to mechanical hazards, and the risk of electric shock. Always wear protective gloves and eyewear to protect against potential biohazard exposure. Before cleaning, unplug the instrument. Do not use liquid or aerosol cleaning agents, always use a damp cloth. See Safety Information on page 7.

Cleaning

Isopropanol and ethanol (between 70% to 100%) are recommended to clean and disinfect the DispenCell. Observe the applicable Safety Data Sheets (SDS) when manipulating those substances and wear personal safety equipment accordingly. Disposal of wastes must also be in accordance with all national, state, and local health and safety regulations and laws.

Disinfection and Placement Under Biosafety Cabinet

Use the appropriate disinfectant for the potential pathogen and to decontaminate surfaces in contact with biohazardous samples.

To disinfect and place the instrument under biosafety cabinet:

1. Remove the base plate of the DispenCell.
2. Wipe down the external surfaces of the instrument, the base plate, and cables using a lint-free cloth damp with an appropriate solution (e.g., 70% ethanol or 70% isopropanol).
3. Place the DispenCell on a trolley in front of the biosafety cabinet.
4. Repeat the previous wiping on all the external surfaces of the DispenCell, base plate, and cables.
5. Place the DispenCell under the biosafety cabinet, ideally on the right side. Placement on the left might require a USB type A extension. Do not cover the front grid of the biosafety cabinet with the DispenCell and leave a minimum distance of 15 cm / 5.9 inches from the front window.

   Leave a minimum distance of 10 cm / 3.9 inches from the back and lateral walls of the biosafety cabinet.
6. Ideally, the cables connected to the DispenCell should go through a dedicated opening on the biosafety cabinet wall. Alternatively, they can exit the biosafety cabinet through the front window.

Chapter 7: Troubleshooting

ID	Action	Expected Result	Observation	Cause	Failure Mode	Fix
1	Manually move all the axes at the mid-way position	Axes should be free and can be placed mid-way on all the axes	Impossible to move the axis	Mechanical blockage	DispenCell collides with an external object	IQ procedure
					Casing blockage, slider blockage, motor blockage	Contact support
2	Plug the DispenCell into its power supply and connect its two USB cables to the NUC	DispenCell power supply can be inserted with reasonable force	Impossible to insert the power supply plug	Wrong orientation	Wrong orientation	Control the connector's correct orientation

ID	Action	Expected Result	Observation	Cause	Failure Mode	Fix
3	Turn DispenCell ON by pressing its power button	The power button turns blue	Front Power button does not light ON	The DispenCell main cable is not connected	DispenCell is not power supplied	Plug the main cable (CAB1) into the power outlet
			Front Power button does not light ON, and the power supply makes an unusual noise	12V power supply connector is connected upside down	DispenCell is not power supplied	Control the connector's correct orientation
			Front Power button does not light ON, and the power supply green LED does not light ON	12 V power supply default	DispenCell is not power supplied	Change the power supply and the main cable with a replacement part
			Front Power button does not light ON	The wall outlet is not powered	DispenCell is not power supplied	Connect the main cable (CAB1) into another outlet, and test the outlet with another device
			Front Power button does not light ON	The LED of the button is not functioning	DispenCell is power supplied but there is no blue light on the Power button	Contact support
			Front Power button does not light ON	Blown fuse	DispenCell is not power supplied	Change the fuse
			Front Power button does not light ON	Wrong cabling	DispenCell is not correctly powered	Contact support
4	Observe the ZHead LED (through the Head Cover)	Red and blue LEDs turned ON	No red LED	ZHead not power supplied		Contact support
			No blue LED	ZHead firmware not flashed		Contact support

ID	Action	Expected Result	Observation	Cause	Failure Mode	Fix
5	Listen to the noise of the pumps	A constant electrical-motor-like noise of ~50 dB can be heard in a quiet environment	Pumps do not make any sound	Firmware power up failure	Pumps do not start because the firmware is not flashed or did not power up	Turn DispenCell off and turn it on again, twice if necessary
				Disconnected Pumps connectors	Pumps do not start because the pumps connectors are not connected or defective	Contact support
6	Try again to displace the axis manually	All axes should be blocked	One or more axes are loose	Undriven axis	Motor misconnection	Contact support
					Undriven belt / untighten pulley	Contact support
					Mechanical defector on a motor	Contact support
7	Open the DispenCell-driver software	Launch the DispenCell-driver and observe the first screen. The labels down to "Software ready" display a green mark (within 30 seconds)	Observe the "USB CAB2 & CAB3" tick in the first software panel	USB cables (CAB2 or CAB3) unplugged	DispenCell is not connected to the software	Make sure both USBs are plugged
			Observe the "USB CAB2 & CAB3" tick in the first software panel	USB/COM port corrupted	DispenCell is not connected to the software	Unplug both USBs, quit the DispenCell-driver software, restart the computer, and replug the two USBs
			Observe the "USB CAB2 & CAB3" tick in the first software panel	USB cables (B or Z) damaged	DispenCell is not connected to the software	Change the USB-B cable (CAB2)

ID	Action	Expected Result	Observation	Cause	Failure Mode	Fix
8	Run a Hardware Self-test with a dummy tip inserted in the DispenCell pipetting head	Self-test results without errors or warnings	No text is written in the console	Connection / communication problem	Broken USB Port on Motherboard	Contact support
			No movement on the Z axis (to reach zero)	Endstop Z misconnection		Contact support
				Endstop Z defective		Contact support
				Motor misconnection		Contact support
				Motor defective		Contact support
			Consecutively to the Z axis movement, the XY axis does not move simultaneously (to reach zero)	Endstop X or Y misconnection		Contact support
				Endstop X or Y defective		Contact support

ID	Action	Expected Result	Observation	Cause	Failure Mode	Fix
8	Run a Hardware Self-test with a dummy tip inserted in the DispenCell pipetting head	Self-test results without errors or warnings	Strange noise at the end of the axis displacement, the axis goes to a stop, and the motor lock is heard	Endstop / magnet misplacement or axis encumbrance		Contact support
			Error on the axis displacement values	Missed step, mechanical encumbrance, mechanical defect, intermittent connection	Warning on XYZ movements	Contact support
			Error on pressure values, both positive and negative	Dummy tip not correctly connected	Leak on the dummy tip	Disconnect and reconnect the dummy tip firmly and air-tight
			Error on pressure and negative pressure value	Leaky manifold	The manifold was incorrectly mounted, the glue was missing on the vias, unmounted O-ring	Contact support
			Error on a pressure value, only one pressure value	Defective pump	Jammed valve, broken / blocked motor, dusty membrane	Contact support
				Pressure divider badly tuned	Throttle valve untuned	Tune the divider
				The pneumatic circuit is open (tube, fitting, throttle valve)	Tubing disconnected, torn fitting, torn throttle valve	Contact support
			Error on the rise time (rise time > 50 ms)	Pinch in the pneumatic tube		Contact support
				MoleEye defective		Contact support

ID	Action	Expected Result	Observation	Cause	Failure Mode	Fix
9	Initiate a 60 second loading in the driver software, observe DispenTip positioning	The DispenTip enters correctly in the loading tube	DispenTip is not correctly entered into the tube	Tube wrongly placed, Base Plate is incorrectly mounted, Base Plate tolerances out of specifications	Base Plate tolerances are out of specification	Change the Base Plate
				COM connection / software issue	Software not responding	Restart the DispenCell-driver software

ID	Action	Expected Result	Observation	Cause	Failure Mode	Fix
10	Initiate a loading of 60 second (without histogram) in the driver software. At the end of the loading process, observe if the liquid loading level and the impedance readout	After loading, the DispenTip (30 µm aperture) liquid height is 14 mm +/- 5 mm (.55 in. +/- .2 in)	The liquid level is below 9 mm (.35 in.)	Bad pneumatic connection between the tip and the connector	The connection between the tip and the instrument connector is not sufficiently tight and creates a pressure drop that prevents an efficient loading	Try to remount the same DispenTip firmly. Press with a sufficient force (similar to regular manual pipette - tip insertion).
				DispenTip clogging	Clogging of the aperture prevents loading	Try to reload and if not successful, change the DispenTip
				The tube conveying pressure inside the instrument is pinched	No more pressure is applied to the DispenTip	The instrument requires a corrective maintenance according to ID8
				DispenTip defects	Burrs on the tip outlet break the tightness and prevent loading	Change DispenTip
					The inner electrode is damaged with the spring terminal turn, breaking tightness and preventing loading	Change DispenTip
					The aperture is not correctly ablated, preventing the loading	Change DispenTip

ID	Action	Expected Result	Observation	Cause	Failure Mode	Fix
10	Initiate a loading of 60 seconds (without histogram) in the Driver software. At the end of the loading process, observe if the liquid loading level and the impedance readout	After loading, the impedance readout is comprised in the following range: 30 kΩ > |Z| < 65 kΩ	Impedance readout is 65535 Ω (signal saturation)	Signal saturation due to an electrical contact issue	Electrical contact loss because of a wrong tip installation (gold electrode not in the right position)	
					Electrical contact loss because of a damage to the DispenTip electrode	
					Electrical contact loss due to a defect in the ZHead connector	
			Impedance readout is exactly 0 Ω	No acquisition of the impedance signal	Impedance readout deactivated due to electrostatic discharge on the impedance acquisition system.	Leave the DispenTip on the DispenCell, restart the computer and the DispenCell. Reopen the DispenCell-driver and resume at the loading step

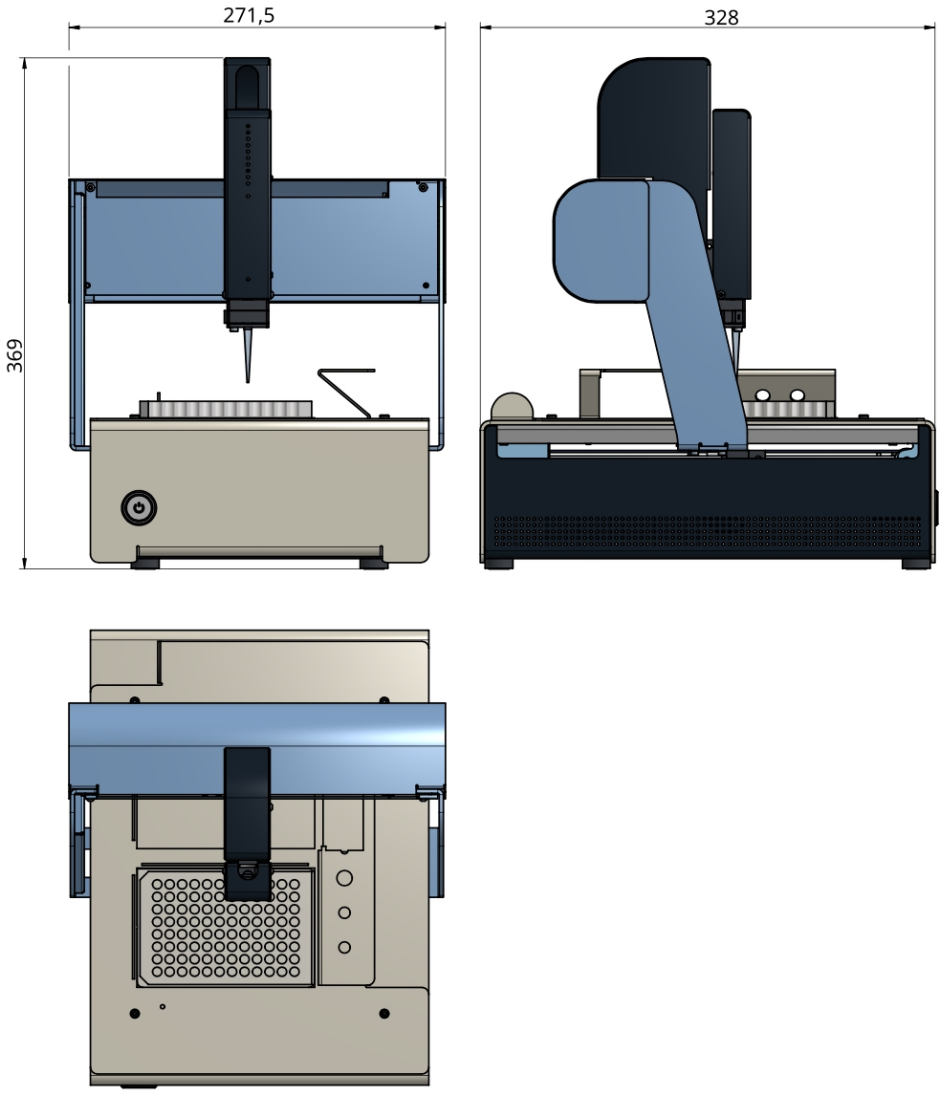
Appendix A: Technical Specifications

Item	Description
Physical Characteristics	
Instrument size	328 x 271.5 x 369 mm (12.9 x 10.7 x 14.5 in.)
Instrument weight	11.1 kg (24.5 lb.)
Electrical Characteristics	
Power supply	External, Meanwell GSM160A12-R7B, 138W, 12v, DC 11.5A certified IEC60601
Input voltage (external power supply)	100 - 240 V~, 50/60 Hz Accepts 10% voltage fluctuation, Transient overvoltages cat. 2, Temporary overvoltages
Input current (external power supply)	max 2.0 A
Input voltage (instrument)	12.0 V
Max. power (instrument)	40 w
Main Fuse	250v, 10A, Type T, Format 5x20
Process	In use with DispenTip 30 µm aperture
Consumables	
Plate compatibility (by default)	96-well 200 µL, (655101, Greiner) 384-well 50 µL, (781101, Greiner)
Plate compatibility (advanced)	96-well 100 µL, (655101, Greiner) 384-well low volume 10 µL, (788096, Greiner) 12-well 2 mL, (665102, Greiner) 24-well 1 mL, (0030722019, Eppendorf) 384-well PCR 5µL, (4309849, Appl. Biosys.) 96-well PCR 10 µL, (0030129504, Eppendorf) 6-well 3 mL, (353224, Falcon)
Loading duration in function of plate (current options)	6-well: 30 seconds 12-well: 30 seconds 24-well: 30 seconds 48-well: 30 seconds 96-well: 60 seconds 384-well: 240 seconds
Loading volume	Per 30 sec loading time at $1.5x10^4$ cells/mL : 10 µL, 200 cells
Loading tube	Sarstedt 0.5mL, 150µL, (pos. 3) Sarstedt 2.0mL, 500µL, (pos. 3)

Item	Description
Loading tube (advanced)	Sarstedt 0.5mL, 40µL, small sample 200 cells (pos. 3) Eppendorf 0.5mL, 40µL small sample 200 cells (pos. 1)
Cleaning and decontamination	Method: wipe Agent: Isopropanol 70% (water 30%) Isopropanol 98%+ Ethanol 70% (water 30%) Ethanol 98%+
Performance	
Particle range detection capability	Dielectric, from 8 µm to 25 µm
Time to dispense a 96-well plate	≤10 min (provided Tcc < 4s) ≤13 min (provided Tcc < 6s)
Time to dispense a 384-well plate	≤40 min (provided Tcc < 4s) ≤52 min (provided Tcc < 6s)
PFR (plate filling rate) or efficiency	≥70% (provided Tcc > 2.5s)
Monoclonal reliability	≥90%
Missed/corrupted data points	< 1% per plate (only accounted for point series n >6)
Communication protocol reliability	N/A
Fleet averaged MTBF	N/A
Standards and Certifications	
Electromagnetic compatibility	FCC part 15 B
Safety	cBVus IEC61010
Materials	RoHS
	REACH
Waste	WEEE
Environmental Conditions	
Altitude	Up to 2000 m
Temperature	5 to 40°C (41 to 105.8°F)
Maximum relative humidity	80% for temperature up to 31°C (87.8°F) decreasing linearly to 50% relative humidity at 40°C (104°F)
Pollution	Degree 2
Electromagnetic environment	According to IEC61000-4-3, domestic class, max 3 V/m
Packaging	
Weight (pallet)	22.5 kg (49.6 lb.)
Weight (case)	25.0 kg (55.1 lb.)
Dimensions (pallet)	600 x 465 x 480 mm (23.6 x 18.3 x 18.9 in.)

Item	Description
Dimensions (case)	650 x 520 x 390 mm (25.6 x 20.4 x 15.3 in.)
Pallet phytosanitary measures	ISPM-15 (only for pallet package)
Ship & drop tests	partial ISTA 2A (self-tested, only for pallet package, pre-conditioning, load, shocks)
Context Demonstrations	
GMP, annexe 1 : Manufacture of Sterile Medicinal Products	Report available upon request

The DispenCell exhibits a footprint that can conveniently fit in a biosafety cabinet or on any lab bench. Its weight and dimensions also allow transport in airway checked baggage.



Weight = 11 kg (24.3 lb.)

Stage Capacity

Standard elements:

- 2 x plate (96-well, 384-well) with a three-tube position loading cart

Maximal working volume:

- X : 220 mm (8.66 in.)
- Y : 155 mm (5.91 in.)
- Z : 50 mm (1.97 in.)

Power Supply and Connectors

External, Meanwell GSM160A12- R7B, DC 11.5A certified IEC60601

Type	Specs
DC Power supply (Toby DIN 4p)	138w, 12v
USB for DispenCell control	2 x USB

Appendix B: Warranty and Liability

The sale of instruments, consumables, reagents, software, or service parts (collectively hereinafter referred to as the "Products") by Molecular Devices (the "Seller") to the party purchasing the Products (the "Buyer") shall be governed by these terms and conditions.

Seller's offer to sell the Products to Buyer is expressly limited to Buyer's acceptance of these terms and conditions. Any of the following constitutes Buyer's unqualified acceptance of these terms and conditions:

- Issuance or assignment of a purchase order for the Products,
- Acceptance of any Product under the purchase order, or
- Payment for any of the Products under the purchase order.

Additional or different terms or conditions proposed by Buyer (including any additional or different terms provided in a purchase order) shall be void and of no effect unless specifically accepted in writing by Seller.

This Agreement shall be the exclusive agreement between the parties for the Products subject to the terms and conditions herein. Any prior or contemporaneous understandings, agreements, and representations, oral or written, are superseded by these terms and conditions. No modification to these terms and conditions shall be valid unless in writing and signed by Seller.

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Obtaining Support

Molecular Devices is a leading worldwide manufacturer and distributor of analytical instrumentation, software, and reagents. We are committed to the quality of our products and to fully supporting our customers with the highest level of technical service.

Our Support website—support.moleculardevices.com/—describes the support options offered by Molecular Devices, including service plans and professional services. It also has a link to the Molecular Devices Knowledge Base, which contains documentation, technical notes, software upgrades, safety data sheets, and other resources. If you still need assistance, you can submit a request to Molecular Devices Technical Support.

Please have the instrument serial number (on the rear of the instrument), and any related sample data files available when you call.

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