

Cellytics® system

User Manual



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Cellytics® system User Manual

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The information in this manual is described as accurately as possible.

Firmware and software changes and updates may change without prior consent or notification.

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1. Product Information

Product description

Introducing MetaImmuneTech's Revolutionary Lens-Free Shadow Imaging Technology: Unveiling the Hidden World of Cells

Discover a groundbreaking leap in cellular analysis with MetaImmuneTech's Cellytics platform, powered by cutting-edge lens-free shadow imaging technology. Unlock the secrets of cells like never before as we present a pioneering solution that revolutionizes the way we perceive, analyze, and understand cellular structures.

At the heart of our innovation lies a transformative technology that transcends conventional imaging techniques. The Lens-Free Shadow Imaging Technology harnesses the power of light to delve deep into the intricacies of cellular entities. Unlike traditional microscopy methods that often require lenses and complex setups, our technology simplifies the process without compromising on accuracy or precision.

Key Features:

- Cellular Characterization: Gain unparalleled insights into cells by analyzing their number, type, and condition based on size and shape – unique cellular characteristics that hold the key to understanding their functions and behaviors.
- Wavelength-Specific Illumination: By irradiating cells with light of a specific wavelength, our technology generates digital inline holograms of the cells, capturing their essence in intricate detail. This opens up a new dimension of imaging that goes beyond the limitations of traditional optical systems.
- Advanced Analysis: Our platform doesn't stop at image capture – it's designed to analyze the captured holograms with precision. Uncover cellular morphology, behavior, and interactions through sophisticated algorithms that decode the holographic data into meaningful insights.

Benefits: MetaImmuneTech's Cellytics platform offers a myriad of benefits that will redefine the landscape of cellular research and diagnostics:

1. Efficiency Redefined: Say goodbye to labor-intensive microscopy setups. Our lens-free technology streamlines the process, saving valuable time and resources.
2. Holistic Analysis: Capture a comprehensive view of cells – their size, shape, and even subtle nuances that might hold the answers to critical questions.
3. Innovation for All: Cellytics isn't just for the experts. Its user-friendly interface and automated analysis make it accessible to a wide range of researchers, from novices to seasoned

professionals.

Target Audience:

- Research Institutes: Empower researchers to delve deeper into cellular behavior, contributing to advancements in fields like biology, medicine, and biotechnology.
- Diagnostic Laboratories: Enhance diagnostic accuracy by providing healthcare professionals with advanced tools to identify and analyze cells with unprecedented precision.
- Pharmaceutical Industry: Revolutionize drug discovery and development by enabling detailed studies on cellular responses to compounds and treatments.

MetaImmuneTech's Lens-Free Shadow Imaging Technology is poised to redefine the boundaries of cellular analysis, inviting you to step into a new era of scientific exploration. Join us in uncovering the hidden world of cells and embark on a journey of discovery that will reshape our understanding of life itself.

Standard items included

The Cellytics® system is shipped with the components listed below. Once you receive your instrument, please check that all items listed below are found. If any items are missing or damaged, contact your local distributor or contact@metaimmunetech.kr.

Item	Quantity
Cellytics® system (Unit, CS001R)	1
AC/DC adapter	1
Cellytics® assay slides (1 Box, AS050G)	
Cellytics® assay slides	50
Cellytics® calibration slide	1
Cellytics® CMOS sensor cleaning stick/cloth	1
(Optional) Cellytics® Magnetic Stand (MS410)	1

Any damage incurred during transit must be filed with the carrier.

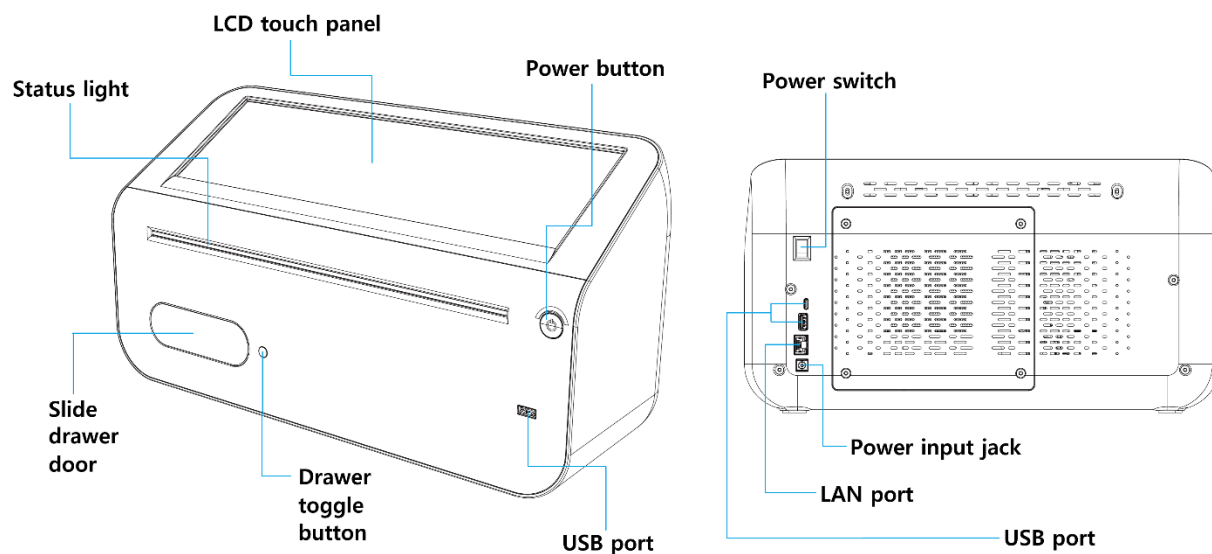


Caution:

Neglecting to remove any or all shipping brackets or foam inserts prior to operation may result in damage to the equipment.

The shipping brackets or foam inserts must be reinstalled prior to shipping the unit to prevent damage to the equipment.

Instrument exterior components



No.	Part	Description
1	LCD touch panel	Conduct tests and check results using the device software via touch panel
2	Power button	Press the power button to light on to turn the instrument on or to light off to turn it off.
3	Status light	The color of the light indicates the test's progress
4	Slide drawer door	For inserting and removing the assay slide
5	Drawer Toggle Button	Provides manual operation for opening and closing the slide drawer door
6	USB port (front)	For data download/backup
7	Power switch	Toggles the main power supply to the unit on and off
8	Power input jack	Connects the AC/DC adapter
9	LAN port	For wired internet connection
10	USB port (rear)	Connects barcode reader, keyboard, mouse, and/or other devices

2. Installation

Cellytics® system setup procedure

- Carefully examine the box for damage. Remove all components of Cellytics® system from the box.

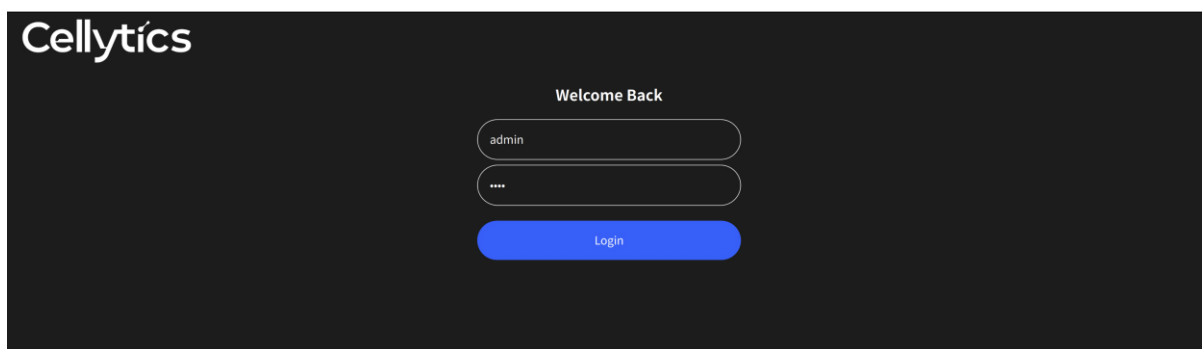
- b. Plug the power cord into the adaptor.
- c. Carefully examine the adaptor and make certain it is compatible with the power at the plug location. If it is the appropriate adaptor, plug the adaptor into the Cellytics™ system and the the AC power cord into the wall socket.



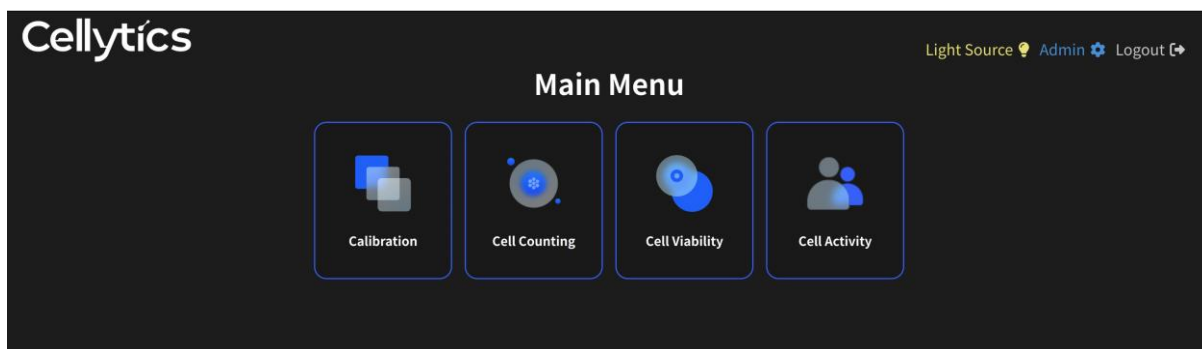
Caution:

If you use an incorrect adaptor, the Cellytics™ system may explode or start to burn. If this happens, it will no longer work properly anymore.

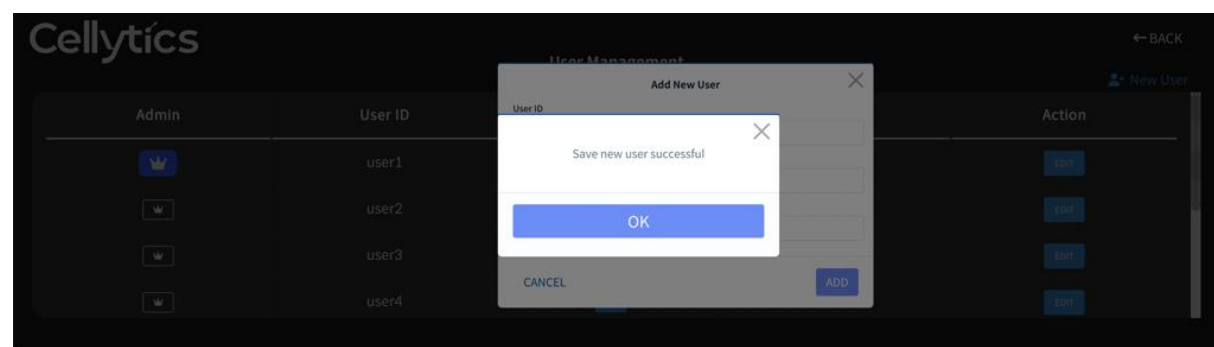
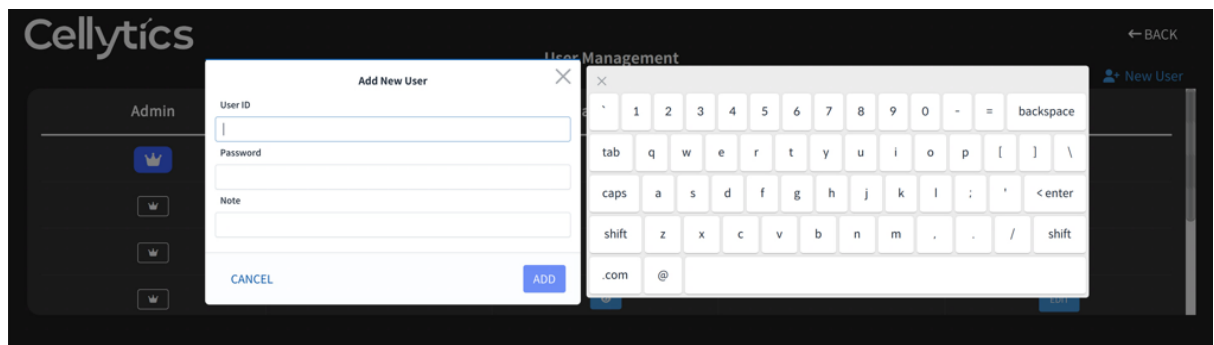
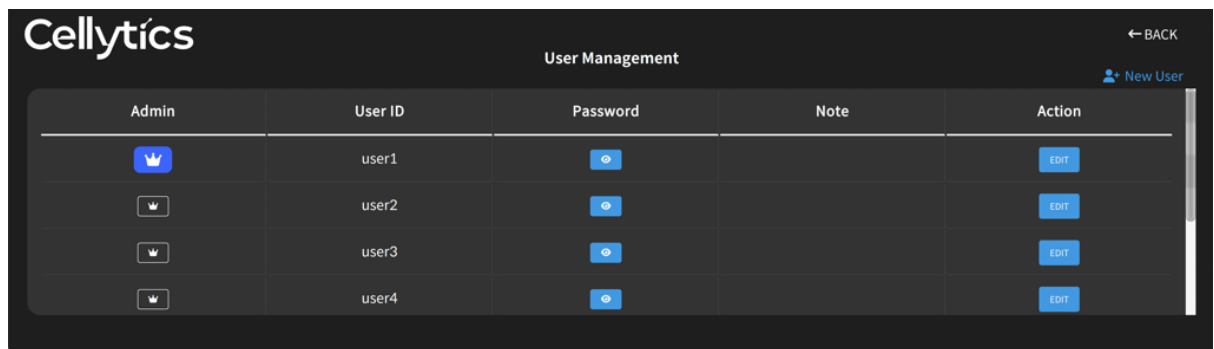
- d. Press the power button on the right side of the front of the equipment to turn it on.
- e. When the system boot is complete, the Login screen appears.



- f. If you log in with ADMIN id, you can see the light-blue ADMIN sign in the top right corner of the screen (next to LOGOUT button)

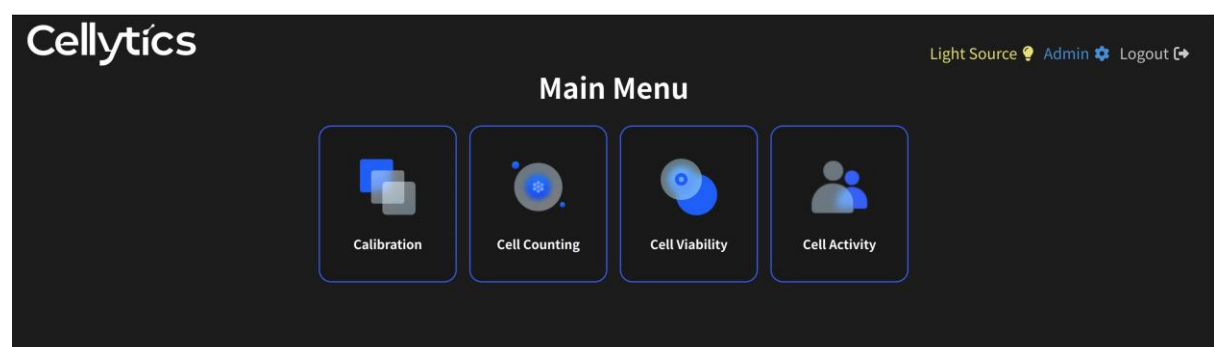


- g. Only ADMIN user can Add, Edit and Delete User IDs as needed.

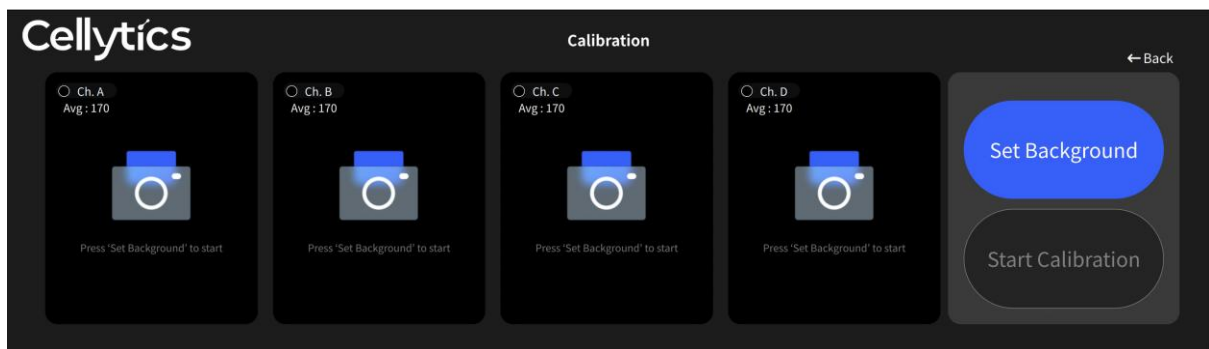
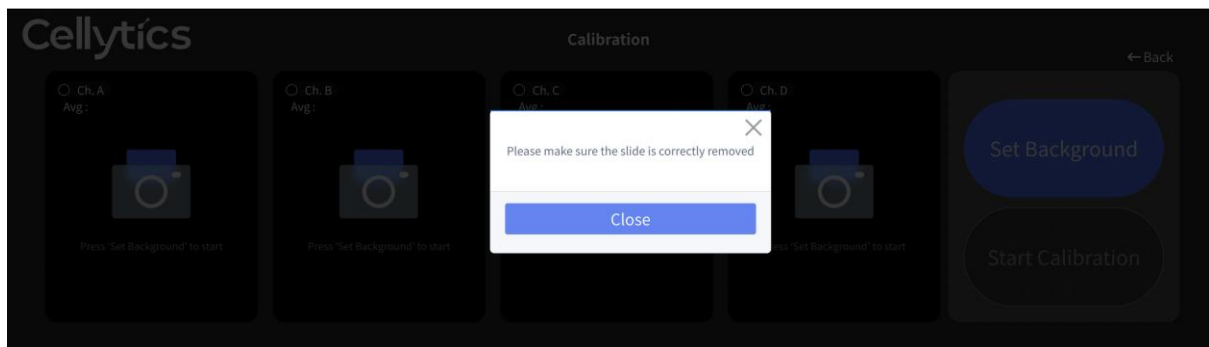
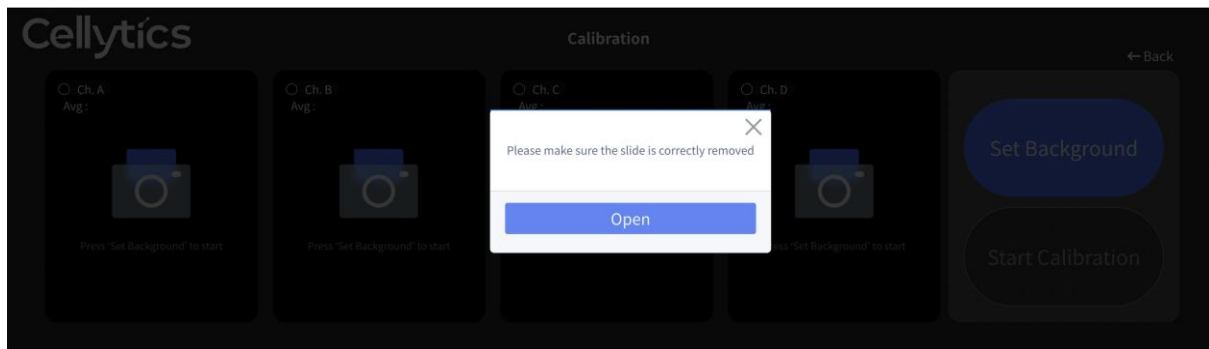


3. Operation

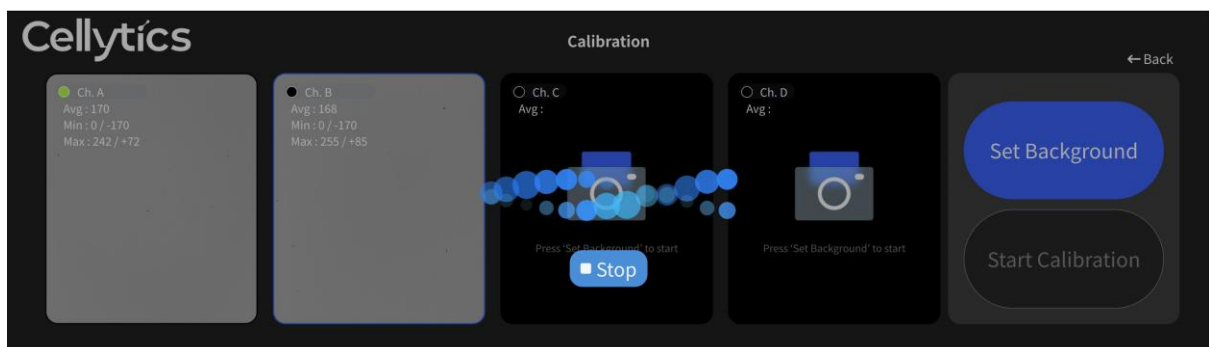
Calibration

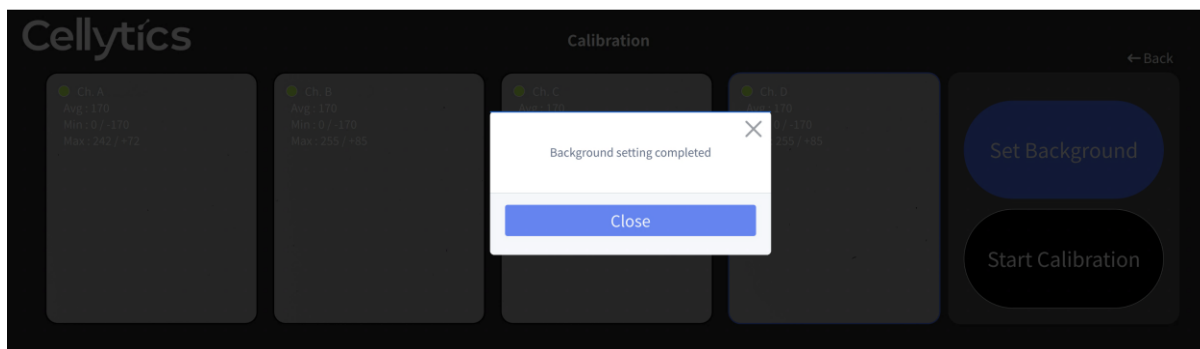


- After logging in, press the **Calibration** button on the far left of the main menu to start calibrating the device.

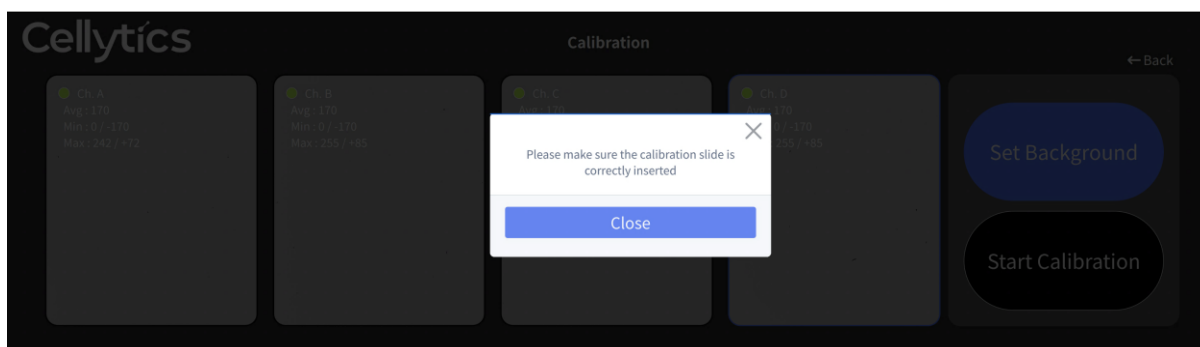
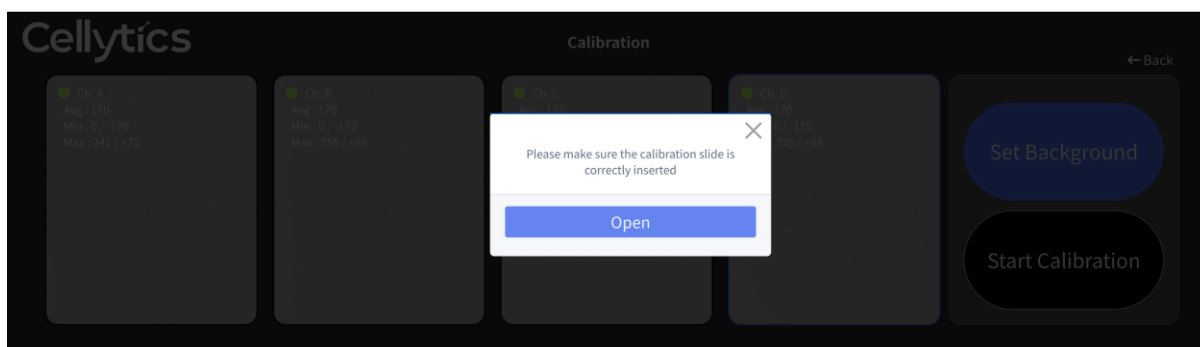


- b. Open the slide loading drawer, remove any slide inside, close it, and then press the **Set Background** button.

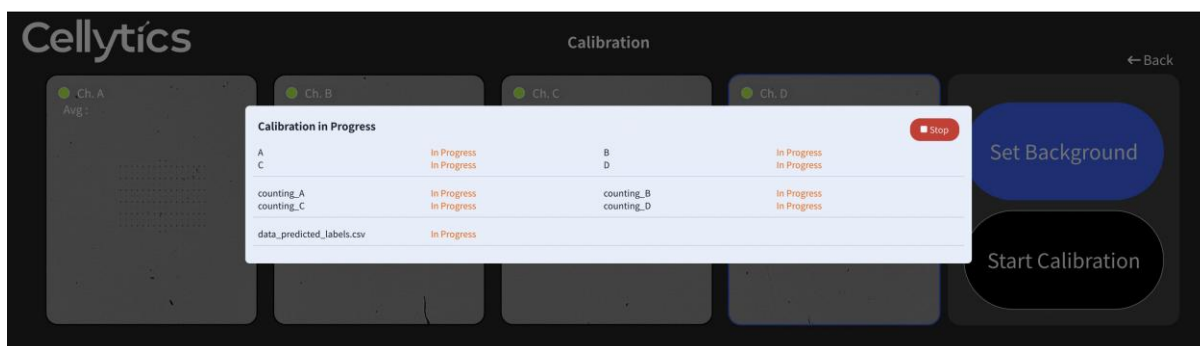


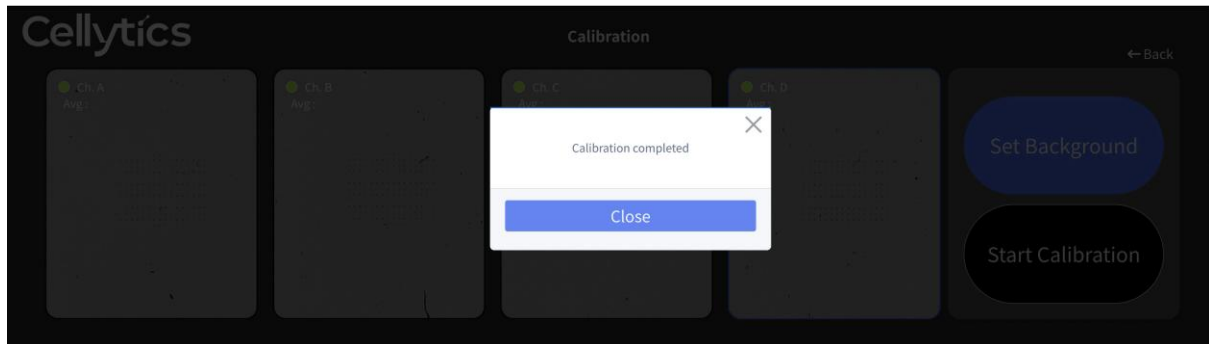
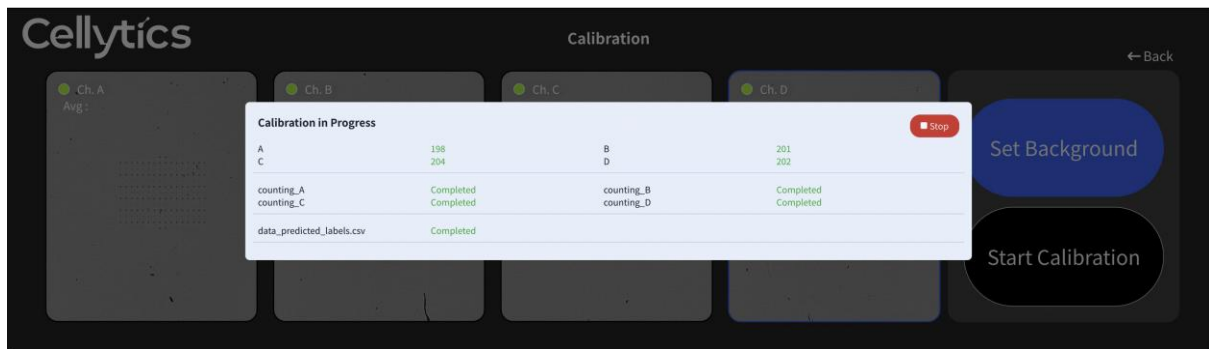


- c. Once the background brightness is adjusted, tap **Close** to move to the Calibration step.



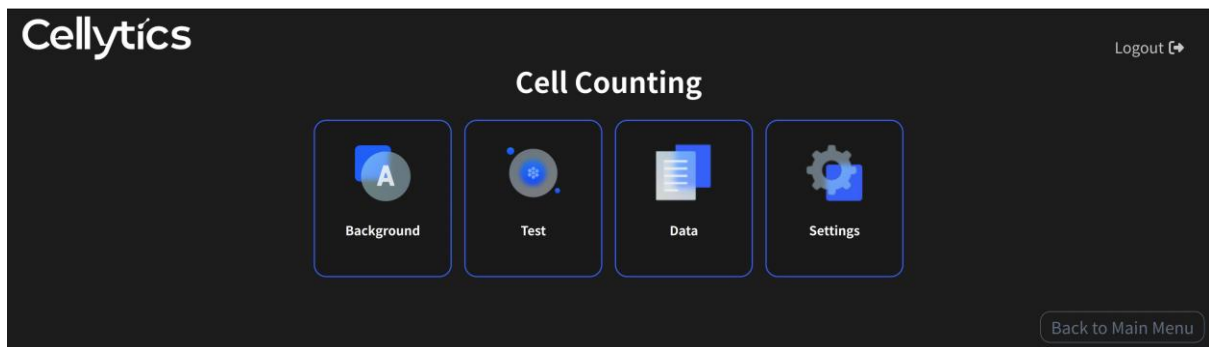
- d. Open the slide door, insert the Calibration slide, close it, and then press the **Start Calibration** button.



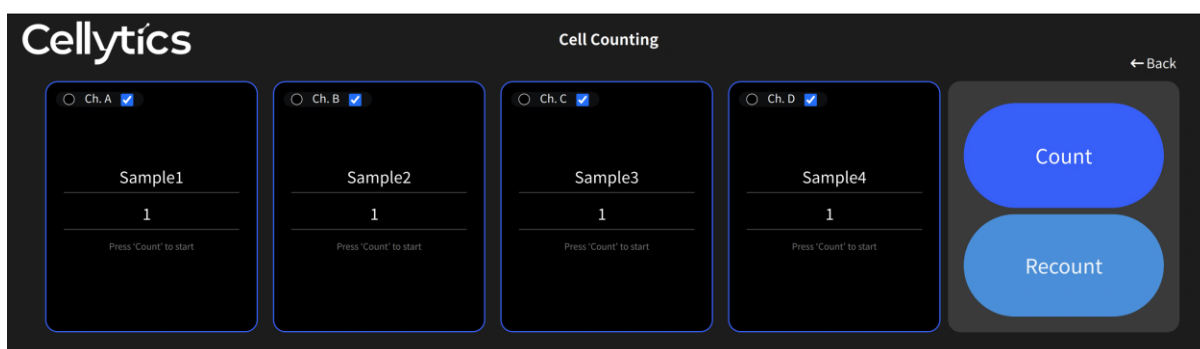
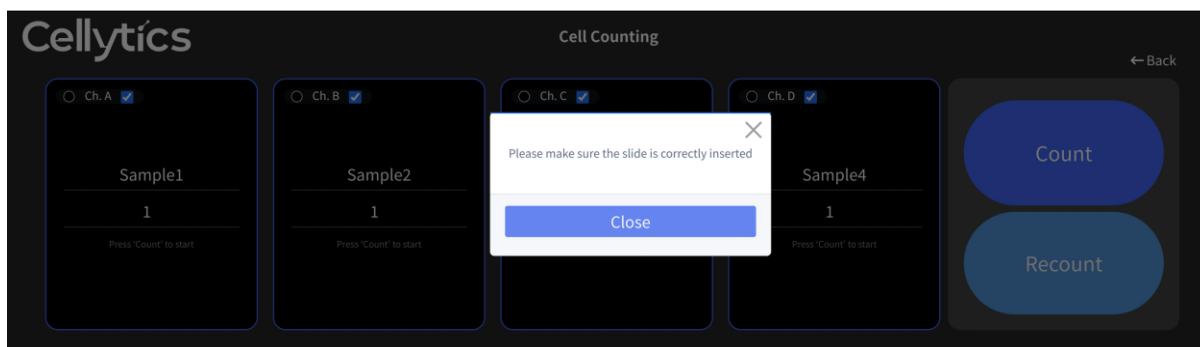
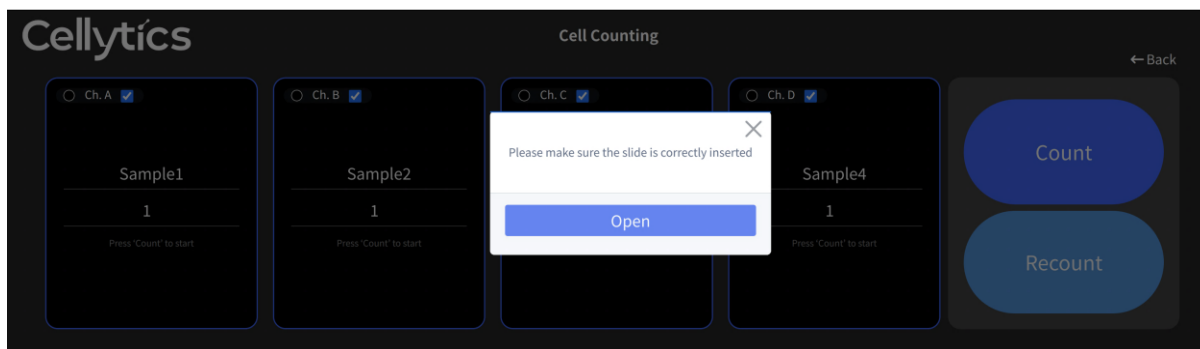


- e. When calibration is complete, press **Close** and then press **Back** to return to the Main Menu.

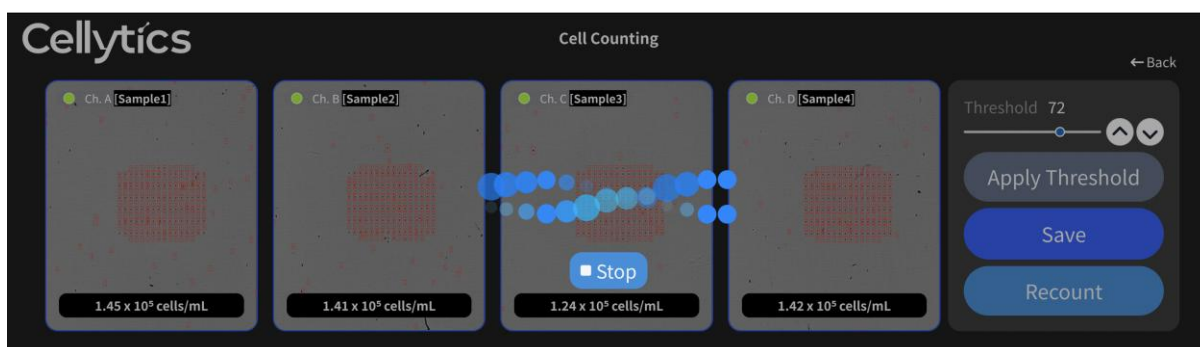
TEST MENU 1: Cell Counting

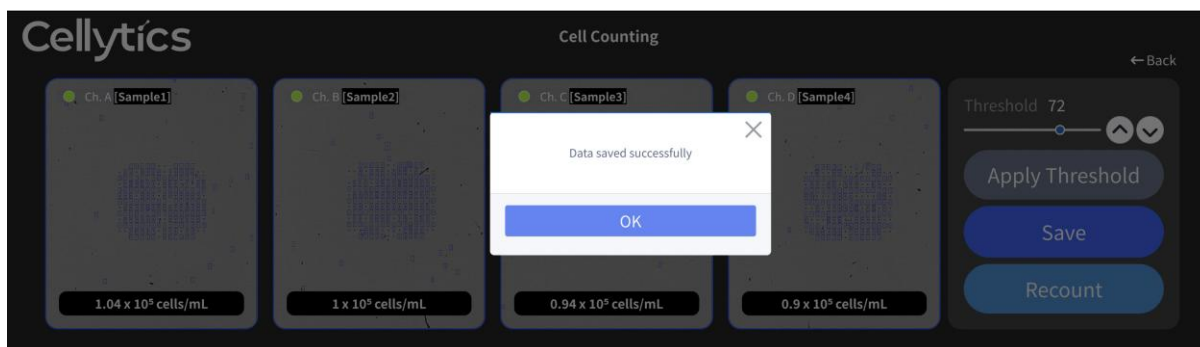
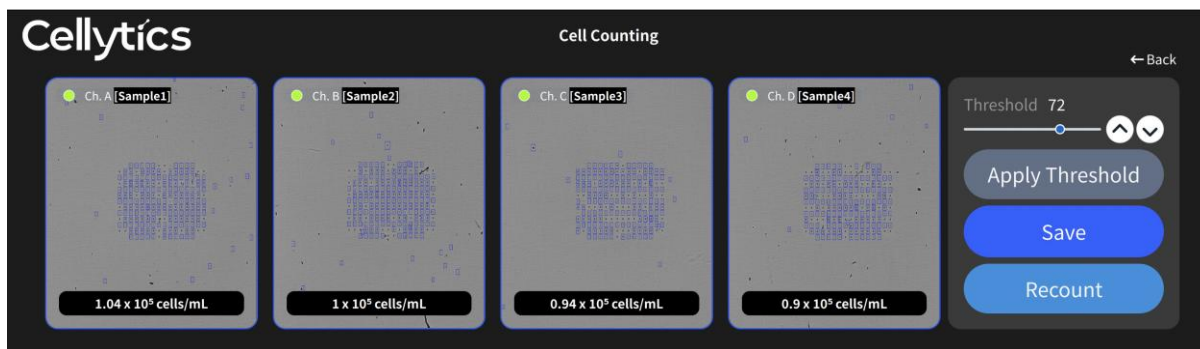


- f. Prepare the slide loaded with the sample, then press the **Cell Counting** > **Test** button on the Main Menu to start the Cell Counting analysis.



- g. Open the slide door, insert the sample-loaded slide, close the door, enter the sample information and dilution factor, and then press the **Count** button.



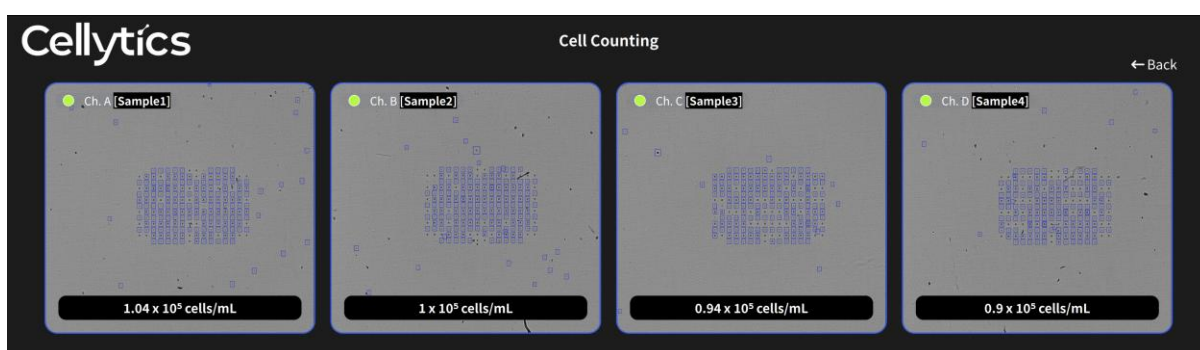


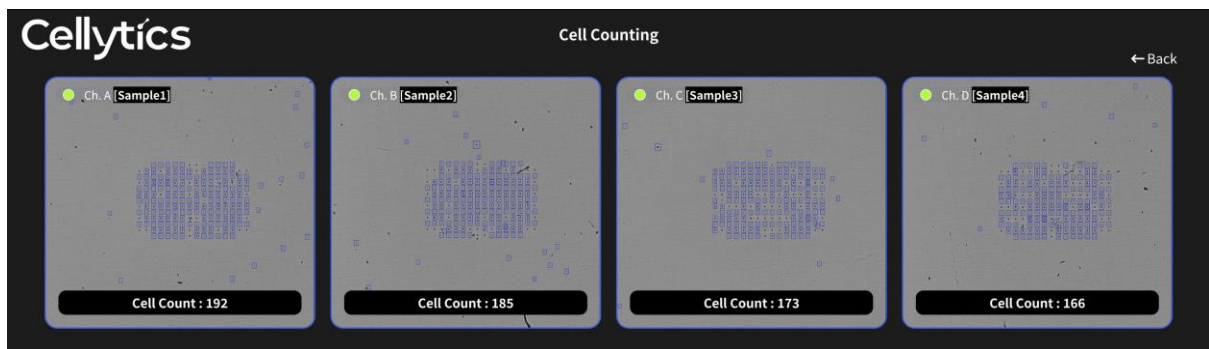
- h. Once counting is complete, the results are displayed as the cell count per microliter, adjusted for the dilution factor. Tapping the black result box switches to a mode where you can view the actual number of cells captured in the image. After reviewing the results, press the **Save** button to save them. If necessary, adjust the threshold using the slider bar at the top right, press the **Apply Threshold** button directly below it to recheck the results, and then press **Save** button to save.

Cellytics Data List / Cell Counting Download ← Back

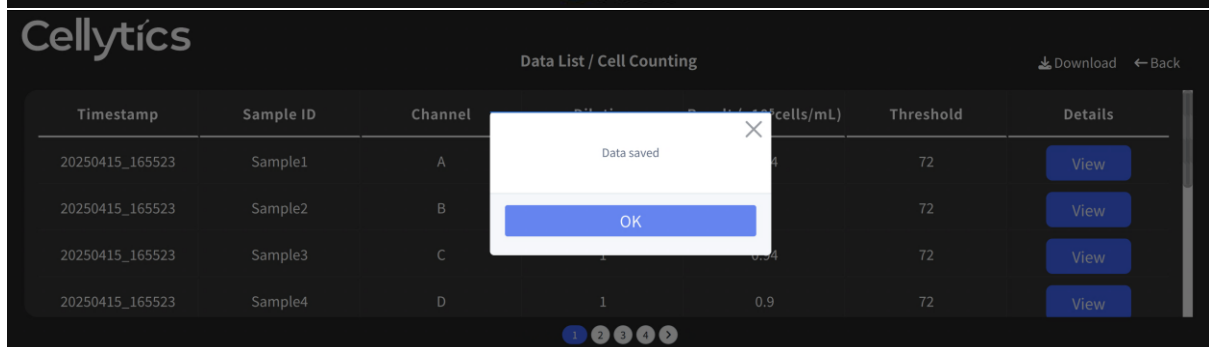
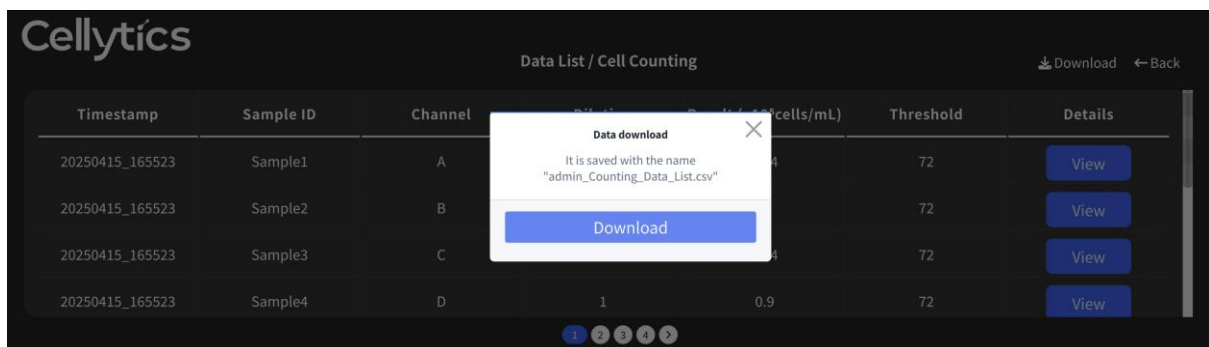
Timestamp	Sample ID	Channel	Dilution	Result (x10 ⁵ cells/mL)	Threshold	Details
20250415_165523	Sample1	A	1	1.04	72	View
20250415_165523	Sample2	B	1	1	72	View
20250415_165523	Sample3	C	1	0.94	72	View
20250415_165523	Sample4	D	1	0.9	72	View

1 2 3 4 >

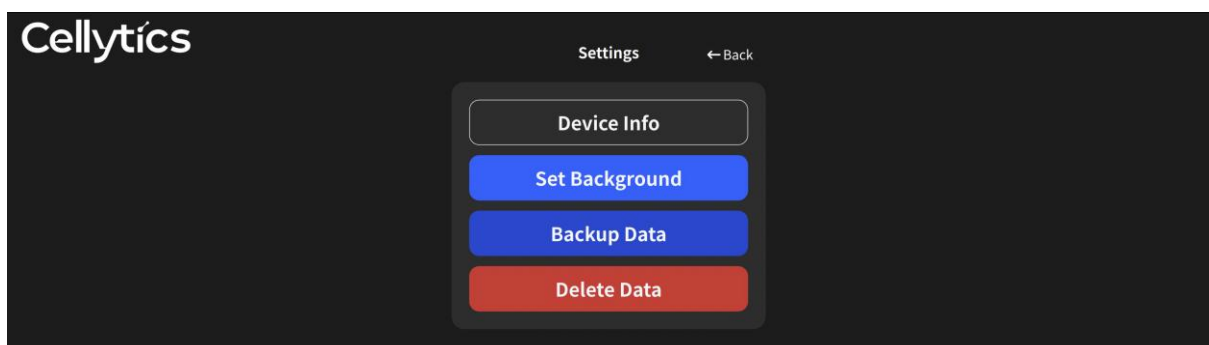


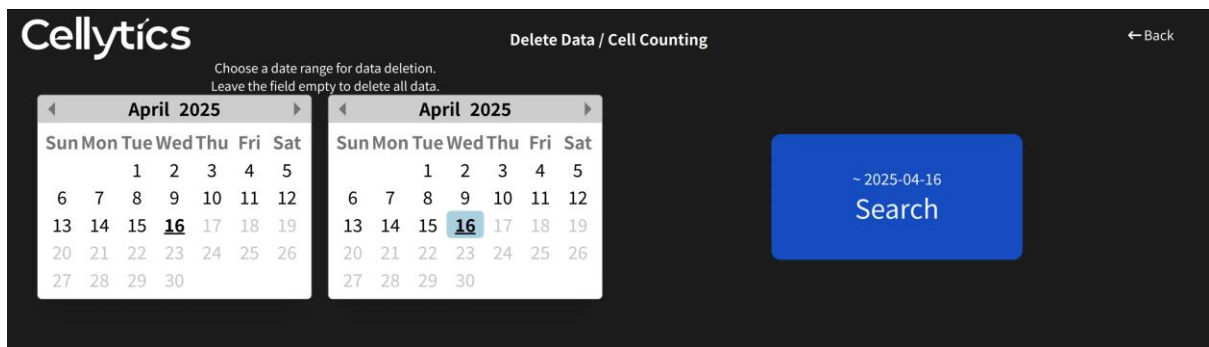
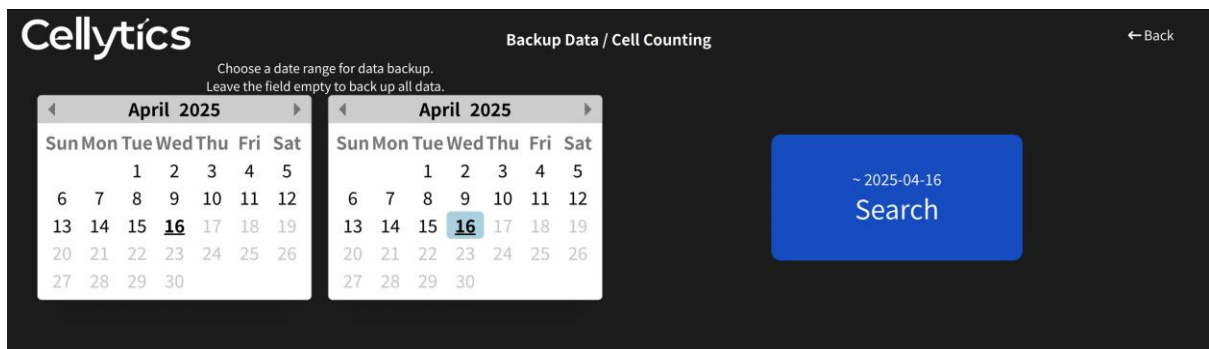


- i. Select the **Cell Counting** > **Data** menu to load and check your saved results.



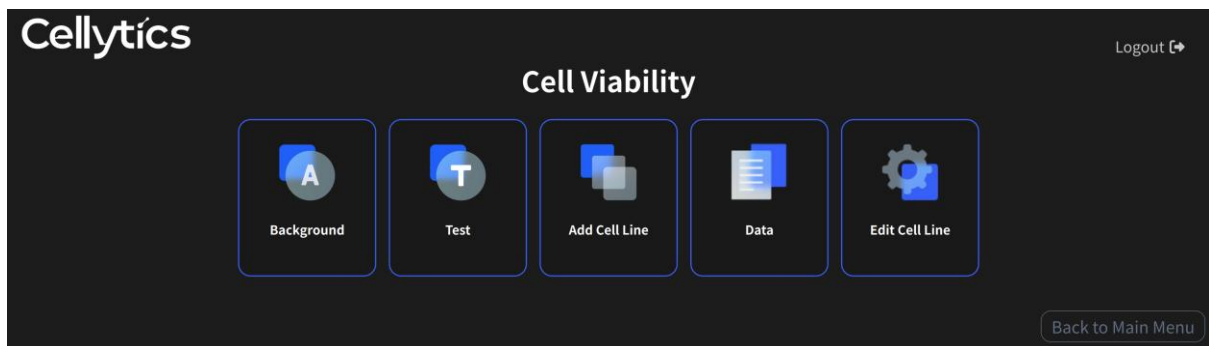
- j. Plug a USB flash drive into the USB port on the front of the device, then tap the **Download** icon at the top right of the Data List. The entire list of counting results will be saved as a CSV file.



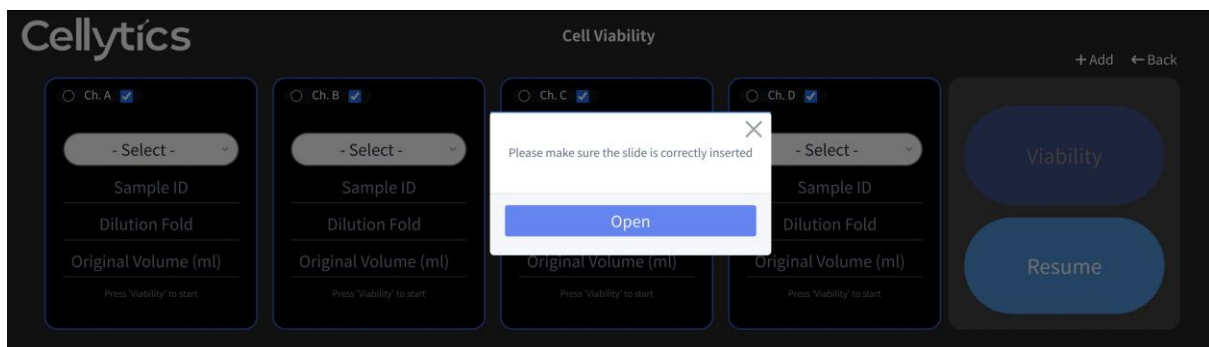


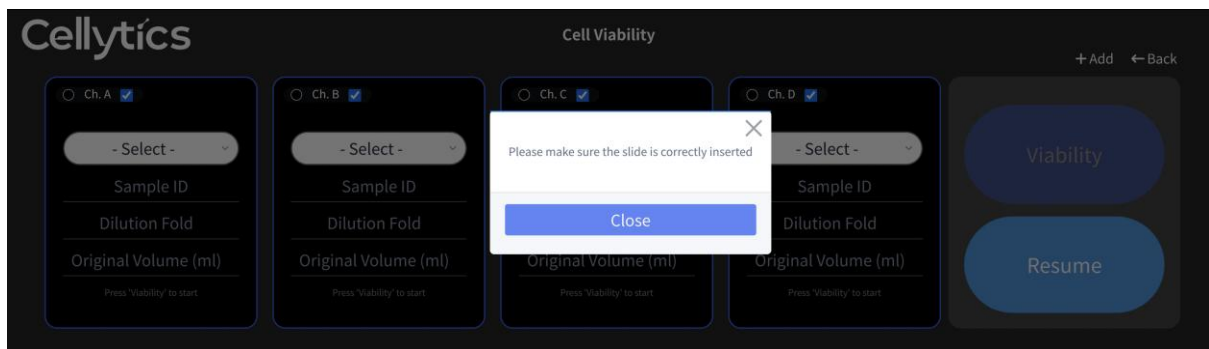
- k. Go to **Cell Counting** > **Settings** to run system checks and back up or delete all data when needed.

TEST MENU 2: Cell Viability

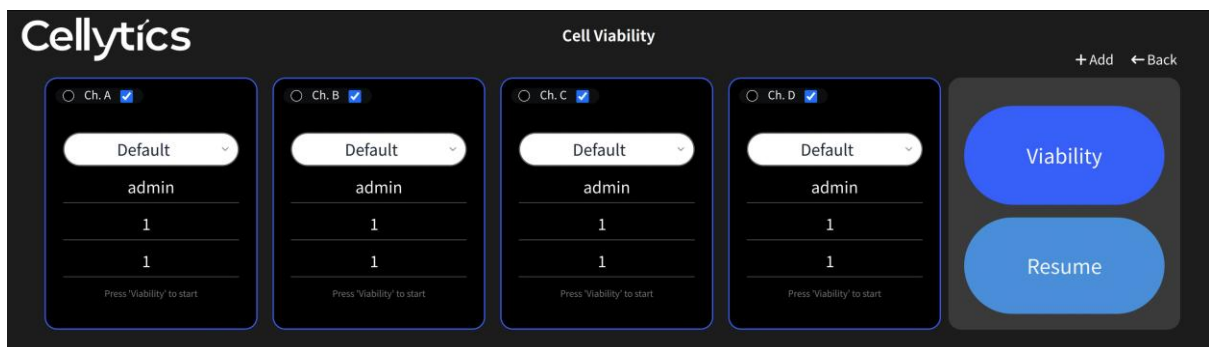


- l. Prepare the slide loaded with the sample, then press the **Cell Viability** > **Test** button on the Main Menu to start the Cell Viability analysis.

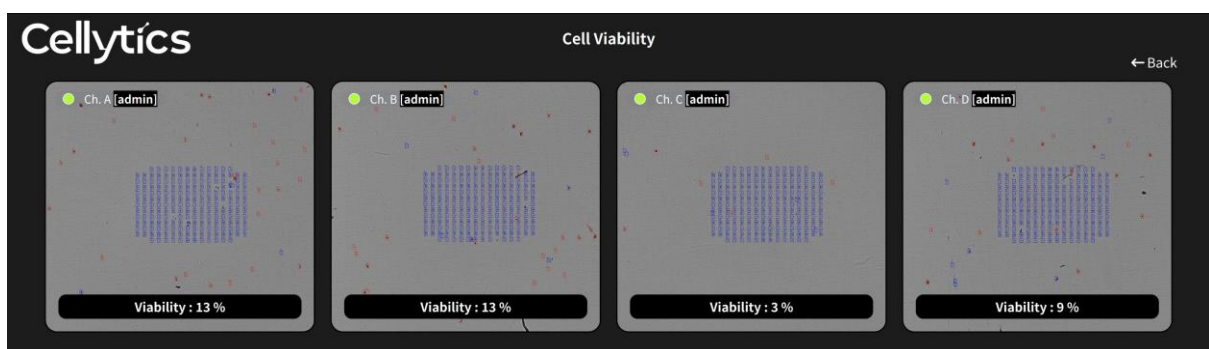
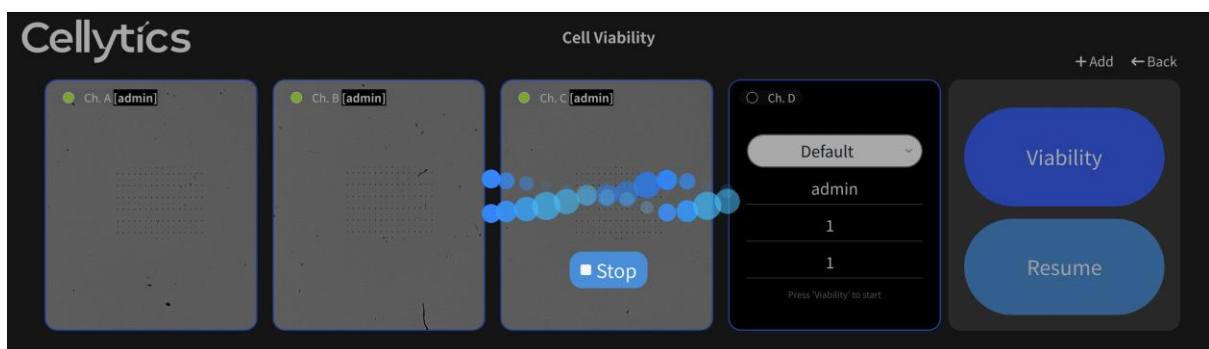




m. Open the slide door, insert the prepared slide, and close the door.



n. Default settings—such as Target Channel (A–D), Cell Line (Default), Sample ID (admin), Dilution Factor (1), and Original Volume (1 mL)—are pre-populated. After entering or modifying the sample information, press the **Viability** button to run the analysis.



	Cells/mL	% of Total Cells	Cells in Original Sample
Viable	0.16x10 ⁵	13	0.16x10 ⁵
Dead	1.08x10 ⁵	87	1.08x10 ⁵
Total	1.24x10 ⁵	100	1.24x10 ⁵

Dilution Fold : 1 Original Vol : 1

	Cells/mL	% of Total Cells	Cells in Original Sample
Viable	0.17x10 ⁵	13	0.17x10 ⁵
Dead	1.1x10 ⁵	87	1.1x10 ⁵
Total	1.27x10 ⁵	100	1.27x10 ⁵

Dilution Fold : 1 Original Vol : 1

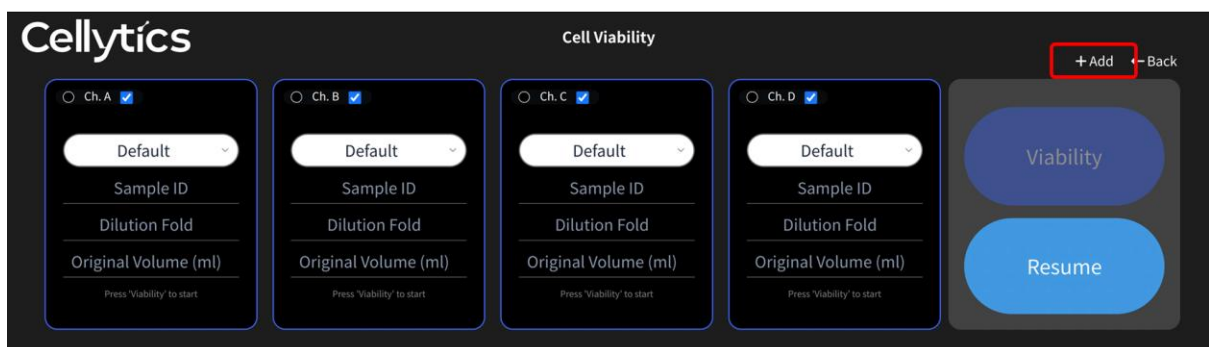
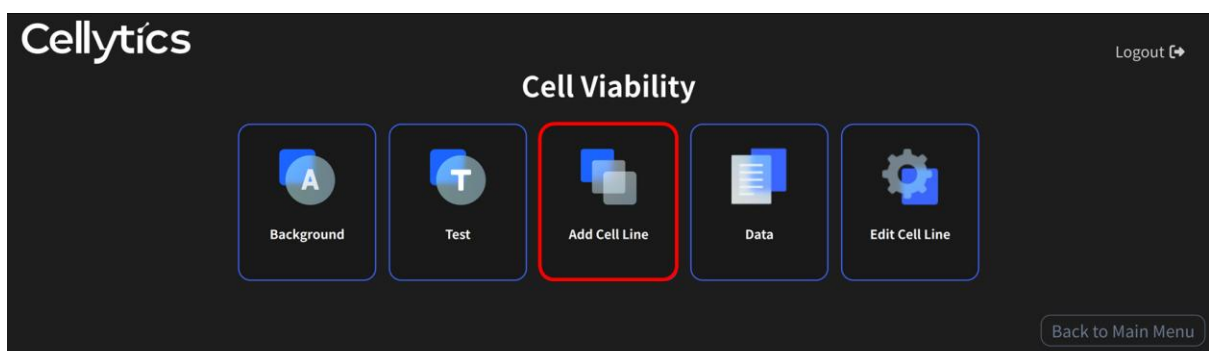
	Cells/mL	% of Total Cells	Cells in Original Sample
Viable	0.04x10 ⁵	3	0.04x10 ⁵
Dead	1.11x10 ⁵	97	1.11x10 ⁵
Total	1.15x10 ⁵	100	1.15x10 ⁵

Dilution Fold : 1 Original Vol : 1

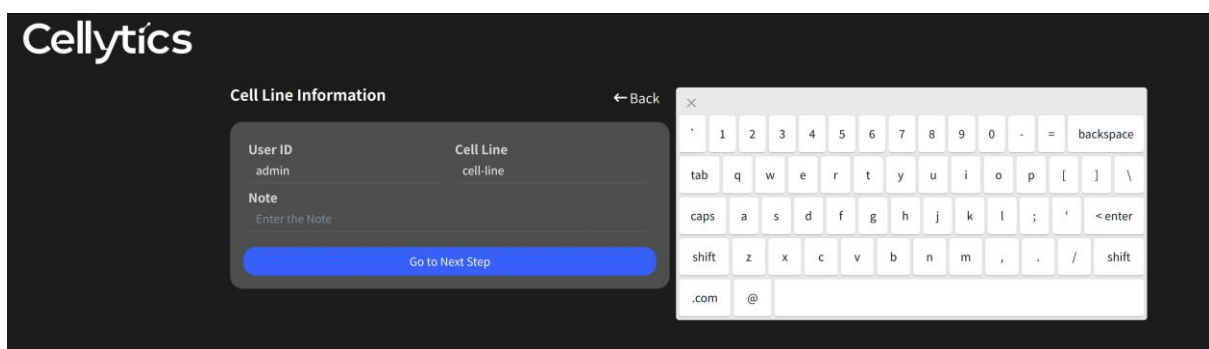
	Cells/mL	% of Total Cells	Cells in Original Sample
Viable	0.1x10 ⁵	9	0.1x10 ⁵
Dead	1.11x10 ⁵	91	1.11x10 ⁵
Total	1.21x10 ⁵	100	1.21x10 ⁵

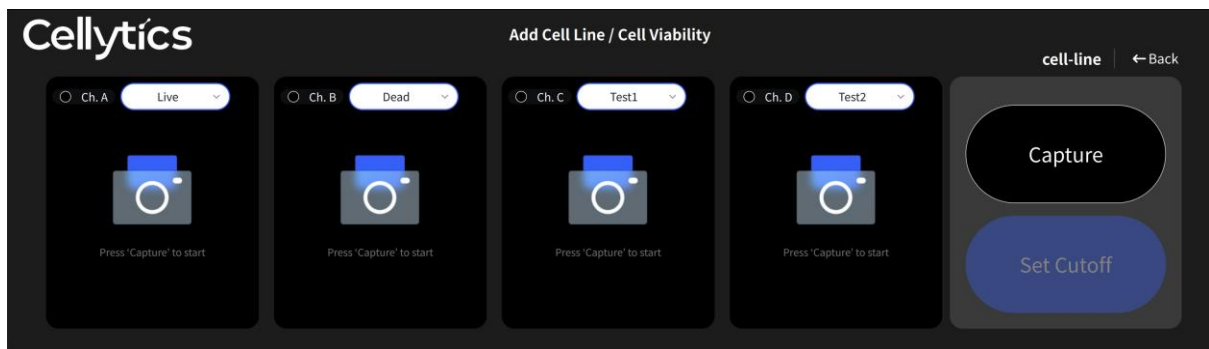
Dilution Fold : 1 Original Vol : 1

- o. Tap the Viability (%) analysis result to display a table with detailed analysis results for each channel.

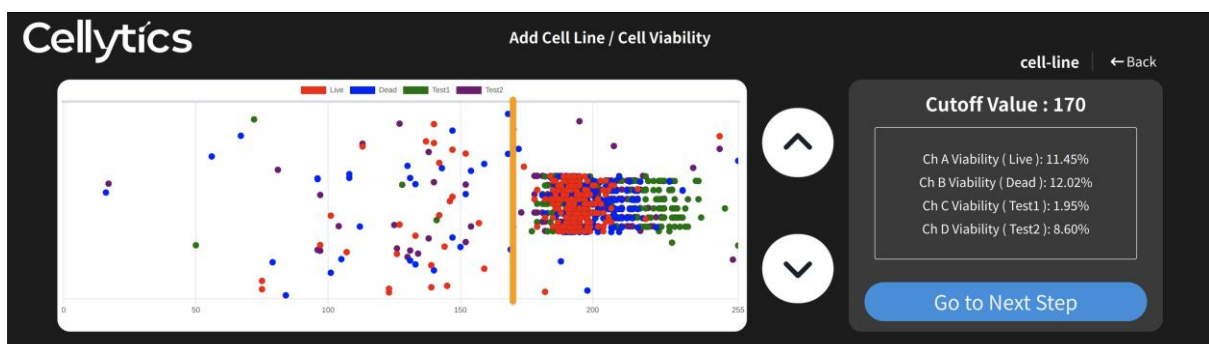
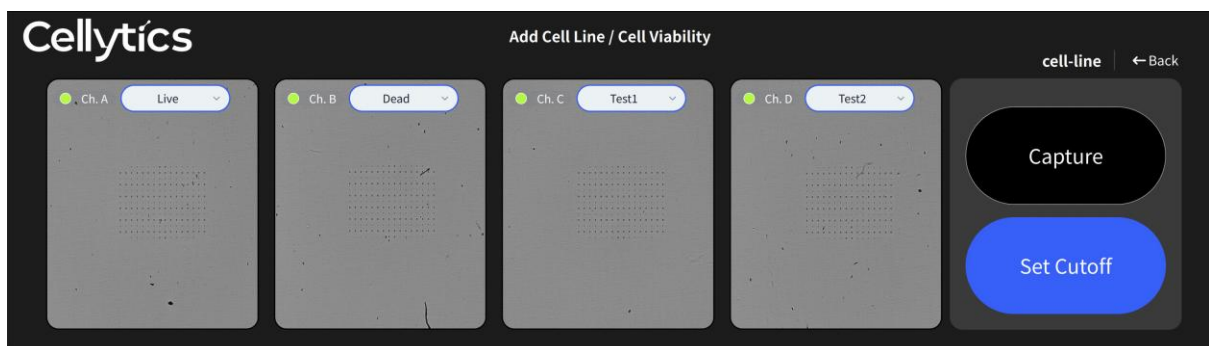


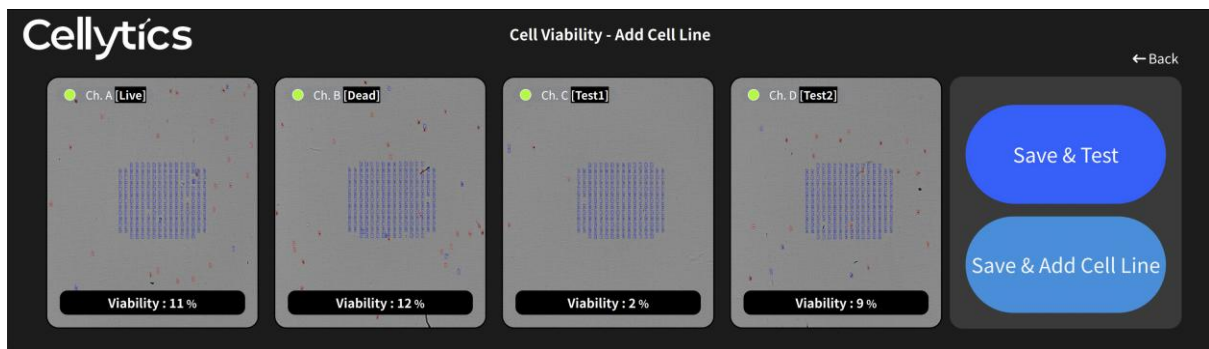
- p. To analyze a new cell line, select the **Cell Viability** > **Add Cell Line** menu, or press the **+Add** button at the top right of the sample information window.



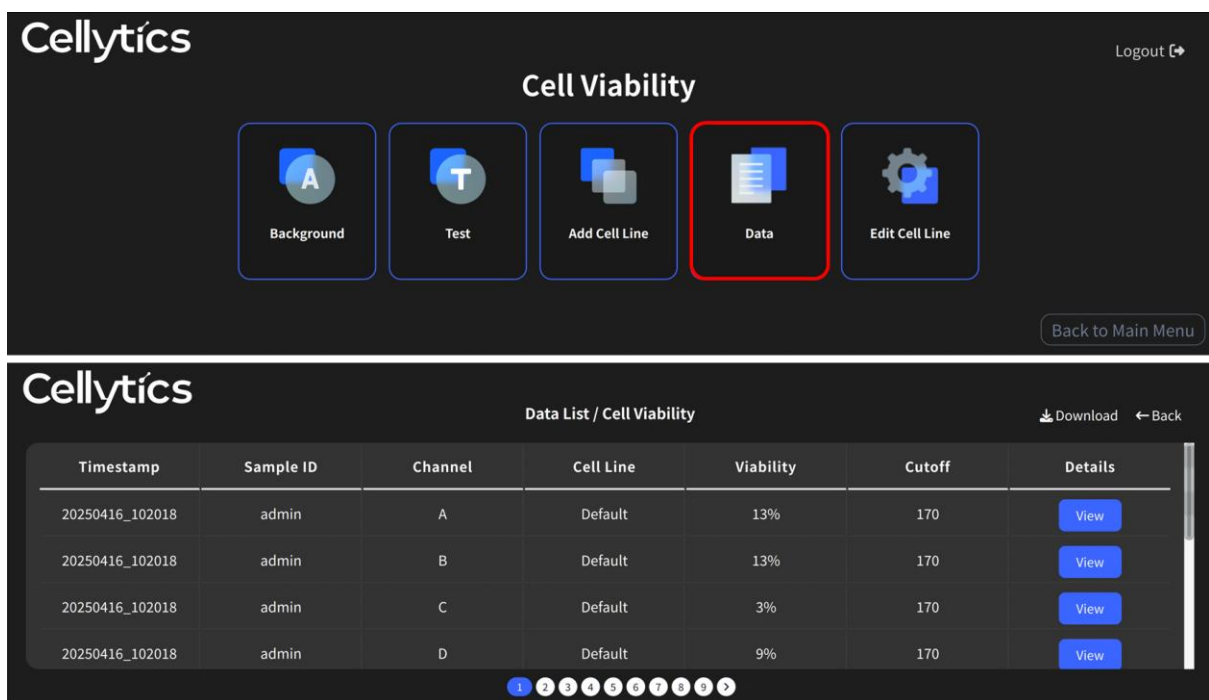


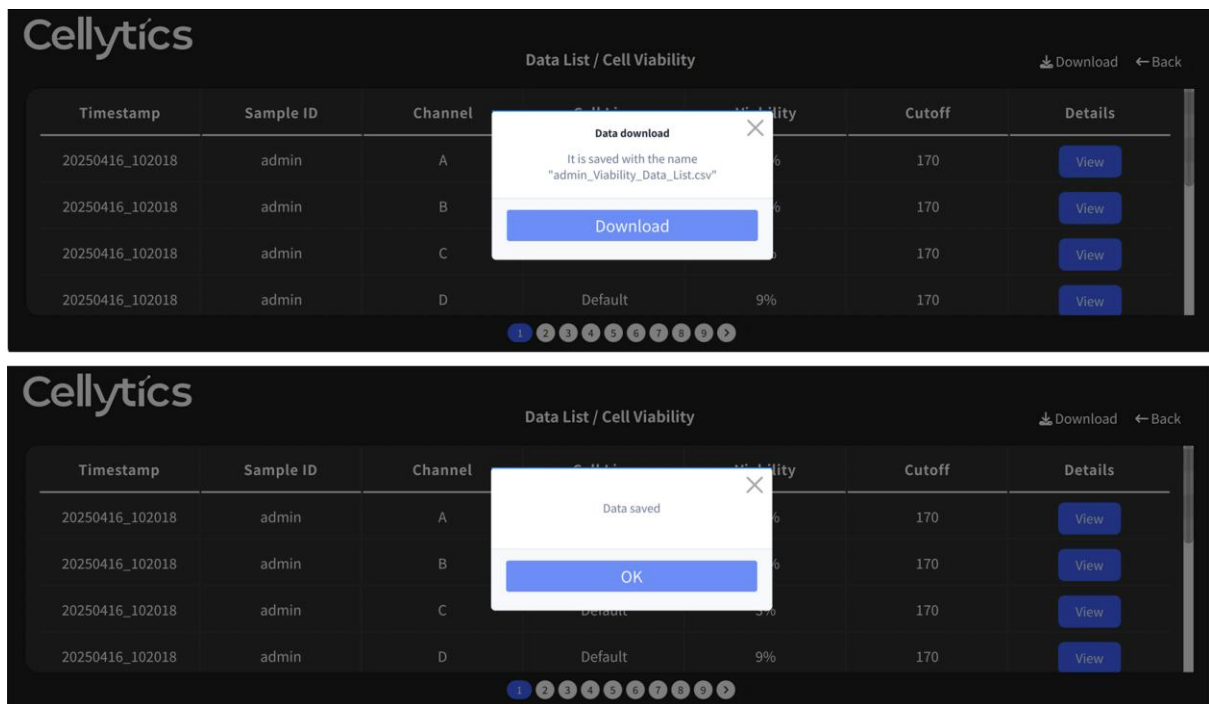
- q. Enter the name of the cell line to add and press Go to Next Step. Then, enter the sample information for cutoff value setting and analysis for each channel, and press the **Capture** button. The default pre-entered options are Live, Dead, Test1, and Test2.



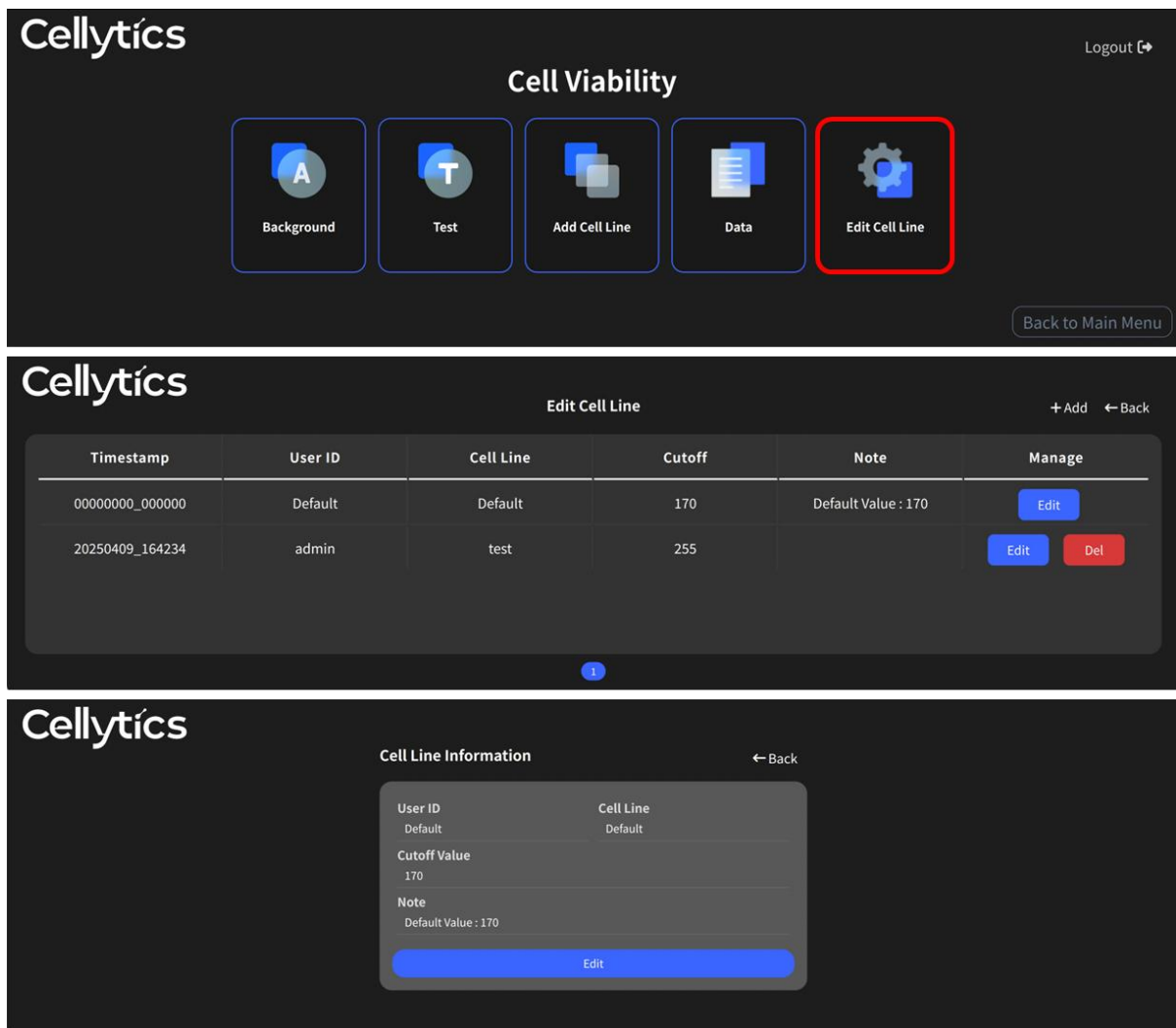


- r. If there are no issues with the captured image, press the **Set Cutoff** button, then set the cutoff using the up/down arrow buttons on the right side of the Scatter Plot. If you wish to save the settings and perform additional tests with the same cell line, select **Save & Test**; to set the cutoff for a different cell line, select **Save & Add Cell Line**.



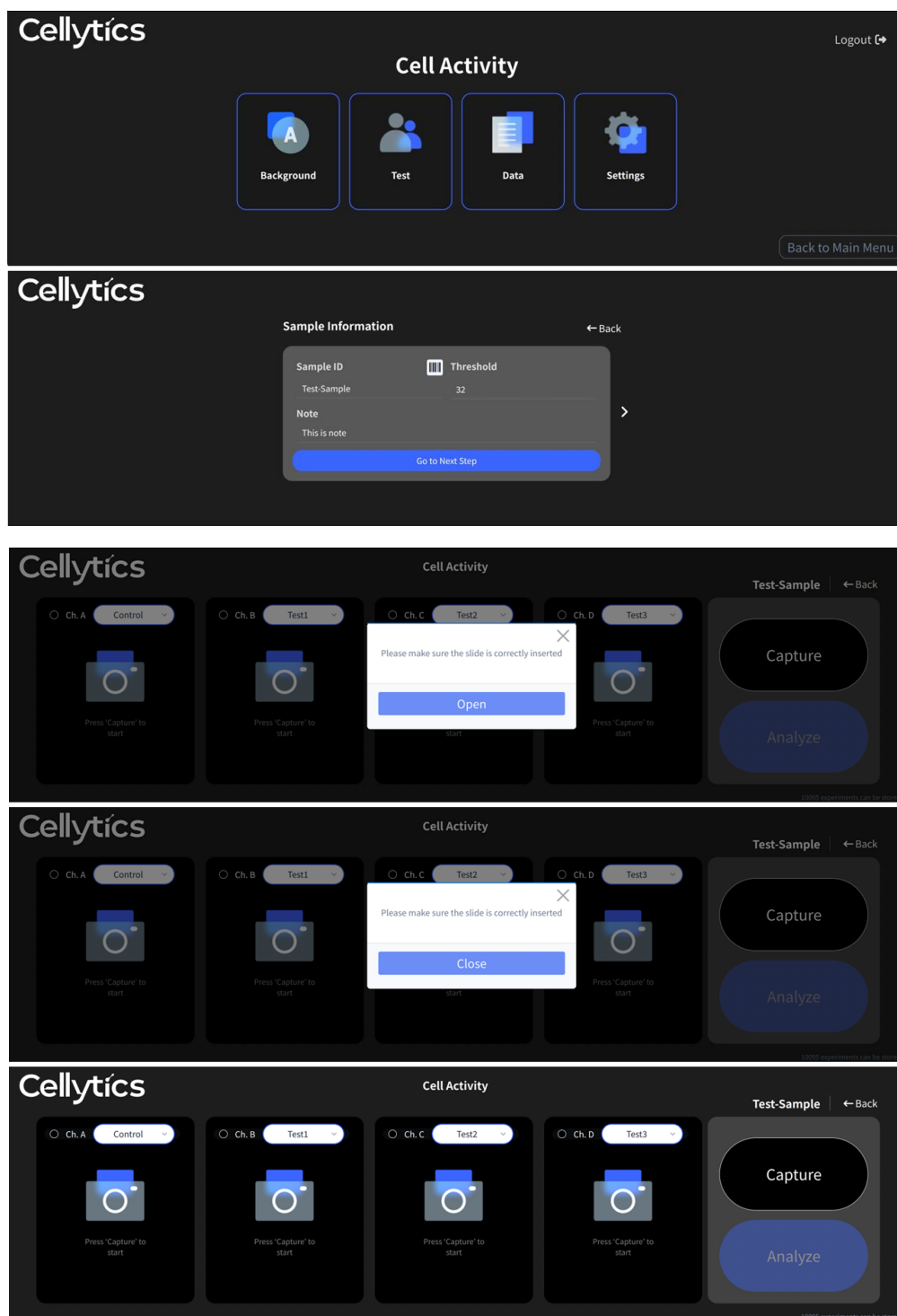


- s. Select the **Cell Viability** > **Data** menu to retrieve and review saved results. If you wish to save the results list, connect a USB flash drive and press the **Download** button at the top right of the screen.

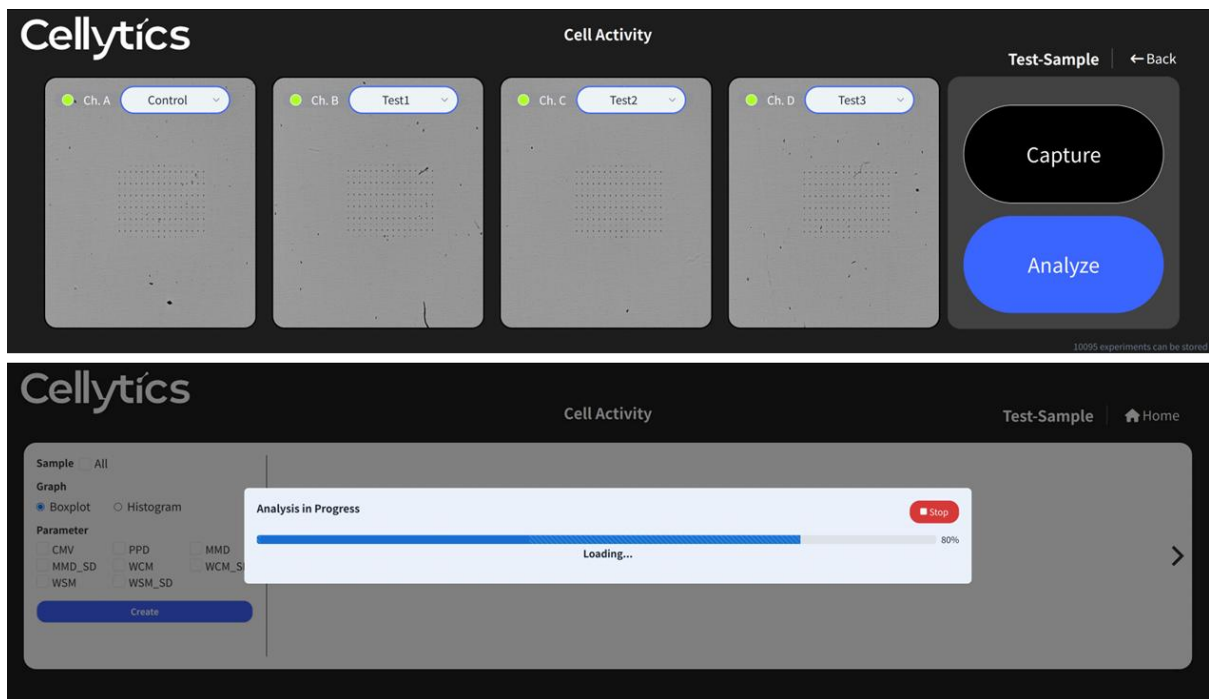


- t. If you need to edit saved cell line information or cutoff values, select the **Cell Viability > Edit Cell Line** menu and press the Edit or Del button to edit or delete.

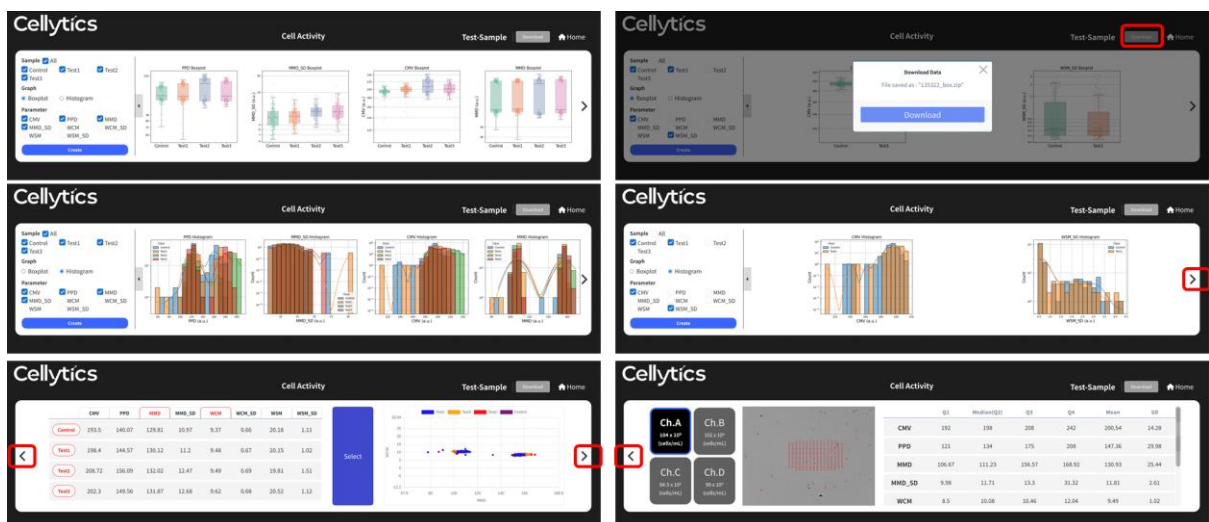
TEST MENU3: Cell Activity



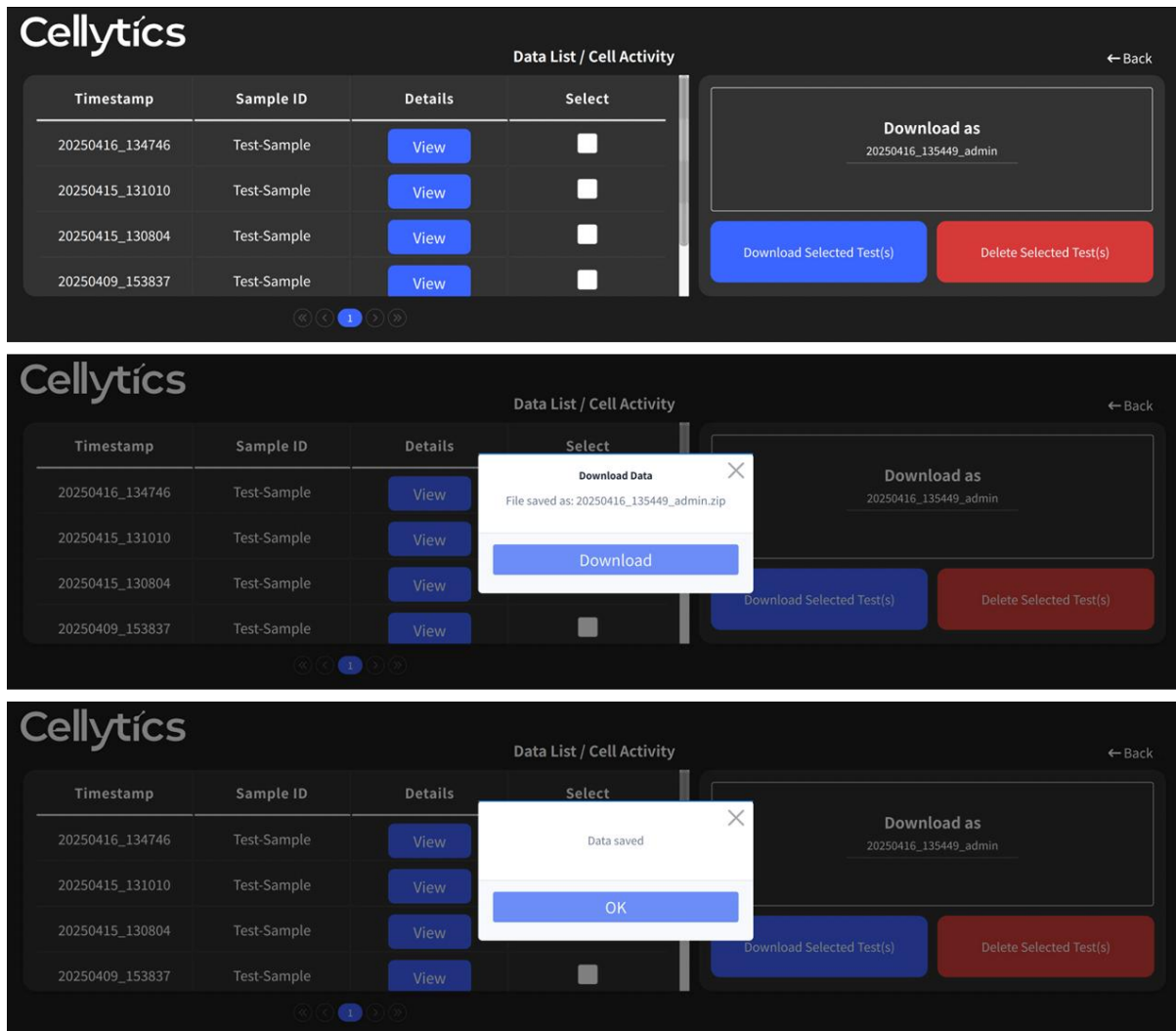
- u. Prepare the slide loaded with the target cells, then select the **Cell Activity > Test** menu to begin cell activity analysis using shadow parameters. Enter the Sample ID and Threshold (default preset values are Test-Sample and 32), insert the slide, enter the sample information for each channel, and then press the Capture button to acquire the image.



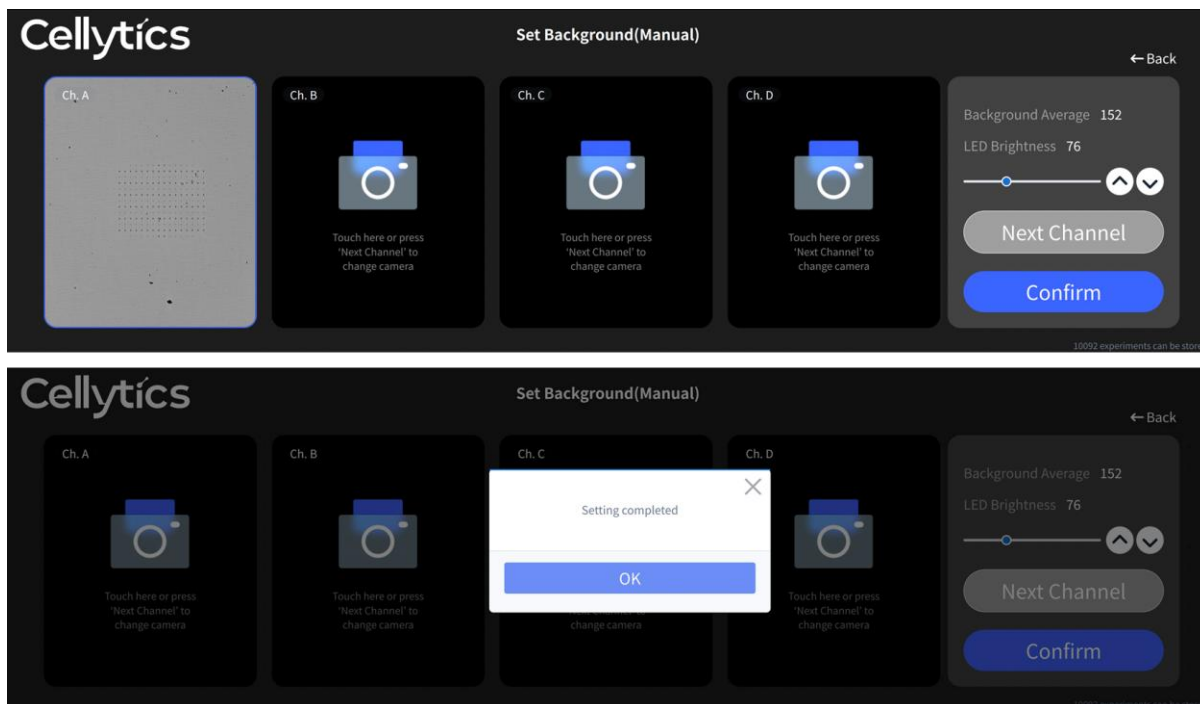
- v. If there are no issues with the captured image, press the **Analyze** button to run the analysis.



- w. On the first analysis results screen, select the sample, graph type, and shadow parameters on the left to view the desired data, and press the **Download** button at the top right of the screen to save it. On the second analysis results screen (using the arrow on the right side of the screen), you can view the scatter plot for the two selected parameters. On the third analysis results screen, you can check the raw image data for each channel.



- x. Saved analysis results can be accessed under **Cell Activity > Data**, press the blue **VIEW** button to check detailed results for the selected test, and use the **Download / Delete** buttons on the right to save or delete data selected with checkboxes



- y. In the **Cell Activity** > **Set Background** menu, you can adjust or inspect the background brightness if necessary.

4. Care and Maintenance

- After use, remove the tested Assay slide and reinsert the Calibration slide before turning off the device to prevent dust from accumulating on the CMOS sensors.
- When cleaning the slide mounting surface, wrap the provided sensor cleaning cloth around your index finger and gently wipe across all four sensors in a single, smooth stroke to avoid scratching the CMOS sensor coating. Be careful not to rub with force.
- If liquid is spilled on the device, turn off the power immediately and wipe it off.
- Never disassemble or repair the device yourself. Unauthorized disassembly or repair may damage the instrument or alter its functionality, which may void the warranty. For service, please contact your Cellytics® system distributor or Technical Support.

5. Troubleshooting

The following are the error messages that may occur and their descriptions

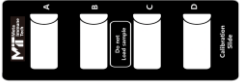
Error Code	Error Message
ER001 Log-in & User Management	Check username or password
	Failed to save users
	You cannot modify your own permissions
	`Password` must be at least 4 characters
	`User ID` must be at least 4 characters
	Duplicated User ID
	The number of users cannot exceed 10
	Please select parameter
	Please select class
	Please select two parameters
	Enter the Dilution amount or Sample ID
	Enter the Sample ID or select cell-line
ER002 H/W & S/W Operation	Please reboot the device
	Problem occurred during analysis
	Analysis in Progress
	Server is not running
	No USB device detected
	Failed capture. Retry 'Calibrate' or reboot the device
	No matching line found
	currently being analyzed
ER003 Data and File Management	No data available
	A file with the same name already exists
	Failed to make zip file
	Please select the files to delete
	Unable to delete the file. Please try again
	Failed to download Data List
	Invalid data. Back to page
	If you leave the session, you will lose all information. Do you want to go back?
	Please save your data before recounting
	Failed to save cell line information
	Failed to detect data
	Please set the default values in the list
	Failed to set background
	Failed to find data
	Failed to delete cell line information

6. Specifications

Cellytics® System



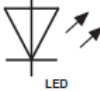
Electrical rating	Voltage	100 - 240 V
	Current	~1.5 A
	Frequency	50/60 Hz
Electric input	Voltage	DC 19V
	Current	4.74 A
Dimension	420 mm x 224 mm x 160 mm (WxHxD) 16.5 inch x 8.82 inch x 6.30 inch	
Weight	3.72 kg (8.2 pounds/130.5 ounces)	
Light Source	460 ~ 480 nm(Blue)	
Image Sensor	1/2.5-Inch 5 MpCMOS Digital Image Sensor 2592(H) x 1944(V) Pixels	
Technology	LSIT (Lens-free Shadow Imaging Technology)	
Number of channels	4 channels	
Print	Thermal Printing	
User interface	Active screen size	344.22(H)x98.60(V)
	Pixel format	3840(H) x 1100(V)
Printer	size	76.8 x 77.4 x 47.7 mm
	weight	150g 이하
	Paper width	57.5mm
	Print width	48mm
	Printing speed	50mm/s
Plastic Outer Case	Temperature rating	60°C
Environmental suggestions for optimal performance	Indoor use	
	0 meters ≤ Altitude ≤ 2,500 meters	
	5°C ≤ Temperature ≤ 40°C	
	20% ≤ Humidity ≤ 80%	
	Ingress Protection Rating: IP21	
Transportation & storage environment condition	-20 ~ +70 °C	
Input / Output Port	USB 3.2 x 2 USB 2.0 x 1 Ethernet x 1	Peripheral connectivity Data transfer Networking

Cellytics® assay slide 		
Assay Slide	Number of Channels	4
	Sample loading volume (per channel)	10 µL
	Slide size (W x L)	25 mm x 75 mm
Calibration Slide	Number of Channels	4
	Slide size (W x L)	25 mm x 75 mm
CMOS cleaning cloth	Microfiber	150 mm x 150 mm

7. Safety

Safety symbols

The following symbols are around on the instrument and this document. Always use the equipment in the safest possible manner.

Symbol	Meaning
	Caution & Warning
	ON (Power)
	Protective earth (Ground)
	This instrument and consumables conforms to the Declaration of Conformity.
	Caution: BIOHAZARD Protective measures must be used in dealing with biologically hazardous materials such as carcinogenic reagents.
	USB Connection
	LED
	Disposal of your old appliance 1. When this crossed-out wheeled bin symbol is attached to a product it means the product is covered by the European Directive 2012/19/EU. 2. All electrical and electronic products should be disposed of separately from the municipal waste stream via designated collection facilities appointed by the government or the local authorities. 3. The correct disposal of your old appliance will help prevent potential negative consequences for the environment and human health. 4. For more detailed information about disposal of your old appliance, please contact your city office, waste disposal service or visit our website, www.nanoentek.com .
	<i>In vitro</i> diagnostic medical device

General instrument safety

- Make sure that you have a secure, comfortable grip on the instrument when lifting.
- Make sure that the path from where the object is to where it is being moved is clear of obstructions.
- Do not lift an object and twist your torso at the same time.
- Keep your spine in a good neutral position while lifting with your legs.
- Participants should coordinate lift and move intentions with each other before lifting and carrying.
- Instead of lifting the object from the packing box, carefully tilt the box on its side and hold it stationary while someone slides the contents out of the box.

Operating the instrument

Ensure that anyone who operates the instrument has:

- Received instructions in both general safety practices for laboratories and specific safety practices for the instrument.
- Read and understood all applicable Safety Data Sheets (SDSs).

Cleaning or decontaminating the instrument.



Caution Using cleaning or decontamination methods other than those recommended by the manufacturer may compromise the safety or quality of the instrument.