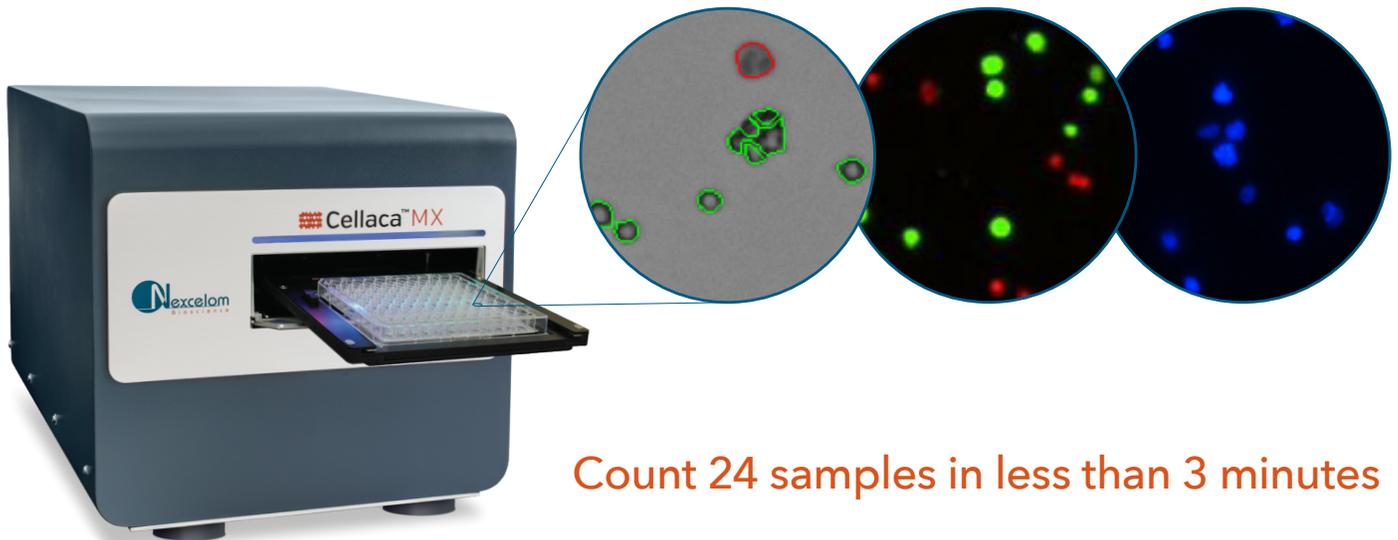


# Cellaca™ MX

High-throughput Automated Cell Counter



Count 24 samples in less than 3 minutes

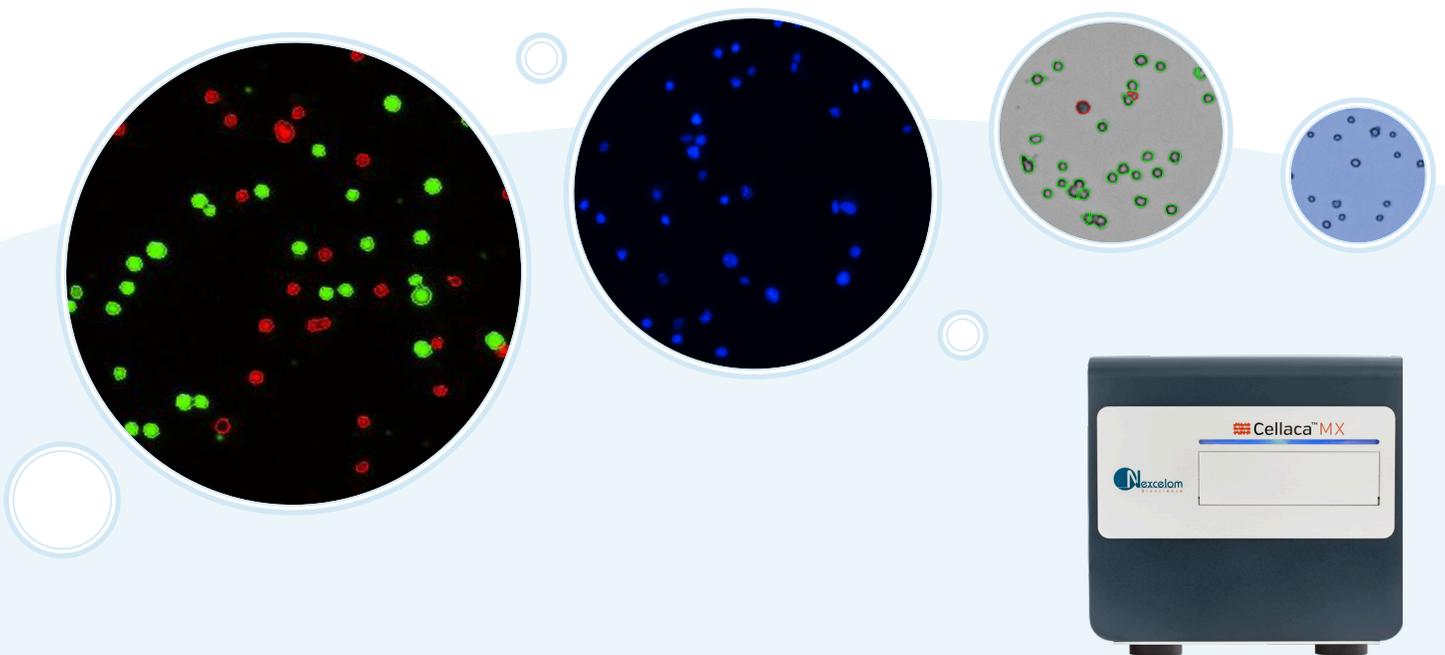
# Cellaca MX™

## High-throughput Automated Cell Counter

Count 24 samples in less than 3 minutes

Your workflow will be streamlined and more efficient when you integrate the Cellaca MX with these capabilities:

- **Batch samples** - run up to 24 samples at a time
- **Small sample volume** - only 25 µl of cell sample required
- **Autofocus** - fast autofocus prior to analysis
- **Cell based assays** - data output at a single cell level enables you to do cell-based assays such as apoptosis, cell cycle, protein expression (including GFP and RFP), and reactive oxygen species (ROS)
- **Multiple configurations** - choose to add up to five fluorescent filters
- **Automation ready** - robotic integration ability with optional API
- **Customizable reports** - add graphs, images, charts, and tables
- **Multi-language support** - over 7,000 languages available
- **21 CFR Part 11 ready** - optional add-on that includes audit trail, user access control, and digital signature



# You don't have to limit your experimental design

Run 24 samples in less than 3 minutes! No more reloading of individual slides or waiting for small batch counters to finish counting. With the Cellaca MX High-throughput Automated Cell Counter your experiments are no longer limited by the number of samples you can quickly and accurately count.

Multiple fluorescent filter options enable you to perform additional cell-based assays in minutes. With the Cell Fitness Panel you can get a quick check of the following cell health parameters:

- Viability
- Vitality
- Apoptosis
- Reactive oxygen species (ROS)

*"The ease of use and fast, high-throughput capabilities definitely make the Cellaca MX the best cell counter on the market, even over the Beckman Vi-Cell which I've used for the past decade."*

- Jasmine Ta, Eli Lilly

Select a well to view an image and results

Select multiple channels to view image in a single overlay

Choose the "All Wells" tab to see data from all 24 samples

View image to easily see what was included in the count

Export data in variety of file types and formats, including customizable reports

Overview of key results

Quick visual assessment of viability

**Cellaca MX** Assay: ADPL\_Live Dead Assay Plate: Plate 1 Eject

Wells

Well	1	2	3
A	Counted	Counted	Counted
B	Counted	Counted	Counted
C	Counted	Counted	Counted
D	Counted	Counted	Counted
E	Counted	Counted	Counted
F	Counted	Counted	Counted
G	Counted	Counted	Counted
H	Counted	Counted	Counted

Well View All Wells

BR FL1 FL2 Zoom Counted

Zoom: 7.20x

Plate Name: Plate 1 Dilution Factor: 2

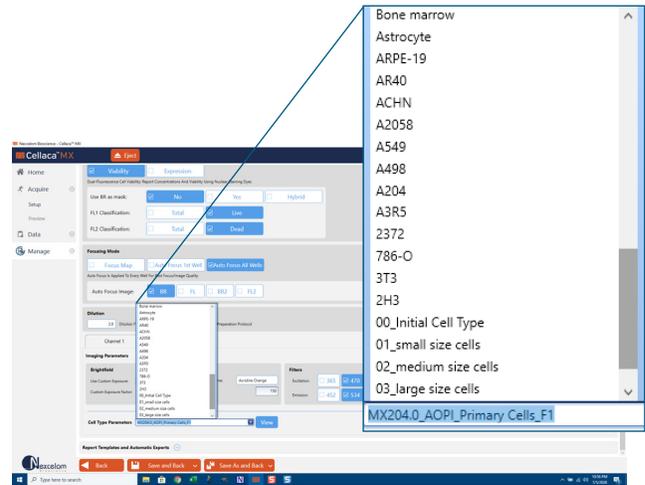
Well: A1	Cell Type	Count	Concentration (cells/mL)	Mean Size	Viability
	Live	1576	2.950 x 10 <sup>6</sup>	8.23	90.0%
	Dead	179	0.334 x 10 <sup>6</sup>	0.95	
	Total	1755	3.280 x 10 <sup>6</sup>	8.38	

Viability Gauge

0 10 20 30 40 50 60 70 80 90 100

# Assay settings and cell type parameters ready to use

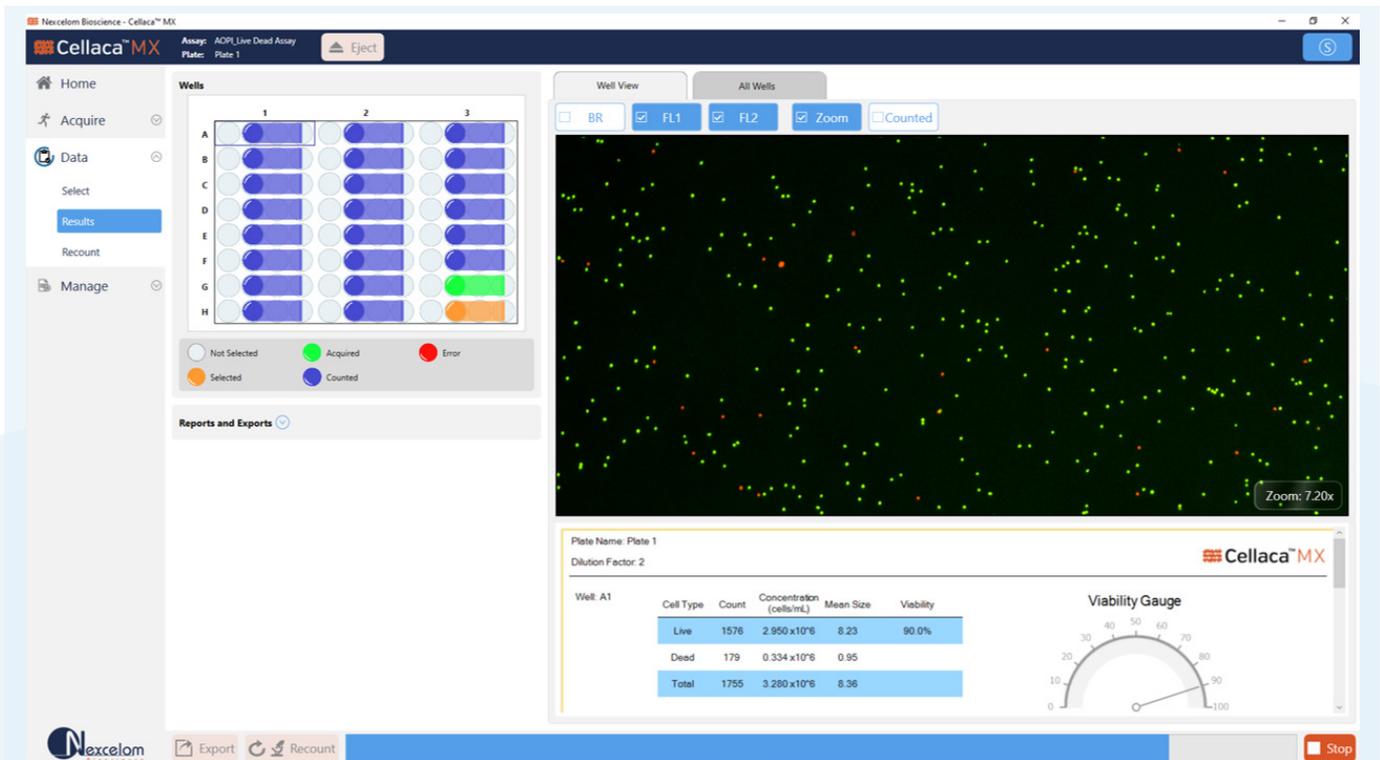
With the Cellaca MX you can build your own assays or choose from the many assays already included in the software. In addition, there are over 200 cell types preloaded with optimized settings. Simply find your assay and cell type in the menu and you are ready to count.



# Save time with simultaneous imaging and analysis

As soon as the first well has been acquired you can begin reviewing the images and data. No need to wait until the entire batch has been analyzed before starting to assess the results. Answers are available in seconds, not minutes.

The ability to add additional automation with robotic integration can further increase productivity.



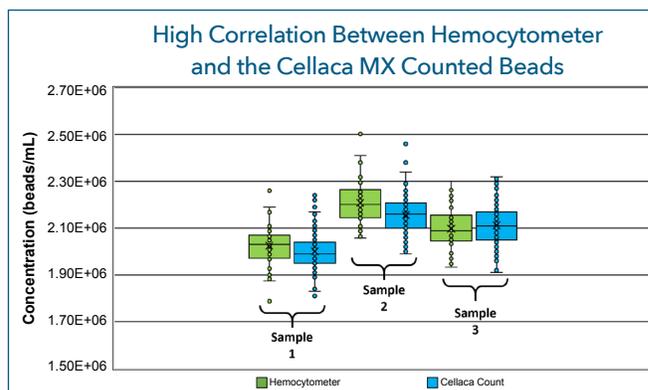
**Figure 1.** Wells in blue have been captured and analyzed. The green well is in progress of being analyzed. The orange well is next to be analyzed. Well A1 is selected and the AO/PI image is displayed on screen (AO is green, PI is red). The report shows the number of live, dead and total cells counted for well A1.

## Accurate results you can trust

The Cellaca MX has undergone rigorous testing and validation to ensure highly accurate results. In comparisons to manual counting with a hemocytometer and Cellometer automated counters, the Cellaca MX proves to be a highly accurate instrument. In addition, the Cellaca MX can warn the operator when the cell count is out of range (too few or too many cells in the sample) and will suggest a corrective course of action (concentrating or diluting the cell sample and by how much).

### Close correlation to hemocytometer

In this study, three tubes of 5-micron polystyrene beads were diluted to a concentration of  $\sim 2 \times 10^6$  beads/mL. To determine the concentration within each tube, 40 individual hemocytometer counts were performed for each tube. The Cellaca MX was then used to measure the concentration on the same set of tubes. The results show a very close correlation between the hemocytometer counted beads and the Cellaca MX counts.



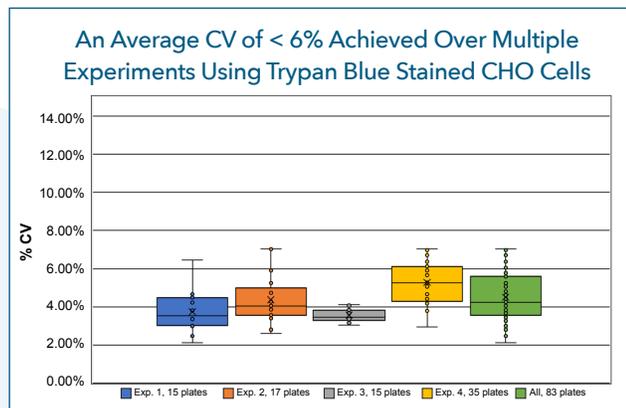
**Figure 2.** A total of 18 Cellaca plates (432 wells) were used over the 3 tubes of beads and had average CV values of < 4%.

	Hemo CV	Cellaca CV	Hemo Average	Cellaca Average	% Difference
Tube 1	4.46%	3.69%	2.03E+06	2.00E+06	1.20%
Tube 2	4.33%	3.64%	2.21E+06	2.16E+06	2.35%
Tube 3	4.28%	3.94%	2.10E+06	2.11E+06	0.71%

**Table 1.** The measured concentration difference between the Cellaca MX and the hemocytometer bead counts were between 0.7 - 2.3%.

*"After testing this cell counter and comparing it to other counting methods, we have seen that the Cellaca MX produces tighter/accurate counts and saves us time."*

- Kimberly Sandy, Pfizer



**Figure 3.** CHO cells stained with trypan blue were shown to have a CV of 6% or less over 4 independent experiments totaling 83, 24-well plates (1,992 samples).

### Low plate-to-plate variability

Cellaca MX plates are made in the USA to exacting standards. This ensures accurate cell counts you can trust across manufacturing lots of Cellaca plates.

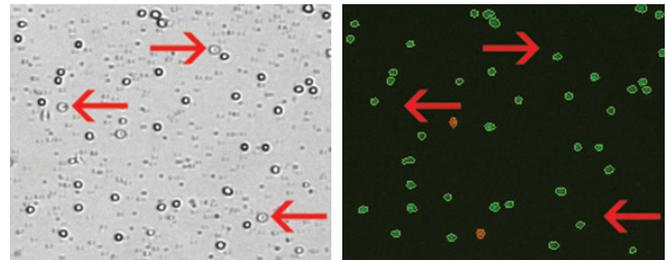
In a study of 1,992 individually loaded samples (83 plates) by multiple users over multiple weeks a count of  $\sim 2 \times 10^6$  cells/mL CHO-s cells with Trypan Blue yielded a CV less than 6% (figure 3). The cumulative counting time for all 83 plates was 70 minutes.

## Consistent viability measurement using fluorescence

Count messy samples more accurately with fluorescence! With the Cellaca MX 2FL and 5FL models, you can eliminate red blood cells, platelets and debris from your counts using fluorescent nuclear stains. Acridine orange and propidium iodide are perfect for counting the nucleated cells in samples like PBMCs, patient samples, tumor digests and samples with lots of debris.

### The advantage of fluorescent counting for primary cells

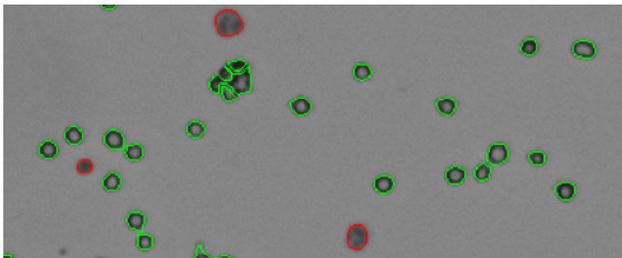
The images (right) demonstrate the advantage of fluorescent counting for primary cells. The bright field image shows the combination of nucleated cells, red blood cells and platelets present in the sample. Only the live and dead nucleated cells are visualized and counted in the green and red fluorescent channels.



**Figure 4.** Several red blood cells are indicated in the bright field image (above, left). The red blood cells are not visible in the fluorescent image (above, right) detecting cells stained with nuclear staining dye.

## Count clumpy cells using declustering algorithm

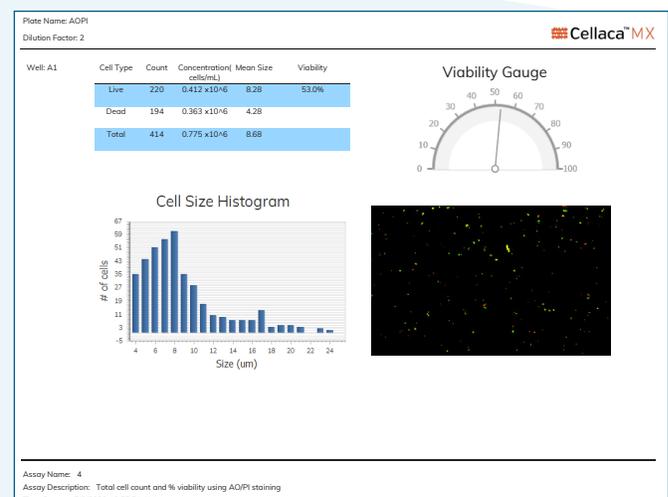
When working with clumpy cells you can apply declustering settings to identify and individually count each cell in your sample to get highly accurate counts.



**Figure 5.** The above image shows cells counted with trypan blue on the Cellaca MX. The software automatically declusters and counts individual live cells (in green outlines) and trypan blue positive dead cells (in red).

## Customizable reports

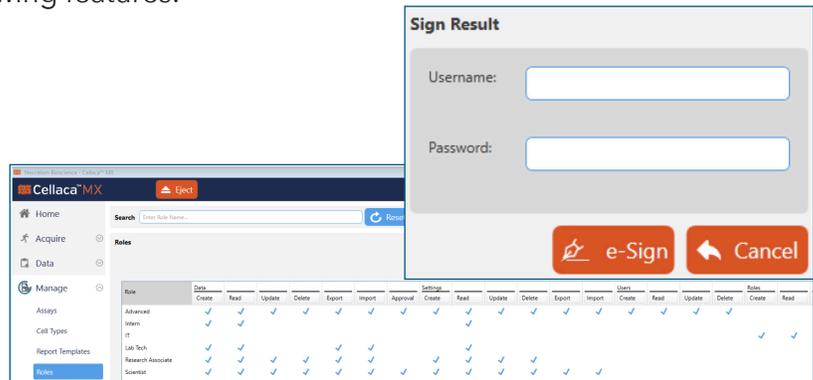
Export reports as CSV, Excel, Word, or PDF files. Use default reports or customize based on the data and images you want included for the assay that was run. Statistical analysis can be included for various parameters. Different languages are available for reporting.



## Facilitates 21 CFR Part 11 compliance

An optional module can be purchased to meet the FDA requirements for 21 CFR Part 11. The additional module comes with the following features:

- User login with passwords
- User assigned permissions
- Audit trail
- Error log files
- Electronic signatures

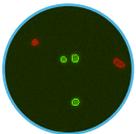


**Figure 6.** Different user roles can be assigned in 21 CFR Part 11 module. An electronic signature can be applied to the results.

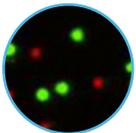
## Cell Fitness Panel on the Cellaca MX

There are many parameters that can indicate the fitness of your samples but this is the first time that these parameters have been combined into a single kit to allow you to better examine samples of interest. These individual tests provide potential insight into sample quality. These tests can be run on the Cellaca MX FL2 or FL5.

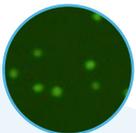
The Cell Fitness Panel includes the following tests:



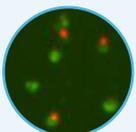
**Viability - AO/PI (Acridine Orange and Propidium Iodide)** - Using AO/PI allows for the identification, enumeration of mononuclear cells, and provides cell viability in the counted sample without a RBC lysing step.



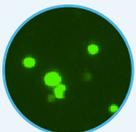
**Vitality/Enzymatic Activity - Calcein AM/PI** - By looking at the conversion of non-fluorescent calcein AM to green fluorescent calcein we can measure the number and concentration of both metabolically active live cells as well as non-viable cells in a given population.



**Reactive Oxygen Species - Total ROS** - While reactive oxygen species (ROS) are natural by-products of normal metabolism, during oxidative stress-related events, the accumulation of ROS can result in significant damage to cell structures. Cultures that are positive for ROS may signal unhealthy culture conditions that can lead to apoptosis and cell death.



**Mid-Stage Apoptosis - Annexin V/PI** - An assay commonly carried out by researchers interested in performing functional assays to measure the percent of live, apoptotic, and necrotic cells in a sample. May serve as an early indicator of an unhealthy cell population.



**Late-Stage Apoptosis - Caspase 3/7** - Early or mid-stage apoptotic cells may recover or may progress to late stage apoptosis. A cell culture with a high number of caspase 3/7 positive cells may be in trouble. In this assay the executioner caspase is detected as a bright nuclear signal.

The Cellaca MX is available in different configurations. Cellaca MX BF and FL2 can be upgraded in the field to expand the experimental capabilities of your instrument and quickly dive to deeper cellular insights.

	Cellaca MX BF	Cellaca MX FL2	Cellaca MX FL5
Channels	Bright field	Bright field, Green, Red	Bright field, Blue, Green, Red, Far Red
Number of Channels	1	4	14
Excitation LED	N/A	470, 527 nm	365, 470, 527 and 620 nm
Emissions Filters	N/A	534, 655 nm	452, 534, 605, 655 and 692 nm
Commonly Used Compatible Dyes	Trypan Blue	Trypan Blue, AO/PI, Calcein AM, Annexin V, Caspase 3/7	Trypan Blue, AO/PI, Hoechst, DAPI, GFP, RFP, CMFDA, Calcein AM, 7AAD, Annexin V
Counting Speed Per 24 Samples	48 seconds	Trypan Blue - 48 seconds Fluorescence - Less than 3 minutes	Trypan Blue - 48 seconds Fluorescence - Less than 3 minutes
Volume (per well)	25 $\mu$ L - 100 $\mu$ L sample volume 50 $\mu$ L - 200 $\mu$ L total well volume	25 $\mu$ L - 100 $\mu$ L sample volume 50 $\mu$ L - 200 $\mu$ L total well volume	25 $\mu$ L - 100 $\mu$ L sample volume 50 $\mu$ L - 200 $\mu$ L total well volume
Size/Diameter Range	5 - 80 $\mu$ m	5 - 80 $\mu$ m	5 - 80 $\mu$ m
Concentration Range	$1 \times 10^5$ - $1 \times 10^7$	$1 \times 10^5$ - $1 \times 10^7$	$1 \times 10^5$ - $1 \times 10^7$
Fluorescence Upgradeable	Yes	Yes (add additional colors)	N/A
IQ/OQ Option	Yes	Yes	Yes
21 CFR Part 11 Ready Option	Yes	Yes	Yes
Automation Compatible	Yes	Yes	Yes
Operating System	Windows 10	Windows 10	Windows 10
Dimensions	13 in x 13 in x 16 in (33 cm x 33 cm x 41 cm)	13 in x 13 in x 16 in (33 cm x 33 cm x 41 cm)	13 in x 13 in x 16 in (33 cm x 33 cm x 41 cm)
Weight	40 lbs (18 kg)	42 lbs (19 kg)	42 lbs (19 kg)

## Innovation and Expertise in the Science of Cell Counting

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