Molecular Devices

SpectraMax MiniMax Imaging Cytometer

for the SpectraMax i3 Multi-Mode Microplate Detection Platform

Key Features

- Perform visual inspection of cells within the same microplate reader workflow
- Image using brightfield and fluorescence
- Acquire and analyze fluorescent images easily with SoftMax® Pro Software

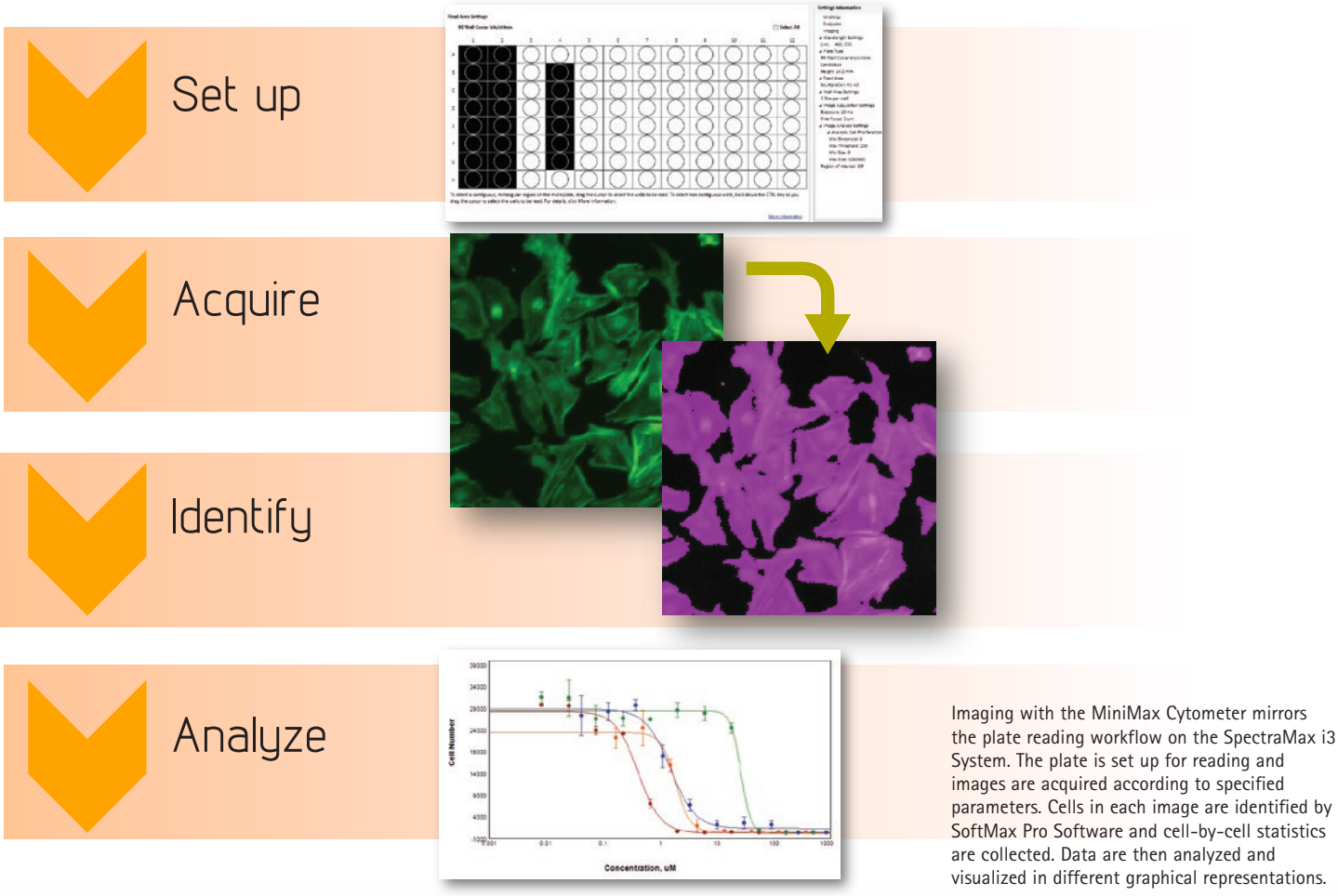
The SpectraMax® MiniMax™ Imaging Cytometer is designed to provide visualization and cell-based analysis that compliments well-based intensity readings on the SpectraMax i3 Multi-Mode Microplate Detection Platform. As the first-of-its-kind imaging modality on a microplate system, this easily installed option makes cytometry more accessible to a wider audience, providing researchers with cellular analysis capability without the need for investment in complex imaging systems.

The MiniMax Imaging Cytometer enhances the SpectraMax i3 System with true microplate imaging in both brightfield and fluorescent modes. The imaging cytometer allows inspection of cell health and dye loading without switching instruments. While plate reading provides the total signal of each well, the imaging cytometer delivers information- rich images.

Furthermore, the included software enables fluorescent cellular assays at higher resolution. The supported assays are cell counting, cytotoxicity/cell proliferation, and marker expression in the same small footprint.

Set-up, acquisition, and analysis

Visualize cells with your microplate reader



Imaging with the MiniMax Cytometer mirrors the plate reading workflow on the SpectraMax i3 System. The plate is set up for reading and images are acquired according to specified parameters. Cells in each image are identified by SoftMax Pro Software and cell-by-cell statistics are collected. Data are then analyzed and visualized in different graphical representations.

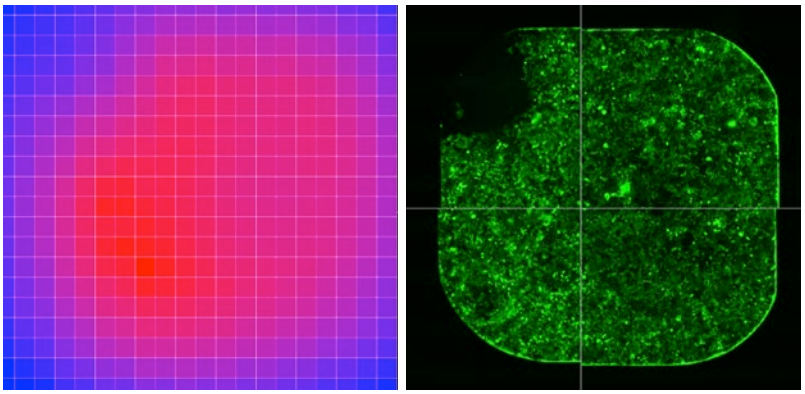
The MiniMax Imaging Cytometer is controlled by the well-established SoftMax Pro Software, and is further enhanced by the analysis capabilities of the MetaMorph® Software backbone. Powerful cell identification and image analysis are supported in fluorescence mode and easily accessible within the software. In the settings interface, users can select between fluorescence or transmitted light, define plate type, read area and number of images per well, plus specify positive/negative wells.

Users can also select fluorescent analysis types with corresponding output parameters as follows:

Analysis types	Output parameters
Cell count	• Cell Count • Average area • Average intensity • Average integrated intensity
Cell proliferation	• Covered area
Marker expression	• Expression in image

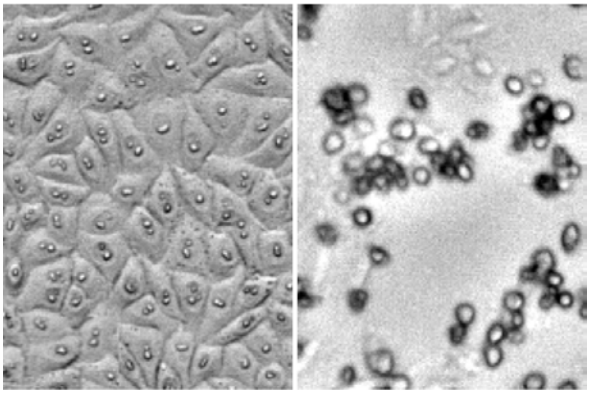
Performance and applications

100-fold improved resolution with imaging



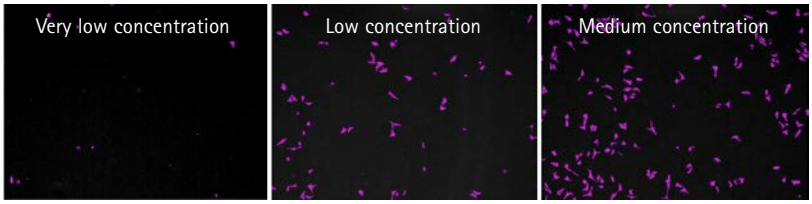
A well scanned with a microplate reader (left) and captured using the MiniMax Imaging Cytometer (right). Cells and a pipetting artifact can be visualized with the imaging cytometer.

Visually inspect cell health



HeLa cells (left: healthy; right: dead/dying) observed under transmitted light. The brightfield mode of the MiniMax Imaging Cytometer option for the SpectraMax i3 Microplate System allows quick visual inspection of cells without staining.

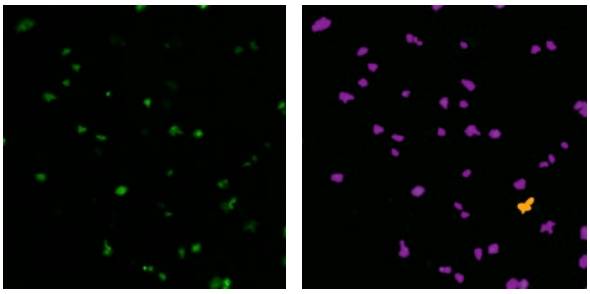
Detect signals better at low concentrations



MiniMax Imaging Cytometer		
10 cells	57 cells	76 cells
2,520 RFU	27,840 RFU	78,120 RFU
Microplate reader		
162,165 RFU	163,206 RFU	166,131 RFU

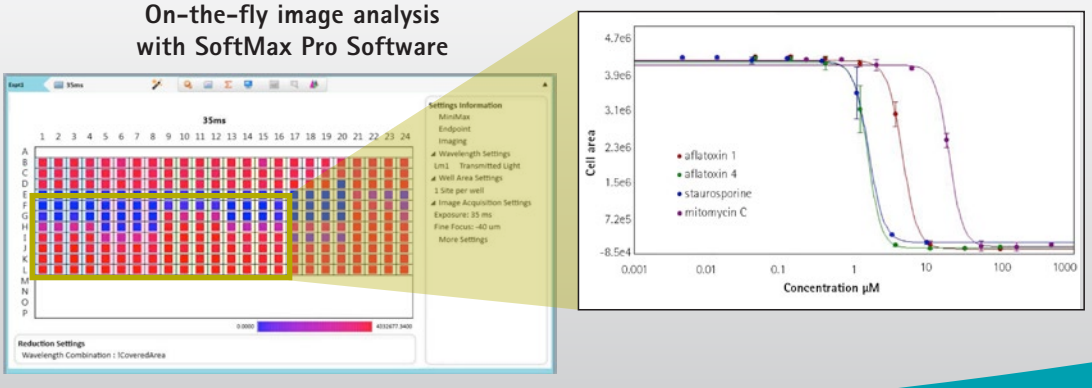
Very low-, low-, and medium-concentration wells detected by the MiniMax Imaging Cytometer and a plate reader. The relative intensity units (RFUs) obtained from the plate reader are very similar, whereas the difference can be readily distinguished and visualized by the MiniMax Cytometer.

Segment and identify cells automatically



HEK cells stained with GFP (left) and segmentation mask (right) created using the SoftMax Pro Software MiniMax Imaging Edition. The software outputs various parameters, such as cell area and average intensity per cell (yellow highlight).

On-the-fly image analysis with SoftMax Pro Software



Hepatotoxicity effects assessed by measuring well covered area for hepatocytes treated with various compounds. The software displays values per well in addition to a graphical heatmap (left). After image analysis, the software plots results and fits the curves to determine IC_{50} values (right).

Technical specifications

Light source	Proprietary solid state illumination, 460 nm excitation
Detector	1.25 megapixel, 12-bit high sensitivity CCD camera
Emission	Green 535 nm and bright-field
Objective	Single 4X objective
Resolution	1.8 µm x 1.8 µm pixel size
Autofocus	Proprietary laser scanning autofocus
Imaging speed (typical; computer dependent)	4 minutes per 96-well plate, 1 image per well 15 minutes per 384-well plate, 1 image per well
Visualization	SoftMax Pro Software MiniMax Imaging Edition
Specimen carriers	ANSI/SBS-conformant microplates, 96 and 384 wells
Computer	Windows 7 operating system 64-bit, 8GB RAM
Dimensions (cm)	39.2 W x 19.5 H x 60.6 L (MiniMax Imaging Cytometer alone) 39.2 W x 44.0 H x 60.6 L (with SpectraMax i3 System)

Ordering information

The MiniMax Imaging Cytometer is an option to the required SpectraMax i3 Multi-Mode Microplate Detection Platform. It can be purchased together with the base system, or added separately should your application needs expand in the future.

- SpectraMax MiniMax Imaging Cytometer
  PN: 5024062
- SpectraMax MiniMax Desktop Computer
  PN: 5023982
- SpectraMax MiniMax 22" Monitor
  PN: 5024296
- SpectraMax i3 Multi-Mode Detection Platform
  PN: i3

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Check our website for a current listing of worldwide distributors.

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