

# DeNovix<sup>®</sup>



# CellDrop<sup>™</sup>

## User Guide

rev MAR-27-2019

<b>1. Introduction</b>	<b>3</b>	
Product Technology		3
Key Features		3
Optics		3
<b>2. Set-up and Safety</b>	<b>4</b>	
<b>3. Quick Guides</b>	<b>6</b>	
Basic Procedure		6
Best Practices		6
Software Icons and Buttons		7
Top Gray Action Bar		7
Chamber Height Options		8
Data Storage		8
<b>4. Count Apps</b>	<b>9</b>	
Brightfield App		9
Trypan Blue App		9
AO App		9
PI App		9
AO/PI App		10
GFP App		10
Yeast App		10
<b>5. Count Tab Screen</b>	<b>11</b>	
Sample Information (A)		11
Image Controls		12
Dilution Calculator Settings (E)		12
Count Button		12
<b>6. Results Tab Views</b>	<b>13</b>	
Blue Action Bar		13
Single Sample Results View		14
Results List View		14
Image List View		14
Graph View		14
<b>7. Export and Print Options</b>	<b>16</b>	
Screen Capture		16
Export		16
<b>8. Utility Apps</b>	<b>17</b>	
Accounts App		17
Data App		18
Count Codes App		19
Calculator App		19
Timer App		20
Settings App		20
Updater App		21
Diagnostics App		21
<b>9. Troubleshooting and Maintenance</b>	<b>22</b>	
Quick Help		22
Software Errors		22
Cleaning		22
<b>10. Customer Support</b>	<b>24</b>	
Warranty		24

## 1. Introduction

### Product Technology

DeNovix CellDrop™ cell counters are compact instruments with integrated processors and high-resolution touch screens. The software utilizes application specific icons along with a custom operating system to provide an intuitive, easy-to-use instrument for cell count measurements.

The pre-configured app settings are factory optimized for ease of use. The software allows the user to customize settings when needed to meet lab specific workflow preferences.

The CellDrop uses three chamber heights to enable cell counts over a wide dynamic concentration range according to specifications. This innovative and patent-pending technology along with user-defined protocols allows users the flexibility required for today's cell culture workflows.

This User Guide is designed for both CellDrop BF (Brightfield only) and CellDrop FL (Dual Fluorescence plus Brightfield) owners. Several applications and software features are only applicable for instruments with Fluorescence mode (CellDrop FL) and do not apply to the CellDrop BF.

### Key Features

- No consumable slides required
- Integrated processor and Hi-Definition 7-inch touchscreen
- Custom software interface with intuitive EasyApps®
- Variable chamber heights to enable an accurate count for a broad range of cell population densities
- Option to use common disposable slides enables the measurement of biohazard level cell cultures

### Optics

#### Brightfield

- Illumination = LED 530 nm

#### Fluorescence

- Excitation: 470 nm +/- 20 nm
- Green Fluorescence Emission: 525 nm +/- 25 nm
- Red Fluorescence Emission 645 nm +/- 37 nm

### Upgrade Options

CellDrop instruments may be upgraded at any time. Contact DeNovix or your distributor if you are interested in converting from:

- Pay-As-You-Go to Unlimited
- CellDrop BF (Brightfield only) to CellDrop FL (Dual Fluorescence plus Brightfield)

## 2. Set-up and Safety

1. Remove all packing materials including the protective cover on the screen.
2. Place the instrument on a flat bench and avoid vibrations to ensure optimal performance.
3. Plug the unit into a 100-240 VAC, 50-60/Hz receptacle using the grounded power supply (GlobTek, Inc. part number TR9CE3000C95CP-NR6B, 12V / 3A / 36W) included with each unit.
4. Toggle the power switch to the On position to turn on the instrument, toggle the switch off to initiate shutdown. To enable initialization, ensure the arm is down every time the instrument is turned on or a count app is launched. The operating system will boot up in less than a minute.

### Biological Hazard Safety

Trypan Blue, Acridine Orange, Propidium Iodide and other reagents are known hazardous materials. Consult Safety Datasheets (SDS) for these assays prior to use.

Biological samples such as tissues and bodily fluids of humans and other animals have the potential to transmit infectious diseases. Follow all applicable local regulations. Wear appropriate personal protective equipment (PPE). Read and follow the guidelines in this User Guide, in the SDS for any chemicals in use, and additional biosafety publications applicable for the types of sample used and institution/region of use.

### Instrument Connectivity

The CellDrop comes equipped with one Ethernet, one HDMI and three USB ports. The USB ports are used to facilitate data transfer to a FAT32 formatted USB storage device, and support the use of an Opticon OPI 3601 USB barcode reader. USB mouse and keyboard devices may also be used with CellDrop Series instruments.

## Cautions



**DO NOT REMOVE COVER:** No operator serviceable components inside. Refer servicing to qualified personnel. CellDrop cell counters are designed for indoor use under the following conditions:  
Temperature: 15° to 35° C Humidity: 35 to 65 %

Use only the power supply provided with the instrument. Use of the instrument in any manner not specified by the manufacturer may impair the protection provided by the supplied power cord and power supply.

### NE PAS OUVRIR L'APPAREIL.

Aucun composant réparable par un utilisateur est inclus. Confiez l'entretien à du personnel qualifié. Le CellDrop est conçu pour une utilisation en intérieur dans les conditions suivantes :  
Température : 15° à 35°C Humidité: .....35 à 65%

Utilisez uniquement le bloc d'alimentation inclus avec l'instrument. Utiliser l'appareil dans des conditions non spécifiées par le fabricant peut compromettre la protection offerte par le câble d'alimentation et le bloc d'alimentation fournis avec l'appareil.

VCCI (Class B) compliance statement for users in Japan:



この製品は、技術基準適合証明に関する条例等特定無線設備(MPT省令第37号または1981)のタイプによって認定に準拠しています。この機器のカテゴリ：第2条、第1項のアイテム(19) 第2条第1項、項目(19)-2

This is a Class B product based on the standard of the Voluntary Control Council for Interference (VCCI) from Information Technology Equipment. If this is used near a radio or television receiver in a domestic environment, it may cause radio interference. Install and use the equipment according to the instruction manual. This equipment has been tested for radio frequency emissions and has been verified to meet CISPR 22.2 Class B.

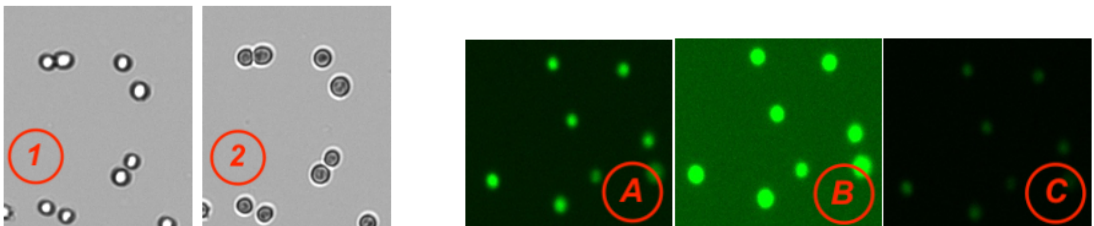
### 3. Quick Guides

#### Basic Procedure

1. With the instrument arm in the down position, launch the app of interest.
  - Optional: Enter a sample name and additional sample information.
2. Select or add a new protocol.
  - Optional: Optimize image and count settings.
3. With the arm down, dispense the sample onto the measurement surface.
  - Note: A slide may be used when counting biohazard samples. Choose "Slide" mode in protocol.
4. Focus the image so that brightfield cells are visible with a bright center and a dark outline (figure 1).
5. Ensure the cells are no longer moving and then tap the Count button.
6. Once measurement is complete, wipe away sample with a clean dry laboratory wipe and close the arm

#### Best Practices



















- Ensure surface is clean prior to dispensing a sample onto the measurement surface.
- Vortex samples before loading for best results.
- Ensure all sample concentrations fall within concentration limits of the instrument for accurate results.
  - Use the appropriate protocol settings for Chamber Height when measuring high or low concentration samples, or when using slides.
  - Note: Refer to the text located in the Count button background field for the proper loading volume when measuring low or high-density samples.
- Lower the arm before dispensing the sample onto the surface.
- Ensure cells have settled to the lower surface before tapping the Count button. The time for cells to settle may vary by cell type and should be determined empirically.
- Avoid introducing air bubbles into the sample solution when mixing or dispensing samples.
- Refer to DeNovix assay protocols or other manufacturer guidelines for cell dyes such as Acridine Orange, Propidium Iodide or Fluorescein Diacetate for assay specific instructions.
- Optimize Focus and Exposure settings to ensure the algorithms deliver the most accurate results.






Focus Example: 1) Properly focused 2) Improper focus

Exposure Example: A) Correct B) Exposure too high C) Exposure too low

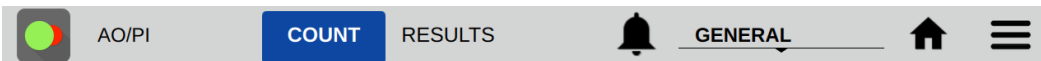
## Software Icons and Buttons

	Home		Add		Select All
	Overflow Menu		Edit		Increase / Decrease
	Count		Copy		Export
	Exposure		Delete		Clear Selected
	Focus		Expand / Collapse		Information
	Calculator		Notifications		Favorite

## Channel View Selectors

	Brightfield		Brightfield/ Green Overlay
	Green Fluorescence		Brightfield/ Red Overlay
	Red Fluorescence		Green/ Red Overlay
	Brightfield/ Green/Red Overlay		

## Top Gray Action Bar



- **Count Tab:** This screen is used to preview cell populations, optimize image settings, define dilution guidance parameters and initiate cell counts.
- **Results Tab:** This tab enables the user to review the data for all samples measured in the current measurement session.
- **Alerts:** System alerts including Timer finished alert and low count alerts as set in the Count Codes app (Pay-As-You-Go-Models).
- **Account:** The current account in use is displayed on the top action bar. Tap the account name to display a list of available accounts. Changing an account will automatically use the protocol indicated as the default option selected in the Accounts app accessed from the Home screen.
- **Home Icon:** Tapping the Home icon will navigate back to the Home screen and close the app.
- **Overflow:** The Overflow icon is used to access a drop down menu of screen specific options as described below:
  - Screen Capture: Screen shots may be taken of most but not all views. Refer to the Export and Print Options chapter for more information.
  - Count Code Log (PAYG models only): Displays a log of count code use.
  - About: The About feature brings up an information box displaying the current app version number.

## Chamber Height Options

The CellDrop uses three chamber heights to enable measurements over a wide dynamic concentration range. The 100  $\mu\text{m}$  chamber height is equivalent to the 0.1 mm depth used on standard hemocytometers.

Use a modified protocol with the appropriate chamber height when the cell solution is expected to be dilute or dense. This ensures that only one aliquot of sample will be needed. If the cell solution is out of range for the protocol in use, the software will direct the user to reload a fresh aliquot using the required volume.

Refer to the tables below for guidance regarding which chamber height to use based on the expected sample cell count or cells/mL.

The equation used to determine the equivalent hemocytometer count is as follows:

$$\text{Equivalent cell count} = \frac{\text{Cells/mL}}{(\text{Dilution factor}/\# \text{ of squares counted})} * 10,000 \text{ cells/mL}$$

## Minimum and Maximum Recommended Concentrations

Gap Height	Required Volume	Minimum Cells/mL	Maximum Expected Cells/mL
400 $\mu\text{m}$	40 $\mu\text{L}$	$7 \times 10^2$	$5 \times 10^4$
100 $\mu\text{m}$	10 $\mu\text{L}$	$5 \times 10^4$	$1 \times 10^7$
50 $\mu\text{m}$	5 $\mu\text{L}$	$1 \times 10^7$	$2.5 \times 10^7$

## Data Storage

CellDrop models include a solid state drive with 60 GB or more of storage capacity, sufficient for several thousand results. Should the memory approach capacity the user will be alerted. Data may be deleted from the CellDrop at any time from the Data App. If the limits are exceeded, old data will be automatically deleted on a first-in, first-out basis.

## Screen Saver

The backlight for the screen will automatically turn off after a user-defined period of inactivity. Adjust the value in the Settings App.

## Preview Suspend

The CellDrop live preview on the Count screen is suspended if the arm is left in the down position for longer than a normal sample is viewed. The user may resume the preview when desired.



## 4. Count Apps

### Brightfield App



The Brightfield app is used for quick, label-free total cell or particle counts. It is not used to determine cell viability.

### Trypan Blue App



Trypan blue is a cell membrane impermeable dye that only enters cells with compromised membranes. Upon entry, the dye binds to intracellular proteins resulting in bluish colored cells. The trypan blue exclusion assay enables a direct counting of live (unstained) and dead (blue) cells.

Published literature suggests that using trypan blue for samples with viabilities less than 70% may result in higher reported cell viability values when compared to fluorescent-based detection methods.

Calculation:

$$\% \text{ Viability} = (\text{Brightfield count} / (\text{Brightfield count} + \text{Trypan Blue count})) * 100.$$

#### Trypan Blue Concentration and Exposure Setting

Any brand of trypan dye can be used on the CellDrop but the concentration must be either 0.4%, which is the common concentration of the dye sold by many vendors, or 0.2% trypan dye if the user chooses to dilute the dye.

- If the user is using 0.4% trypan dye then use the Trypan Normal Exposure setting
- If the user is using 0.2% trypan dye then use the Trypan Low Exposure setting.

#### Trypan Blue Threshold

The brightfield channel captures a monochrome image so the darker cells stained with trypan have a lower intensity. Therefore the trypan blue threshold setting is the intensity value from 1-100 at which anything below is counted as a dead cell.

### AO App



The AO App uses green fluorescence images to count live nucleated cells.

Acridine orange is a nuclear staining cationic fluorescent dye that enters live and dead cells and interacts with DNA and RNA by intercalation or electrostatic attractions. When bound to DNA, it is spectrally very similar to fluorescein, with an excitation maximum at 502 nm and an emission maximum at 525 nm.

Although AO enters dead cells, the intensity of the green fluorescence is very low for these cells compared to the green fluorescence emitted from live cells. This app may be useful when counting solutions containing either red blood cells and/or significant cellular debris.

The % cell viability is not provided when using this app.

### PI App



The PI app uses brightfield images to capture live cell counts and red fluorescence images for counting dead cells.

Propidium iodide (PI) is a red-fluorescent nuclear and chromosome stain that only enters dead cells. Upon entry the PI stain binds to DNA by intercalating between the bases with little or no sequence

preference. In aqueous solution, the dye has excitation/emission maxima of 493/636 nm. When bound, the excitation/emission maxima shifts to 535/617 nm respectively.

Calculation:

$$\% \text{ Viability} = (\text{Brightfield count} / (\text{Brightfield count} + \text{PI count})) * 100.$$

### AO/PI App



The AO/PI App uses green fluorescent images to capture live nucleated cell counts and red fluorescent images for counting dead cells.

Acridine orange (AO) and propidium iodide (PI) are both cell permeable nuclear dyes that in combination are used to count live and dead cells within a cell solution. The AO enters both live and dead cells and results in green fluorescing cells. PI enters only nucleated cells with compromised membranes to generate red fluorescence. Cells stained with both AO and PI fluoresce red due to fluorescence resonance energy transfer (FRET).

$$\% \text{ Viability} = (\text{AO count} / (\text{AO count} + \text{PI count})) * 100$$

### GFP App



The GFP App uses green fluorescent images to count GFP transfected cells and brightfield images to count non-transfected cells

The green fluorescent protein (GFP) isolated from the *Aequorea victoria* jellyfish is a useful reporter molecule for monitoring gene expression. GFP emits green light ( $\lambda_{\text{max}} = 509 \text{ nm}$ ) when excited with UV or blue light resulting in cells that green fluorescent cells.

The GFP app is used to determine the transfection efficiency of transient transfections.

$$\% \text{ Efficiency} = (\text{GFP+ count} / (\text{GFP+ count} + \text{Brightfield count})) * 100$$

### Yeast App



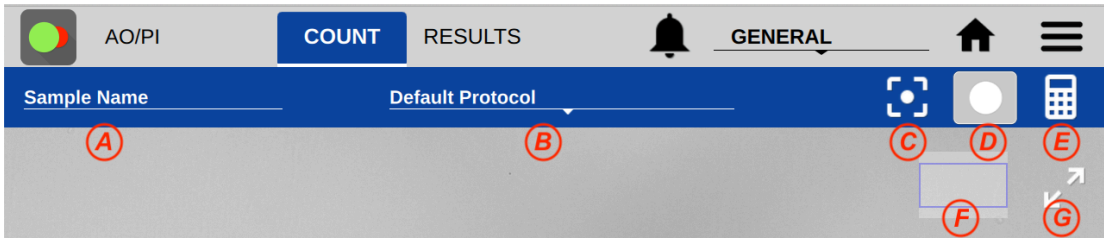
The Yeast App uses green fluorescent images to capture live yeast cell counts and red fluorescent images for counting dead yeast cells.

Yeast cell live/dead staining can be done using Fluorescein diacetate (FDA) and Propidium iodide (PI). FDA freely moves in and out of the plasma membrane of diverse organisms from bacteria to mammalian cells. The non-fluorescent FDA taken up by cells is converted into the green fluorescent metabolite fluorescein. The green fluorescence is used as an indicator of live cells. PI enters only nucleated cells with compromised membranes to generate red fluorescence indicating dead cells.

Note: Yeast cells are smaller than typical mammalian cells and may take a little longer to settle into position.

$$\% \text{ Viability} = (\text{FDA count} / (\text{FDA count} + \text{PI count})) * 100$$

## 5. Count Tab Screen




### Sample Information (A)

- Tapping the Sample Name field will bring up a dialog box where an optional sample name, short description and a passage number may be entered. This information is saved along with the count results.

### Protocol Selector and Protocol Settings (B)

- Each app opens to the Default Protocol. Users may set a custom protocol as their default in the User Accounts app.
- Cell Outline: The enhanced cell outline is the default option. Using a generic circle stamp to illustrate which cells are counted may result in a faster count.
- Sample Mode: The DirectPipette™ option is the default selection. Users should select “Slide” when a disposable or reusable slide is required.
- Chamber Height: The expected cell concentration or cell count dictates which chamber height the instrument will use to make the measurement. Refer to the section describing the Chamber Height Options for more information.
- Dilution Factor: This value is applied to the cell count when calculating cells/mL to account for any dilutions or reagents added to the sample.  
Examples:
  - For pure cell suspensions, the Protocol Dilution Factor = 1.
  - For a mixture of 5 uL of assay working solution to 5 uL of cell suspension, set Dilution Factor = 2.
  - For a mixture of 8 uL of assay working solution to 2 mL of cell suspension, set Dilution Factor = 5.
- Minimum and Maximum Diameters: The size range for cells that will be included in a count are set in the protocol. Cells outside this range will not be shown on histograms. The allowable range is 2-400  $\mu\text{m}$ .
- Roundness: The percent roundness setting is a score for circularity and outline completeness, the value at which cells meeting the criteria will be counted. The higher the value the more round and completely outlined the cell must be to be included in the count. Elliptical or irregularly shaped cells will be better counted by lowering the roundness setting.
- Trypan Blue Threshold: The brightfield channel on the CellDrop captures a monochrome image so the darker cells stained with Trypan Blue have a lower intensity. Therefore, the trypan blue threshold setting is the intensity value (scale of 1-100) at which anything below is counted as a dead cell.
- Green and Red Fluorescence Thresholds: The threshold settings are the minimum intensity values (1-100) of an object in the field that will be counted as a cell. Therefore, the Fluoresce threshold setting is the intensity value (scale of 1-100) at which anything above is counted as a cell in that channel.

## Image Controls

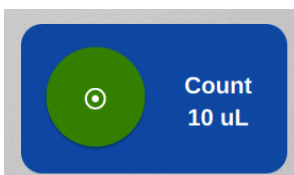
- (C) Focus: The focus controls may be used when previewing any Count screen mode (brightfield, green or red fluorescence). Note: Changing the focus when viewing one mode will automatically focus the other modes. Use the arrows to change the focus.
- Exposure: Use the exposure icon  to display the exposure controls. Default exposure values are app-dependent. The control is not available in brightfield preview mode and has limited preset values for the Trypan Blue app. Tap the arrows to adjust exposure time. The live preview will change as the exposure value changes.
- (D) Channel Selector: An icon indicating which channel image (brightfield, green or red) is shown in the blue action when applicable. Tap the icon to display the channel selector options which vary from app to app. CellDrop BF units only include the brightfield channel.
- Zoom Controls: All preview and result images on the CellDrop support zoom and pan capabilities. Use two fingers to zoom in or out. Tap and drag the image to move it around.
- Image map (F): A small position map in the top right is an indicator of what portion of the full image is currently displayed on the screen.
- Expand/Collapse Icon (G): Tapping the expand icon located on the top right of all preview and result screens will result in the image filling the entire screen.

## Dilution Calculator Settings (E)

- Tap the calculator icon to set dilution guidance parameters for the next sample count.
- Setting targets is optional for any specific count. Inputs may be added or modified post measurement from the Results tab Calculator screen.
- Once targets are set, they will stay in effect for all subsequent sample measurements within a session until changed.
- When applied, the inputs are used to generate the dilution guidance presented under the Single Sample view as well as the Results tab Results List view when the Show Dilution Guidance box is checked.

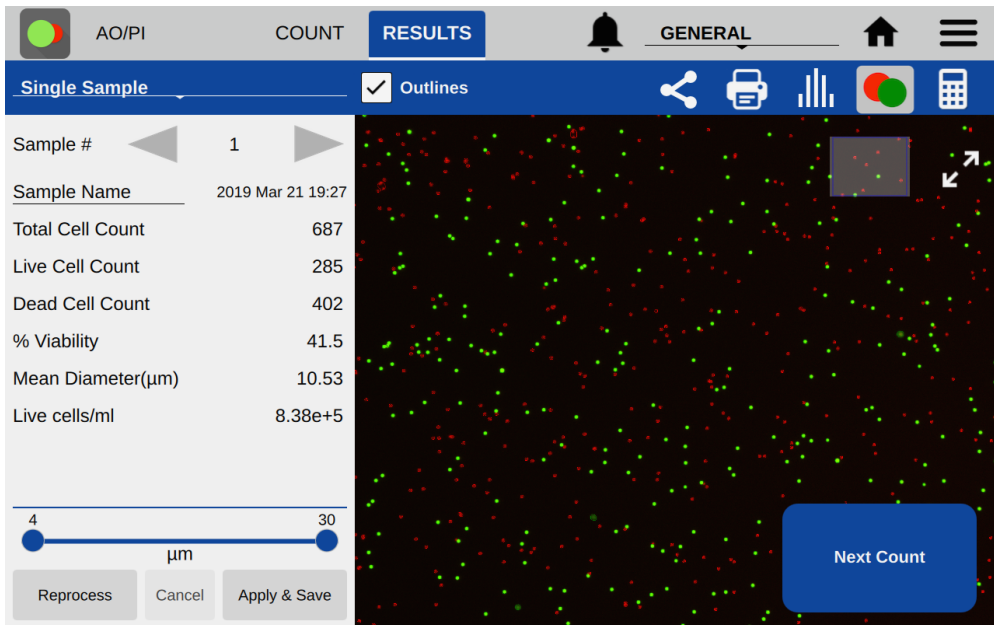
## Count Button

- Tap the Count button to initiate a measurement.
- The required volume of sample is displayed on the Count button.



## 6. Results Tab Views

The Results tab includes 6 views, which enable the user to review all sample count data made in the current measurement session.



### Blue Action Bar

- **View Drop-Down Menu:** This feature is used to navigate between the various Results tab views. The Default selection is Single Sample view.
- **Outlines:** The checkbox is used to toggle on/off the outlines for counted cells for views that include cell images.
- **Export icon:** Export results in .csv, .pdf, or .png formats via USB, Email, Network Folder, and Network Printer.
- **Print icon:** *This feature is not yet implemented and will be included in future software.*
- **Intensity Graph icon:** In the GFP app, this icon opens a Cell Number versus Intensity graph. GFP results may be gated by intensity as well as size.
- **Histogram icon:** This icon opens a histogram of Cell Number versus Cell Diameter for a given count.
- **Image Selector:** This icon indicates which channel's image (brightfield, green, red or composite) is currently displayed. Tap the icon to display the channel selector feature. The selected image determines which composite result image is exported.
- **Calculator icon:** Dilution targets may be added or edited in the Dilution Calculator.
- **Select/Deselect All icons:** These icons enable all items in a list to be selected or deselected with one tap of the icon.
- **Edit icon:** Highlight a single sample and then tap the edit icon to add or modify sample information. Changes will overwrite the information stored in the database and will be applied in all lists referencing the sample.
- **Delete icon:** Tapping this icon will delete the highlighted samples from all results lists.

## Single Sample Results View

- **Sample Number:** The arrows on either side of the sample number are used to switch between samples measured in the current session.
- **Sample Name:** This is an editable field. Changes will overwrite the information stored in the database and will be applied to all lists referencing the sample.
- **Results Panel:** A table of results will be displayed in the Results panel. If dilution parameters were provided at the time the count was initiated, then dilution guidance will also be presented in the panel.
- **Gating Panel:** A cell size gating bar is shown at the bottom of the left side of the screen. The size gating may be changed for a given sample and the results shown in the Results Panel and image will automatically update. The results can be saved by tapping the Apply and Save button.
- **Reprocess Panel:** The Reprocess button enables the user to reanalyze the saved images. The user may adjust a subset of protocol settings and then reprocess the image using the new set of parameters. The reprocessed result overwrites the previous result. The raw images are unaffected by reprocessing.
- **Next Count Button:** The user may return from the result screen to the count screen and count the active sample again. The user may adjust protocol settings, exposures, and focus and capture a new image to count. The previous results will be overwritten. To capture a new result of a new sample, raise the arm, clean the upper and lower sample surfaces, and lower the arm to load the next sample.

## Results List View

- **List:** The list includes all samples counted in the current measurement session.
- When the Show Dilution Guidance box is checked, the dilution guidance is displayed with each result in the list for which dilution information was entered.

## Image List View

- **List:** The list includes all samples counted in the current measurement session.
- **Cell Count:** The sample cell count is presented in the table. This value automatically updates whenever the results are recalculated due to a change in cell size limits or other counting parameters.

## Graph View

- Includes a summary of results to allow the user to select different charts to add.
- A color legend is included for the various histograms. Select up to 5 samples at a time to chart.
- **Graph Type Menu:** Use the drop down to select additional graph types.

## Graph Types

The graph types available are app dependent. Graphs may be expanded to full screen for easier viewing using the expand/collapse button.

The types available to view:

### **With or without cell size distribution**

- **Total Cell Count:** Available for the Brightfield and GFP apps only.
- **Live Cell Count:** Available for all apps except Brightfield.
- **Dead Cell Count:** Available for Trypan Blue, PI, AO/PI and Yeast apps.
- **Live and Dead Cell Count:** Available for Trypan Blue, PI, AO/PI and Yeast apps.

- GFP+ Cell Count: Available for the GFP app only.

**Without cell size distribution**

- Cluster #: Available for all apps. Displays count of cell size clusters.
- % Viability: Available for Trypan Blue, PI, AO/PI and Yeast apps.

## 7. Export and Print Options

There are several export and print options available on the CellDrop. Data export options are accessed using the export icon in the blue action bar. The screen capture option is accessed from the overflow menu. Options include:

- Screen Captures
- Data Export for results and protocol settings, images, and histograms

Note: To open an exported .csv file on a computer, the DeNovix instrument and the computer must **both** be set to use either period or comma number formats. The CellDrop number format is determined by the language selected using the Settings app.

### Screen Capture

*This feature is not yet implemented and will be included in a future software release.*

The screen capture feature is used to export a .png file and is available for most screens.

### Export

Tapping the Export option from the Overflow menu will bring up a series of two dialog boxes. The first dialog is used to select the desired combination of results, images and histograms to include in the export. The second dialog is used to select the export destination.

### Export Selections

- Results and Protocol Settings: The calculated results and protocol settings may be exported either as .csv, .pdf, or .png files.
  - .csv: The results and protocol settings will be presented in a format that can be opened in Excel. Additional sample related information not displayed in the Results tab Single Sample view is included when exporting in a .csv format.
  - .pdf: The results and protocol settings will be presented in a table format. The results table will include only the fields included on the Results tab Single Sample View.
  - .png: The selected images will be exported as .png files.
- When results are not included in the export selection, images and histograms will be exported as .png files.
- Images: Both raw and annotated (showing the counted cells) may be exported. When the results and protocol settings are exported in the .pdf format, the images will be included in the .pdf document. When the results and settings are exported in the .csv format, the images will be exported as .png files.
- Histograms: The cell size distribution and/or the cell cluster histogram may be selected for export. When included with results and setting tables, they will be included in a .pdf file. When selected alone or in combination with images only, histograms will be exported as .png files.
  - Note: When exporting histograms for multiple samples using the Export function, the graphs will be single sample cell distribution or single sample cell cluster graphs. To export histograms with multiple samples overlaid as is available on the Results Tab Graph screen, use the Overflow menu Screen Capture option.

### Export Destinations

- Export destinations include: USB, Email, Network Printer, and Network Folder/File Share. See the Settings app section for Email and Network Folder set up.



## 8. Utility Apps

### Accounts App



User accounts manage user-defined protocols and default settings within specific apps. Accounts are also used as a means of segregating data when performing searches in the Data app.

#### App Structure

Accounts are listed in the left pane of the screen. A menu of app function options is presented in the action bar, where the selected option is highlighted with a blue background.

- Select a user account from the dropdown list in the top grey bar, and select an option to edit: Profile, Report Emails, File Share, and Defaults.

#### App Functions

There are five basic functions that are controlled using the Account app.

- Adding and deleting accounts
- Managing passwords for accounts
- Managing email addresses associated with an account
- Setting up account specific network folder access
- Setting account specific app protocol preferences

#### Adding or Deleting Accounts

There are two preconfigured system accounts built into the software: the General Account and the Primary Administrator Account. These accounts may not be deleted.

#### Primary Administrator

- This account is used to manage instrument settings. It is not used within the count applications.
- The primary administrator account is not initially password protected. A password may be applied at any time.

#### General Account

- This account is used as the default selection for all apps each time an app is opened. This account may not be password protected or deleted.

There are two types of accounts that may be added, edited or deleted as described below:

#### User Added Standard Accounts

- Any user may add a standard level account. It is not necessary to select an account before adding a new standard account.
- Standard accounts may only modify or delete protocols or emails created from within their account.

#### User Added Administrator Accounts

- An administrator level account may only be created by another administrator. The primary administrator or another existing administrator account must be highlighted in order to enable the adding of a new administrator.

- Administrator accounts may modify or delete user entries of any sort created from within any account. A drop-down menu will be used to select the account of interest.
- Administrators may change the password for any account as well as delete any account.

### Account Passwords

- Passwords are optional for all added administrator or standard user accounts.
- Contact the holder of an administrator account if a standard user account password is forgotten.
- Contact DeNovix customer support or your local distributor if the Primary Administrator password is forgotten. Please have the serial number of the instrument available when requesting help for the Primary Administrator password reset.

### Email Addresses

Multiple email addresses may be set up for each account. The nickname is used in the drop-down list presented on an export destination dialog box.

### Network Folders

*This feature is not yet implemented and will be included in a future software release.*

### Deleting an Account

- When an account is deleted, all protocols and custom report formats created by that account are reassigned to the General Account.
- The account specific saved data will also be permanently removed from the instrument at the time the account is deleted.

### Data App



This app allows the user to search for past data filtering by date, app name, protocol name and/or sample names. Data can then be added to the Result tab screens for review and export. In addition, data may be archived from the Search Screen.

- Once the filter criteria have been selected, tap the **Search** button at the bottom of the screen. Tap any column header to sort the results list.
- Highlight the sample(s) of interest and tap the **Add to Results** button to include the samples on Results tab pages.
- All data must be from the same app type for the samples to be added to the Result tab.
- Features and functions previously described for the Results tab screens apply to the corresponding Data app screens.

### Export

- All data is automatically saved to the CellDrop onboard computer database at the time of measurement.
- The **Export Selected** function available from any Results tab screen Overflow menu enables sample data to be emailed, sent to a network folder or saved to a FAT32 formatted USB flash drive.

- When the export function is used, the data is **not** deleted from the database and can be accessed using the Data app.

## Delete Data

- The **Delete** function available from the Search screen Overflow **permanently** removes the selected data from the instrument database and cannot be restored to the instrument.
- The deleting privilege for standard accounts is enabled or disabled using the Settings app. When disabled, only administrative accounts may delete or archive data.
- The storage capability of the CellDrop is a minimum of 120 GB of data. When the storage capacity has been reached the software uses a first in/first out paradigm for remaining sample data. The **Delete** function should be used as an infrequent method of removing a large amount of data from the CellDrop database.
- The delete process continues to work even when the interface goes to sleep after 10 minutes of no user activity. Touch the screen to wake-up the user interface and update the progress message.

If the Cancel button is tapped during the archiving process, samples already copied up to the stop point may be deleted from the instrument at the user's discretion.

## Count Codes App



The purpose of the Count Codes app is to manage pre-paid counts using codes on a per account basis. This app will appear on instruments purchased on a pay-as-you-go basis.

The Primary Administrator account is only used to add, review or transfer codes for other accounts. This account cannot be used to make cell measurements.

For Admin accounts- the drop-down menu options include:

- Enter New Code
- Review Code History
- Transfer Counts

Administrators may transfer unused counts between accounts on the instrument.

For Standard accounts- the drop-down menu options include:

- Enter New Code
- Review Code History

Please include the serial number of your instrument when contacting DeNovix by email to purchase additional count codes.

Outside of the US, please contact your local distributor for assistance.

## Calculator App



*This feature is not yet implemented and will be included in a future software release.*

## Timer App



*This feature is not yet implemented and will be included in a future software release.*

## Settings App



The Settings app may be found on the second Home screen page. Only administrator accounts may access and change settings.

The app provides access to the following functions:

### **System Info**

- View software and firmware versions, IP addresses, current language, and hostname.

### **Date/Time**

- Select manual or automatic date and time options.

### **Language**

- Although the custom operating system provides translations for some routine functions in many languages, the majority of the app specific text will be available in a limited number of language options.

### **Network Information**

- The WiFi and Ethernet MAC addresses and IP addresses can be found under this setting.

### **Permissions**

This selection is used to enable the following options:

- **Automatic Archive:** Use this selection to enable or disable all standard accounts, including the General Account, to archive data from the instrument. Refer to the [Delete, Archive Data](#) section for additional information.
- **Network Folders:** Use this selection to enable or disable the general account and/or standard user accounts to set-up network folders for data export.

### **Sound**

- Volume controls are available for media and timer alarms.

### **Storage**

- Displays current storage statistics.

### **WiFi**

- Turn Wifi on or off and connect/disconnect from a network.

## Ethernet

- Ensure the Ethernet cable is connected.
- Tap the Edit button to configure Ethernet connection.

Contact your local IT department if additional help setting up WiFi or Ethernet is needed.

## Display

- Includes controls for screen brightness and when the screen sleeps.

## Network Printing

*This feature is not yet implemented and will be included in a future software release.*

## Email

### Email Set-up

1. It is recommended that a new, dedicated POP3 **Gmail** account be used for all outgoing email from the CellDrop. This type of account works very well with the instrument's operating system and prevents personal incoming email from being stored on the unit.
2. Ensure that the instrument is connected to WiFi or Ethernet.
3. Launch the Settings app and navigate to the Email section on the left scroll menu.
4. Enable the **POP3** option on your Email configuration. Do not use an IMAP account as messages from IMAP accounts could occupy a significant amount of the instrument's memory.
5. Input Outgoing Server Information:

Email Configuration	Example Input for Gmail
SMTP Server	smtp.gmail.com
Security	SSL
Port	465
Email Username	example@gmail.com
Email Password	Examplegmail123
Test Email To	info@denovix.com

Refer to your local IT support group if additional assistance is required.



## Updater App

This app is used to update CellDrop software and firmware to the most current available versions. Updates may be downloaded using the Updater app when connected to Ethernet or Wifi. An Ethernet connection is recommended for software updates.

*USB updates are not yet implemented and this capability will be included in a future software release.*

## Diagnostics App



*This feature is not yet implemented and will be included in a future software release.*

## 9. Troubleshooting and Maintenance

### Quick Help

Most issues concerning accuracy or reproducibility are sample, technique or protocol related and may be resolved by following the suggestions below:

- Clean sample surfaces prior to dispensing a sample onto the measurement surface.
- Do not over or under fill the counting chamber. Follow the Count button dispense volume directions. Volume is dependent on the chamber height specified in the protocol.
- Ensure samples are monodispersions of cells in solution. Vortex before loading into the count chamber.
- Ensure cells are in focus before tapping the Count button.
- Ensure all sample concentrations fall within concentration limits of the instrument for accurate results. When measuring samples with very low or very high cell densities, it is best to use a modified protocol indicating the expected concentration.
- Review the protocol settings used to make the sample count. Some parameters such as cell size limits, fluorescence intensity thresholds and cell roundness values may need to be empirically determined for the cell type and culture solution in question. For example, when measuring adipocytes, the cell diameter limits may need to be increased to capture the appropriate cell population.
- Ensure cells have stopped moving before tapping the Count button. The time for cells to settle may vary by cell type and should be determined empirically.
- Avoid introducing air bubbles into the sample solution when mixing or dispensing samples/
- Refer to the manufacturer of cell dyes such as Acridine Orange, Propidium Iodine or FDA for assay specific troubleshooting guidance.

### Software Errors

Pop-up messages will provide guidance for software-based errors or invalid user actions. In most cases, simply re-launching the app will allow the user to continue to make measurements. Update the software using the **Updater** app if experiencing a reoccurring software error.

Contact DeNovix Customer Support at 302-442-6911 or [info@denovix.com](mailto:info@denovix.com) if additional help is required. Please include the serial number of your instrument and all pertinent data when contacting Customer Support by email. The serial number may be found on the bottom of the instrument. Outside of the US, please contact your local distributor for assistance.

### Cleaning

Between Measurements:

- Use only a dry, lint-free cloth to wipe top and bottom sample surfaces. Check the live preview to verify the sample has been removed.
- Optional: For additional disinfection or cleaning if sample residue has dried on the surface: Lower the arm and pipette 10 uL of 70% ethanol or 10% bleach into the sample chamber. Wait approximately 10 seconds. Lift the arm and wipe both the top and bottom sample surfaces with a dry, lint free wipe.

Full Instrument Cleaning.

- *To clean the entire instrument, spray 70% ethanol or 10% bleach onto a paper towel first and wipe down the surface of the instrument.*
- *Do not use a spray bottle to douse the entire instrument. Excessive liquid may damage internal components.*

### **ScreenLocker App**

Launch the ScreenLocker app from the Home screen prior to cleaning the touch screen. This will disable swiping motions from activating other software activities. Tap the home button to exit.

### **Solvent Compatibility**

The CellDrop are compatible with most solvents typically used in life science laboratories.

**Exception: Do not use Hydrofluoric Acid (HF) as the fluoride ion will etch the surfaces of the measurement surfaces.**

## 10. Customer Support

DeNovix Inc.  
3411 Silverside Road, Hanby Building  
Wilmington, DE USA 19810  
302-442-6911  
info@denovix.com  
www.denovix.com

Please include the serial number of your instrument when contacting Customer Support by email. If sending Customer Support a screen capture or a report file using the CellDrop email feature include your name, institute/company, phone number and return email address. **Please note responses will not be sent directly to the email account used by the instrument.**

Outside of the US, please contact your local distributor for assistance.

### Warranty

All product(s) and accessories sold by DeNovix Inc. are under warranty against manufacturing defects.

### Disclaimer

All information in this document is for reference purposes only. DeNovix Inc. makes no claims that this document is complete or error-free and assumes no responsibility and will not be liable for any errors, omissions, damage or loss that might result from any use of this document.