

# ADAM™ CellIT Plus

A New Standard of Automated Cell Counter

## Instruction Manual



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## **ADAM™ CellT Plus Instruction Manual**

Website : [www.nanoentek.com](http://www.nanoentek.com)

E-mail : [sales@nanoentek.com](mailto:sales@nanoentek.com)

### **NanoEntek, Inc.**

851-14, Seohaero, Paltan-myeon, Hwaseong-si, Gyeonggi-do, 18531, Korea

Tel. +82-2-6220-7940

Fax. +82-2-6220-7999

### **NanoEntek America, Inc.**

220 Bear Hill Road, Suite 102, Waltham, MA 02451, USA

Tel. +1-781-472-2558

Fax. +2-781-790-5649

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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# Table of Contents

|   |           |
|---|-----------|
| <b>Introduction</b> .....                           | <b>5</b>  |
| General Description .....                           | 5         |
| Technology .....                                    | 6         |
| Basic principle of counting .....                   | 7         |
| <b>Product contents</b> .....                       | <b>8</b>  |
| ADAM™ CellIT Plus .....                             | 8         |
| AccuPlus Slide & Reagent .....                      | 8         |
| Upon receiving the instrument .....                 | 8         |
| <b>Product Description</b> .....                    | <b>9</b>  |
| Front view of ADAM™ CellIT Plus .....               | 9         |
| Rear view of CellIT Plus .....                      | 10        |
| Graphical User Interface of ADAM™ CellIT Plus ..... | 11        |
| <b>Getting started</b> .....                        | <b>12</b> |
| Environmental requirements .....                    | 12        |
| Power on and Initial Display .....                  | 12        |
| Error messages during booting .....                 | 13        |
| Count setting .....                                 | 14        |
| <b>General Operation</b> .....                      | <b>15</b> |
| Quick Guide .....                                   | 15        |
| Sample preparation .....                            | 16        |
| Cell counting .....                                 | 16        |
| <b>Measure</b> .....                                | <b>19</b> |
| Run sample .....                                    | 19        |
| Result analysis .....                               | 20        |
| Result Analysis - Error code .....                  | 21        |
| <b>QC</b> .....                                     | <b>22</b> |
| QC Mode .....                                       | 22        |
| QC Slide Edit .....                                 | 23        |
| QC Slide Result Edit .....                          | 24        |
| QC Slide Result .....                               | 25        |
| <b>Data</b> .....                                   | <b>26</b> |
| Data list .....                                     | 26        |
| EDIT .....  | 27        |
| IMAGE .....   | 28        |
| SAVE .....  | 29        |

|                                       |           |
|---------------------------------------|-----------|
| MAIL.....                             | 30        |
| <b>Approval.....</b>                  | <b>31</b> |
| Requestable .....                     | 31        |
| Requesting.....                       | 32        |
| Approvable.....                       | 33        |
| Approved.....                         | 34        |
| Setting.....                          | 35        |
| <b>Setting.....</b>                   | <b>36</b> |
| Wifi.....                             | 36        |
| Remote support.....                   | 36        |
| Update .....                          | 37        |
| Auto logout.....                      | 37        |
| Backup .....                          | 37        |
| Recovery .....                        | 38        |
| <b>User .....</b>                     | <b>39</b> |
| User .....                            | 39        |
| User manage.....                      | 40        |
| Privilege .....                       | 41        |
| Password Option .....                 | 42        |
| Log manage .....                      | 43        |
| Document manage.....                  | 44        |
| Deleted list .....                    | 45        |
| <b>Power off.....</b>                 | <b>46</b> |
| Lock .....                            | 46        |
| Power off.....                        | 46        |
| <b>Maintenance and cleaning .....</b> | <b>47</b> |
| <b>Trouble shooting .....</b>         | <b>48</b> |
| <b>Warranty.....</b>                  | <b>49</b> |
| <b>Technical specifications .....</b> | <b>50</b> |
| <b>Product list .....</b>             | <b>51</b> |
| <b>Safety precautions .....</b>       | <b>52</b> |
| <b>Mesures de sécurité.....</b>       | <b>53</b> |
| <b>Safety symbols.....</b>            | <b>54</b> |
| <b>Warnings.....</b>                  | <b>56</b> |
| <b>Technical support.....</b>         | <b>57</b> |

# Introduction

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## General Description

The ADAM™ CellT Plus is a highly accurate dual fluorescence cell counter that uses AO (acridine orange) and DAPI to count total and dead cells and also provides a bright field channel for cell size measurement.



# Introduction

---

## Technology

Measuring the number of cells and their viability is an essential part of biological experiments and biopharmaceutical procedures. Traditionally, the hemocytometer and trypan blue exclusion method have been used to quantifying total cells, dead cells, and cellular viability. These manual methods have been widely adopted as a standard for cell counting, however, they have limitations.

Non-cellular debris, such as dust or tissue residues, can be miscounted as cells, and the trypan blue exclusion method is known to overestimate cellular viability. Additionally, manual counting is prone to user-to-user variability, impacting consistency and accuracy.

To address these challenges, NanoEntek has developed ADAM™ CellT Plus, an image-based fluorescence cell counter. It captures bright field images to quantify cell sizes while using two fluorescence images to quantify the number of total cells and dead cells.

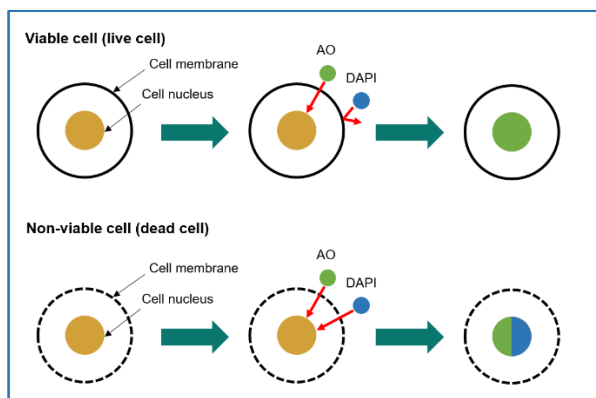
ADAM™ CellT Plus is designed to provide accurate, simple, and reliable results.

# Introduction

## Basic principle of counting

ADAM™ CellIT Plus uses acridine orange (AO) and 4',6-diamidino-2-phenylindole (DAPI) to count total number of cells and number of dead cells, respectively. AO is a cell-membrane permeable dye that stains nucleus of every cells regardless of the cell's condition. Therefore, it is used to count total number of cells. DAPI is a cell-membrane impermeable dye that only stains nucleus of cells with damaged membranes or cells with inactive metabolism. Therefore, it is used to count number of dead cells. Schematics of counting principal is shown below. From total cell counts and dead cell counts, viability of cells is calculated as below;

### Principle (Total cell count)



$$*Viability(\%) = \frac{(A-B)}{A} \times 100$$

A: Total cell / B: Non-viable cell

# Product contents

## ADAM™ CellT Plus

ADAM™ CellT Plus is shipped in a carton box containing followings;

| Item                | Quantity |
|---------------------|----------|
| Main device         | 1        |
| User manual         | 1        |
| USB hub             | 1        |
| Wifi dongle         | 1        |
| Power cord          | 1        |
| Adapter             | 1        |
| External Hard disk  | 1        |
| Test Bead           | 1        |
| QC slide (optional) | 1        |
| PC (only PC Mode)   | 1        |
| Printer (optional)  | 1        |

## AccuPlus Slide & Reagent

AccuPlus Slide and reagent has following supplies:

| Item                   | AccuPlus Slide<br>(Cat. No: AP4S-100) | Cell viability reagent<br>(Cat. No: APAD-400) |
|------------------------|---------------------------------------|---|
| Disposable Slide       | 100 pcs (4 channel)                   | N/A   |
| Reagent                | N/A                                   | 20 mL x 1 bottle                              |
| Available test<br>Q'ty | 400 test                              |   |

*\*These supplies are sold separately.*

## Upon receiving the instrument

- Examine the instrument carefully for any damage incurred during transit.
- Ensure that all parts of the instrument including accessories listed above are included with the product.
- Any damage claims must be filed with the carrier.
- The warranty does not cover in-transit damage.
- Upon receipt, store AccuPlus Slide at room temperature. Cell viability reagent should be stored at 2~8°C

# Product Description

## Front view of ADAM™ CellT Plus

The front view of the ADAM™ CellT Plus is shown below:

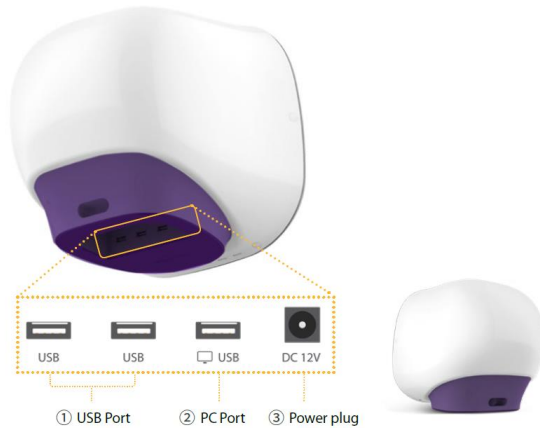


| Components | Description  |
|------------|--|
| ① Door     | Allows the slide holder to move in and out of the instrument.                                    |
| ② Power    | Turns the instrument on / off.   |
| ③ LCD      | Serves as the main user interface for operating the instrument and viewing progress and results. |

# Product Description

## Rear view of ADAM™ CellIT Plus

The rear view showing various parts of the ADAM™ CellIT Plus.:



| Ports        | Description   |
|--------------|---|
| ① USB Port   | Port for software update and save the data.                                   |
| ② PC port    | Connects with PC (Only PC Mode).  |
| ③ Power Plug | Connects the adapter plugged into a 12V power outlet to the ADAM CellIT Plus. |

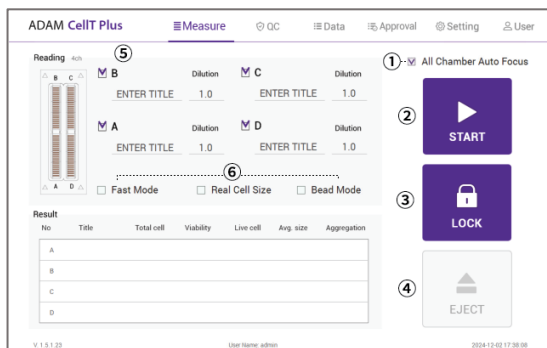
### ⓘ **CAUTION**

Do not use the ② PC port with a flash drive. This port does not recognize a flash drive.

# Product Description

## Graphical User Interface of ADAM™ CellT Plus

The graphic user interface of the ADAM™ CellT Plus is shown below:



| Control buttons     | Description  |
|---------------------|--|
| ① <b>Auto Focus</b> | Turn on/off the auto focus function. (If the auto focus function is turned off, the autofocus is only activated for the first measurement.)  |
| ② <b>START</b>      | Performs all procedures of automatic counting.   |
| ③ <b>LOCK</b>       | Protects the alignment of stage from external shock when ADAM™ CellT Plus is being moved. Lock ADAM™ CellT Plus before turning it off or moving it.  |
| ④ <b>EJECT</b>      | Ejects the slide holder from ADAM™ CellT Plus. Functions as unload.  |
| ⑤ <b>Sample</b>     | Check the sample to be measured and enter the name. Also enter the dilution factor.  |
| ⑥ <b>Mode</b>       | Select the measurement mode. The default mode is 13 frames for fluorescence and the Fast mode is 6 frames. Real cell size mode is a mode for measuring bright field images. Bead mode is for QC. |

# Getting started

---

## Environmental requirements

### ⚠ CAUTION

*At low temperature ( $\leq 10$  °C), allow the device to warm up for 10 minutes at ambient temperature before use. Not recommended for cold room use ( $\leq 4$  °C).*

To ensure correct operation and stable performance, install the ADAM™ CellT Plus in a location which meets the following conditions:

1. Use at room temperature between 20 and 35 °C
2. Do not expose the device to direct sunlight.
3. Do not subject the device to direct or continuous vibration.
4. Do not subject the device to intense magnetic or electromagnetic fields.
5. Do not install the device in high-humidity environment.
6. Location of device should be free from corrosive gases or other corrosive substances.
7. Ensure minimal contact with dust or other airborne particles.
8. Allow a 10 cm (4 inches) minimum space around the device for proper airflow.
9. Do not place any objects on top of the device.

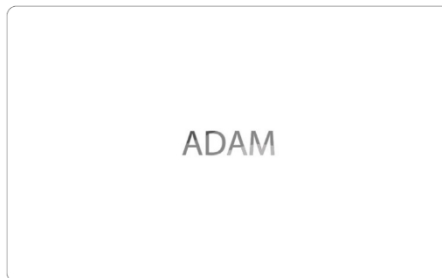
---

## Power on and Initial Display

1. Plug 12V power supply to the power port at the back of the instrument.
2. Press the power button in the front for 2~3 seconds to turn the instrument on.

If you get an error message, please contact your local distributor or [sales@nanoentek.com](mailto:sales@nanoentek.com).

If booting is successful and no errors are detected, the home screens will be displayed as below.



### ⚠ CAUTION

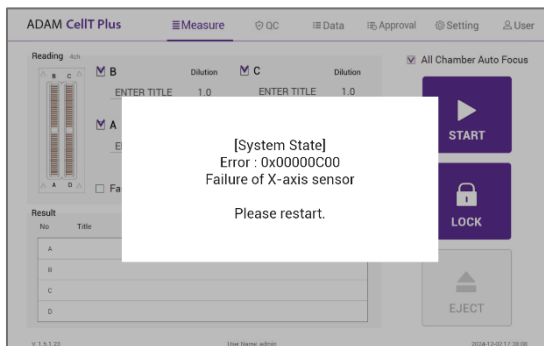
- Do not tilt the device too much in the forward when connecting the power cord.
- Do not move the device after connecting power cord.

*When you connect the power cord to ADAM™ CellT Plus even without power on the device, it will go through self diagnostic tests.*

# Getting started

## Error messages during booting

### [System State : Error]



If the "System State" error message appears, it indicates that the boot process was not completed properly.

To resolve this, press and hold the power button for at least 5 seconds to turn off the instrument. Wait until the instrument is completely turned off, and turn it back on by pressing and holding the power button for 2–3 seconds.

If this message still appears after restarting, contact your local distributor or [sales@nanoentek.com](mailto:sales@nanoentek.com).

| Error code | Cause                            |
|------------|----------------------------------|
| 0x00000C00 | Failure of X-axis sensor         |
| 0x00007000 | Failure of Y-axis sensor         |
| 0x00008000 | Failure of Z-axis sensor         |
| 0x06000000 | Failure of Locking module sensor |

# Getting started

## Count setting

### [Cell size]

The initial counting range is set between 3 and 80, but the size can be adjusted to customize the counting range.

Cell size

Min 3

Max 100

### [Dilution factor]

If the sample was diluted before mixing with the CellT Plus reagent, set the dilution factor here. For example, if the sample was diluted 3-fold, enter "3" as the dilution factor.

#### **!** CAUTION

*Factor values for the Cell viability reagent is already applied.*

Dilution factor

1.0

#### **!** CAUTION

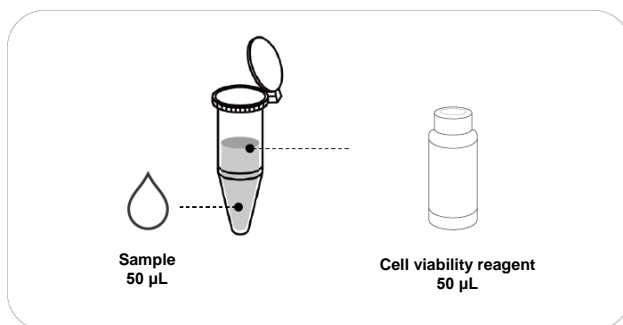
*In Bead mode and QC mode, adjustments to [Cell size] and [Dilution factor] will not be applied.*

# General Operation

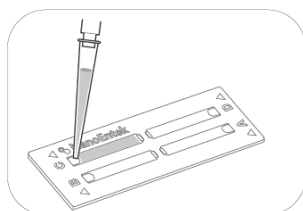
## Quick Guide

Instruction is provided in this section for preparing the sample with Cell viability reagent for use with disposable AccuPlus Slide for automated cell count using the ADAM™ CellIT Plus. Please follow these steps to prepare samples and run tests.

1. Mix the sample and the cell viability reagent at a 1:1 ratio. The recommended ratio is mixing 50 $\mu$ L of the sample with 50 $\mu$ L of cell viability reagent. Then, mix thoroughly.



2. Take 15 $\mu$ L of the mixed sample and load it into each chamber of the AccuPlus slide. Wait for 1 minute on a flat surface to allow cells to settle.

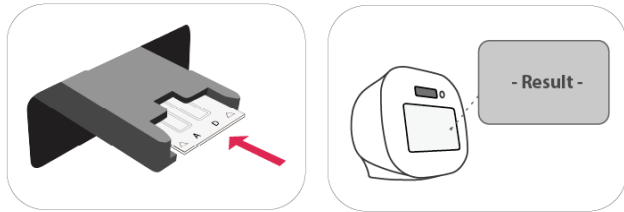


### ⓘ CAUTION

1. This waiting step is essential for ensuring accurate measurements.
2. A chamber that has been loaded with a sample cannot be reused.

# General Operation

3. Insert the AccuPlus Slide into the slide holder. Press the START button to begin the measurement and obtain the results.



## Sample preparation

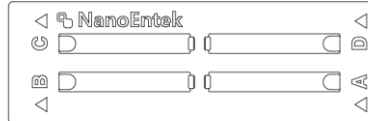
1. Cultivate the required number of cells.

**NOTE**

Concentration out of this range will result in errors. Refer to page 20 for more information about errors.

2. Thoroughly mix the cell pellet by vortexing or pipetting.
3. Check visually if any cell clumps or agglomerates remain.

## Cell counting



[AccuPlus Slide 4 ch]

### Counting cell

- 1) Add 50  $\mu$ L of your sample to 50  $\mu$ L supplied Cell viability reagent.
- 2) Pipette or vortex the tube vigorously.
- 3) Load 15  $\mu$ L sample mixture to the AccuPlus Slide A,B,C or D channel. Then, wait 1 minute for settling down.

**NOTE**

When loading the sample mixture to the AccuPlus Slide, take care to avoid creating bubbles.

# General Operation

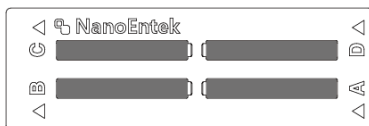
## Cell counting

### **⚠ WARNING**

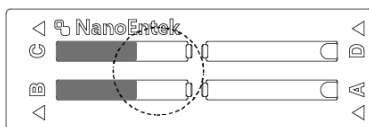
#### **[Sample loading error]**

When loading the sample into the AccuPlus Slide, ensure the correct volume of 15µL is used. Incorrect sample volumes, either too low or too high, may result in inaccurate results.

#### Correct volume

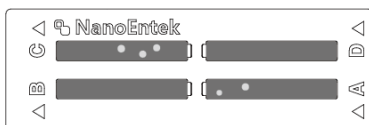


#### Low volume



### **⚠ CAUTION**

Avoid bubbles which may negatively affect the result.



# General Operation

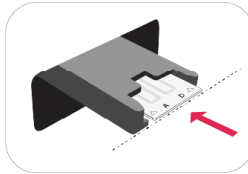
## Cell counting

### **!** WARNING

#### **[AccuPlus Slide insert error]**

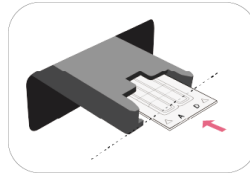
Completely insert AccuPlus Slide face up, in the direction of the arrow on the slide. The instrument will not detect if slides are inserted incorrectly.

See pictures below for proper insertion.



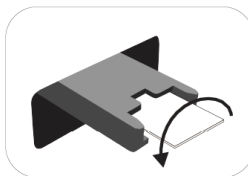
**(O)**

Correctly inserted



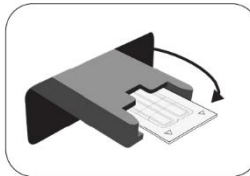
**(X)**

Not fully inserted



**(X)**

Upside down inserted



**(X)**

Wrong direction inserted

### **!** WARNING

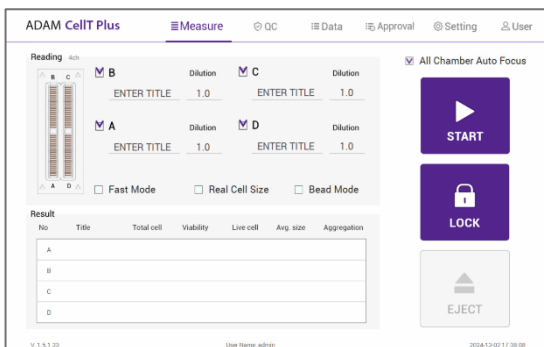
- Please insert or remove the AccuPlus Slide when the slide holder is fully ejected.
- When the test is finished, please remove the AccuPlus Slide from the slide holder.

# Measure

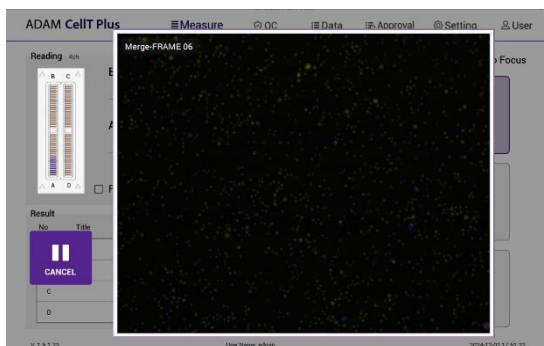
## Run sample

**Start counting process by pressing 'START'.**

Upon the first measurement after turning on the instrument, the auto-focus function is applied automatically. If the "All Chamber Auto Focus" option is selected, it may take approximately 3 minutes or longer to find the optimal focus for all chambers.



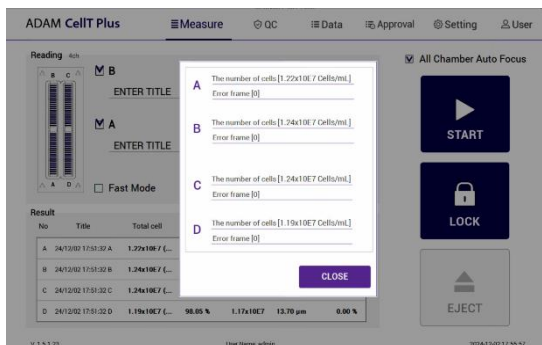
While the test is in progress, the merged channel image can be viewed in real time.



# Measure

## Result analysis

Based on the captured images, the ADAM™ CellIT Plus software automatically calculates the results and displays them in a simple pop-up.



### \* Examples of Results

| Title        | Number of Total cell | Number of Non-Viable cell | Viability |
|--------------|----------------------|---------------------------|-----------|
| Viability 01 | 1.10E6               | 5.50E5                    | 50%       |
| Viability 02 | 2.20E6               | 5.50E5                    | 75%       |

- The viability will be automatically calculated by the ADAM™ CellIT Plus software after each measurement of the total cells and the non-viable cells.
- First, the total cell count is measured, followed by the non-viable cell count. The cell viability is then calculated by subtracting the non-viable cell count from the total cell count.

### ! NOTE

*'Print' button will be automatically activated when portable printer (optional) is connected.*

# Measure

## Result Analysis - Error code

| All                      | No   | CH  | Side | Sample             | Exp. Name | Date/Time           | Total         | Viability | Live       | Dead       | Avg. cfu |
|--------------------------|------|-----|------|--------------------|-----------|---------------------|---------------|-----------|------------|------------|----------|
| <input type="checkbox"/> | 0041 | CH4 | D    | 055 23/10/13 14.41 | admin     | 2023-10-13 14:41:09 | 2.59e1197 (0) | 79.82%    | 1.83e10E7  | 7.55e10E6  | 9.79e7   |
| <input type="checkbox"/> | 0008 | CH4 | C    | 094 23/10/13 14.41 | admin     | 2023-10-13 14:41:09 | 1.20e1167 (0) | 79.62%    | 9.17e10E5  | 2.01e110E6 | 9.79e7   |
| <input type="checkbox"/> | 0050 | CH4 | B    | 052 23/10/13 14.41 | admin     | 2023-10-13 14:41:09 | 3.21e110E5    | 71.28%    | 2.29e110E5 | 9.21e110E5 | 9.89e7   |
| <input type="checkbox"/> | 0030 | CH4 | A    | 052 day1           | admin     | 2023-10-13 14:41:09 | 3.29e110E5    | 78.98%    | 2.33e110E5 | 6.59e110E5 | 9.79e7   |
| <input type="checkbox"/> | 0057 | CH4 | D    | 051 23/10/13 14.34 | admin     | 2023-10-13 14:34:10 | 2.22e110E5    | 79.30%    | 2.28e110E5 | 9.56e110E5 | 9.79e7   |
| <input type="checkbox"/> | 0056 | CH4 | C    | 050 23/10/13 14.34 | admin     | 2023-10-13 14:34:10 | 3.22e110E5    | 78.82%    | 2.29e110E5 | 6.41e110E5 | 9.79e7   |
| <input type="checkbox"/> | 0050 | CH4 | B    | 049 23/10/13 14.34 | admin     | 2023-10-13 14:34:10 | 3.14e110E5    | 78.58%    | 2.21e110E5 | 6.23e110E5 | 9.79e7   |
| <input type="checkbox"/> | 0054 | CH4 | A    | 048 day1           | admin     | 2023-10-13 14:34:10 | 3.24e110E5    | 71.82%    | 2.33e110E5 | 9.14e110E5 | 9.79e7   |
| <input type="checkbox"/> | 0053 | CH4 | D    | 047 23/10/13 14.27 | admin     | 2023-10-13 14:27:41 | 3.16e110E5    | 71.62%    | 2.24e110E5 | 6.11e110E5 | 9.79e7   |
| <input type="checkbox"/> | 0050 | CH4 | C    | 046 23/10/13 14.27 | admin     | 2023-10-13 14:27:41 | 3.24e110E5    | 71.68%    | 2.30e110E5 | 6.41e110E5 | 9.79e7   |
| <input type="checkbox"/> | 0051 | CH4 | B    | 045 23/10/13 14.27 | admin     | 2023-10-13 14:27:41 | 3.19e110E5    | 71.50%    | 2.21e110E5 | 6.01e110E5 | 9.79e7   |

| Error code      | Cause  |
|-----------------|--|
| E               | Frames with errors are over 50% of total counting frame.   |
| O               | Cells are more than $2 \times 10^7$ cells/mL.  |
| H               | Cells are more than $4 \times 10^6$ cells/mL.  |
| L               | Cells are less than $4 \times 10^5$ cells/mL.  |
| U               | Cells are less than $5 \times 10^4$ cells/mL.  |
| Error frame [#] | Frame with error that contains cells whose diameter is larger than 100µm.<br>When this error shown in result window, please check the image. |

# QC

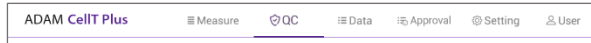
## QC Mode

The QC Mode uses QC Slide (optional) to check equipment QC status by date at a glance.

[Activation of QC mode]

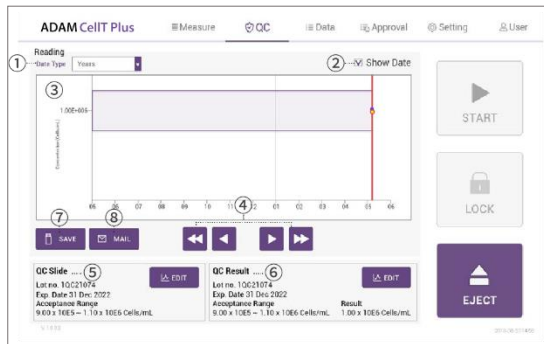
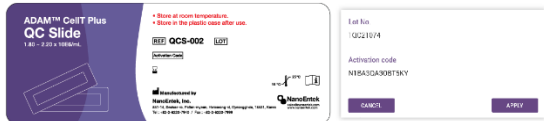
To activate 'QC' mode, an activation code must be entered.

1. Select 'QC' tab from top menu.
2. Enter lot no. and activation code. Then, click 'APPLY' button. Slide lot no. and activation code can be found on the plastic package label. See below for details.



### NOTE

A unique activation code is given for each instrument, and its authenticity can be checked by registering activation code.



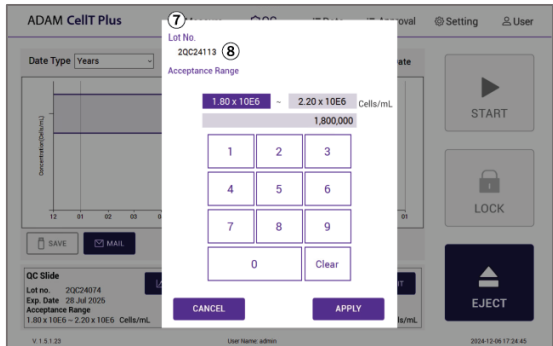
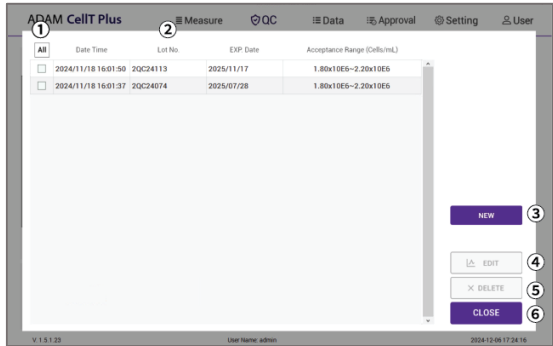
| Control buttons   | Description   |
|-------------------|---|
| ① Data Type       | QC result graph unit (Years, Months, Days, No.[Index])                                  |
| ② Show Data       | Displays the date of QC progress on the graph   |
| ③ QC Result Graph | Graph left/right (QC date, number) movement button                                      |
| ④ Arrow Button    | Graph left/right (QC date, number) movement button                                      |
| ⑤ QC Slide        | QC Slide Lot. information and editing (create, edit, delete) functions                  |
| ⑥ QC Result       | QC result information and editing (whether or not graph is displayed, deleted) function |
| ⑦ SAVE            | Saves the QC Result Report to USB   |
| ⑧ MAIL            | Sends the QC Result Report to e-mail  |

### WARNING

QC Mode must use the QC Slide (optional), and the result without using the QC Slide is unreliable.

## QC Slide Edit

The QC Mode uses QC Slide (optional) to check equipment QC status by date at a glance.

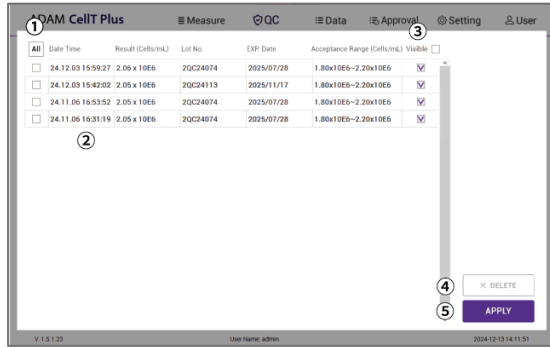


| Control buttons               | Description  |
|-------------------------------|--|
| ① All                         | The checkbox is used to activate the 'DELETE' button. Select all QC Slide lots to be deleted from the QC Slide lot list. |
| ② QC Slide List               | Provides registered QC Slide lot information list  |
| ③ New                         | Registers new QC Slide lot   |
| ④ Edit                        | Edits selected QC Slide lot  |
| ⑤ Delete                      | Deletes selected QC Slide lot  |
| ⑥ Apply/Close                 | Applies function or closes selected QC Slide lot   |
| ⑦ Lot No. (New/Edit)          | QC Slide Lot No. input field to create new or edit lot number  |
| ⑧ Acceptance Range (New/Edit) | QC Slide acceptance range input field to enter new or edit range values  |

- NOTE**
- The QC Slide lot and Acceptance Range can be found at the top of the QC Slide.
  - Expired QC Slide cannot be selected.

# QC

## QC Slide Result Edit

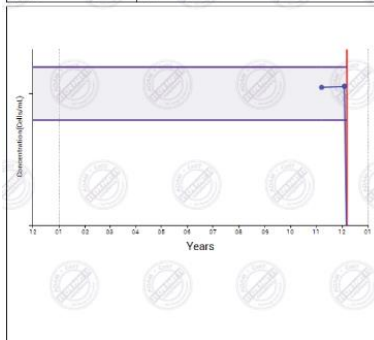


| Control buttons | Description  |
|-----------------|--|
| ① All           | The checkbox is used to activate the 'DELETE' button. Select all QC Slide lots to be deleted from the QC Slide lot list. |
| ② QC Slide List | QC result information list   |
| ③ Visible       | Selects all QC result to display graph from the QC result List.  |
| ④ Delete        | Deletes selected QC result   |
| ⑤ Apply/Close   | Applies visible function or closes QC result   |

## QC Slide Result

QC result acceptance criteria:

|                             |  |
|-----------------------------|--|
| Experiment Date Time:       | 2024-12-06, 05:21 PM                                 |
| Slide Lot:                  | 20C24113   |
| Exp. Date:                  | 17 Nov 2025  |
| Acceptance Range:           | 1.60x10 <sup>5</sup> – 2.20x10 <sup>5</sup> Cells/mL |
| Acceptance Slide Peak Size: | 13–16 $\mu$ m  |
| Concentration:              | 6.94x10 <sup>5</sup> Cells/mL                        |
| Slide Peak Size:            | 12 / 12 $\mu$ m                                      |
| Result:                     | Fail   |



•The QC Slide result acceptance criteria include the acceptance range (different for each QC Slide lot) and the acceptance slide peak size (13 ~ 16  $\mu$ m)

### ! NOTE

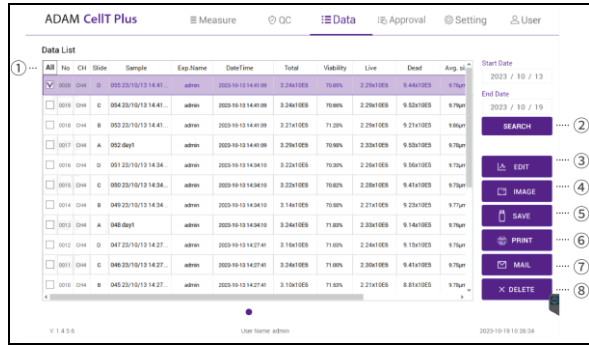
- The acceptance range of the selected QC slide lot is displayed on the graph as a purple area.
- Acceptance slide peak size results can be found in the ADAM™ CellIT Plus Test report.

### ! WARNING

Contact sales@nanoentek.com or your local distributor if the QC result does not come within the acceptance criteria.

# Data

## Data list



| Control buttons           | Description  |
|---------------------------|--|
| ① <b>All</b>              | Select all data in Data List.  |
| ② <b>SEARCH</b>           | Display the data of the selected date.   |
| ③ <b>EDIT</b>             | View and edit the data.<br>Multiple data can be edited with the same settings.             |
| ④ <b>IMAGE</b>            | Check the cell images of each channel.   |
| ⑤ <b>SAVE</b>             | Save the selected data to USB (PDF, Excel, Image).   |
| ⑥ <b>PRINT (optional)</b> | Prints the selected data.  |
| ⑦ <b>MAIL</b>             | Send the Excel, PDF, and Image files of selected data to e-mail. Delete the selected data. |
| ⑧ <b>DELETE</b>           | Delete the selected data.  |

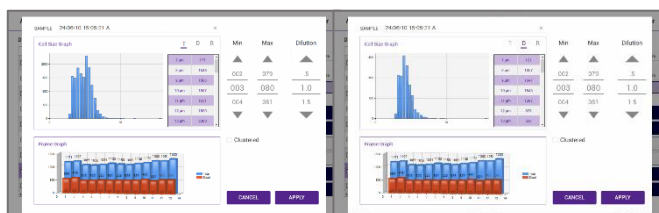
① **NOTE**  
*'PRINT' button will be automatically activated when portable printer (optional) is connected.*

# Data

## EDIT



| Control buttons     | Description  |
|---------------------|--|
| ① Sample            | Edit the sample name.  |
| ② Cell size graph   | Allows to view the cell size graph for each channel.   |
| ③ Cell size table   | Allows to view the number of cells in each cell size.<br>T=Total cell (AO), D=Dead cell (DAPI), R=Real cell size(Bright) |
| ④ Cell size setting | Set the min/max size of the cell.  |
| ⑤ Dilution Factor   | Set the dilution factor of sample.<br>(Factor values for the Cell viability reagent is already applied.)                 |
| ⑥ Frame graph       | Allows to view the counted cell number of each frame.  |

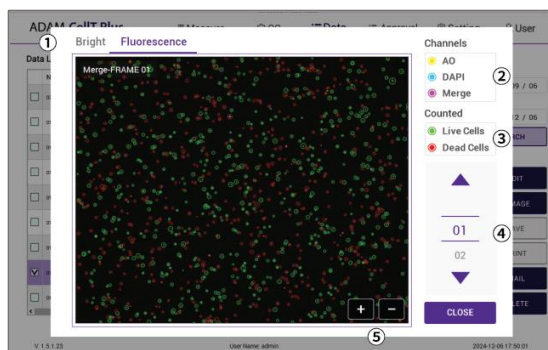


### ① NOTE

After measurement, size range adjustment is available only in the R channel when Bead mode or Real size mode is selected. If neither mode is selected, adjustment is only available in the T (AO) channel. Cells excluded by the size range adjustment are highlighted with yellow squares in the image.

# Data

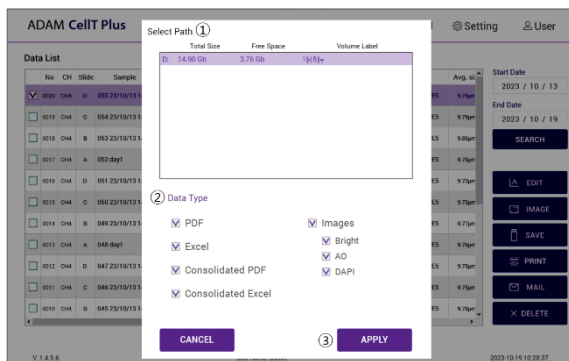
## IMAGE



| Control buttons | Description  |
|-----------------|--|
| ① Channel       | Select images measured in bright field and fluorescence channel. |
| ② Original      | Turn on/off AO, DAPI, and Merge to check channel image.          |
| ③ Counted       | Turn on/off Live, Dead cells to check counted cell image.        |
| ④ Frame         | Select a frame number of the channel.                            |
| ⑤ Zoom-in/out   | Zoom in and out to check the cell image.                         |

# Data

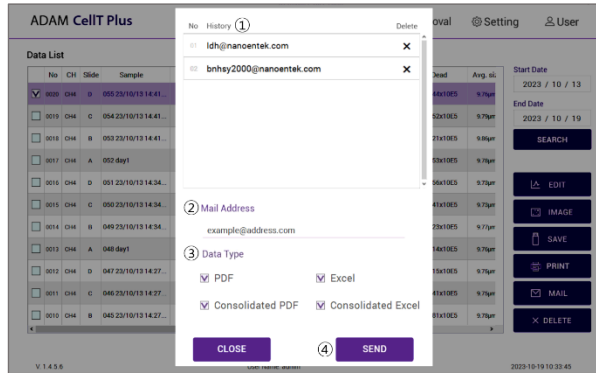
## SAVE



| Control buttons | Description   |
|-----------------|---|
| ① Select Path   | Selects a save path from the list to send the selected data.                                    |
| ② Data Type     | Selects which data type to save.  |
| ③ Apply         | Exports the files to a selected save path<br>Files can be sent to only one save path at a time. |

# Data

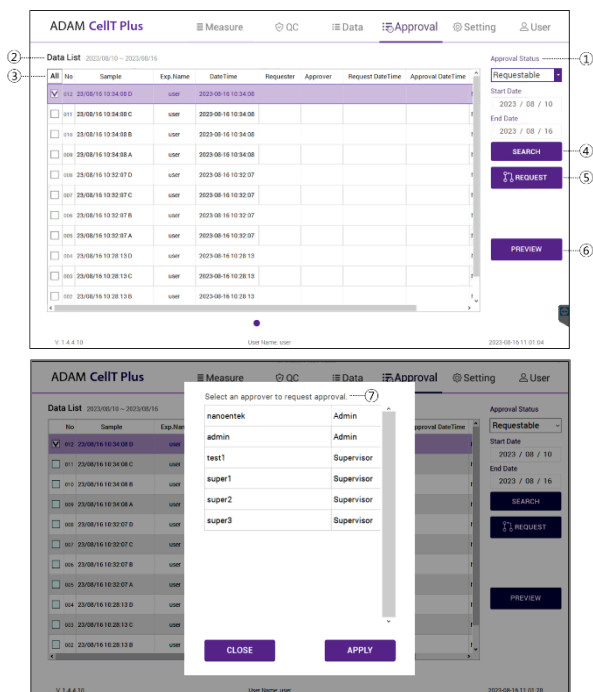
## MAIL



| Control buttons | Description   |
|-----------------|---|
| ① History       | Selects e-mail address from the list to send data<br>The e-mail address where data has been sent will be saved. |
| ② Mail Address  | To send files to new e-mail, enter the applicable e-mail address.   |
| ③ Data Type     | Selects which data type to send via e-mail  |
| ④ Send          | Send the files to a selected e-mail address.<br>Files can be sent to only one e-mail at a time.                 |

# Approval

## Requestable



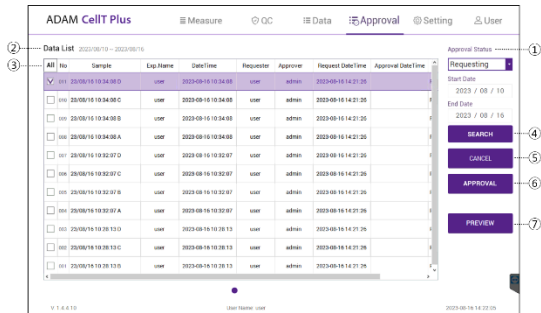
| Control buttons   | Description   |
|-------------------|---|
| ① Approval Status | Settings tab related to data approval such as Requestable, Requesting, Approvable, and Approved.                |
| ② Data List       | List of data that can check status information related to approval.   |
| ③ All             | Select all data in Data List  |
| ④ Search          | Display the data of the selected date.  |
| ⑤ Request         | Request approval of selected data.  |
| ⑥ Preview         | Select Preview to check the results before approval or requesting approval. (Providing preview in a PDF format) |
| ⑦ Select approval | Select an approval to request approval.   |

### NOTE

- Approval can only be done by an approver who has been granted Approval authority in the Privilege setting.
- Approved data displays approval status on Data Tab. (Approval: O / Approval in progress: Δ / Not approved X).
- Data in the process of approval cannot be edited or deleted.
- Approved data cannot be edited.

# Approval

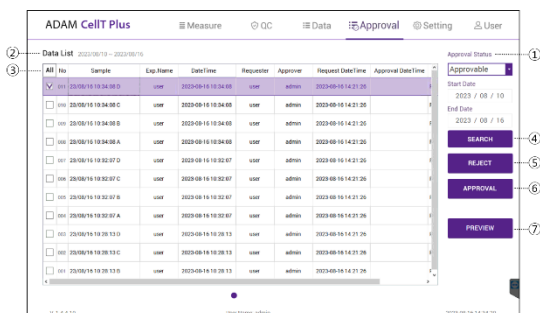
## Requesting



| Control buttons          | Description   |
|--------------------------|---|
| ① <b>Approval Status</b> | Settings tab related to data approval such as Requestable, Requesting, Approvable, and Approved.                |
| ② <b>Data List</b>       | List of data that can check status information related to approval.   |
| ③ <b>All</b>             | Select all data in Data List  |
| ④ <b>Search</b>          | Display the data of the selected date.  |
| ⑤ <b>Cancel</b>          | Cancel approval of selected data in the process of approval.  |
| ⑥ <b>Approval</b>        | Direct approval by only entering the approver's password without approver login.                                |
| ⑦ <b>Preview</b>         | Select Preview to check the results before approval or requesting approval. (Providing preview in a PDF format) |

# Approval

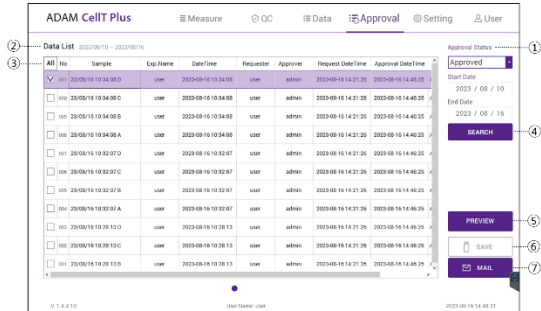
## Approvable



| Control buttons   | Description  |
|-------------------|--|
| ① Approval Status | Settings tab related to data approval such as Requestable, Requesting, Approvable, and Approved. |
| ② Data List       | List of data that can check status information related to approval.                              |
| ③ All             | Select all data in Data List   |
| ④ Search          | Display the data of the selected date.   |
| ⑤ Reject          | Reject approval of selected data in the process of approval.                                     |
| ⑥ Approval        | Approval of the data selected during the approval process.                                       |
| ⑦ Preview         | Select Preview to check the approvable approval results. (Providing preview in a PDF format.)    |

# Approval

## Approved



| Control buttons   | Description  |
|-------------------|--|
| ① Approval Status | Settings tab related to data approval such as Requestable, Requesting, Approvable, and Approved. |
| ② Data List       | List of data that can check status information related to approval.                              |
| ③ All             | Select all data in Data List   |
| ④ Search          | Display the data of the selected date.   |
| ⑤ Preview         | Select Preview to check approved results. (Providing preview in a PDF format)                    |
| ⑥ SAVE            | Save the selected approved data to USB.  |
| ⑦ MAIL            | Send the selected approved data to e-mail.   |

# Approval

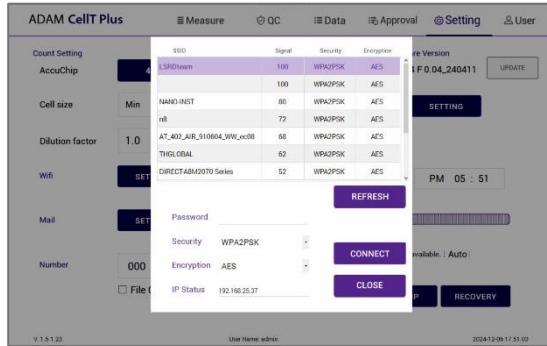
## Setting



| Control buttons            | Description   |
|----------------------------|---|
| ① AccuChip                 | Select AccuPlus slide type (2ch, 4ch) to use.   |
| ② Cell size                | Set default values of cell size.  |
| ③ Dilution factor          | Set default values of dilution factor.  |
| ④ Wifi                     | Sets the Wi-Fi to use the e-mail or remote support function.                              |
| ⑤ Remote                   | Connects to remote support software.  |
| ⑥ Mail                     | For the sender's email address, DO NOT change the setting in mail.                        |
| ⑦ Number                   | Using the data list counter function, select auto-numbering in the title.                 |
| ⑧ Update                   | Updates firmware or software through USB. (Refer to page 37)                              |
| ⑨ Auto Logout              | Sets auto logout time. (Refer to page 37)   |
| ⑩ Date & Time              | Sets current date and time.   |
| ⑪ Capacity                 | Checks remaining capacity.  |
| ⑫ Data Backup              | Allows to view the storage path of additional data backup.                                |
| ⑬ Backup                   | Sets backup (automatic, manual) function. (Refer to page 37)                              |
| ⑭ Recovery                 | Runs recovery (automatic, manual) function. (Refer to page 38)                            |
| ⑮ Auto Backup Informations | Allows to view the working automatic backup information.<br>(Sync=O, SDMS=-, Sync+SDMS=○) |

# Setting

## Wifi



1. Click the 'Refresh' button.
2. Select the wifi.
3. Insert the password of selected wifi.
4. Click the 'Connect' button.

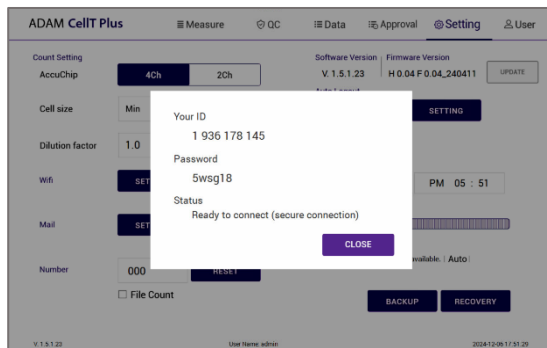
! **CAUTION**

*If connection error occurs, please contact a laboratory facility manager.*

! **NOTE**

*In PC Mode, please use internet (Windows).*

## Remote support



1. Connect to wifi.
2. Click 'Remote support' button.
3. Share your ID and password to NanoEntek.

! **NOTE**

*The remote support feature is to be used for maintenance only by request of NanoEntek.*

! **WARNING**

*If you do not see your Remote Support ID and Password, click the 'Close' and 'Remote Support' button again until they appear.*

# Setting

## Update

1. Prepare the USB with update file.
2. Insert the USB.
3. Click the UPDATE button.

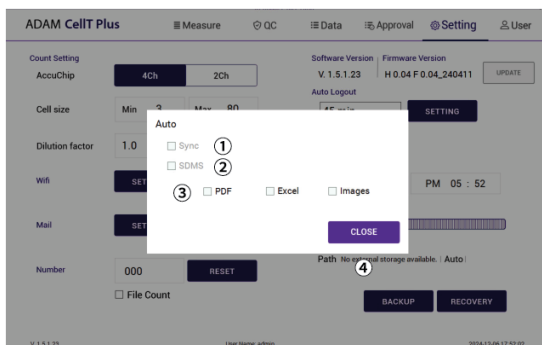
### ! CAUTION

- The 'AdamUpdate' folder must exist in the root path of the USB folder.
- ADAM™ CellIT Plus can be updated only when the firmware or software file exists in the 'AdamUpdate' folder. The 'ADAM™ CellIT Plus.exe' file should be in the 'AdamUpdate' folder.
- Do not rename the 'AdamUpdate' folder. The folder name should be 'AdamUpdate'.

## Auto logout

## Backup

The auto logout time when not in use can be set to 5, 15, 30, 45, or 60 minutes.



| Control buttons | Description   |
|-----------------|---|
| ① Auto-Sync     | Real-time automatic backup of counted data required for automatic recovery                                    |
| ② Auto-SDMS     | Real-time automatic backup of counted data required for SDMS (Scientific Data Management System) interworking |
| ③ Manual        | To manually back up the counted data required for manual recovery   |
| ④ Close         | Applies function to the selected lists.   |

### ! NOTE

Auto-SDMS backup is available only for approved data.

### ! CAUTION

Please be cautious as data may be lost when Auto Backup (Sync) is turned off.

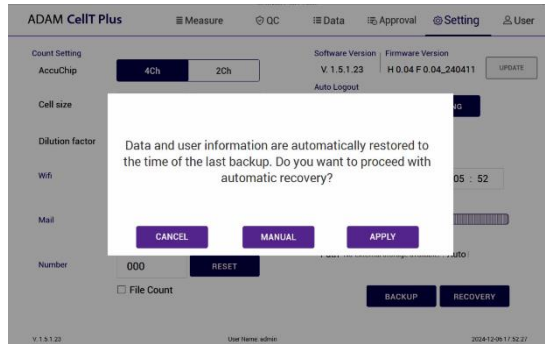
### ! WARNING

- DO NOT remove an external hard drive for backup at any time as it may cause data loss.
- If you change backup data path, auto backup function becomes inactive. DO NOT change data path as it may cause backed up data loss.

We are NOT responsible for such error or problem mentioned above.

# Setting

## Recovery



- Restore counted data to the point of the last automatic backup (Sync).
- Manual recovery restores manually backup counted data.

! **NOTE**

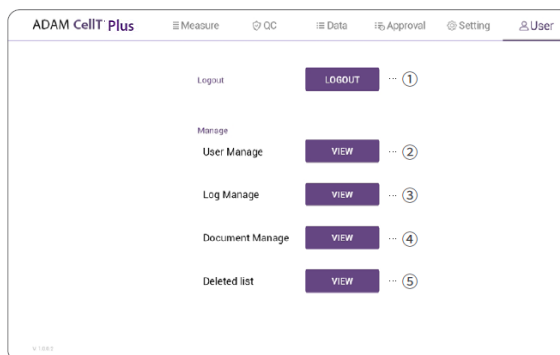
*The automatic backup function is turned off after recovery, please re-enable the automatic backup function.*

! **CAUTION**

*Please be careful with manual recovery, because counted data that is not manually backed up will be lost.*

# User

## User



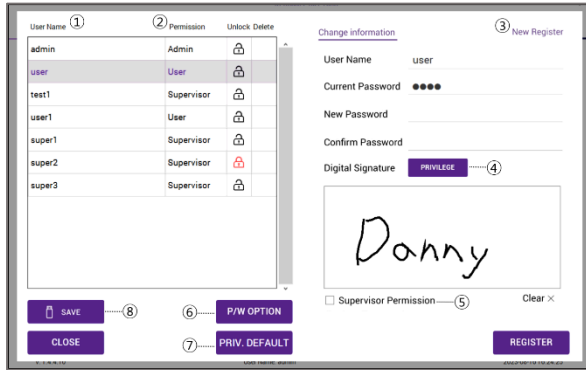
| Control buttons   | Description                                    |
|-------------------|--|
| ① Logout          | To logout                                      |
| ② User manage     | To register a user and modify account settings |
| ③ Log manage      | Tracks user access records                     |
| ④ Document manage | Tracks management document records             |
| ⑤ Deleted list    | Tracks deleted data records                    |

*ADAM™ CellIT Plus provides a comprehensive solution to comply with the requirements of the 21 CFR Part 11 rule.*

*Please see the appendix for more information on these features.*

# User

## User manage

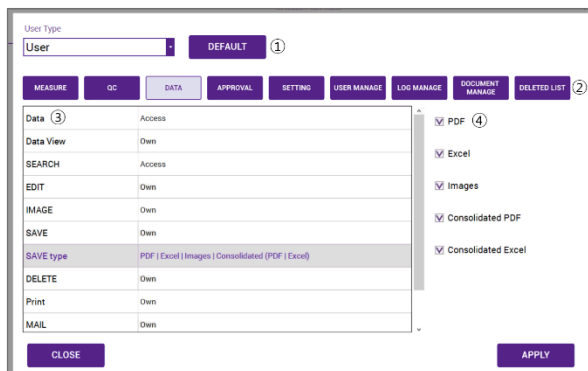


| Control buttons         | Description  |
|-------------------------|--|
| ① User Name             | To view the registered user list.                                    |
| ② Permission            | To view the user access authority                                    |
| ③ New Registration      | To register new user   |
| ④ Privilege             | Option for permission setting  |
| ⑤ Supervisor Permission | To register as a supervisor  |
| ⑥ Password Option       | To set password  |
| ⑦ Privilege Default     | Option for default permission setting (supervisor, User)             |
| ⑧ Save                  | Download the permissions of users in the user list as an Excel file. |

# User

## Privilege

The Admin can grant or release access to functions when creating or editing new users (Supervisor, User).



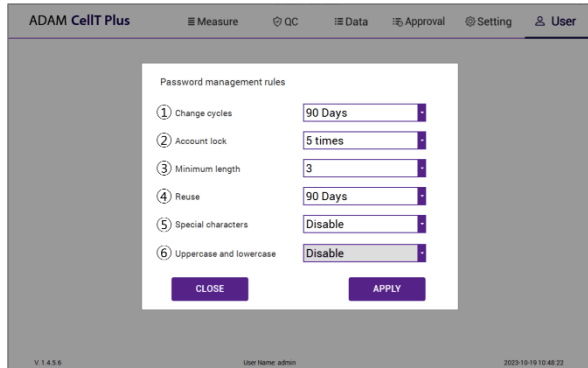
| Control buttons                  | Description  |
|----------------------------------|--|
| ① <b>User Type &amp; Default</b> | Selects account level and sets default permissions     |
| ② <b>Tab</b>                     | Tab for permission Settings                            |
| ③ <b>Function list</b>           | Detailed functions for each permission setting tab     |
| ④ <b>Detailed function</b>       | List of possible permission settings for each function |

### ! **NOTE**

Granting basic access rights for each user (For the default access rights for each user, refer to the ADAM™ CellT Plus SW 21 CFR PART11 requirement support appendix).

# User

## Password Option

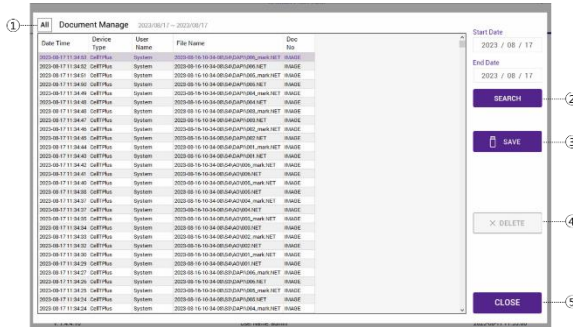


| Control buttons                  | Description   |
|----------------------------------|---|
| ① <b>Change cycles</b>           | Set password change interval (30, 90, 180 days).  |
| ② <b>Account lock</b>            | Number of incorrect passwords in account lockout ( $\leq 3, 5, 10, 15$ ).                             |
| ③ <b>Minimum length</b>          | Minimum length of password ( $\leq 3, 5, 10, 15$ ).   |
| ④ <b>Reuse</b>                   | Prohibition of using the same password for a certain period of time ( $\leq 30, 90, 180, >180$ days). |
| ⑤ <b>Special characters</b>      | Use at least one special character.   |
| ⑥ <b>Uppercase and lowercase</b> | Use at least one uppercase letter.  |



# User

## Document manage

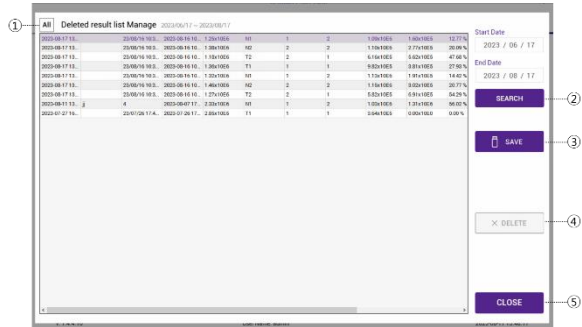


| Control buttons | Description                            |
|-----------------|--|
| ① <b>ALL</b>    | Select all data in Data List.          |
| ② <b>SEARCH</b> | Display the data of the selected date. |
| ③ <b>SAVE</b>   | Save the selected data to USB.         |
| ④ <b>DELETE</b> | Delete the selected data.              |
| ⑤ <b>CLOSE</b>  | Close the document manage.             |

**NOTE**  
*The search period is limited to 90 days (Except PC Mode).*

# User

## Deleted list




| Control buttons | Description                            |
|-----------------|--|
| ① All           | Select all data in Data List.          |
| ② SEARCH        | Display the data of the selected date. |
| ③ SAVE          | Save the selected data to USB.         |
| ④ DELETE        | Delete the selected data.              |
| ⑤ CLOSE         | Close the deleted list.                |

### ! NOTE

The search period is limited to 90 days (Except PC Mode).

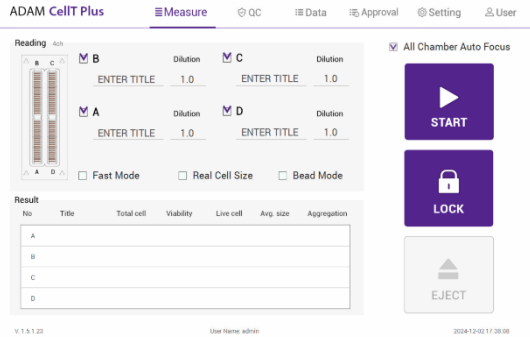
# Power off

## Lock

Press  LOCK before turning off the device.

If there is no operation for 1 minute, the lock function will be activated automatically.

When the device is locked, the screen will be changed as shown below.



## Power off

If you press the power button 2~3 seconds, then 'Slide to shut down your PC' message will appear. Slide down the screen to turn off the power.



### **NOTE**

*In PC mode, press the 'X button (quit)' to turn off the power.*

# Maintenance and cleaning

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## Maintenance and cleaning

1. ADAM™ CellIT Plus does not need regular maintenance.
2. ADAM™ CellIT Plus has no replacement of consumable materials.
3. Please clean the exposed surface of ADAM™ CellIT Plus frequently or before testing, using a soft cloth and isopropyl alcohol or deionized water.

**ⓘ CAUTION**

*Dispose of wipes in an appropriately labeled solvent contaminated waste container.*

# Trouble shooting

## Trouble shooting

| Problem  | Description  | Solution   |
|--|--|--|
| <b>ADAM™ CellIT Plus does not power up</b>   | <ul style="list-style-type: none"> <li>No power from outlet</li> <li>Bad power cord.</li> </ul>  | <ul style="list-style-type: none"> <li>Check power source.</li> <li>Replace.</li> </ul>  |
| <b>Inaccurate result</b>   | <ul style="list-style-type: none"> <li>Cell number may be out of range.</li> <li>Cell viability reagent has expired.</li> <li>Too high clumped cells.</li> </ul> | <ul style="list-style-type: none"> <li>Adjust the number of cells to recommended concentration (refer to page 50).</li> <li>Discard Cell viability reagent that have expired. Purchase the Cell viability reagent (refer to page 50).</li> <li>Try again after vortexing the cells.</li> </ul> |
| <b>When error message is shown</b><br>(For information on each error message, see page 20) | <ul style="list-style-type: none"> <li>When frames with errors are over 50% of total counting frame. (Error message: E)</li> </ul>                               | <ul style="list-style-type: none"> <li>Check the suspension of cells if all cells are fully dissociated into single cells.</li> <li>If contaminants except cells are found, prepare sample again.</li> </ul>   |
|  | <ul style="list-style-type: none"> <li>High concentration of cells (Error message: H)</li> <li>Over detection range (Error message: O)</li> </ul>                | <ul style="list-style-type: none"> <li>Check if concentration of cell is too high.</li> <li>Dilute the sample and count again.</li> </ul>  |
|  | <ul style="list-style-type: none"> <li>Low concentration of cells (Error message: L)</li> <li>Under detection range (Error message: U)</li> </ul>                | <ul style="list-style-type: none"> <li>Check if concentration of cell is too low.</li> <li>Use concentrated sample and count again.</li> </ul>   |

# Warranty

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## Warranty

If any defects occur in the ADAM™ CellIT Plus during one (1) year warranty period, NanoEntek will repair or replace the defective parts at its discretion without charge. The following defects, however, are specifically excluded:

1. Defects caused by improper operation.
2. Repair or modification done by anyone other than NanoEntek or an authorized agent.
3. Damage caused by substituting alternative parts.
4. Use of fittings or spare parts supplied by anyone other than NanoEntek.
5. Damage caused by accident or misuse.
6. Damage caused by disaster.
7. Corrosion caused by improper solvent or sample.

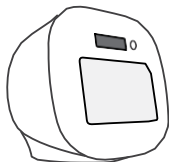
For your protection, items being returned must be insured against possible damage or loss. NanoEntek cannot be responsible for damage incurred during shipment of a repair instrument. It is recommend that you save the original packing material in which the instrument was shipped. This warranty should be limited to the replacement of defective products.

For any inquiry or request for repair service,  
Contact [sales@nanoentek.com](mailto:sales@nanoentek.com) or your local distributor.

For extended warranty purchase, contact [sales@nanoentek.com](mailto:sales@nanoentek.com).

# Technical specifications

## Technical Specifications



| ADAM™ CellIT Plus    |   |
|----------------------|---|
| Measuring range      | $5 \times 10^4 - 2 \times 10^7$ cells/mL            |
| Optimal range        | $4 \times 10^5 - 4 \times 10^6$ cells/mL            |
| Analysis time*       | Please refer to following table.                    |
| Voltage              | DC12V   |
| Current              | 5A  |
| Objective lens       | 4 X   |
| LED                  | Green, Blue, UV                                     |
| Camera               | CMOS camera   |
| Filter               | Excitation filter, Dichroic filter, Emission filter |
| Weight               | 7 kg  |
| Size (WxLxH)         | 277 x 276 x 270 mm                                  |
| Degree of protection | IPX0  |

### ► Analysis time\*

| Mode (channel)                   | All Chamber Auto Focus (on) | All Chamber Auto Focus (off) | Captured Frames |
|----------------------------------|-----------------------------|------------------------------|-----------------|
| Bead mode (BF/AO/DAPI)           | 8 min/slide                 |                              | 13 frames       |
| Accuracy mode (AO/DAPI, Default) | 3 min 30 sec/slide          | 1 min 30 sec/slide           | 13 frames       |
| Real + Accuracy (BF/AO/DAPI)     | 6 min 30 sec/slide          | 5 min/slide                  | 13 frames       |
| Fast mode (AO/DAPI)              | 3min/slide                  | 1 min/slide                  | 6 frames        |

### Operating environment condition

|             |   |
|-------------|---|
| Temperature | $5\text{ °C} \leq \text{Temperature} \leq 40\text{ °C}$ |
| Humidity    | $20\% \leq \text{Humidity} \leq 80\%$                   |
| Altitude    | Altitude $\leq 2,000$ m                                 |



| AccuPlus Slide        |                  |
|-----------------------|------------------|
| Loading sample vol.   | 15 $\mu$ L/test  |
| Measuring sample vol. | 3.2 $\mu$ L/test |

### Solutions

|                        |                |
|------------------------|----------------|
| Cell viability Reagent | 20 mL / bottle |
|------------------------|----------------|

### Storage temperature

|                        |           |
|------------------------|-----------|
| AccuPlus Slide         | 0 ~ 30 °C |
| Cell viability reagent | 2 ~ 8 °C  |

### Expiration date

|                        |                                  |
|------------------------|----------------------------------|
| AccuPlus Slide         | 2 years                          |
| Cell viability reagent | 1 year<br>2 months after opening |

# Product list

## Product list

| Cat. No.                | Description               | Contents  |
|-------------------------|---------------------------|---|
| <b>ADAM CellIT Plus</b> | Fluorescence cell counter | <ul style="list-style-type: none"><li>• Main device</li><li>• User manual</li></ul>   |
| <b>APAD-400</b>         | Cell viability reagent    | <ul style="list-style-type: none"><li>• 20 ml x 1 bottle (400 Tests):<br/>Acridine orange (AO) &amp; 4',6-diamidino-2-phenylindole (DAPI) stain</li></ul> |
| <b>AP4S-100</b>         | AccuPlus Slide 4ch.       | <ul style="list-style-type: none"><li>• 4ch. Slide 100ea</li></ul>  |

## ► Accessories

| Cat. No.       | Description         | Q'ty |
|----------------|---------------------|------|
| <b>QCS-002</b> | QC slide (Optional) | 1    |

# Safety precautions

Review and follow the safety instructions below:

- If water or other material enters the instrument, the adaptor, or power inlet, disconnect the power cord and contact a service person. For operating environment, refer to Product Specifications.
- Do not touch the main plug or power cord with wet hands.
- Always ensure that the power supply input voltage matches the voltage available at your location.
- This instrument is air-cooled and its surfaces may become hot during operation. When installing, leave a space of more than 10 cm (4 inches) around the instrument and do not place any objects between the instrument and walls.
- Do not install an instrument on a slant or a place prone to vibrations, which induces the risk of malfunction or damage of the instrument.
- Never insert any objects into the air vents of the instrument as this can result in electric shock, personal injury, and equipment damage.
- Plug the power cord firmly into the wall outlet and AC adapter.
- To avoid potential shock hazard, make sure that the power cord is properly grounded.
- Be sure to position the instrument such that it is easy to disconnect.
- Turn off an instrument before unplugging the power cord and/or moving the instrument.
- If an instrument is dropped or broken, disconnect the power cord and contact a service person. The warrant will be void in case of disassembly.
- Use only authorized accessories (adaptor, power cord, and USB drive).



## **WARNING**

***Class A equipment is intended for use in an industrial environment. In the documentation for the user, a statement shall be included drawing attention to the fact that there may be potential difficulties in ensuring electromagnetic compatibility in other environments, due to conducted as well as radiated disturbances.***

# Mesures de sécurité

Examiner et suivre les instructions en matière de sécurité ci-dessous:

- Si de l'eau ou d'autres matières entrent dans l'instrument, l'adaptateur, ou l'entrée de la prise, débrancher le cordon d'alimentation et contacter un technicien de service. Pour l'environnement d'exploitation, se reporter aux Spécifications du Produit.
- Ne pas toucher la prise principale ou le cordon d'alimentation avec les mains mouillées.
- S'assurer toujours que la tension d'alimentation correspond à la tension disponible à votre localisation.
- Cet instrument est refroidi à l'air et ses surfaces peuvent devenir chaudes pendant le fonctionnement. Lors de l'installation, laisser un espace de plus de 10 cm (4 pouces) autour de l'instrument et ne placer aucun objet entre l'instrument et les murs.
- Ne pas installer d'instrument sur une pente ou un endroit sujet aux vibrations, qui entraînent un risque de défaillance ou de détérioration de l'instrument.
- Ne jamais insérer d'objets dans les événements d'air de l'instrument, car cela peut causer des chocs électriques, des blessures corporelles et des dommages de l'instrument.
- Mettre le cordon d'alimentation fermement dans la prise murale et l'adaptateur courant alternatif.
- Pour éviter tout risque de choc, s'assurer que le cordon d'alimentation est correctement mis à la terre.
- S'assurer de positionner l'instrument de telle sorte qu'il soit facile à débrancher.
- Éteindre l'instrument avant de débrancher le cordon d'alimentation et/ou de le déplacer.
- En cas de chute ou de rupture d'un instrument, débrancher le cordon d'alimentation et contacter un technicien de service. La garantie sera annulée en cas de démontage.
- Utiliser uniquement les accessoires autorisés (adaptateur, cordon d'alimentation et clé USB).














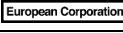
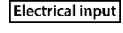


## **AVERTISSEMENT**








***L'équipement de classe A est destiné à être utilisé dans un environnement industriel. Dans la documentation pour l'utilisateur, une déclaration doit être incluse pour attirer l'attention sur le fait qu'il peut y avoir des difficultés à assurer la compatibilité électromagnétique dans d'autres environnements, en raison de perturbations aussi bien conduites que radiées.***

# Safety symbols

## Safety symbols

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

| Symbol  | Meaning  |
|---|--|
|    | Caution & Warning  |
|    | Protective earth (Ground)  |
|    | Power On/Off   |
|    | The moving parts symbol indicates areas of the medical device in which moving parts can cause injuries. Do not operate the medical device with the door open.  |
|    | This instrument has been tested and found to comply with the limits for a Class A digital medical device, pursuant to Part 15 of the FCC Rules.<br><br>These limits are designed to provide reasonable protection against harmful interference when the instrument is operated in a commercial environment. This instrument generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this instrument in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense. |
|    | This instrument and consumables conforms to the EC Declaration of Conformity.  |
|    | USB Connection   |
|    | This product conforms to UL 61010-1, CAN/CSA C22.2 No.61010-1 "Safety Requirements for Electrical Instrument for Measurement, Control, and Laboratory Use, Part I: General Requirements." This instrument bearing the TÜV symbol are certified by TÜV Product Services to be in conformance with the applicable safety standard for the US and Canada.   |
|    | Catalogue number/Reference number  |
|    | Serial number  |
|    | Manufacturer   |
|    | European Corporation   |
|    | Electrical input   |
|    | US Corporation   |
| <br><a href="http://www.nanosentek.com/eLFU.php">www.nanosentek.com/eLFU.php</a> | Consult Instructions for Use<br>An electronic instructions for us (eLFU) indicator (website address) may accompany the symbol when used to indicate an instruction to consult an eLFU.   |

|   |  |
|---|--|
|  | <p>Disposal of your old appliance</p> <ol style="list-style-type: none"> <li>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.</li> <li>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.</li> <li>3. The correct disposal of your old appliance will help prevent potential negative consequences for the environment and human health.</li> <li>4. For more detailed information about disposal of your old appliance, please contact local distributor, waste disposal service or call the number listed in the manual.</li> </ol> |
|  | <p>LED</p>   |
|  | <p>Physician.<br/>Keep dry<br/>Keep away from rain</p>   |
|  | <p>Fragile, handle with care</p>   |
|  | <p>This way up</p>   |
|  | <p>General symbol for recover/recyclable</p>   |
|  | <p>Team lift</p>   |
| <p><b>US Corporation</b></p>  | <p>US Corporation</p>  |
| <p><b>EC REP</b></p>  | <p>Authorized representative in the European community</p>   |
| <p><b>UK Representative</b></p>   | <p>Authorized representative in United Kingdom</p>   |
| <p><b>CH REP</b></p>  | <p>Authorized representative in Switzerland</p>  |
| <p><b>BRH</b></p>   | <p>Authorized representative in Brazil</p>   |

# Warnings

## Warning

### 1. After using device, please turn off main power.

If not, it may cause malfunction or may reduce product life.

### 2. When turning off the device, be sure to lock the device with Lock button.

If not, it may cause mechanical problem or error message when device is booting.

| Item                  | Warning   |
|-----------------------|---|
| Battery inside device | <ul style="list-style-type: none"><li>• Risk of explosion if battery is replaced incorrectly.</li><li>• This battery is not replaceable by user. Refer to an authorized service person.</li></ul>   |
| Cover                 | <ul style="list-style-type: none"><li>• Do not remove cover or dissemble case. There are no adjustable components inside the instrument.</li><li>• If a malfunction is found, refer to an authorized service person.</li></ul>  |
| Manual                | <ul style="list-style-type: none"><li>• Do not attempt to service the equipment.</li><li>• This manual is only available in English.</li><li>• Failure to heed warnings may result in injury to service provider or operator.</li></ul>   |
| Sample handling       | <ul style="list-style-type: none"><li>• Wear personal protective equipment during sampling and testing.</li><li>• Sample may contain infectious or bio-hazardous agents.</li><li>• Use capped tubes and lint free wipes. Lint free wipes to be used one time and discarded.</li></ul> |
| Waste                 | <ul style="list-style-type: none"><li>• After using AccuPlus Slide, appropriately dispose as bio-hazardous waste.</li><li>• Do not reuse AccuPlus Slide.</li></ul>  |

# Technical support

Visit our Website at [www.nanoentek.com](http://www.nanoentek.com) for:



- Technical resources, including manuals, FAQs, etc.
- Technical support contact information
- Additional product information and special offers

For more information or technical assistance, please call or email.

## **NanoEntek, Inc.**

851-14, Seohae-ro, Paltan-myeon, Hwaseong-si,  
Gyeonggi-do, 18531, Korea  
Tel: +82-2-6220-7940  
Fax: +82-2-6220-7999

## **NanoEntek America, Inc.**

220 Bear Hill Road, Suite 102, Waltham, MA 02451, USA  
Tel: +1-781-472-2558  
Fax: +1-781-790-5649

## **Email**

[sales@nanoentek.com](mailto:sales@nanoentek.com)

## **Website**

[www.nanoentek.com](http://www.nanoentek.com)

# ADAM™ CellT Plus

NESMU-ACTP-001E (V.1.0)



## **NanoEntek, Inc.**

851-14, Seohae-ro, Paltan-myeon, Hwaseong-si  
Gyeonggi-do, 18531, Korea  
Tel: +82-2-6220-7940  
Fax: +82-2-6220-7999

### **US Corporation**

#### **NanoEntek America, Inc.**

220 Bear Hill Road, Suite 102, Waltham, MA 02451, USA  
Tel: +1-781-472-2558  
Fax: +1-781-790-5649

### **European Corporation**

#### **NanoEntek Europe | med-tech supplies GmbH**

Lochhamerstr. 4a, 82152 Martinsried, Germany  
Tel: +49-89-21-55-38-43 / Fax: +49-89-99-95-46-60

#### **E-mail**

[sales@nanoentek.com](mailto:sales@nanoentek.com)

#### **Website**

[www.nanoentek.com](http://www.nanoentek.com)