CE

ADAM SCC2

Automated Somatic Cell Counter

Instruction Manual

NanoEntek

ADAM-SCC2 Instruction Manual
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The information in this manual is described as accurately as possible.
Firmware and software changes and updates may change without prior consent or notification.

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V.1.0 DEC 2019
V.1.1 OCT 2021
V.1.2 DEC 2022

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General Description

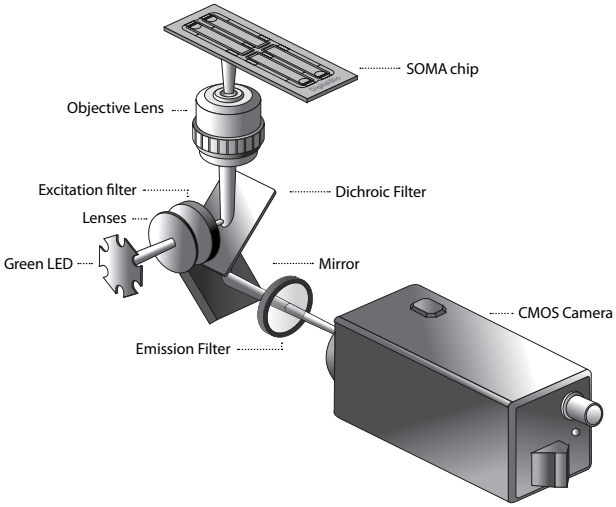
ADAM-SCC2 is an automated somatic cell counter integrated with fluorescence optic and image analysis software. ADAM-SCC2 counts the number of somatic cells to determine the quality of raw milk with unique image cytometer technology. ADAM-SCC2 can be used as an ideal equipment in the research field, dairy farms, milk manufacturing facilities, and veterinary institutes working with somatic cell analysis. It will be helpful to manage the milk quality to provide the best grade of milk.

Technology

High levels of somatic cells cause disagreeable taste and reduce storage life in dairy products. These somatic cell counts (SCCs) are accepted as an international standard for the measurement of milk quality. For this reason, somatic cell counts are readily available to a dairy farmer in most countries.

Standard reference method for enumeration of somatic cells in raw milk is the direct microscopic somatic cell count (DMSCC). However, it needs the training and skill of analysts for accuracy, precision, and reproducibility of this method. ADAM-SCC2 is fully compatible with the DMSCC. It is composed of the disposable plastic microchips and staining solutions, a fluorescence microscopic optics equipped with a CMOS camera, and an image analysis system. It utilizes the capillary flow of the microfluidic chamber by the surface modification of hydrophilicity. Microfluidic technology of disposable microchips provides low reagent consumption and combining with the ready-to-use reagent makes daily work easy.

ADAM-SCC2 is not only easy to use but offers the same repeatability and accuracy as the conventional expensive device.



Somatic Cell Count Kit

Somatic Cell Count Kit of ADAM-SCC2 is composed of Propidium Iodide (PI) for counting somatic cells. It can be used without diluting raw milk.

Measuring range of cell density is 0.05 ~ 1.15 x 10^6 cells/mL.

Each SCC-Solution has 25 mL reagent of somatic stain solution. Simply add 100 µL volume of the raw milk sample and 100 µL stain solution in the 1.5 mL tube. Once the experiment is complete the results can be printed through the optional thermal print. Printed number indicates cell concentration (x 1000/mL) in each channel.

- SOMA Chip 2X : Load 23 µL/Channel, 2 test/Chip
- SOMA Chip 4X : Load 13 µL/Channel, 4 test/Chip

Store kit box upright and at room temperature. Expiration date of stain solution is written on the bottom of the kit box (yy-mm-dd). Be sure to check the expiration date before using. Follow the exact steps detailed in the Instructions for Use section.

ADAM-SCC2

The contents of the ADAM-SCC2 are listed below:

Item	Quantity
Main device	**1**
Instruction manual	**1**
USB hub	**1**
Wifi dongle	**1**
Power cord	**1**
Adapter	**1**
SOMA Chip Kit	**1**
Calibration Bead	**1**
Barcode scanner	**1**
Printer (optional)	**1**

SOMA Chip kit

The contents of the ADAM-SCC2's Somatic Cell Count Kit are listed below:

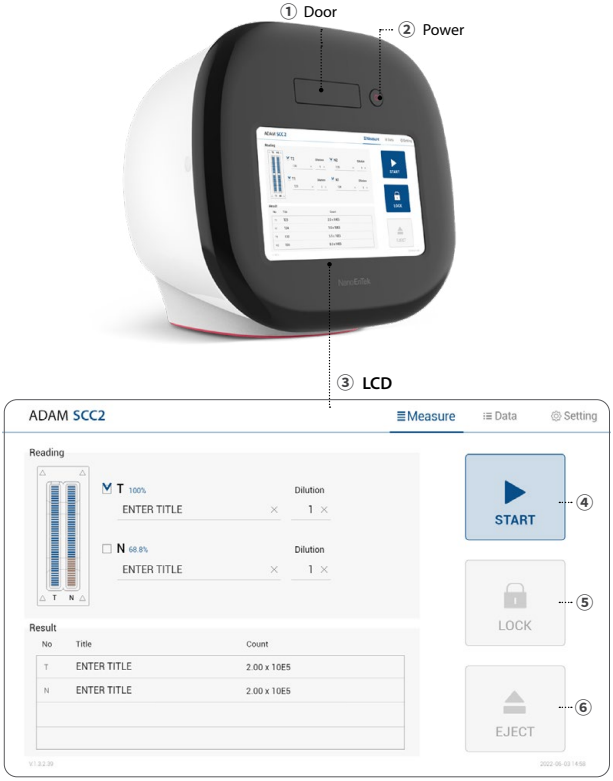
Item	SOMA Chip 2x Kit (Cat. No: CRS-K01)	SOMA Chip 4x Kit (Cat. No: CRS-K02)
Disposable Chip	**50pcs (2 channel)**	**100pcs (4 channel)**
SCC-Solution	**25 mL x 1ea**	**25 mL x 2ea**
Available test Q'ty	**100 test/kit**	**400 test/kit**

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 SOMA Chip at room temperature.
- SCC-Solution should be stored at 2~8°C.

Front view of ADAM-SCC2

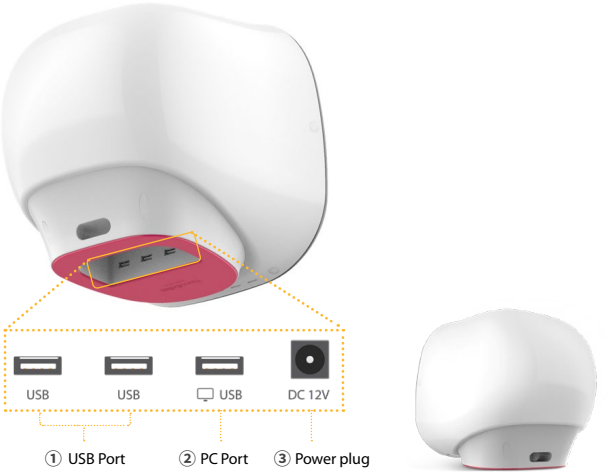
The front view showing various parts of the ADAM-SCC2 is shown below:



Control buttons	Description
① **Door**	Slide holder is inserted and ejected.
② **Power**	Power on / off.
③ **LCD**	Display processes and results.
④ **START**	Performs all procedures of automatic counting.
⑤ **LOCK**	Protects the alignment of stage from external shock when ADAM-SCC2 is being moved. **Lock ADAM-SCC2 before turning it off or moving it.**
⑥ **EJECT**	Ejects the slide holder from ADAM-SCC2. Functions as unload.

Rear view of ADAM-SCC2

The rear view showing various parts of the ADAM-SCC2.



Port	Description
① **USB Port**	Port for software update and save the data.
② **PC port**	Connects with PC
③ **Power Plug**	Connects ADAM-SCC2 power cord to wall outlet

CAUTION

Do not use the ② PC port. This port does not recognize USB.

Environmental requirements

CAUTION

At low temperature (≤10 °C), allow the device to warm up for 10 minutes at ambient temperature before use.

To ensure correct operation and stable performance,
install the ADAM-SCC2 in a location which meets the following conditions:

1. Use at room temperature between 20 and 35 °C.
   • Not recommended for cold room use (≤ 4 °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 the device.

Power on and Initial Display

1. Check the connection of ADAM-SCC2 and power cord.
2. Press the power button for 2~3 seconds.

If you get an error message,
please contact your local distributor or sales@nanoentek.com.

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

CAUTION

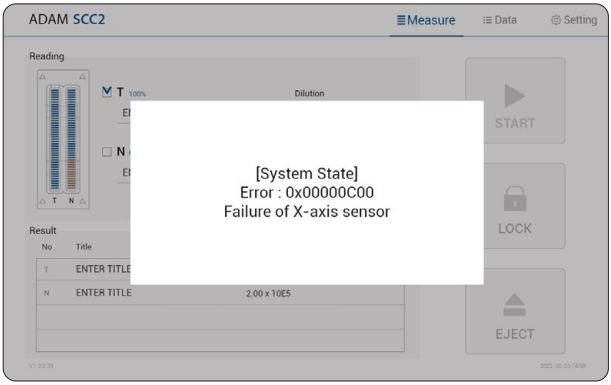
•Do not tilt the device too much in the forward when connecting the power cord.

•Do not move the device after connecting power cord.

- When you connect the power cord to ADAM-SCC2 even without power on the device, it will go through self diagnostic tests.

Error Messages during booting

[System State]



It appears when booting is not working properly.
Turn off main power and restart device.

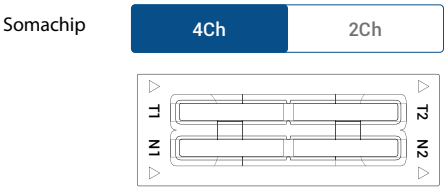
If this message still appears after restarting,
contact your local distributor or sales@nanoentek.com.

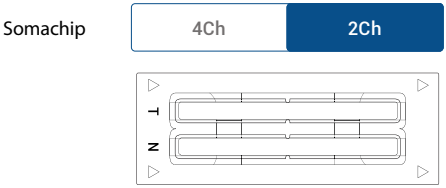
Error code	Cause
0x00000C00	Failure of X-axis sensor
0x00007000	Failure of Y-axis sensor
0x00008000	Failure of Z-axis sensor
0x06000000	Failure of Locking module sensor

Count setting

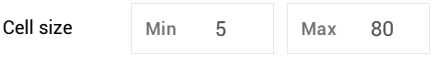
Set the conditions in the 'Setting' tap before counting.

[SOMA Chip]
Set the SOMA Chip according to you are using.





[Cell size]
Set the minimum and maximum size of cell.



[Dilution factor]
When diluting sample, set the Dilution factor.

CAUTION
Factor values for the SCC-Solution is already applied.

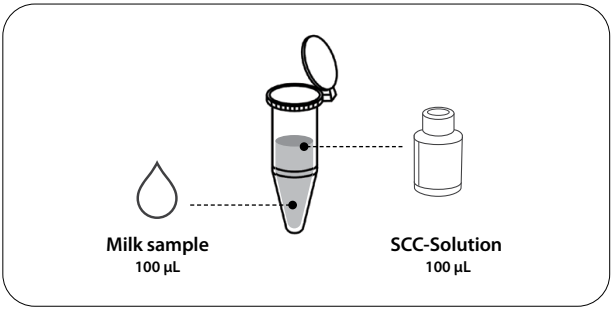
Introduction

Instructions are provided in this section for preparing the sample with SCC-Solution for use with disposable SOMA Chip for automated somatic cell count using the ADAM-SCC2.

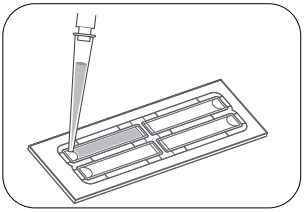
Please check the procedure of sample preparation and testing below.

For more detailed information, please refer to the next page.

1. Mix the raw milk sample with SCC-Solution.

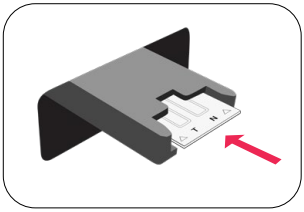


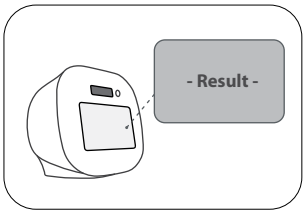
2. Load the mixed sample. Then, wait 1 minute for the sample settling.



- 2 channel: 23µL
- 4 channel: 13µL

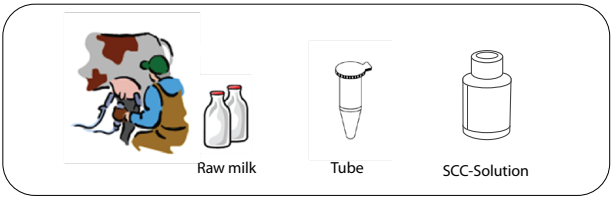
3. Insert SOMA Chip. Get the result.





Sample preparation

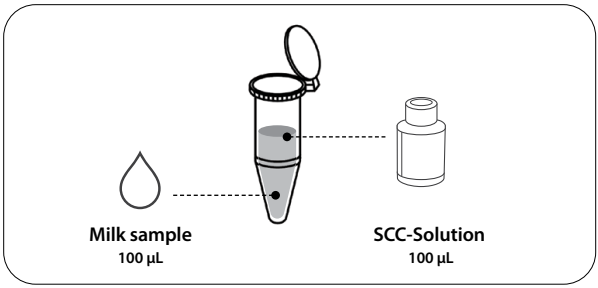
1. Prepare some raw milk sample, SCC-Solution, tube, pipette, and tips.



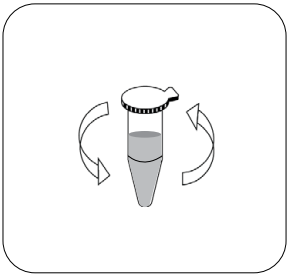
2. Thoroughly mix the raw milk sample.

Counting Cell

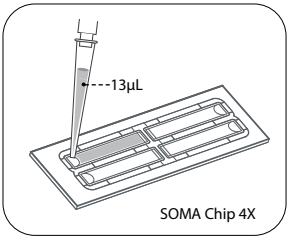
1. Add 100 µL of raw milk sample and 100 µL of SCC-Solution in the tube. (1:1 ratio)



2. Mix the raw milk sample and SCC-Solution by turning the tube upside down 3-5 times.



3. Load the cell sample onto the chip. Then, wait 1 minute for the sample settling.
   - 2 channel: 23µL
   - 4 channel: 13µL



NOTE

Ensure that no bubbles enter each channel.

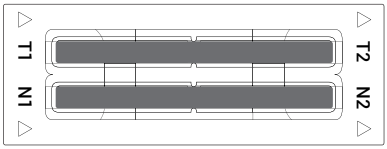
Counting cell

WARNING

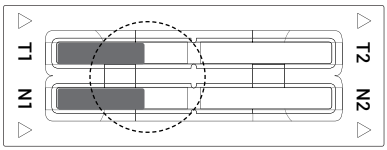
[Sample loading error]

Be cautious of loading the correct volume of the sample into SOMA Chip. The instrument will not detect low or high sample volumes.

Correct volume

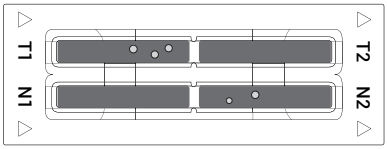


Low volume



CAUTION

Avoid bubbles which may negatively affect the result.

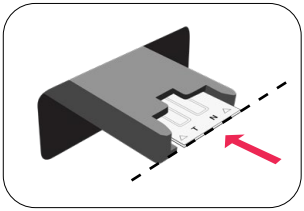


Counting cell

WARNING

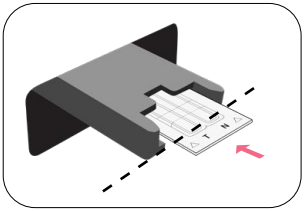
[SOMA Chip insert error]

Completely insert SOMA Chip 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.



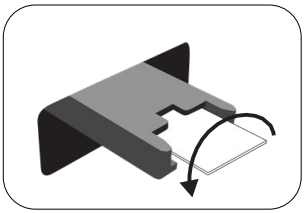
(O)

Correctly inserted



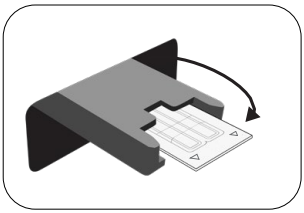
(X)

Not fully inserted



(X)

Upside down inserted



(X)

Wrong end inserted

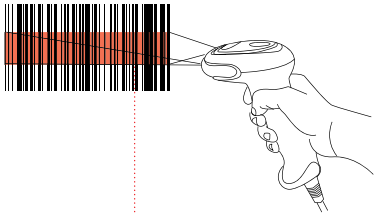
CAUTION

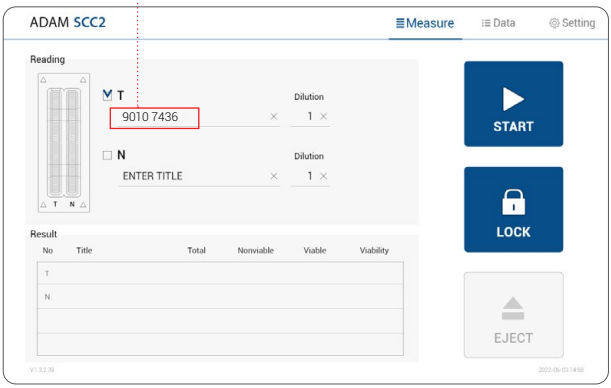
- *Please insert or remove the SOMA Chip when the slide holder is fully ejected.*
- *When the test is finished, please remove the SOMA Chip from the slide holder.*

Run Sample

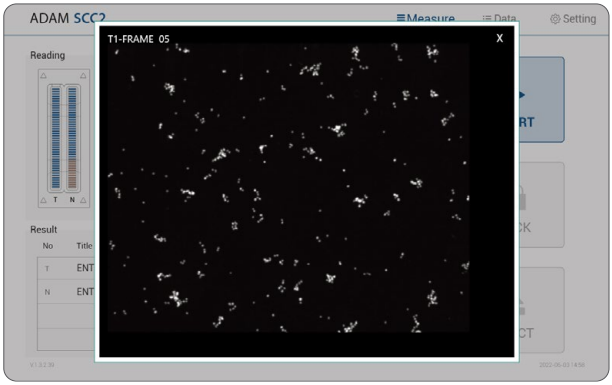
Enter a title for each channel of the slide.
Click the title section, then scan the cow ID with a barcode scanner to automatically enter as the title.

Start counting process by pressing 'START'.
It may take about 2 minutes longer for auto focus at the initial test.



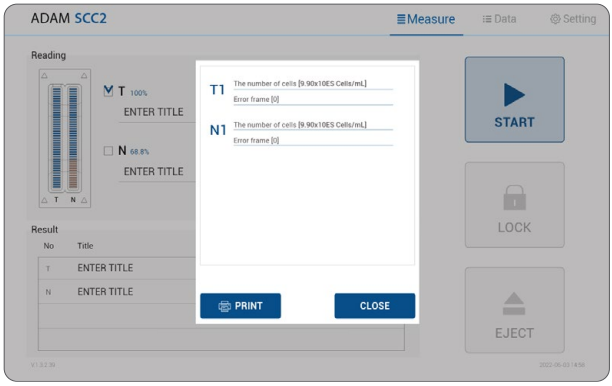


While the test is in progress, you can check the cell images of each channel.



Result Analysis

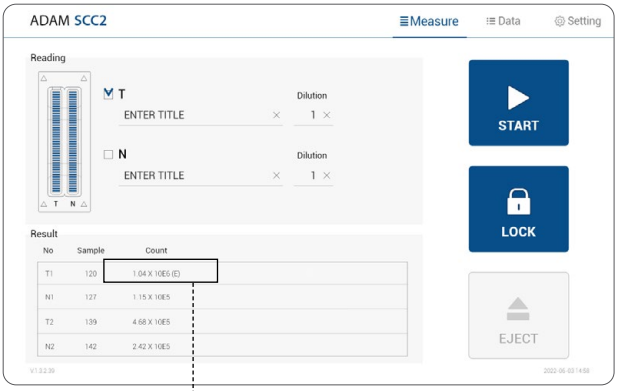
The result will be displayed after being automatically calculated by ADAM-SCC2 software.



No	Title	Count
T1	120	1.04 x 10E6
N1	125	1.15 x 10E5
T2	130	4.68 x 10E5
N2	143	2.42 x 10E5

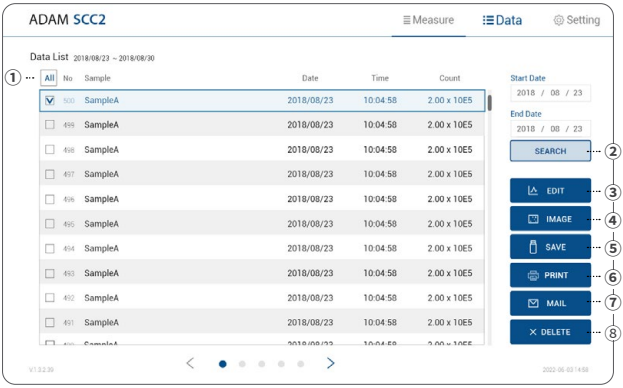
NOTE *'PRINT' button will be automatically activated when portable printer (optional) is connected.*

Result Analysis - Error code



Error code	Cause
E	Frames with errors are over 50% of total counting frame.
Error frame [#]	Frame with error is a frame that contains cells whose diameter is larger than 100μm. **When this error shown in result window, please check the image.**

Data list

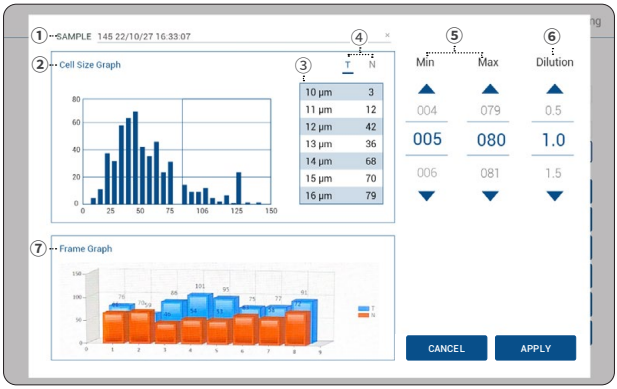


Control buttons	Description
① **All**	Select all data in Data List.
② **SEARCH**	Display the data of the selected date.
③ **EDIT**	View and edit the data. **Multiple data can be edited with the same settings.**
④ **IMAGE**	Check the cell images of each channel.
⑤ **SAVE**	Save the selected data to USB(PDF,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

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

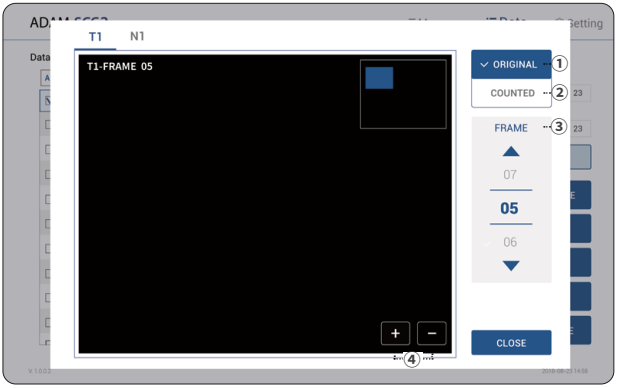
NOTE *The list will be sorted when you click the columns.*

EDIT



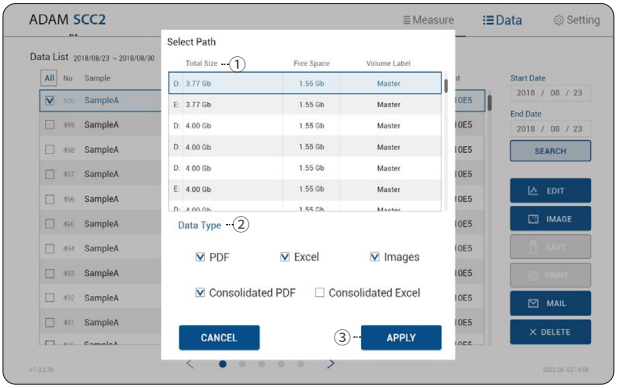
Control buttons	Description
① **Sample**	Edit the sample name.
② **Cell size graph**	Allows to view the cell size graph each channel (T/N).
③ **Cell size table**	Allows to view the number of cells in each cell size.
④ **Channel**	Select a channel(T/N).
⑤ **Cell size setting**	Set the min/max size of the cell.
⑥ **Dilution Factor**	Set the dilution factor of sample. **(Factor values for the AccuStain Solution is already applied.)**
⑦ **Frame graph**	Allows to view the counted cell number of each frame.

IMAGE



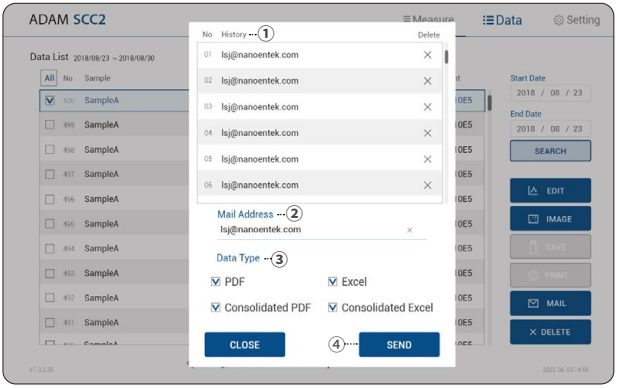
Control buttons	Description
① **Original**	Check the original image.
② **Counted**	Check the counted cell image.
③ **Frame**	Select a frame number of the channel.
④ **Zoom-in/out**	Zoom in and out to check the cell image.

SAVE



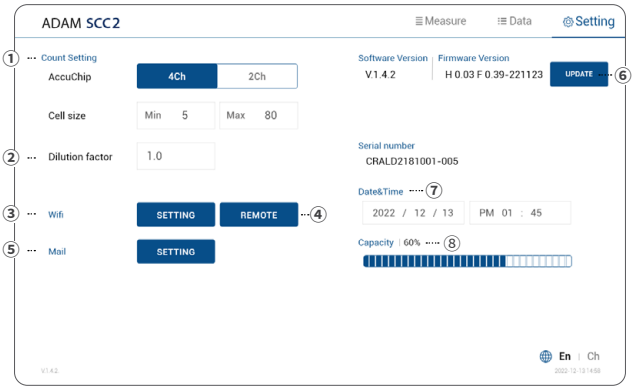
Control buttons	Description
① **Select Path**	Selects a save path from the list to send the selected data
② **Data Type**	Selects which data type to save
③ **Apply**	Exports the files to a selected save path *Files can be sent to only one save path at a time.*

MAIL



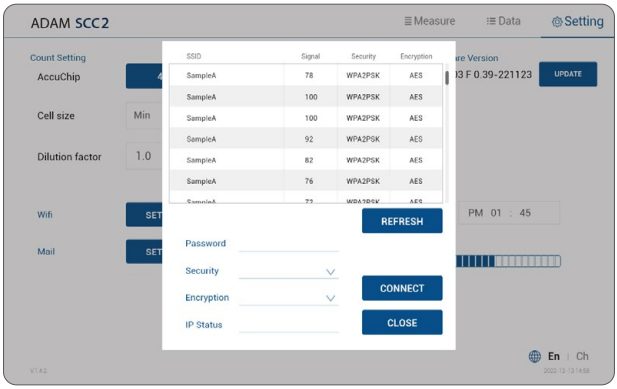
Control buttons	Description
① **History**	Selects e-mail address from the list to send data *The e-mail address where data has been sent will be saved.*
② **Mail Address**	To send files to new e-mail, enter the applicable e--mail address.
③ **Data Type**	Selects which data type to send via e-mail
④ **Send**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

Setting



Control buttons	Description
① **Count setting**	Set the conditions in the setting tap before counting. Refer to page 10 for more information.
② **Dilution factor**	Set the dilution concentration of the sample.
③ **Wifi**	Set the wifi to use the e-mail function.
④ **Remote support**	Connects to remote support software.
⑤ **Mail**	Do not change the setting in mail.
⑥ **Update**	Software update through the USB.
⑦ **Date&Time**	Sets current date and time.
⑧ **Capacity**	Check remaining capacity.

Wifi

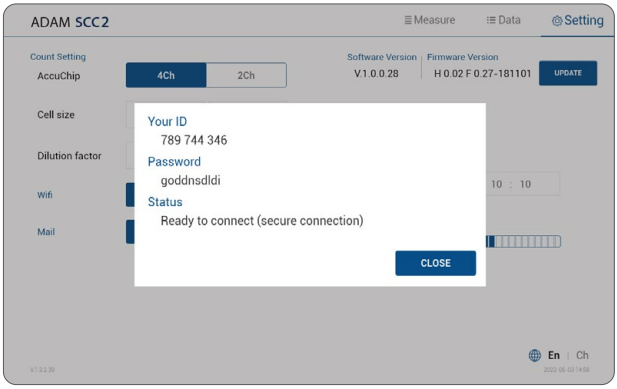


1. Click the Refresh button.
2. Select the wifi.
3. Insert the password of selected wifi.
4. Click the Connect button.

CAUTION

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

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 until they appear.

Update

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

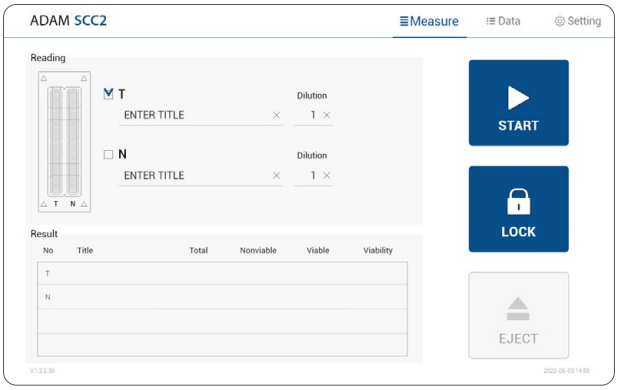
CAUTION

- *The 'AdamUpdate' folder must exist in the root path of the USB folder.*
- *ADAM-SCC2 can be updated only when the firmware or software file exists in the 'AdamUpdate' folder. The 'ADAM SCC2.exe' file should be in the 'AdamUpdate' folder.*
- *Do not rename the 'AdamUpdate' folder. The folder name should be 'AdamUpdate'.*

Lock

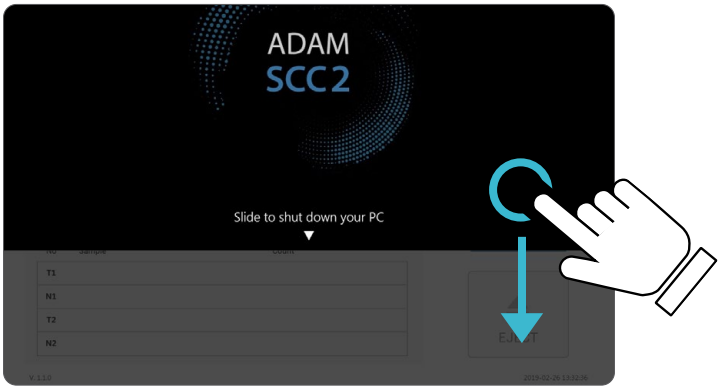
Press LOCK before turning off the device.
If there is no operation for 3 minutes, the lock function will be activated automatically.

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.



Maintenance and cleaning

1. ADAM-SCC2 does not need regular maintenance.
2. ADAM-SCC2 has no replacement of consumable materials.
3. Please clean the exposed surface of ADAM-SCC2 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

Problem	Description	Solution
ADAM-SCC2 does not power up	• No power from outlet. • Bad power cord.	• Check power source. • Replace.
Inaccurate result	• Cell number may be out of range. • SCC-Solution has expired. • Too high clumped cells.	• Adjust the number of cells between 0.05 ~ 1.15 x 10^6 cells/mL (refer to page 4). • Check the expired date. • Try again after vortexing the cells.
When error message is shown (For information on each error message, see page 17)	• When there are too many frames with errors **(Error message: E)**	• Check the suspension of cells if all cells are fully dissociated into single cells. • If contaminants except cells are found, prepare sample again.
	• Error frame	• Prepare sample again except contamination.

Warranty

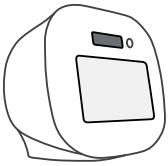
If any defects occur in the ADAM-SCC2 during one(1) year warranty period, NanoEntek will repair or replace the defective parts at its discretion without charge. The following defects, however, are specifically excluded:

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** or your local distributor.

Technical Specifications



ADAM-SCC2	
Measuring range	0.05 ~ 1.15 x 10^6 cells/mL
Analysis time	< 13 ~ 25 sec/test : For initial test, max 2 min/test
Voltage	DC12V
Current	5A
Objective lens	4 X
LED	4W Green LED
Camera	CMOS camera
Filter	Excitation filter, Dichroic filter, Emission filter
Weight	7 Kg
Size (W×L×H)	227 × 276 × 270 mm
Degree of protection	IPX0

Operating environment condition

Temperature	0 °C ≤ Temperature ≤ 40 °C
Humidity	10 % ≤ Humidity ≤ 90 %
Altitude	Altitude ≤ 2,000 m

Transportation & storage environment condition

Temperature	-30 °C ≤ Temperature ≤ 60 °C
Humidity	10 % ≤ Humidity ≤ 90 %

SOMA Chip 2x

SOMA Chip 4x

Somatic Cell Count Kit	
SOMA Chip	
Loading sample vol. per test	23 µL/test (SOMA Chip 2X)
	13 µL/test (SOMA Chip 4X)
Measuring sample vol. per test	8.6 µL/test (SOMA Chip 2X)
	3.4 µL/test (SOMA Chip 4X)

**SOMA Chip 2x Kit: please consult your distributor or manufacture for availability.*

Solutions

SCC-Solution	25 mL

Storage temperature

SOMA Chip	0 – 30 °C
SCC-Solution	2 – 8 °C

Expiration date

SOMA Chip	2 years
SCC-Solution	1 year

Product List

Cat. No.	Product	Contents	Quantity
CRS-K01	**SOMA Chip 2X Kit**	50 pcs SOMA Chip 2X	1
		25 mL SCC-Solution	1
CRS-K02	**SOMA Chip 4X Kit**	100 pcs SOMA Chip 4X	1
		25 ml SCC-Solution	2
ADB-500	**ADAM Calibration Bead**	5 mL Calibration Bead	1

**SOMA Chip 2x Kit: please consult your distributor or manufacture for availability.*

Safety Precautions

Review and follow the safety instructions below :

- Always ensure that the power supply input voltage matches the voltage available at your location.
- To avoid the danger of electric shock, install the instrument per the environmental specifications located in "Technical Specifications". If water or other material enters the instrument, the adaptor, or power inlet, disconnect the power cord and contact a service person.
- Do not touch the main plug or power cord with wet hands.
- This machine is air-cooled so its surfaces become hot during operation. During installation and use, leave more than 10 cm (4 inches) free around the device.
- Do not install the instrument on a slant or a place prone to vibrations or the risk of instrument malfunction or damage to the instrument will in crease.
- Never insert any objects (especially metallic) into the air vents of the instrument as this could result in electrical shock, personal injury, and equipment damage.
- Always set the main switch on the power supply unit to OFF before connecting the power cord to the wall outlet.
- To avoid a potential shock hazard, always connect the grounding terminal of the instrument and that of the wall outlet properly. The power cord should be connected to a grounded, 3-conductor power outlet.
- Position the device so that there is sufficient length for the cables and their respective connections.
- Lock the stage before moving, turn off the power button and unplug the power cord.
- If the instrument is broken or dropped, disconnect the power cord and contact an authorized service person. Do not disassemble the instrument.
- Only use authorized accessories.
- Use this equipment only as specified in this manual and as specified in any documentation associated with its components. Use of the equipment in an unspecified manner may result in damage to the device or injury to the user.

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
	ON (Power)
	This instrument and consumables conforms to the Declaration of Conformity.
	Caution: BIOHAZARD Protective measures must be used in dealing with biologically hazardous materials such as carcinogenic reagents.
	USB Connection
	LED
	Disposal of your old appliance 1. When this crossed-out wheeled bin symbol is attached to a product it means the product is covered by the European Directive 2012/19/EU. 2. All electrical and electronic products should be disposed of separately from the municipal waste stream via designated collection facilities appointed by the government or the local authorities. 3. The correct disposal of your old appliance will help prevent potential negative consequences for the environment and human health. 4. For more detailed information about disposal of your old appliance, please contact your city office, waste disposal service or visit our web-site, www.nanoentek.com.
	This product conforms to UL 61010-1, CAN/CSA C22.2 No.61010-1 “Safety Requirements for Electrical Equipment for Measurement, Control, and Laboratory Use, Part I: General Requirements.” Instruments bearing the TUV symbol are certified by TUV SUD America Inc to be in conformance with the applicable safety standard for the US and Canada.

Warnings

1. **After using device, please turn off main power.**
   If not, it may cause malfunction or may reduce product life.

2. **When turn off the device, be sure 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	• Risk of explosion if battery is replaced incorrectly. • This battery is not replaceable by user. Refer to an authorized service person.
Cover	• Do not remove cover or dissemble case. There are no adjustable components inside the instrument. • If a malfunction is found, refer to an authorized service person.
Manual	• Do not attempt to service the equipment. • This manual is only available in English. • Failure to heed warnings may result in injury to service provider or operator.
Sample handling	• Wear personal protective equipment during sampling and testing. • Sample may contain infectious or bio-hazardous agents. • Use of capped tubes and lint free wipes. Lint free wipes to be used one time and discarded.
Waste	• After using SOMA Chip, appropriately dispose as bio-hazardous waste. • Do not reuse SOMA Chip.

Technical Support

Visit the our Website at **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.

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ADAM SCC2

NESMU-ASC2-001E (V.1.2)

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