

ALLEX[®] 64

Automated Nucleic Acid Extraction System

64

samples

10

min

DNA/RNA

extraction

Instruction For Use



Thank you for purchasing the
AllEx[®] 64 Automated Nucleic Acid Extraction System.
This user manual provides essential guidelines and precautions
to ensure the effective and safe operation of the system.
Please read it carefully before operation.

Initial Inspection

Please perform a thorough inspection of the instrument and all accessories when you first open the packaging. If you find any damage or if any components are missing, please get in touch with GeneAll Biotechnology or your local distributor for immediate assistance.

GENEALL BIOTECHNOLOGY CO., LTD

GeneAll Bldg., 303-7, Dongnam-ro, Songpa-gu, Seoul, South Korea, 05729

Phone : 82-2-407-0096

Website : www.geneall.com/en

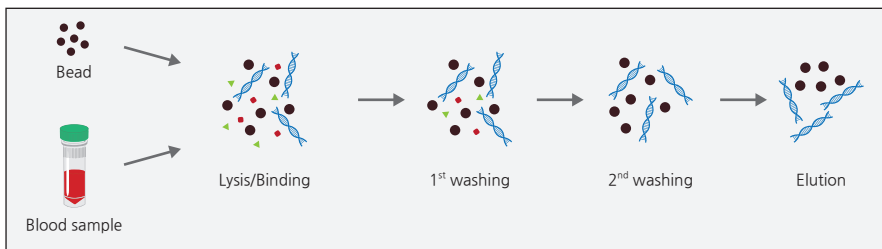
E-mail : sales@geneall.com

Content

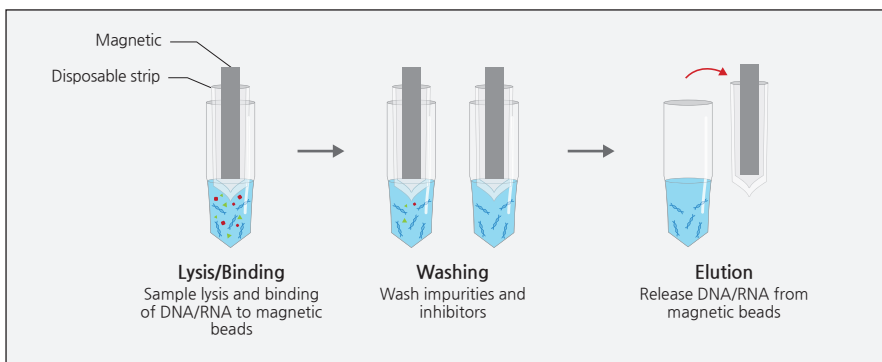
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1. Introduction

AllEx®64 provides compact and comprehensive solution for automated nucleic acid extraction for a variety of sample types. It combines the benefits of proven magnetic bead technology with the capability to rapidly extract 1~64 samples in a single run.



[Figure 1-1] Principle of Silica Coated Magnetic Beads Extraction



[Figure 1-2] Process of Silica Coated Magnetic Beads Extraction

1.1. Intended Use

AllEx®64 is designed to perform automated extraction of nucleic acids in molecular biology applications.

This system is intended to be used in conjunction with AllEx® reagent kits that are recommended for use with AllEx®64, as detailed in the kit manuals.

2. Precautions

Please read this manual carefully for the correct and safe operation of the system. Please be aware that any accidents arising from failure to comply with the instructions outlined in the official user manual will not be eligible for compensation.

2.1. General Precautions

- Before powering on the system, make sure that the correct voltage (200~240 VAC, 50/60 Hz, 5 A).
- Always use grounded power and power cords.
- The system is intended for nucleic acid extraction. Do not use this system for anything other than its designed purpose.
- Do not connect power with wet hands or operate the power switch. There is a risk of electric shock.
- This system can be used with potentially biohazardous materials. Use appropriate personal protective equipment (gloves, safety goggles, lab coat, etc.) for handling and perform sterilization with UV lamp after use.



2.2. Installation Precautions

- Locate on a sturdy, level surface.
- Choose a location that has good air circulation and is not exposed to direct sunlight.
- For proper ventilation, maintain a minimum 5 cm clearance on the sides and rear of the system. Inadequate ventilation can result in overheating, malfunctions, and potential fire hazards.
- Avoid installation near sources of water or damp locations. This can cause electrical shock, fire or system malfunction.
- Install it below 2,000 M above sea level.
- Avoid installation in a dusty environment. Excessive dust may cause malfunction or damage to the system.
- Avoid installation near heat sources. This can cause fire.
- Avoid installation near other electrically sensitive instruments.
- This equipment is designed to be the Pollution Degree of PD2.
- To avoid personal injury or damage to the system, do not lift the instrument alone when removing or replacing the system.

2.3. Maintenance Precautions

- Please follow the instructions in Section 8.
- Do not disassemble the equipment arbitrarily. It can cause malfunctions and serious injuries.
- Disassembly and/or modification of the system voids the warranty and may be refused service.

3. Product Specifications and Components

3.1. Product Specification

Model	AIEx®64
Processing capacity	1~64 samples per run
Dimensions (mm)	420(W) x 599(D) x 440(H)
Weight	36.5 kg
Power Requirements	200~240 VAC, 50/60 Hz, 5 A
Operating temperature	15~30°C
Operating humidity	20~80% relative humidity, non-condensing
User interface	10.1" TFT LCD touch screen
Visualizing the progress/status of operation	Progress Bar (Top side), Status Circle (Front Side)
Decontamination	UV Lamp
Barcode	Internal Barcode Reader

[Figure 3-1] AIEx®64 Specification

3.2. Product Components



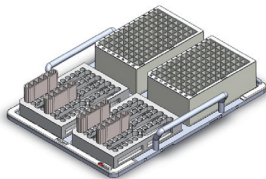
1 AIEx®64 system



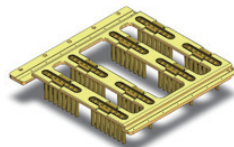
1 220 V Power Cable for AIEx®64 system



1 User Manual



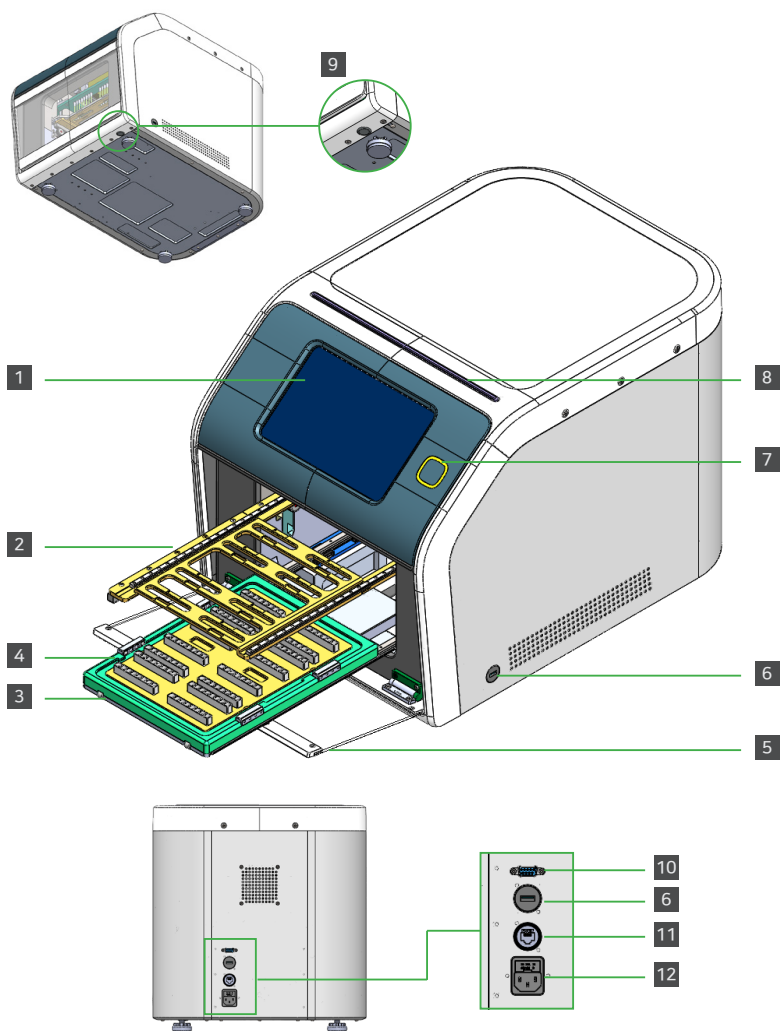
1 Cassette
1 Single Cartridge Adaptor
2 Single Cartridge
2 Plate Cartridge



8 Strip

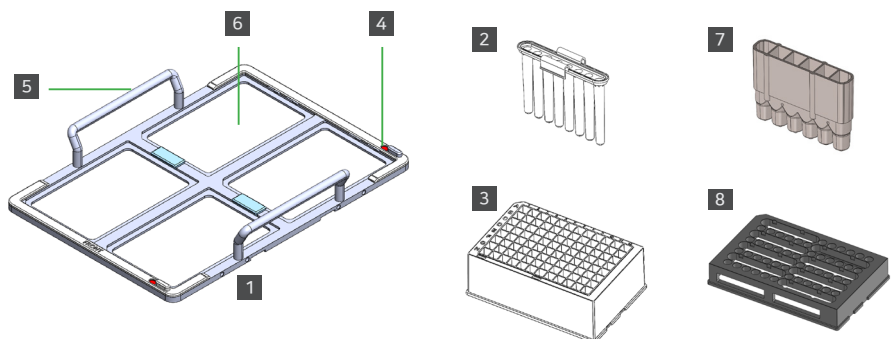
[Figure 3-2] Components

3.3. Components Name



- | | | |
|-------------------|-----------------------------------|------------------------|
| 1 Display | 5 Door | 9 Power Switch |
| 2 Strip Loader | 6 USB port (used for update only) | 10 RS-232C (not used) |
| 3 Cassette Loader | 7 Status LED Circle | 11 LAN Port (not used) |
| 4 Heating Block | 8 Progress LED Bar | 12 Power Socket |





[Figure 3-3] Components name I



1	Cassette	3	Plate Cartridge	5	Cassette Handle	7	Single Cartridge
2	Strip	4	Lock Switch	6	Cartridge Seat	8	Single Cartridge Adapter

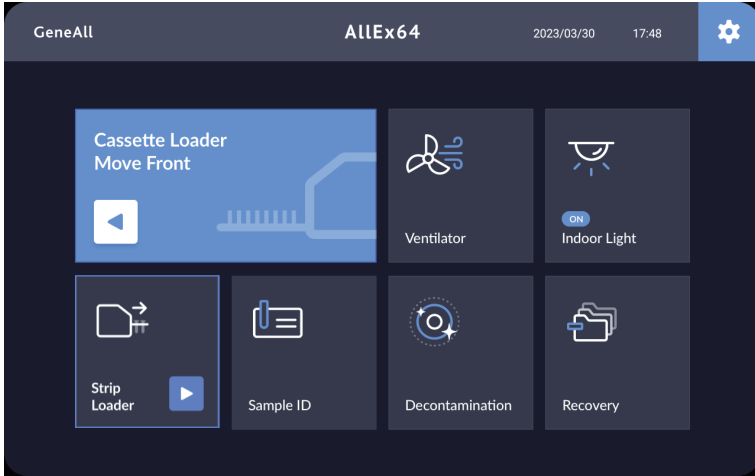
[Figure 3-4] Components name II

4. Product Installation

1. Clear and clean the area where the system will be installed.
2. Check for an appropriate power supply (outlet) in the vicinity.
3. Carefully unpack all of the components from the packaging.
4. Avoid attempting to lift the heavy main body alone to prevent injury or damage.
5. Remove the plastic wrap from the components.
6. Verify that all components are in good condition, without any visible damage or defects.
7. Place the AIEx®64 on a sturdy, level table that can sufficiently support the weight of the main body.
8. Connect the power cable to the rear of the system.
9. Turn on the system.
10. Wait for the system to complete the initialization process.
11. Once the system has completed initialization, confirm that the main menu is displayed on the screen.
12. Touch the  icon to move the Cassette Loader forward.
(Cassette Loader Move Front)
13. Detach the Cassette from the Cassette Loader.
14. Touch the  icon to move the Strip Loader forward.
(Strip Loader)
15. Detach the Strip from the Strip Loader.
16. Touch the  icon.
(Cassette Loader Move Home)
17. When the Protocol Selection screen appears, touch the  icon.
18. The installation of AIEx®64 is complete.



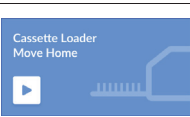
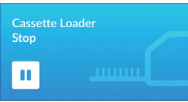

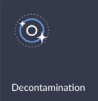
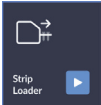

5. User Interface

5.1. Main Menu



[Figure 5-1] Main menu screen

The main menu contains interactive icons :

	Move 'Cassette Loader' forward to open the door	 Activate Setup screen
	Move 'Cassette Loader' to home position in order to initiate nucleic acid extraction	 Stop 'Cassette Loader'
	Continue operating 'Cassette Loader'	 Operate UV Lamp
	Operate 'Strip Loader'	 Turn on Indoor Light in Chamber



[Figure 5-2] Icons on main menu

5.2. Setup



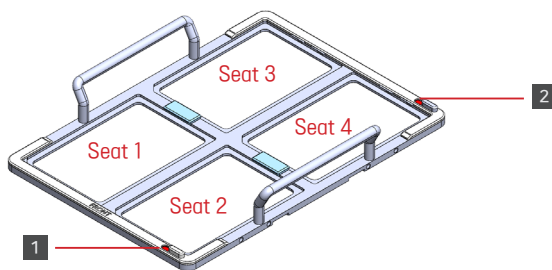
[Figure 5-3] Setup screen

6. Nucleic Acid Extraction

6.1. Kit Installation

1. Check the kit manual and follow the instructions.
2. If Cassette is inside the system, touch  icon to detach Cassette from the Cassette Loader.
(Cassette Loader Move Front)
3. Place Cassette on the experiment bench.

4. Unpack the kit on the bench to take out the Cartridge.
 - *Cartridges come in two types : Single Cartridge for 1 extraction and Plate Cartridge for 16 extractions, each capable of processing 1 or 16 samples.
5. Dispense the required amount of samples into the Lysis Lane (1st and 7th Lane) on the Cartridge following the instructions in the kit manual.
6. Push the Lock Switch towards the Unlock position.
7. For Single Cartridge, use Single Cartridge Adaptor.
8. Load Cartridge with the samples from seat 1.
 - When there are multiple cartridges, load the cartridges in the order of Seat 2, 3, and 4.




1 Lock Switch for Seat 1 & 2

2 Lock Switch for Seat 3 & 4

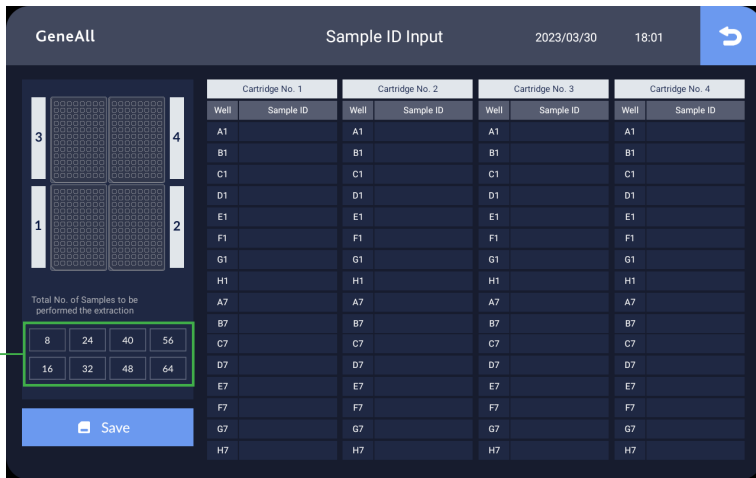
[Figure 6-1] Cassette

9. After loading the cartridge(s), push the Lock Switch towards the Lock position.
10. Bring the Cassette with Cartridge(s) loaded, along with the Strip(s) corresponding to the quantity of the Cassette(s) and sample(s) to the system.
11. Load the Cassette to the Cassette Loader with the FRONT of the Cassette facing forward until you hear a clicking sound.
12. Press on the corners of the Cassette to verify if they are installed correctly on the Cassette Loader.
13. Improperly installed Cassette may cause damage to the system during operation.

6.2. Sample Entry and Strip Installation

1. Touch  icon to open sample ID screen.

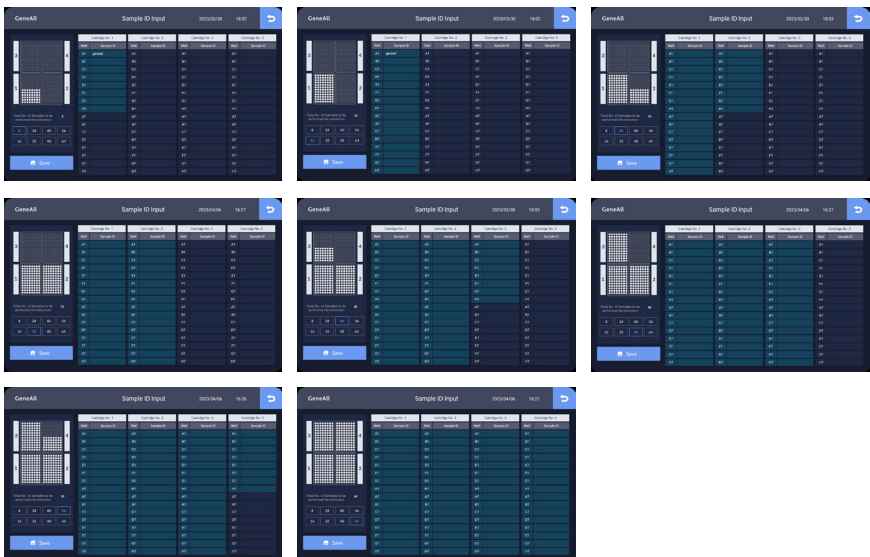
[Sample ID]






[Figure 6-2] Sample ID screen

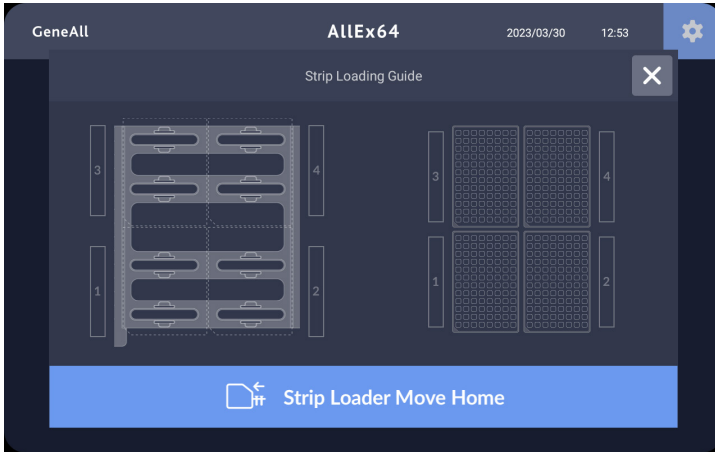
2. Select the appropriate number corresponding to the sample quantity.

* Select 8 for 1~8 samples, select 16 for 9~16 samples, select 24 for 17~24 samples, select 32 for 25~32 samples, select 40 for 33~40 samples, select 48 for 41~48 samples, select 56 for 49~56 samples, and select 64 for over 57 samples.




[Figure 6-3] The position of the cartridge(s) corresponding to the number of sample(s)

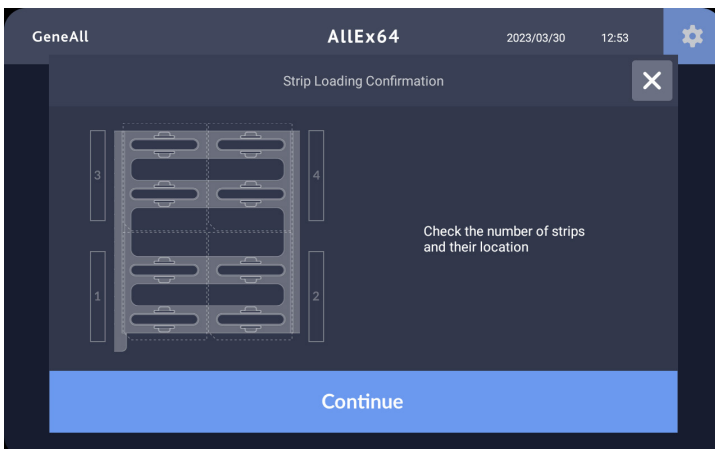
3. Touch  icon to save and touch  icon to return to Main Menu.
4. Touch  icon to move the Strip Loader forward. The Strip Loading Guide will also be displayed on the screen. Please ensure that you insert the strip in the correct position as indicated by the Strip Loading Guide.




[Figure 6-4] Loading position of Strip and Cartridge corresponding to the number of samples

*** Improperly loading Strips and Cartridges can not only lead to errors in the extraction efficiency but also potentially damage the equipment.**



5. The Strip Loader moves back to home position once  icon is touched.

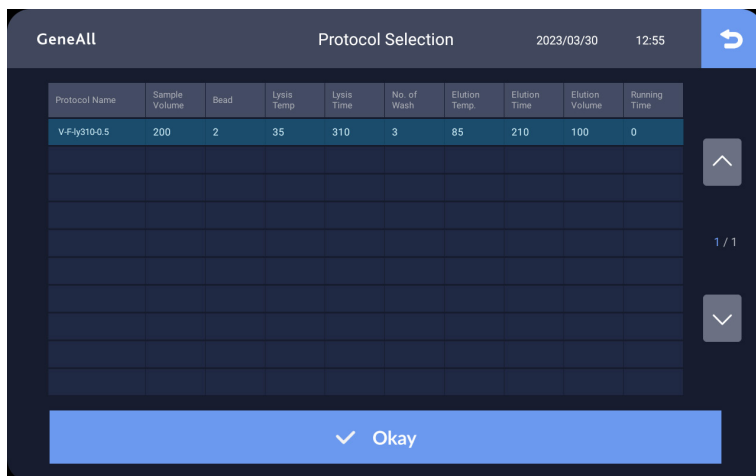


[Figure 6-5] Final confirmation of Strip loading

- Please verify that the Strip is correctly loaded in the designated location, and then touch the  icon to send the Strip Loader to its home position.
[Continue]

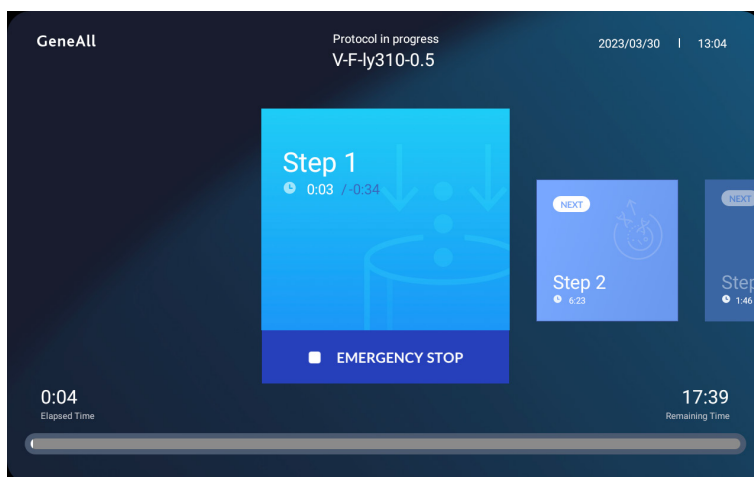
6.3. Protocol Run

- Touch  icon to the Cassette Loader move back to its home position.
[Cassette Loader Move Front]
- Select a protocol and touch  icon to run the protocol.
[Okay]

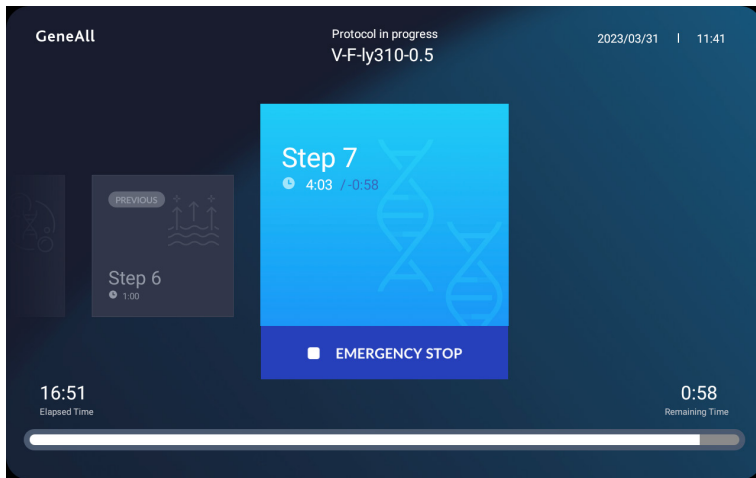


[Figure 6-6] Protocol Selection

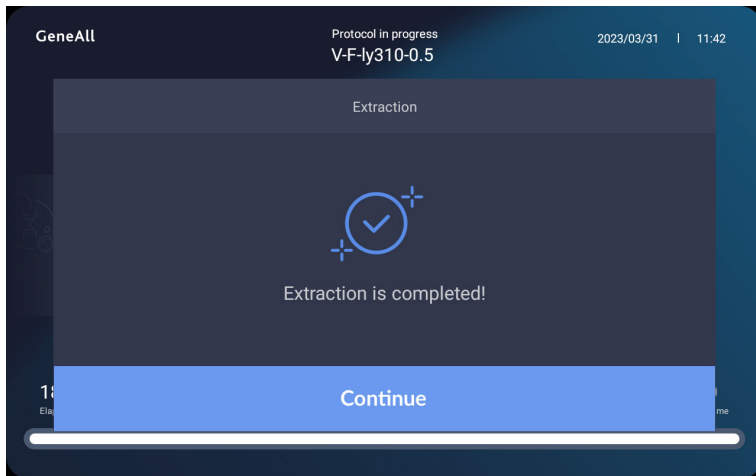
- Check the running Protocol and the estimated end time.






[Figure 6-7] Protocol in Progress 1 Start Step






[Figure 6-8] Protocol in Progress 2 Last Step



[Figure 6-9] Protocol in Progress 3 Step Completion

4. Touch  icon to move to the main menu screen.
[Continue]
5. Touch  icon to Cassette Loader forward to open the door.
[Cassette Loader Move Front]
6. Touch  icon to move the Strip Loader forward in order to separate the used strip from the Loader, and then discard it.
[Strip Loader]

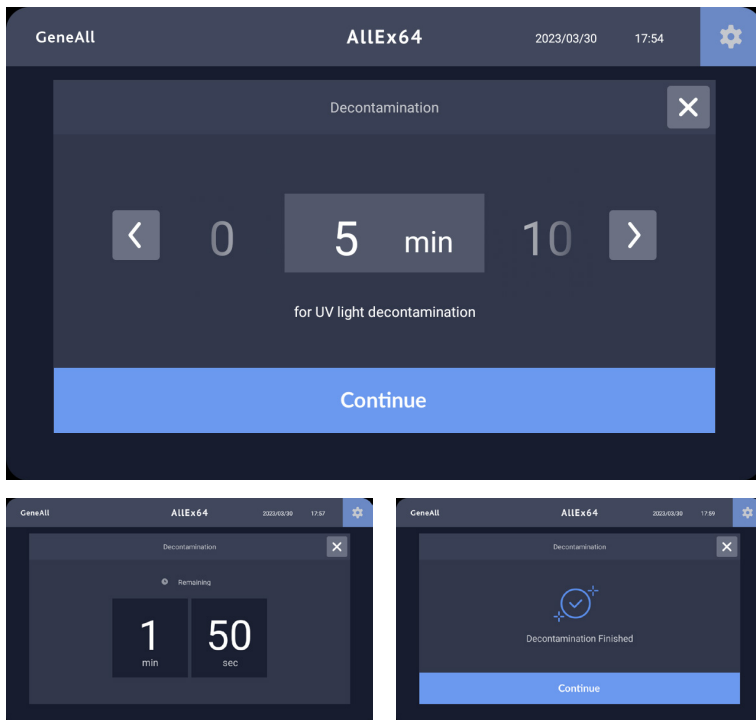
7. Touch  icon to move the Strip Loader to its home position.
[Strip Loader]
8. Detach the Cassette from the Cassette Loader by lifting it up with your hands, and move it to the experiment bench.
9. Touch  icon to move Cassette Loader to its home position.
[Cassette Loader Move Front]
10. When Protocol Selection screen is shown, touch  icon to skip the Protocol Selection.

7. Supplementary Features





7.1. Decontamination

The AllEx®64 contains a UV light that can help aid in Sterilization of the system. It is possible to specify the duration of the UV treatment and when UV light treatment of the system should be performed.


1. Touch  icon to open the Decontamination setting screen.
[Decontamination]

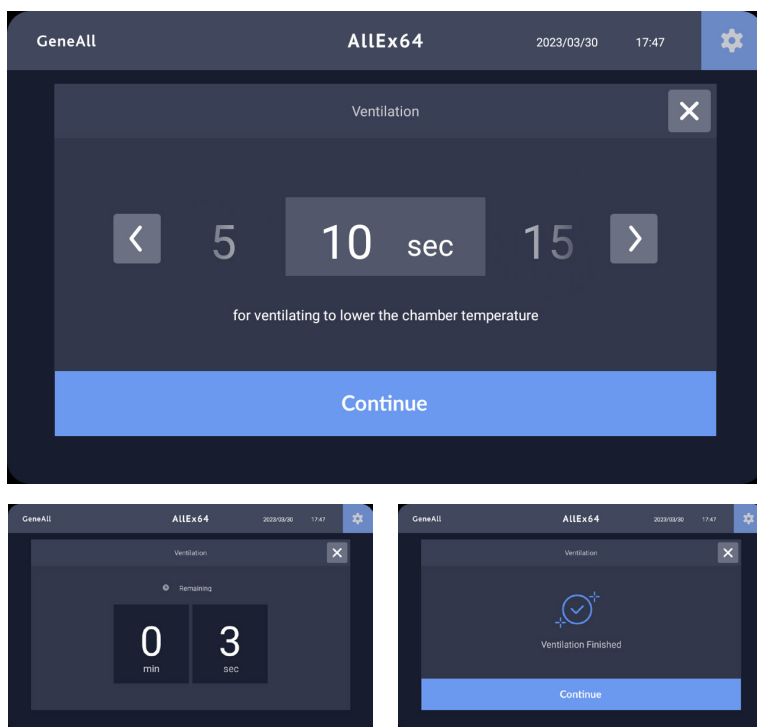


[Figure 7-1] UV-Sterilization





- The initial setting for UV-Sterilization is 10 minutes, and it can be changed in the 'General' section of the icon.
- Touch   button to set the running time.
- Touch  icon to start Decontamination.
- Once the decontamination is completed, touch  icon to return to main menu.

7.2. Ventilation



- Touch  icon to open the Ventilation setting screen.



[Figure 7-2] Ventilation


- Touch   icon to set running time.
- Touch  icon to start Ventilation.
- Once the ventilation is completed, touch  icon to return to main menu.

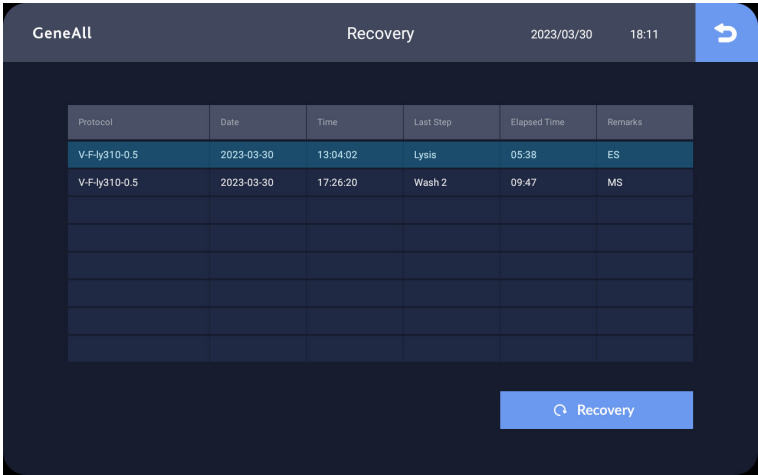
7.3. Indoor Light

1. Touch  icon to turn on the Indoor Light in Chamber.
(Indoor Light)
2. Touch  icon to turn off the Indoor Light in Chamber.
(Indoor Light)

7.4. Recovery

It is designed to resume the protocol from the last failed or interrupted run. The effectiveness and progress of the recovery process are entirely at the user's discretion.

1. Check the interrupted Protocol and consider overall factors, like remaining reagents. Following a comprehensive assessment including run progress and the system status, if it is deemed that recovery is feasible, proceed with the Protocol Run by correctly positioning the Cartridge and Strip.
2. In the [Remarks] column, “ES” means Emergency Stop interrupted by the user, and “MS” indicates Missing Step, which is a malfunction related to motor or operation. Also, blank itself means interruption caused by power failure.
3.  Icon makes screen turned to Recovery mode when touched.
(Recovery)



The screenshot shows the 'GeneAll Recovery' interface. At the top, it displays 'GeneAll', 'Recovery', the date '2023/03/30', and the time '18:11'. Below this is a table with the following data:

Protocol	Date	Time	Last Step	Elapsed Time	Remarks
V-F-ly310-0.5	2023-03-30	13:04:02	Lysis	05:38	ES
V-F-ly310-0.5	2023-03-30	17:26:20	Wash 2	09:47	MS

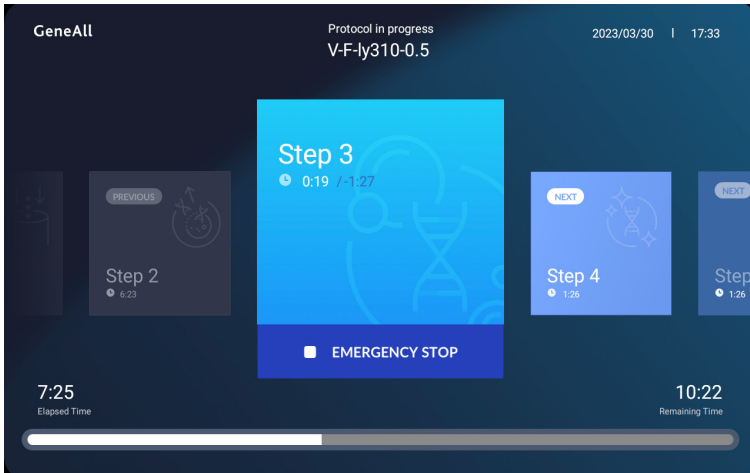
At the bottom right of the screen, there is a blue button labeled 'Recovery' with a circular arrow icon.

[Figure 7-3] Recovery


4. After select the Protocol for Recovery, touch  icon to recover the Protocol.
(Recovery)

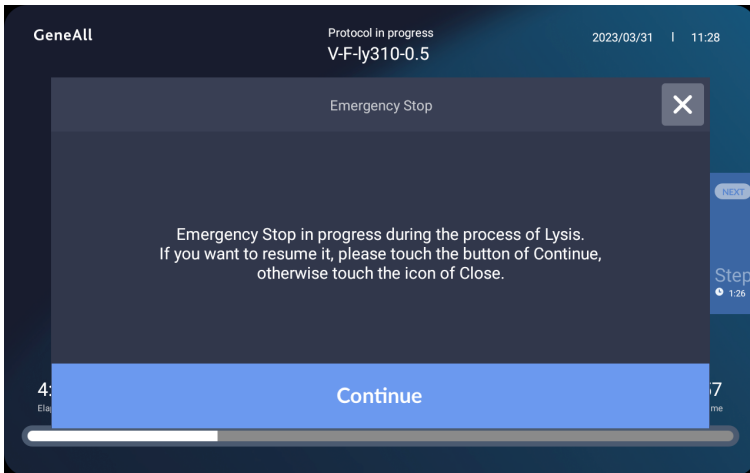
7.5. Emergency Stop

It can be used when there is a need to stop the progress based on the user's discretion during the operation.




[Figure 7-4] Protocol in progress

1. Touch  icon to stop the operation.
[EMERGENCY STOP]



[Figure 7-5] Emergency Stop

2. To cancel the Emergency stop and resume the Protocol, select the icon to continue its protocol.

3. Selecting the  icon to completely stop the operation will terminate the Protocol, and system will return to its initial state.
4. Following a comprehensive assessment including status of Cartridge, Strip, sample and the system, if it is deemed that recovery is feasible, recover the Protocol through Recovery function.

7.6. User Setup

Touch  Icon



[Figure 7-6] General

7.6.1. General

- | | |
|-------------------------------------|---|
| ① On/off of User Name registration | ⑥ Option of Time Format |
| ② On/Off of Sample ID function | ⑦ Set the initial decontamination time |
| ③ On/Off of Barcode Scan function | ⑧ Set the decontamination interval time |
| ④ On/Off of auto protocol selection | ⑨ Set the initial ventilation time |
| ⑤ On/Off of Camera function | ⑩ Set the ventilation interval time |

7.6.2. Protocol

The list of saved Protocol can be viewed.

The screenshot shows the 'Setup' screen in the GeneAll application. The left sidebar contains navigation options: General, Protocol (selected), History, Camera, Calibration, Accumulated data, Software update, and Engineer Mode. The main area displays a table with the following data:

Protocol Name	Sample Volume	Bead	Lysis Temp	Lysis Time	No. of Wash	Elution Temp	Elution Time	Elution Volume	Running Time
AllEx Viral DNA	10	20	30	40	50	60	70	80	1076
GDE-Fast	200	4	65	300	2	55	200	50	15m30
V-F-Iy310.0.5	200	2	35	310	3	85	210	100	0

At the bottom of the table, there are navigation arrows and the text '1 / 1'.

[Figure 7-7] Protocol

7.6.3. History

The performed Protocols can be tracked.

The screenshot shows the 'History' screen in the GeneAll application. The left sidebar contains navigation options: General, Protocol, History (selected), Camera, Calibration, Accumulated data, Software update, and Engineer Mode. The main area displays a table with the following data:

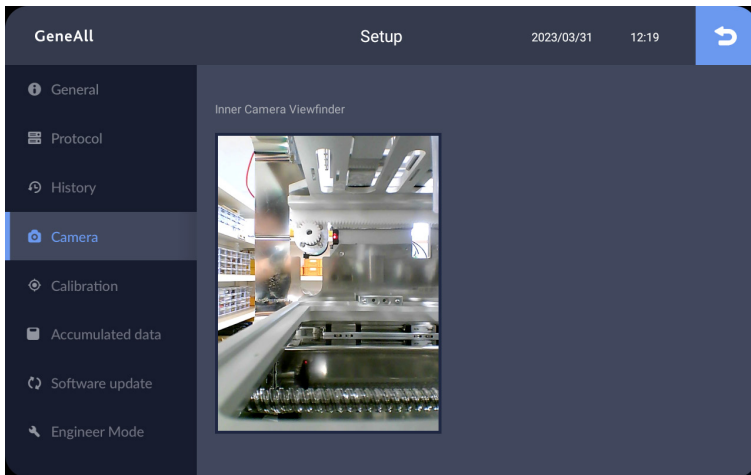
Protocol No.	Date	Start Time	End Time	No. of Samples	Remark
Genomic-Standard	2023-10-05	13:54:25	14:03:41	0	
RPM-TEST2	2023-10-05	14:54:29	14:55:43	0	Terminated
Genomic-Standard	2023-10-05	14:59:41	15:05:42	0	Terminated
Genomic-Standard	2023-10-05	15:16:05	15:36:56	0	Finished
Genomic-Standard	2023-10-05	15:51:40	16:12:31	0	Finished
Genomic-Standard	2023-10-12	09:21:22	09:29:09	0	Terminated
Genomic-Standard	2023-10-12	09:29:56	09:50:47	0	Finished

At the bottom of the table, there are navigation arrows and the text '2 / 4'.

[Figure 7-8] History

7.6.4. Camera

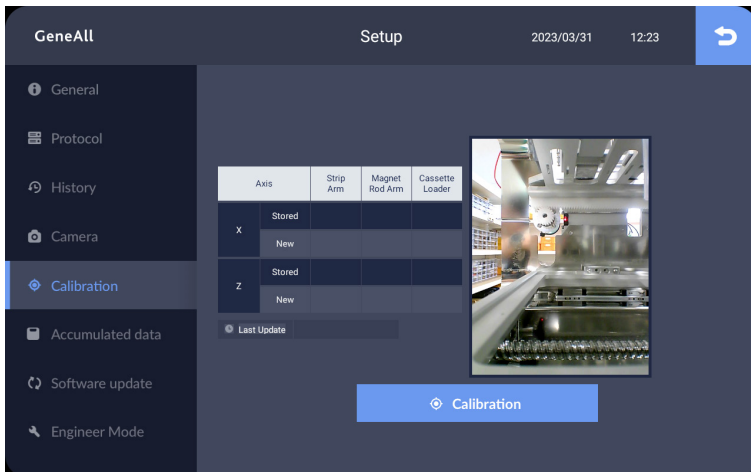
The inside of the Chamber can be viewed by the Camera Viewfinder.



[Figure 7-9] Camera

7.6.5. Calibration

Calibration information can be checked and auto- calibration can be performed.



[Figure 7-10] Calibration

7.6.6. Accumulated Data

Accumulated information about the Device Shelf Life can be accessed.

Item	Accumulated Operating Time	Last Reset	Last Value
AllEx 64	8h 4m 0s		
Indoor Light	0s	2023/03/31 12:39:27	0s
UV Lamp	0s	2023/03/31 12:38:58	5m 12s
Heater	0s	2023/03/31 12:39:04	1m 45s
Ventilation	0s	2023/03/31 12:39:09	1m 10s

[Figure 7-11] Accumulated Data

7.6.7. Software Update

- ① Application
- ② Protocol
- ③ Temperature Conversion File
- ④ Calibration Data

How To Update

1. Prepare USB stick with update file
2. Insert USB into USB port
3. Touch "Update" Button

Update

Date	Version	Updated by
2023/03/30 13:02:34	HeaterConversion_No Conversion.csv	admin
2023/03/30 13:02:34	protocol Viral DNA.csv	admin
2023/03/30 13:02:34	protocol1.csv	admin
2023/03/30 13:02:34	protocol-V-F-L50-7.csv	admin
2023/03/30 12:55:33	HeaterConversion_No Conversion.csv	admin
2023/03/30 12:55:33	protocol-V-F-L50-7.csv	admin

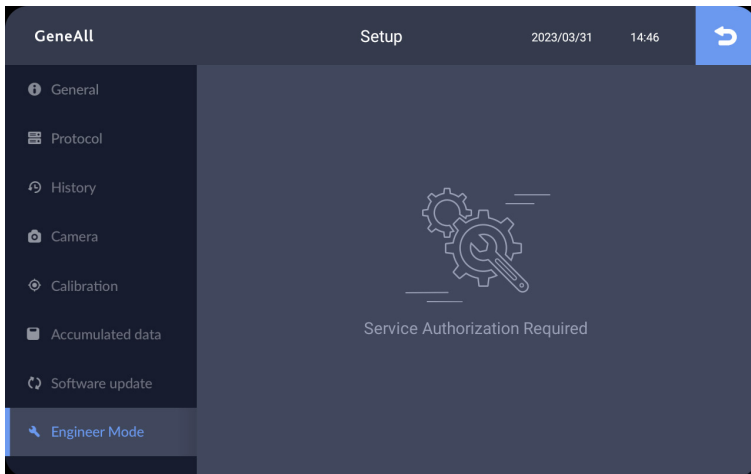
1 / 1

Version : 1.0
Build : 2023/03/03 05:34

[Figure 7-12] Software Update

7.6.8. Engineer Mode

It can only be activated by authorized service engineers.



[Figure 7-13] Engineer Mode

8. Maintenance

8.1. Daily inspection

8.1.1. Before use

1. Clean any dirt from the Magnet Rod.
2. Check whether the Magnet Rod get damaged or broken.
3. Clean any dirt from Heating Block and Cassette.

8.1.2. After use

1. Wipe up any spills immediately. After each use, wipe off the Magnetic Rod, inside/outside system using cloths dampened with 70% ethanol.
2. Operate the Decontamination for 10 minutes.
3. Clean any dirt from stuck in Door hinge.
4. Remove and discard the used Strip.
5. Move back the Cassette Loader to home position.
6. Turn off the power.

8.2. Regular inspection

8.3 Monthly

1. Check the operation status of the UV Lamp.
2. Check for damage and alignment of the Magnetic Rod.

8.4. Semi-annually

1. Check calibration.
2. Check alignment of Magnet Rod.

8.5. Troubleshooting Guide

Trouble	Troubleshooting
No display after tuning on power	Reconnect Power Cable Check the fuse and replace
The Cartridge cannot be equipped	Check for the position of Cartridge Remove any foreign substances from the Cassette Check for the defective of Cartridge
The Strip is cannot be equipped	Check for the defective of Strip
No UV light	Check the accumulated run time Replace UV Lamp

[Figure 8-1] Troubleshooting

9. Quality Assurance

AIEx®64 is the product manufactured under strict quality control and inspection, and we would thoroughly fulfill our accountability for quality assurance in accordance with the relevant regulations.

9.1. Warranty period

1. System : One(1) year from the Invoice date.
2. Consumables : Three(3) months from the Invoice date.
3. Retention period of repair parts : Five(5) years from manufacturing date.

9.2. Warranty details

1. The product in failure under normal operation environment is subject to repair service for free within the warranty period.
2. The following case is not subject to the repair service for free.
 - ① Failure due to negligence, improper use, impact, or submergence
 - ② Disassembled or renovated product
 - ③ Failure due to natural disaster
 - ④ Product repaired by the unqualified
 - ⑤ Out of region covering a warranty
3. 1:1 exchange of product
The product which has been repaired more than three times by same problem is subject to exchange for same model.

9.3. Warranty condition

Only purchased product which has completed the registration as per procedure.

10. Registration Details

Product name	AIEx®64
Item	Automated Nucleic Acid Extraction System
No. of Certificate	-
Issue Date	April 1, 2023
Revision Date	-
Manufacturer	GeneAll Biotechnology Co., Ltd. D-1110, Hanam Techno Valley U1 Center, 947, Hanam-daero, Hanam-si, Gyeonggi-do, 12982, Republic of Korea



GENEALL BIOTECHNOLOGY CO., LTD

GeneAll Bldg., 303-7, Dongnamro, Songpa-gu, Seoul, Korea 05729

E-mail : sales@geneall.com

Tel. 82-2-407-0096 Fax. 82-2-407-0779

www.geneall.com

Manufacturer site

D-1110, Hanam Techno Valley U1 Center,
947, Hanam-daero, Hanam-si, Gyeonggi-do, 12982, Korea