

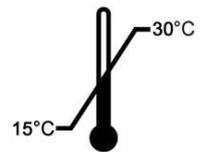
# User's Guide



## AllInOneCycler™ Thermal Block

REF

A-2041



IVD

Thermal Block

# **AllInOneCycler™**

## **Thermal Block**

### **User's Guide**

Version No.: 2.0 (2017-11)

Please read all the information in booklet before using the unit



**Bioneer Corporation**  
**8-11, Munpyeongseo-ro, Daedeok-gu,**  
**Daejeon, 34302, Republic of Korea**  
Tel: +82-42-930-8777  
Fax: +82-42-930-8688  
Email: [sales@bioneer.com](mailto:sales@bioneer.com)  
[www.bioneer.com](http://www.bioneer.com)

*AllInOneCycler™* is a trademark of Bioneer Corporation.  
Copyright 2017. Bioneer Corporation. All Rights Reserved.



## U.S. and Canadian Safety Standards

Standard for Electrical equipment for measurement, control and laboratory use;

Part1: General Requirements,

UL 61010-1, 2<sup>nd</sup> Ed, Rev., October 28, 2008&CAN/CSA-C22. 2 No. 61010-1-04(R2009)

Part 2: Particular Requirements for Laboratory Equipment for the Heating of Materials

CAN/CSA-C22.2 NO. 61010-2-010-04

Part 2: Particular Requirements for Automatic and Semi-Automatic Laboratory Equipment for Analysis and Other Purposes,

CAN/CSA-C22. 2 No. 61010-2-081:04

Part 2: Particular requirements for in vitro diagnostic (IVD) medical equipment,

CAN/CSA-C22. 2 No. 61010-2-101:04



### MANUFACTURER



: Bioneer Corporation  
8-11, Munpyeongseo-ro, Daedeok-gu, Daejeon, 34302  
Republic of Korea

### EUROPEAN REPRESENTATIVE



: MT Promedt Consulting GmbH  
Altenhofstr. 80  
D-66386 St. Ingbert, Germany  
Phone: +49 6894 581020

### PRODUCT

: AllInOneCycler™  
Thermal Block

### CATALOG NO.



A-2041

## Contents

I.	Before Starting .....	1
II.	Symbols Used for <i>AllInOneCycler</i> ™ .....	4
III.	Safety Warnings and Cautions .....	6
	1. Cautions on Using of Instrument .....	6
	2. Cautions on the Electrical Environment.....	7
	3. Cautions on the Operation Environment.....	7
	4. Warnings and Cautions regarding the Instrument Installation .....	8
	5. Warnings and Cautions regarding the Instrument Operation .....	8
	6. Warnings and Cautions regarding the use of the Instrument .....	9
	7. Cautions on Moving the Instrument .....	10
	8. Safety Warnings on Biological and Chemical Hazards .....	10
IV.	System Configuration and Specifications.....	11
	1. System Configuration .....	11
	2. Specifications .....	13
	3. System Exterior.....	14
V.	Installation of <i>AllInOneCycler</i> ™ .....	15
	1. Requirements for the Place of Installation .....	15
	2. Tools required .....	15
	3. Opening of the Packaging .....	15
	4. Installation of <i>AllInOneCycler</i> ™ .....	16
	5. Supplying the Power .....	17
VI.	Operation of <i>AllInOneCycler</i> ™ .....	18
	1. Inserting a Sample .....	18
	2. Home Menu.....	19
	3. Editing a Protocol.....	20
	4. Running a PCR protocol .....	41
	5. Taking out the tube and plate from <i>AllInOneCycler</i> ™ .....	43
	6. Setting menu .....	44
	7. About menu.....	54
	8. Operation of <i>AllInOneCycler</i> ™ Through Network.....	55
VII.	Troubleshooting .....	62
VIII.	User Maintenance.....	66
	1. Cleaning of the main body .....	66
	2. Cleaning the Hot-top Cover .....	67
	3. Replacing the Fuse.....	68
	4. Storage Method .....	70
	5. Shipping the Instrument for Service .....	70
IX.	Quality Assurance.....	71

## I. Before Starting

Thank you for purchasing a product from Bioneer Corp!

We, at Bioneer Corp. always try our best to offer a satisfactory experience to customers.

This manual includes the guidelines and precautions that are necessary in the day-to-day use of the product.

Before starting to use the product, please read and understand the manual thoroughly.

### Website

- For more information regarding *AllInOneCycler™*, visit our website at <http://www.bioneer.com>.

### General Information

- *AllInOneCycler™* is a registered trademark of Bioneer Corp.
- All information in the manual is protected by copyright. Any unauthorized revision and distribution without prior written consent from Bioneer Corp. would be deemed as a violation of the law.
- Bioneer Corp. owns the right to change the specification of the product or contents of the manual without prior notice.
- Ensure that you use only the accessories and the tubes that are supplied with the product.
- *AllInOneCycler™* can be used as multiple systems through PC software.
- Thermal gradient function of *AllInOneCycler™* is not available in some countries. Please contact us for further information.

## Description on Safety Cautions of *AllInOneCycler*™

English	Hot surface. Note that you can hot surface temperature.
Francais	Surface chaude. Faites attention à la surface chaude.
English	Do not work long hours at low temperature to Bath. We had a condensate can cause equipment malfunctions.
Francais	Ne pas utiliser le bain à basses températures pendant plusieurs heures. Risque de condensation pouvant entrainer des fonctionnements défectueux de l'équipement.
English	Door Attention Behavior. Open or close attention to when you crash and insertion.
Francais	Manipulation de la porte Risque de blessures corporelles (pincement/écrasement) lors de l'ouverture /fermeture de la porte.

## About *AllInOneCycler™*

*AllInOneCycler™* Thermal Block is a thermal block with a temperature control mechanism that is based on a peltier element. *AllInOneCycler™* Thermal Block has various functions such as temperature increment, time increment, ramp rate control, thermal gradient PCR, etc. In addition, with its compact size and light weight it offers high space efficiency and high portability. It is convenient for a user to use the instrument through a 7-inch LCD touch screen user interface, and it can also be remotely controlled with a separate PC software. The protocol, which is used for the communication between PC and *AllInOneCycler™*, is TCP/IP and all functions, including modification of PCR protocol from the control software in the PC can be used remotely. All the protocols the user edits are stored in the PC and they can be easily revised or copied later.

## The Use of the Instrument

This instrument is used to amplify a certain gene (DNA or RNA) for diagnosis of a disease.

## II. Symbols Used for *AllInOneCycler*™

### Symbols in *AllInOneCycler*™ User Guide

The table below presents the symbols used in *AllInOneCycler*™ user guide.

	Conformité Européenne Mark
	<i>In vitro</i> diagnostic medical instrument
	Temperature limit
	Manufacturer
	Authorized representative in the European Community
	Catalog number

### Safety Symbols that are attached on *AllInOneCycler*™

The table below presents the safety symbols used in *AllInOneCycler*™. In case of a situation with the high probability of danger, the symbols and clauses shown below would appear.

	Hot surface. Note that you can hot surface temperature.
	Do not work long hours at low temperature to Bath. We had a condensate can cause equipment malfunctions.
	Door Attention Behavior. Open or close attention to when you crash and insertion.

## Electrical Symbols of *AllInOneCycler*™

The table below is the explanation of electrical symbols on *AllInOneCycler*™.

	Indicates the <b>On</b> position of the main power switch.
	Indicates the <b>Off</b> position of the main power switch.
	Indicates a protective grounding terminal in the instruments that must be connected to earth ground.
	Indicates a terminal that can receive or supply alternating current or voltage.
	Indicates a terminal that can receive or supply direct current or voltage.

## Environmental Symbols of *AllInOneCycler*™

The symbol below (WEEE) is the explanation of the symbol of *AllInOneCycler*™ that is used in Europe.



**Do not dispose *AllInOneCycler*™ as unclassified waste.**

To minimize the effect of electric or electronic instruments on the environment, follow the regulations on proper disposal of such items.

### III. Safety Warnings and Cautions

Warnings and cautions are aimed at proper use of the instrument and safe operation. Customers should pay attention to all the below items for ensuring their safety. Bioneer Corp shall not be held responsible if any of the following safety warnings or cautions is ignored.

 <b>WARNING</b>	If a section with this label is ignored and handled improperly, it may cause death or serious injury.
 <b>CAUTION</b>	If a section with this label is ignored and handled improperly, it may cause injury to a person or loss of property.
 <b>WARNING</b>	If a section with this label is ignored and handled improperly, there is a possibility of death or serious injury due to hot temperature.
 <b>DANGER</b>	If a section with this label is ignored and handled improperly, it may cause death or serious injury due to an electric shock.

#### 1. Cautions on Using of Instrument



- (1) Check whether the power cord is connected to a proper external power (100–240VAC, 50/60Hz) and is securely mounted on the instrument. Connecting the power cord improperly may cause damage and failure of the instrument.
- (2) This instrument is designed for amplifying the nucleic acid and it should only be used solely for this purpose.
- (3) If the LCD touch screen is touched while the instrument is connected to the PC through LAN cable, it may cause the instrument to stop working. If the instrument is operated by PC software, disconnect the instrument and PC before touching the LCD touch screen.
- (4) Do not turn off the PC or pull out the LAN cable while the instrument and PC are connected. It may cause breakdown of the instrument or have an effect on the experiment result due to a data transmission error.
- (5) Install the instrument on a flat and even surface.
- (6) Do not operate the instrument with wet hands since it can cause an electric shock or breakdown of the instrument. Do not handle the power cord with wet hands for the same reason.
- (7) The instrument may halt if the instrument is stopped by force due to a user mistake such as the use of an improper accessory.
- (8) Do not place an object in front of or behind the instrument. It may lower the cooling performance as

the airflow of the cooling fan is blocked.

- (9) Do not insert any foreign substance in ventilating openings on the front, rear, and left sides of the instrument. It may cause fire due to overheating because performance of the cooling fan is reduced by the foreign substance.

## 2. Cautions on the Electrical Environment



- (1) Do not use the instrument with a damaged power cord. It may cause an electric shock or fire due to overheating of the power cord.
- (2) Do not connect multiple instruments to one external power source. It may cause fire due to overheating.
- (3) Check whether your hands are wet when you connect or disconnect a power cord to an external power source. Moisture may cause electric shock or fire.
- (4) Only use the power cord that is supplied by our company.
- (5) A power outlet should be located at least 1.5m away from any sink or washstand.
- (6) Do not repair a power outlet with insulation tape. Moisture may get into the tape.
- (7) If some other power cords need to be used, check whether they meet the rated voltage and current specification of *AllInOneCycler*™ (250V, 16A, 0.75 mm<sup>2</sup>, VDE).
- (8) Use only a proper plug that corresponds to the specification of a power outlet.
- (9) To prevent fire due to overheating, pull out the power cord from the *AllInOneCycler*™ when it is not in use for a long time.
- (10) *AllInOneCycler*™ has a grounded alternating current power cord and it is grounded to earth when the power cord is connected to a proper power outlet. To use this function, do not operate the instrument by connecting to the AC power outlet unless it is properly grounded.
- (11) Use of an improper fuse or high voltage power may damage the wiring system of the instrument and may cause the fire. Before supplying the power, check whether proper fuse is installed and the power supplied in the laboratory corresponds to the power of the instrument.
- (12) To be continuously protected from the hazard of fire, replace the fuse with the same type and class specified for the instrument (250V, F10AL, 5x20mm).

## 3. Cautions on the Operation Environment



- (1) Do not place any external object near the instrument.
- (2) Do not install the instrument where there is a lot of dust. The instrument may break down or it may be damaged due to excessive dust.

- (3) Do not install the instrument near a source of heat as it increases the risk of fire.
- (4) Do not install the instrument in the place with high humidity or near water. It may cause an electric shock, fire or breakdown of the instrument.
- (5) Do not install the instrument near any equipment with corrosive or flammable gas. If corrosive or flammable gas is leaked, open the windows to facilitate ventilation without touching the power cord. The spark on the power cord may cause fire or explosion.
- (6) Do not disassemble or modify the instrument for any reason. It can cause fire, electric shock or breakdown of the instrument and such an action shall void the warranty.

#### 4. Warnings and Cautions regarding the Instrument Installation



- (1) This is a precision instrument. Do not install in places that is exposed to the direct sunlight.
- (2) Always install the instrument on a flat and stable surface so that the instrument remains stable while in operation.
- (3) Install the instrument at least 15cm away from the nearest wall.
- (4) Ensure to turn off the power supply to the PC, network hub and *AllInOneCycler*™ before you connect them. If the power is on while connecting those instruments, they may be damaged.
- (5) Check whether the connection is made completely when you connect the PC, network hub and *AllInOneCycler*™. Experiment may go wrong if a data communication error occurs due to unstable network connection.

#### 5. Warnings and Cautions regarding the Instrument Operation



- (1) Remove all the dust around the power plug, and connect it firmly so that it does not wobble. Unstable connection may cause fire.
- (2) Operate the instrument in the temperature between 15°C and 30°C (59 and 86°F). If the instrument is exposed to high temperature, it may affect the instrument and produce inaccurate results.
- (3) Operate the instrument in the recommended humidity range. (20 to 80%, which is in the temperature in which vapor does not turn into water). High humidity may cause corrosion or breakdown.
- (4) Do not place any object to the sides or to the rear of the instrument. It can cause the breakdown of the instrument.
- (5) This instrument includes precision parts. Do not drop or shake hard. It may be damaged, and safety of the instrument cannot be guaranteed if shook hard or dropped.
- (6) If the instrument is not used for a long time, turn off the power of the instrument and disconnect

from the external power source. Otherwise, there is a risk of overheating and fire.

- (7) When the instrument is operated using the PC software, turn off all the power options such as 'Monitor Off', 'Hard Disk Off', 'System Standby Mode,' 'Sleep Mode' so that these functions are not executed. Since the instrument and PC continuously transmit data, the hard disk may break down if the power is shut down while in operation.
- (8) There is a risk of suffering burns on the hand or body. Do not open the hot-top cover during the operation.
- (9) If you touch ventilation openings or parts during the operation, your hand may be pressed or torn, or it may cause electric shock.

## 6. Warnings and Cautions regarding the use of the Instrument



- (1) Use this instrument for amplifying the nucleic acid only. Do not use the instrument for any purpose that is not specified in the user manual.
- (2) Use only the accessories that are supplied with the product, or recommended tubes.
- (3) Do not modify or delete the information that is marked on the instrument.
- (4) When you touch the LCD touch screen, use a blunt object only. Fingernail or such sharp objects may damage the product.
- (5) Do not use strong surfactant or solvent to clean the surface of the instrument. The color of the instrument may change. If such material is spilt on the instrument, wipe it with soft cloth immediately.
- (6) Do not store the instrument in a humid place. If it is stored in a humid place, the instrument could be damaged, and such an action can void the warranty. In addition, in such a scenario, it may be impossible to repair.
- (7) In case the instrument is disassembled or modified, the warranty shall become void, and any request for the service may be turned down.
- (8) Do not pull out the power cord while the instrument is in operation. It may cause instrument breakdown.
- (9) If there is a burning smell or the instrument is extremely hot, stop the operation of the instrument immediately and contact the service staff.
- (10) Do not drop or perform any action that can cause impact damage to the instrument. It may damage the instrument and may void the warranty.

## 7. Cautions on Moving the Instrument



- (1) Only a designated personnel or supplier should move or install the instrument. If you want to move the instrument after installation, it is mandatory to get some help from others around you or have necessary equipment and technology for such shifting.
- (2) If you attempt to lift the instrument improperly, it may cause serious and permanent injury to your back. It may require more than two persons to move the instrument, depending on its weight.

## 8. Safety Warnings on Biological and Chemical Hazards



- (1) Biological specimens such as tissue, body fluid and blood of humans and animals can transmit contagious diseases. Please follow the regulation of each country and region. Put on safety goggles, protective clothing and gloves when experimenting.
- (2) Before handling chemical materials, read and understand the Material Safety Data Sheet (MSDS) that the manufacturer has distributed and go through all the related cautions.
- (3) Before changing the parts of the instrument or reagent, always check what chemical materials were used. Moreover, use proper safety goggle, protective clothing, and gloves when handling the instrument.
- (4) Before storing, handling, or processing any chemical materials or hazardous materials, read and understand the Material Safety Data Sheet (MSDS) that the chemical manufacturer has distributed.
- (5) Minimize contact with chemical materials. When you handle chemical materials, always put on individual protective gears (For example, safety groves, goggles, clothing, etc.).

## IV. System Configuration and Specifications

### 1. System Configuration

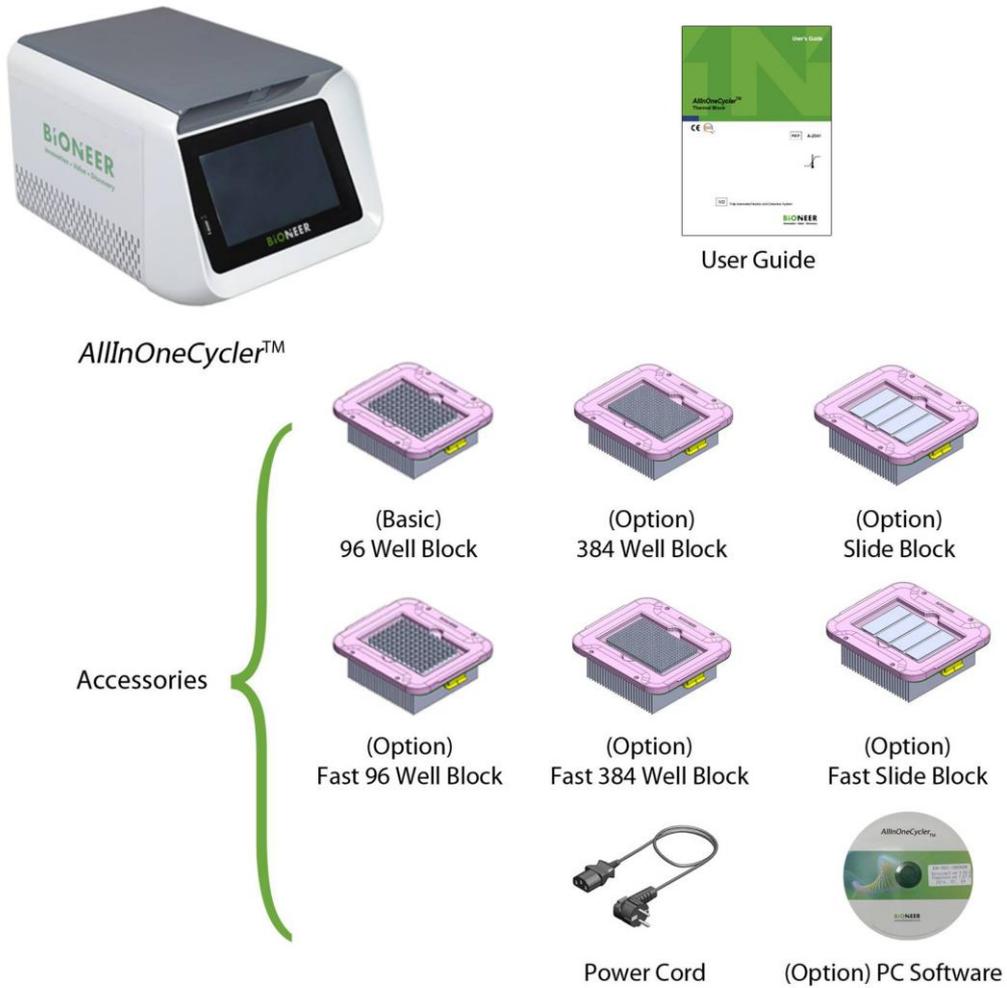


Figure 1. AllInOneCycler™ system configuration

Table 1. List of AllInOneCycler™ System Component List

Part Name	Cat. No.	Qty.
<i>AllInOneCycler</i> ™ PCR system		
(Standard item) <i>AllInOneCycler</i> ™ 96 well PCR system*	A-2041-1N	1 ea
(Optional item) <i>AllInOneCycler</i> ™ 384 well PCR system	A-2041-2N	
(Optional item) <i>AllInOneCycler</i> ™ Slide PCR system	A-2041-3N	
(Optional item) <i>AllInOneCycler</i> ™ Fast 96 well PCR system	A-2041-1F	
(Optional item) <i>AllInOneCycler</i> ™ Fast 384 well PCR system	A-2041-2F	
(Optional item) <i>AllInOneCycler</i> ™ Fast Slide PCR system	A-2041-3F	
<i>AllInOneCycler</i> ™ thermal block		
(Basic) <i>AllInOneCycler</i> ™ 96 well thermal block only*	A-2041-1-1	1 ea
(Optional item) <i>AllInOneCycler</i> ™ 384 well thermal block only	A-2041-2-1	
(Optional item) <i>AllInOneCycler</i> ™ Slide thermal block only	A-2041-3-1	
(Optional item) <i>AllInOneCycler</i> ™ Fast 96 well thermal block only	A-2041-1-2	
(Optional item) <i>AllInOneCycler</i> ™ Fast 384 well thermal block only	A-2041-2-2	
(Optional item) <i>AllInOneCycler</i> ™ Fast Slide thermal block only	A-2041-3-2	
User's Guide		1 ea
Power Cord		1 ea
(Optional item) <i>AllInOneCycler</i> ™ PC control software	A-2041-9	

*AllInOneCycler*™ 96 well PCR system (A-2041-1M), which is provided as default, includes *AllInOneCycler*™ 96 well thermal block (A-2041-1-1).

## 2. Specifications

Physical specifications	
Dimension	246 mm(W) x 232 mm(H) x 369 mm(D)
Weight	8.4 kg (18.52 lbs)
Display	7-inch Touch LCD screen
Power consumption	100–240 V~, Max 8.5 A, 50/60 Hz 630 VA
Port*	2 USB ports for storage (front and lower rear) 1 USB port for engineering (upper rear)
Fuses	Two fuses (250 V, F10AL, 5×20m)
Operating temperature	15 °C ~ 30 °C (59 °F ~ 86 °F)
Operating humidity	20 % ~ 80 %, no condensation
Interchangeable block format†	96-well (0.2 ml), 384-well (0.02 ml) and Slide PCR type
PCR volume range	5 µl ~ 80 µl
Operating specifications	
Method of heating / cooling	Peltier
Temperature range	4.0 °C ~ 99.9 °C (39.2 °F ~ 211.82 °F)
Maximum ramp rate‡	Heating : 6.5 °C/sec (11.7 °F/sec) Cooling : 4.5 °C/sec (8.1 °F/sec)
Temperature accuracy	± 0.3 °C (± 0.54 °F)
Temperature uniformity	≤ 0.3 °C (≤ 0.54°F)
Lid temperature	90 °C ~110 °C (194 °F ~ 230 °F)
Gradient range	1 °C ~ 20 °C (1.8 °F ~ 36 °F)
Temperature increment range	0.1 °C ~ 2.0 °C (0.18 °F ~ 3.6 °F)
Time increment range	1 sec ~ 59 sec
Ramp rate control	0.1 °C/sec (0.18 °F/sec)

\* USB port at the rear of the instrument is the port that is used by an engineer for inspecting the instrument and it cannot be used for storing data.

† The block that is supplied by default is *AllInOneCycler*™ 96-well block (Cat. No. A-2041-1-1) and the blocks in any other format is optional. Blocks can be classified into three types according to the sample type (96-well, 384-well, Slide PCR) and there are standard blocks and special alloy blocks according to the material; 6 blocks in total can be selected and used.

‡ It is the maximum ramp rate when the default *AllInOneCycler*™ 96-well block (Cat. No. A-2041-1-1) is used; If *AllInOneCycler*™ 96-well Fast block (Cat. No. A-2041-1-2) is used, the maximum ramp rate would be 9.5 °C/sec for heating and 7.7 °C/sec for cooling.

### 3. System Exterior



Figure 2. Front side of AllInOneCycler™

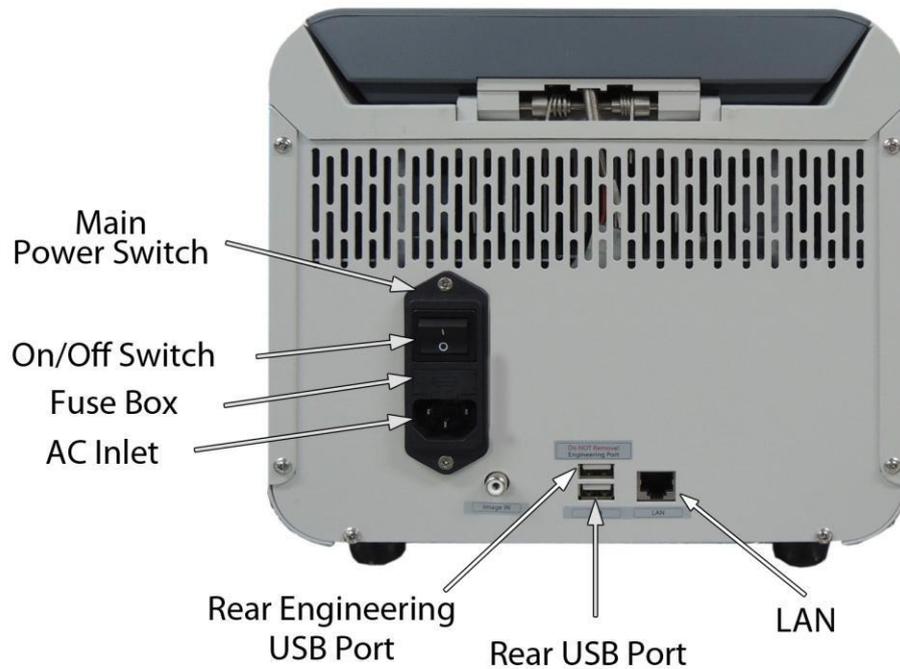


Figure 3. Rear side of AllInOneCycler™

## V. Installation of *AllInOneCycler*™

### 1. Requirements for the Place of Installation

- *AllInOneCycler*™ Thermal Block is the instrument designed for indoor user and the following things must be considered in selecting the place of installation.
  - Satisfies the requirements for space and weight.
  - Satisfies environmental requirements.
  - The power outlet with the power rating of 700VA or above should be located within 1.5m (4.92ft.).
  - Must be isolated from any form of moisture.

### 2. Tools required

- Scissors, pocket knife or box cutter

### 3. Opening of the Packaging



Since there may be need for sending it back to Bioneer Corp. for A/S, keep the packaging materials and box.

(1) Opening of *AllInOneCycler*™:

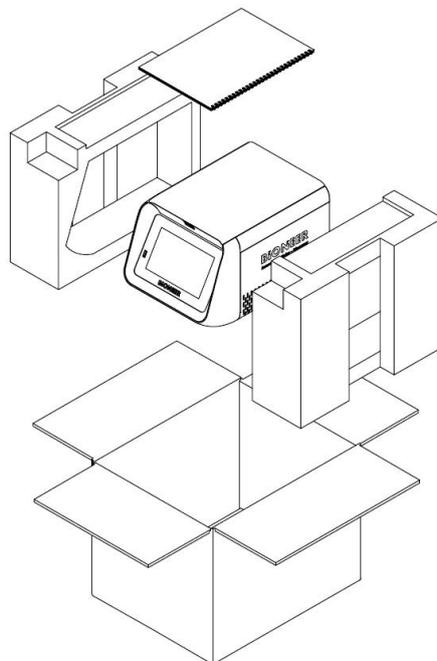


Figure 4. Packing of *AllInOneCycler*™

- 1) Remove the strings that wrap the box.
- 2) Remove the tape that holds the upper covers and open the covers.
- 3) Initially, take out the accessory box of *AllInOneCycler*™.
- 4) Pull up the instrument, wrapped with Styrofoam covers from the box and remove the covers.
- 5) Remove the packaging material of *AllInOneCycler*™ completely and check the instrument to ascertain whether any damage has occurred during delivery.



If *AllInOneCycler*™ is damaged, please get in touch with the technical support manager of Bioneer Corp. through the sales person and provide him the information about your location and damaged exterior.

- (2) Move the *AllInOneCycler*™ to the place of installation. While moving the instrument, follow the guidelines below.
  - Hold the instrument safely and comfortably.
  - After straightening your back and bending down your knees, put the instrument on your lap, and lift it.
  - Do not twist your body when you lift the instrument.
- (3) Open up the accessory box of *AllInOneCycler*™, and check the contents.
  - *AllInOneCycler*™ Thermal Block User Guide
  - Power Cord that complies with the 10A/125V power specification of North America or 10A/220V power specification of Europe

#### 4. Installation of *AllInOneCycler*™

- (1) Remove the packaging materials
  - 1) Open the hot-top cover of *AllInOneCycler*™.
  - 2) Fully remove any fine dust that may have got into the bath block during the delivery using compressed air or compressed air can.
  - 3) Close the Hot-top cover again.
- (2) Connect a power cord to the lower left side in the rear of the instrument.
- (3) (Optional) Put on the recommended protective gear.
- (4) Connect the power cord to the power outlet with the power rating of 700VA or above.

## 5. Supplying the Power

- (1) Check and ensure that the hot-top cover of *AllInOneCycler*™ is closed.
- (2) Press the power button located on the lower left side on the rear of *AllInOneCycler*™.

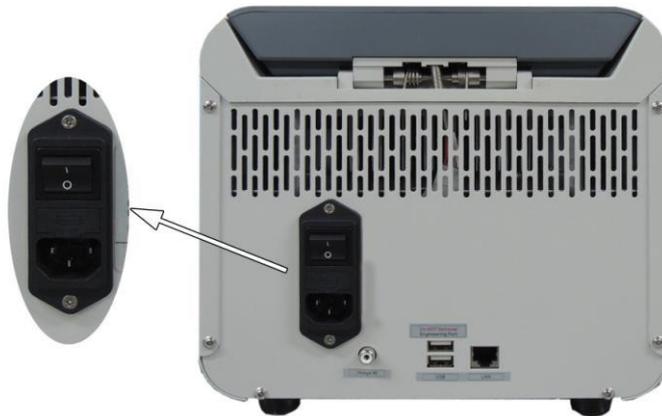


Figure 5. Power button of *AllInOneCycler*™

- (3) When the initialization process is completed, 'Home' Menu appears on the screen in front.



Figure 5. Home screen of *AllInOneCycler*™

## VI. Operation of *AllInOneCycler*™

### 1. Inserting a Sample

- The method of inserting a sample shall be explained in this section.
- Use the instrument by referring to the related explanation according to the relevant block.
- There is no need to use mineral oil, glycerin or any other evaporation prevention product to prevent the evaporation of a sample in a tube. The tube is securely in contact with the well and the hot-top cover provides pressure to all the tubes evenly to prevent the moisture condensation at the time of reaction.

#### (1) Inserting a sample when the 96-well Thermal block is being used.

- **When a PCR tube is used**
  - 1) Prepare a PCR tube with a volume of 0.2 ml.
  - 2) Insert the reaction solution into the PCR tube using a pipette.
  - 3) Close the lid of the tube.
  - 4) Insert the tube into the Bath block.
  - 5) Close the hot-top cover.
- **When a 96-well plate is used**
  - 1) Prepare a 96-well plate with a volume of 0.2 ml.
  - 2) Insert the reaction solution into each well using a pipette.
  - 3) Seal the plate using the transparent film to adhere it.
  - 4) Insert the plate into the bath block.
  - 5) Close the hot-top cover.

#### (2) Inserting a sample when the 384-well Thermal block is being used.

- 1) Prepare a 384-well plate with a volume of 0.02 ml.
- 2) Insert the reaction solution into each well using a pipette.
- 3) Seal the plate using the transparent film to adhere it.
- 4) Insert the plate into the bath block.
- 5) Close the Hot-top cover.

### (3) Inserting a sample when the Slide Thermal block is being used.

- 1) Put a block guide adapter on the slide block.
- 2) Insert the reaction solution into the well of a gel coated slide glass using a pipette.
- 3) Seal the slide glass using the transparent silicon.
- 4) Put the slide glass on the bath block.
- 5) Close the hot-top cover.

## 2. Home Menu

- The user can create a new protocol, select & modify previous protocols, change configured values of the instrument and check the basic information of the instrument from the 'Home' Menu.

Table 2. Function icons of home menu

Function icons	Description
	Creates a new protocol
	Opens or edits an existing protocol
	Changes network setting, Checks and manages protocol files, and calibrates the temperature adjustment function
	Version and contact information of installed software

### 3. Editing a Protocol

#### (1) Creating a new protocol

1) Touch the 'New Protocol' icon on the 'Home' Menu

- If you touch the 'New Protocol' icon in the 'Home' Menu, the screen displays the 'Edit Protocol' screen.
- In this screen, the user can select a template protocol before creating a new protocol.
- The user can create a new protocol by changing temperature, time, the number of repetitions, and number of steps from the template protocol according to the purpose of the use. In addition, the user can save it with the name that is designated by him/her in the designated folder.

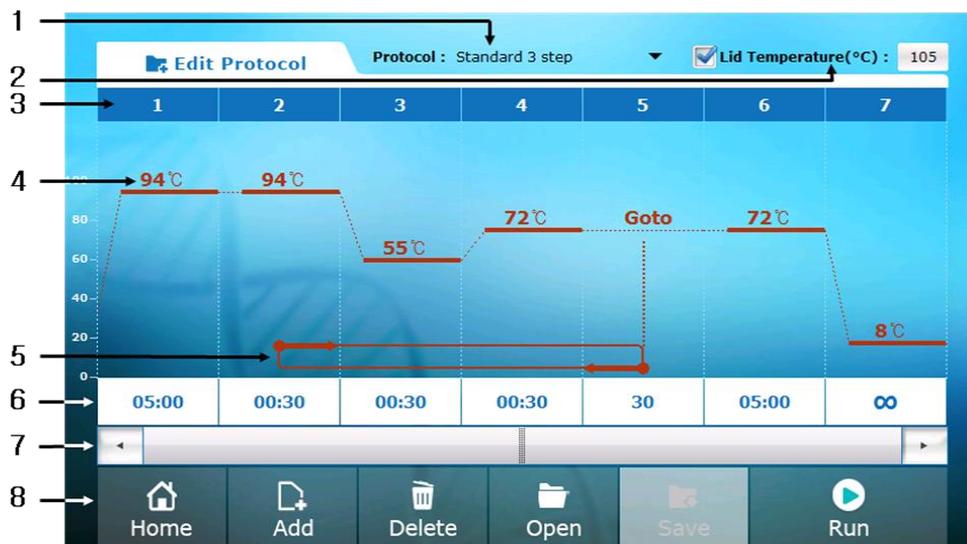
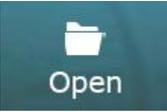
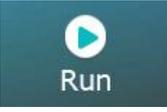


Figure 6. Edit Protocol screen of AllInOneCycler™

Table 3. Components of Edit Protocol screen

Component	Description
1. Protocol name	The template protocol name is displayed and the user can select the protocol according to the purpose of the use. After saving the protocol, the name of the saved protocol is displayed.
2. Lid temperature	If the check box next to the lid temperature is checked, hot top can be used. The default value of hot top temperature is configured as 105°C.

Component	Description	
3. Step order	The order of each step is displayed. The protocol runs in the order of the steps.	
4. Temperature	The temperature of each step is displayed. If you touch the displayed temperature, you can change the value.	
5. Repeat sections	Section that is repeated among all steps is displayed.	
6. Time and additional information	The time and number of repetitions of each step are displayed. If your touch the displayed number, you can change the value.	
7. Side scroll bar	In case of a protocol that includes many steps, you can view the protocol by touching arrows  and  which are located at the both ends of the scroll bar.	
8. Function icons		Returns to 'Home' Menu.
		Insert new step on the right side of selected step.
		Deletes selected step.
		Opens previously stored protocol.
		Saves currently edited protocol.
		Executes current protocol.

## 2) Selecting a protocol from template protocols

- *AllInOneCycler™* offers eight types of template protocols presented in the table below and you can select one of them according to the purpose of the use.

Table 4. Template protocol list

Protocol name
Standard 3 step
Fast 3 step
Fast 2 step
Gradient 3 step
Gradient 2 step
One step RT-PCR
Reverse transcription
Incubation

- a) If you touch the 'Protocol Name' in the 'Edit Protocol' screen, the list of protocols that is presented in the table 4 appears under the name area.

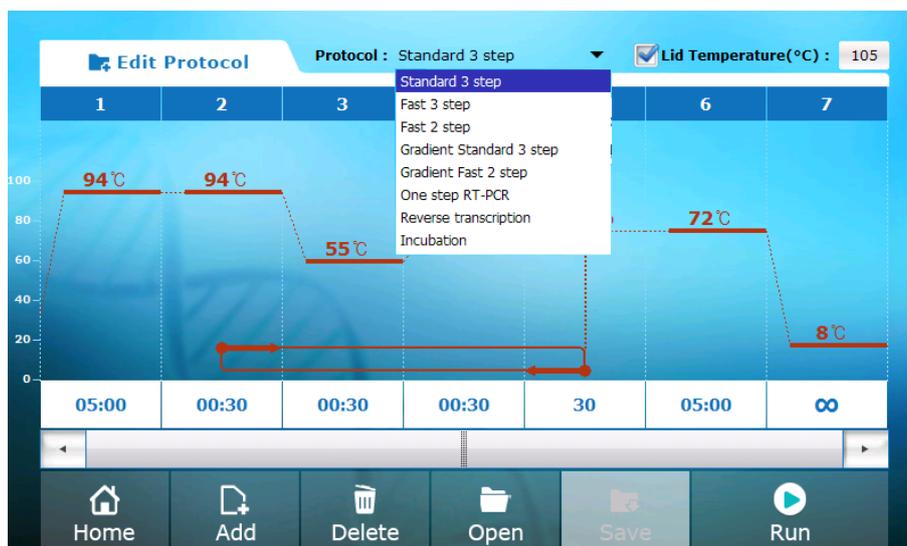


Figure 7. Select a template protocol from the 'Edit Protocol' screen.

- b) 8 Template protocols are displayed in the list and you can select any one of them by touching it.
- c) The protocol that is selected on the graph is displayed.
- d) Edit the protocol according to the purpose of the use. (Refer to the 'Changing Protocol Settings' on the pages 24 to 36)

## (2) Changing Protocol Settings

- 1) Changing temperature, time and the number of repetitions
  - a) Touch numbers for temperature, time and the number of repetitions on the graph.
  - b) The 'Step Options' window is newly created. 'Step Options' includes 'Incubate', 'Goto', 'Gradient' and 'Store' as explained in the table below.
  - c) Touch the value that needs to be changed.
  - d) Change the value by touching the number pad on the right side of the window.
  - e) Touch the 'OK' button.
  - f) The 'Step Options' window disappears and the changed value is applied to the current protocol.

Table 5. 'Step Options'

Protocol step	Description
Incubate	Keeps the temperature within a certain range for a certain period.
Goto	Configures the number of repetitions and the section of repetition.
Gradient	Configures the temperature gradient PCR mode.
Store	Keeps the temperature constant until the user stops the protocol.

### ① Incubate step

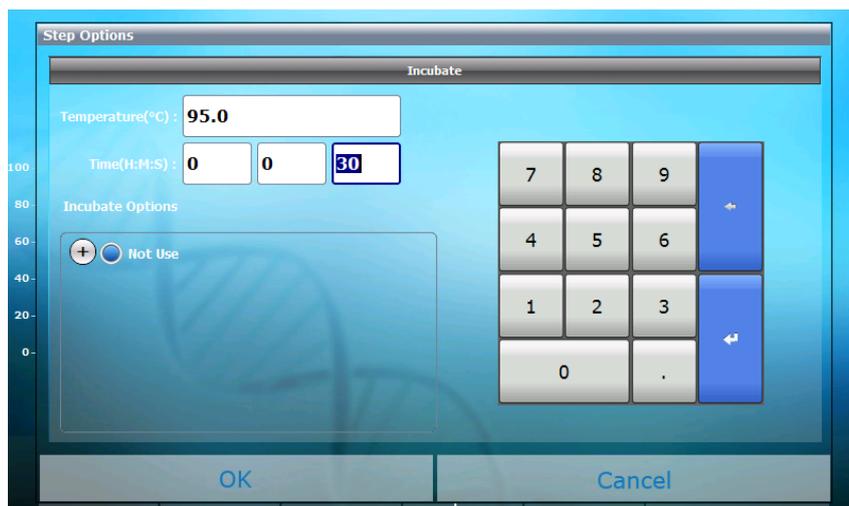


Figure 8. 'Incubate step option' window of the configured step

- Temperature variation range: 4 °C ~ 99.9 °C

- Time variation range: 1 sec ~ 5 hr 59 min 59 sec

※ Setting 'Incubate Options'

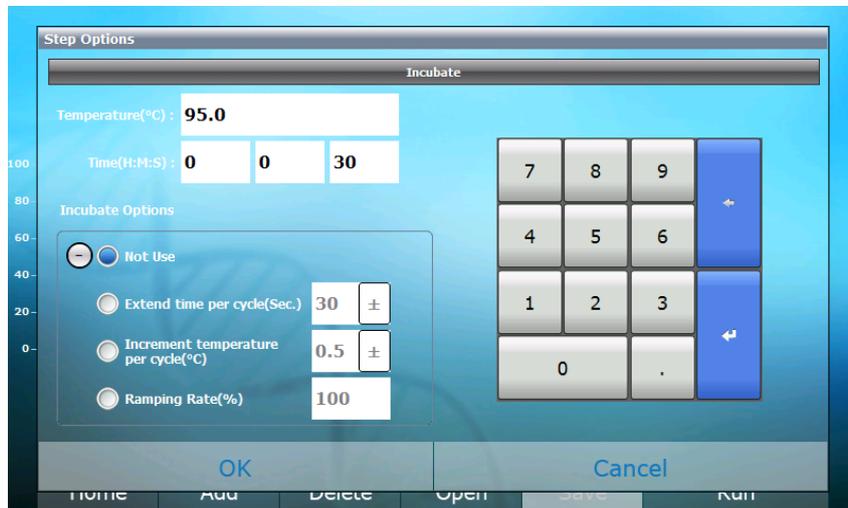
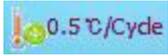


Figure 9. Incubate options setting screen of the 'Incubate step option' (Lower left side)

- Press the  button on the lower side of temperature and time setting window.
- Three setting screens, namely 'Extended time per cycle', 'Increment temperature per cycle' and 'Ramping Rate' are created.
- Activate the desired menu by selecting it and change the value. (Menu cannot be selected as duplicate.)

Table 6. Method to set Incubate options

Option	Description
Extended time per cycle	<ul style="list-style-type: none"> <li>▪ It is a menu to increase or decrease in stages the time of a certain step for each repetition.</li> </ul> <ol style="list-style-type: none"> <li>1. Touch the number keypad and enter the desired value between 0 and 59.</li> <li>2. Decide whether to increase or decrease the time by pressing the  button on the right side of the key pad.</li> <li>3. When this option is applied, the configured value is shown in the step on the protocol graph like .</li> </ol>
Increment temperature per cycle	<ul style="list-style-type: none"> <li>▪ It is a menu to increase or decrease in stages the temperature of a certain step for each repetition.</li> </ul> <ol style="list-style-type: none"> <li>1. Touch the number keypad and enter the desired value between 0 and 2.0.</li> <li>2. Decide whether to increase or decrease the temperature by pressing the  button on the right side of the key pad.</li> <li>3. When this option is applied, the configured value is shown in the step on the protocol graph like .</li> </ol>
Ramping Rate	<ul style="list-style-type: none"> <li>▪ It is a menu to decrease the rate of change of temperature.</li> </ul> <ol style="list-style-type: none"> <li>1. It is applied to the speed between the selected step and the next step.</li> <li>2. Touch the number keypad and enter any desired value between 1 and 100%.</li> <li>3. When this option is applied, the configured value is shown in the step on the protocol graph like .</li> </ol>

## ② Goto step

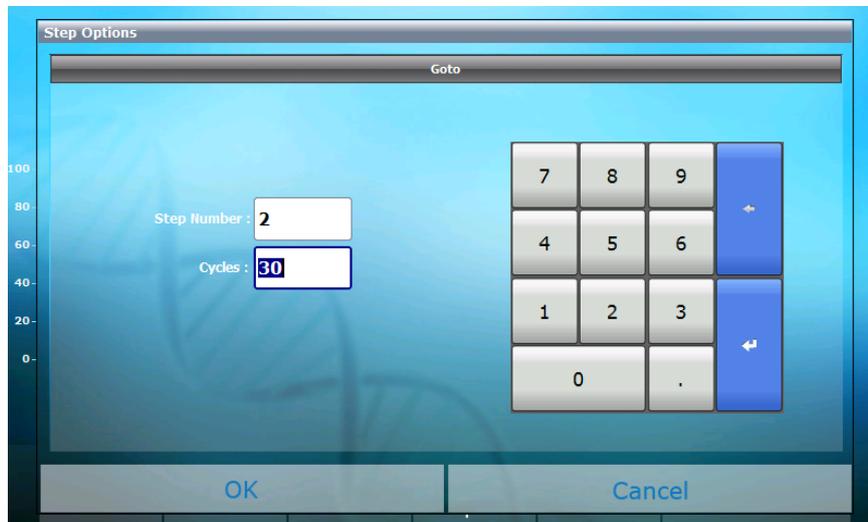


Figure 10. 'Goto step option' window of the configured step

- If you touch the 'Goto' or repeat section, the 'Goto step option' window is created.
- You can change the step number that the repeat section starts. The value for 'step number' must always be smaller than that of 'Goto' step.
- Cycles variation range : 1 ~ 100

## ③ Gradient step



Figure 11. 'Gradient step option' window of the configured step

- Temperature variation range: 20 °C ~ 95 °C, The maximum difference between two values is 20 °C and the gradient function is activated only when the value on the right is configured to be greater than that of the left side.
- Time variation range: 1 sec ~ 5 hr 59 min 59 sec
- If you touch the 'Gradient Calculator' button under the time setting window, the 'Gradient Calculator' window appears and the estimated temperature of each well is shown.



Figure 12. 'Gradient Calculator' of the 'Gradient step option'

④ Store step

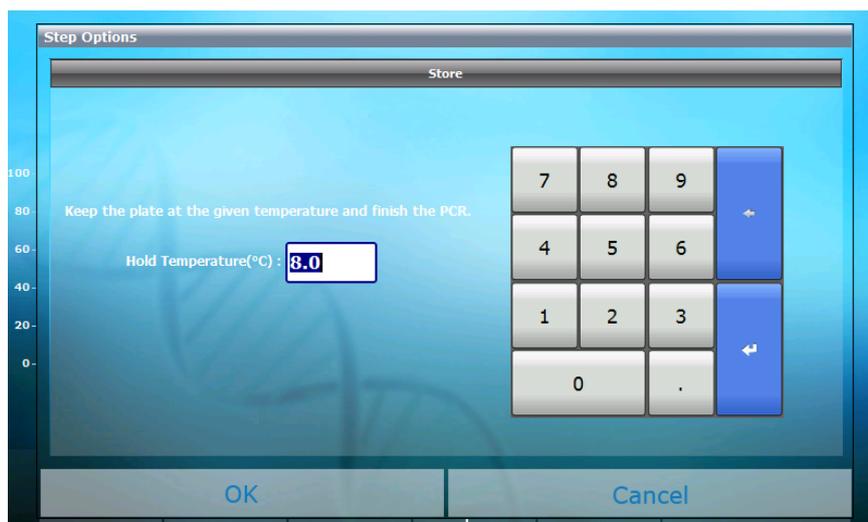


Figure 13. 'Store step option' window of the configured step

- Temperature variation range: 4 °C ~ 12 °C
- 'Store' step can only be added to the right end of the protocol (last step).



If you use the store function in a highly humid environment for a long time (in default temperature of 8°C), water might be condensed inside the instrument. In such highly humid environment, try not to use the store function and if you have to use it, it is recommended to set the temperature to 12°C.

## 2) Adding a step

- Select the location of a new step to be inserted by touching the step on the left of where a new step is to be inserted. A new step is inserted to the right side of the step that is selected. If no step was selected, the new step is added at the first left of the protocol (the first step).
- Press the 'Add' icon on the menu in the lower part of the screen.
- The 'Step Options' window is created.
- You can select one of four steps from the column on the upper side of newly created 'Step Options' window, namely 'Incubate', 'Goto', 'Gradient', and 'Store'. Select one of them.

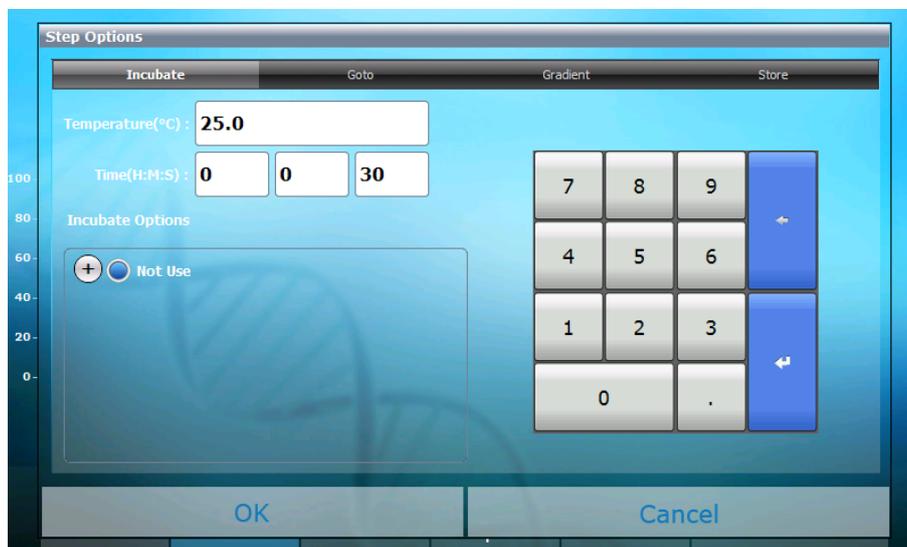


Figure 14. Step Options window of the newly added step

- For each protocol step, the values are set with the same method that was followed for changing values. (Refer to the 'Changing temperature, time and the number of repetitions' of pages 24 to 29)

## 3) Deleting a step

- a) Select the step to be deleted.

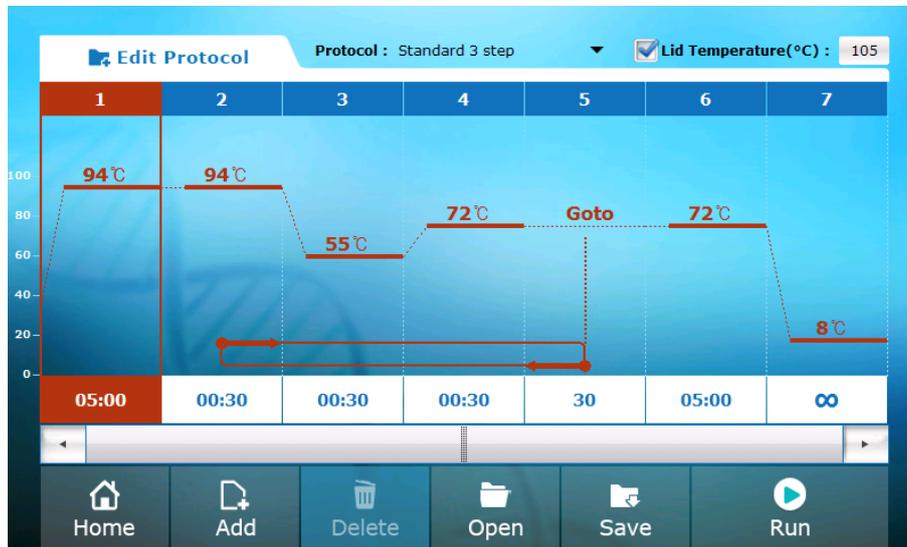


Figure 15. Select the step to be deleted

- b) Press the 'Delete' icon on the lower part of the screen to delete the selected step.
- 4) Setting Lid Temperature
    - a) You can decide whether to use the Hot-top by checking or unchecking the check box next to the Lid Temperature. In the general PCR condition, evaporation phenomenon can be prevented only when the hot-top is used.
    - b) When you use hot-top, you can change the temperature within the range of 90 to 110°C.
    - c) To change the temperature of the hot-top, click on the lid temperature input field on the upper right side of the 'Edit Protocol' screen.

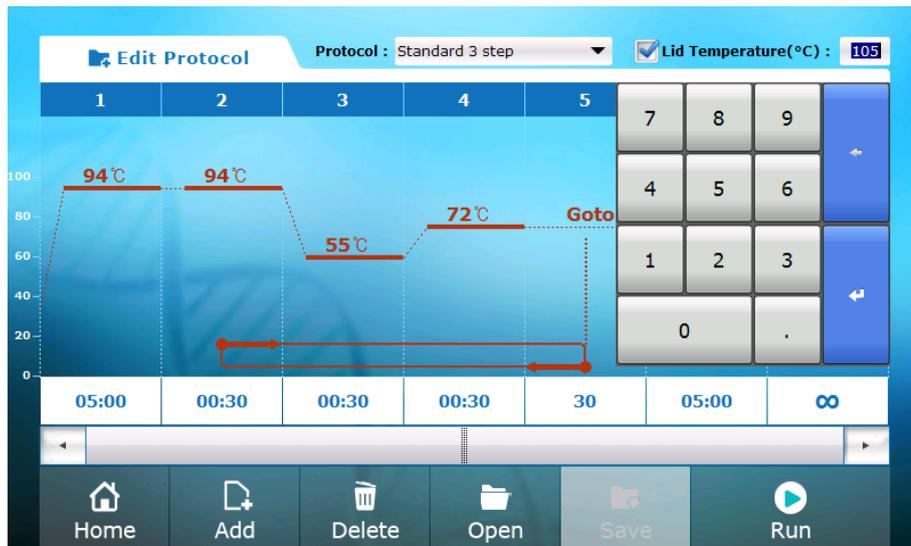


Figure 16. Selecting the lid temperature input field

- d) The key pad that can enter the temperature of the Hot-top appears and the desired temperature in the range of 90 and 110°C can be entered.
- e) If the proper temperature for the Lid Temperature is entered, and the value entered is within the normal temperature range, the 'Save' button on the lower part of the screen becomes activated.

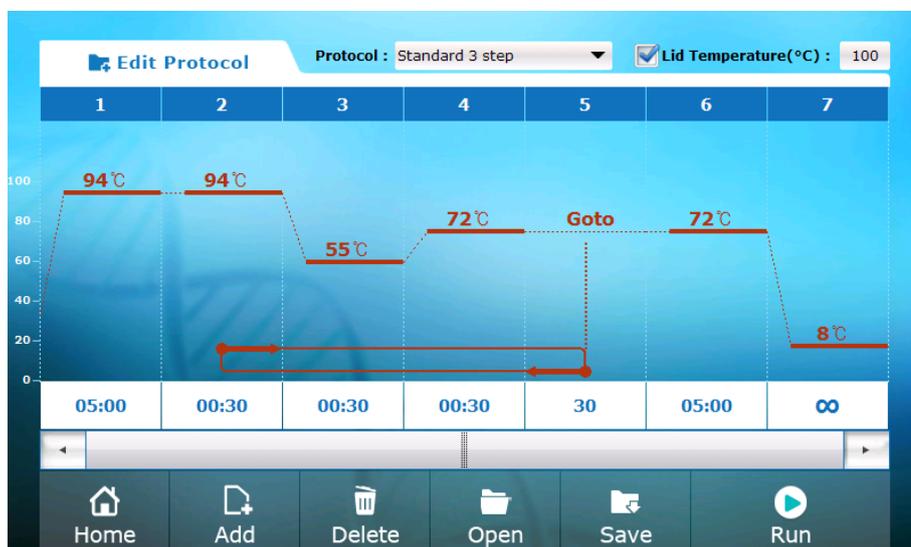


Figure 17. Inputting temperature in the normal range

- f) If the entered temperature is outside the normal temperature range for the lid temperature, an error message pops up and the value will be changed to 105 which is the default value.

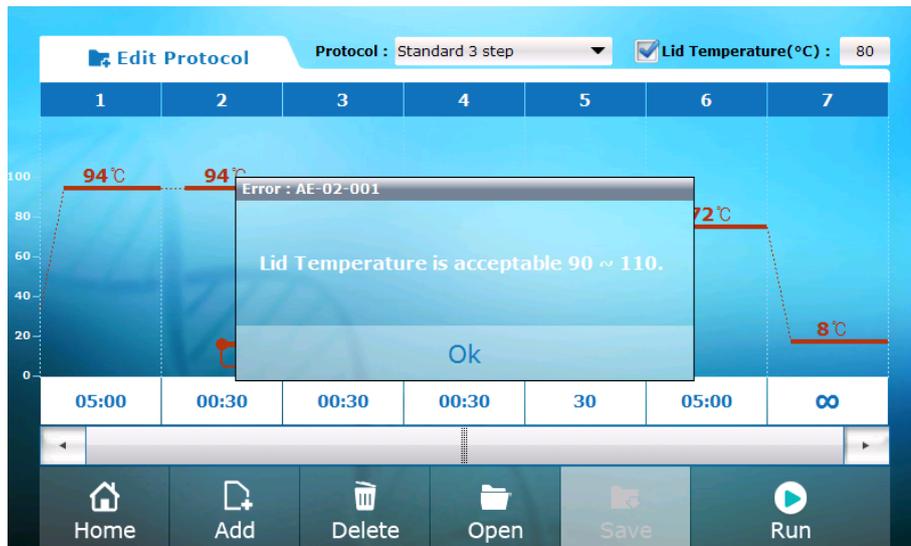


Figure 18. Inputting temperature in the abnormal range

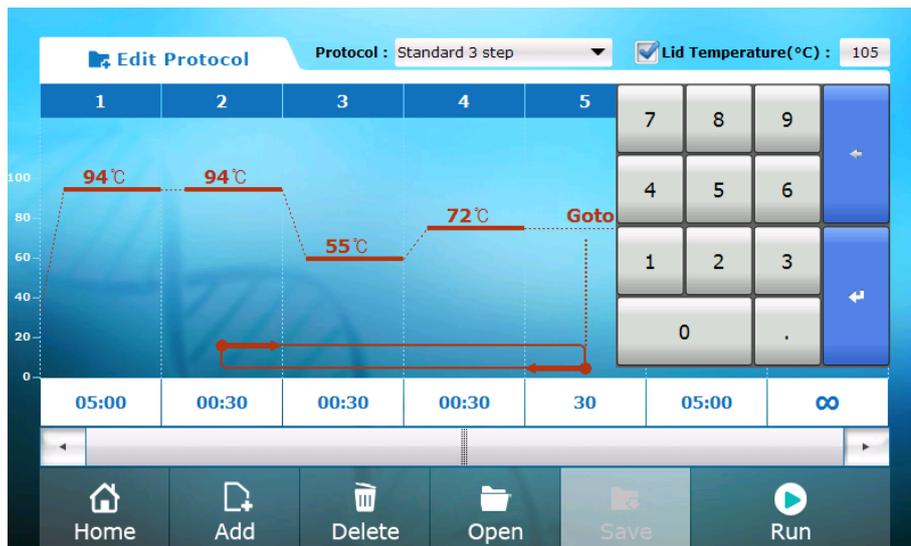


Figure 19. Lid temperature is changed to the default value.

- 5) Opening the stored protocol
  - a) Press the 'Open' icon.
  - b) The screen turns into the 'Open protocol' screen.
  - c) For more detail, refer to the 'Opening the saved protocol' part (pages 37 to 40).

- 6) Saving a protocol
- After editing the protocol in the 'Edit Protocol' screen, touch the 'Save' icon on the menu on the lower side of the screen.
  - The 'Save Protocol' window appears.

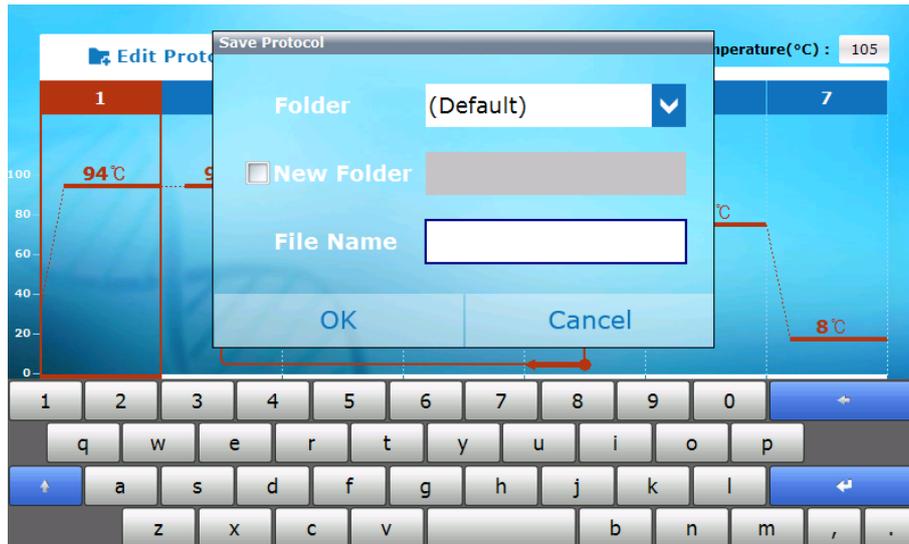


Figure 20. 'Save Protocol' window

- Select one of the existing folders to save the protocol from the folder selection window.

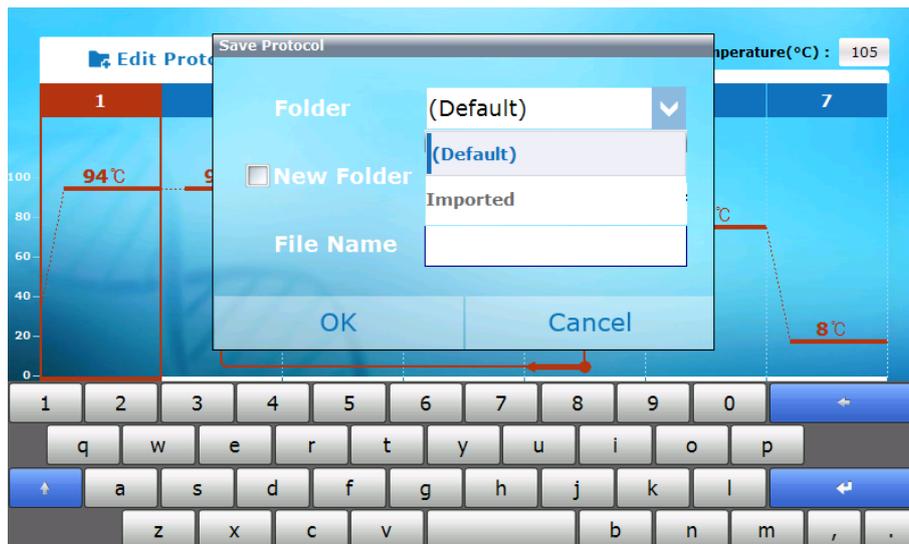


Figure 21. Select one of the existing folders to save the protocol

- d) To create a new folder, check the checkbox on the left side of 'New Folder' to select and enter the name of a new folder in the input field of the window on the right side. If the 'New Folder' is selected, the previous folder selection window on the upper side becomes inactive.

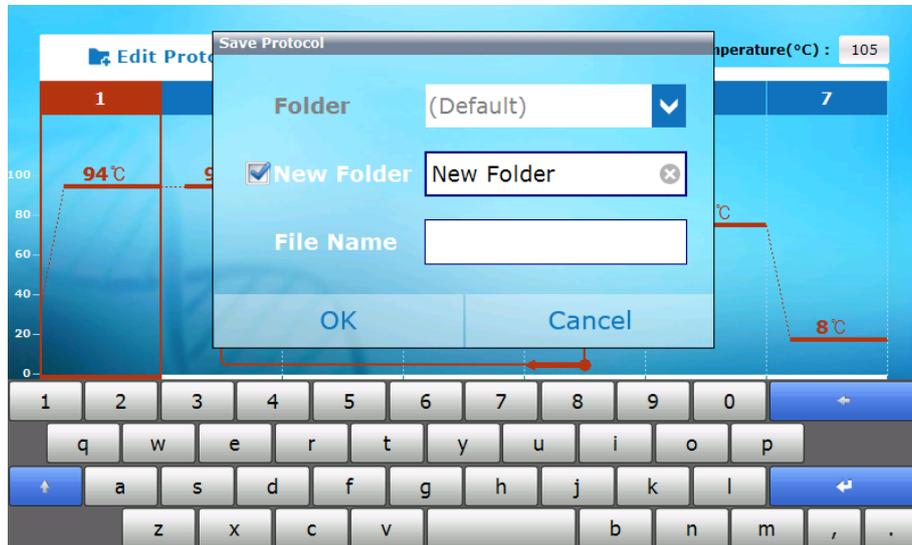


Figure 22. Creation of New Folder

- e) Configure the name of the protocol to save.

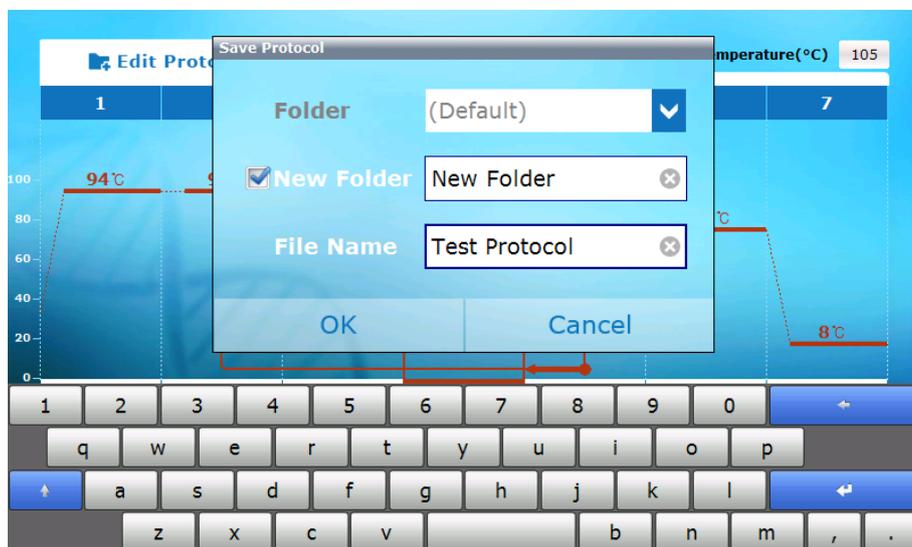


Figure 23. Configure the name of edited protocol

- f) If the location of the folder is not specified, the protocol is stored in the 'Default' folder.

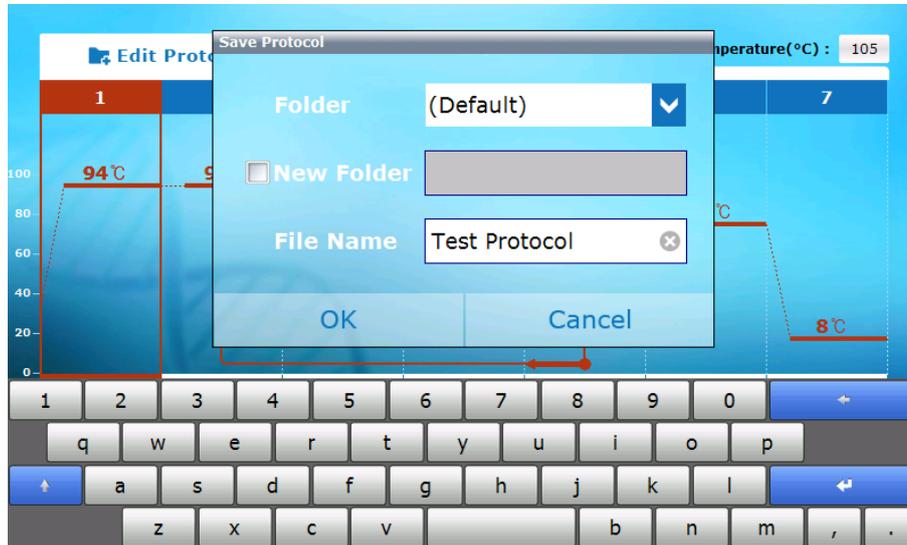


Figure 24. Default setting screen when the folder is not selected

- g) In case the protocol is stored in an USB drive, the USB is shown on the folder selection window when you insert an USB drive into the left side of the front touch screen of *AllInOneCycler™* or on the rear side of the instrument. (Refer to figure 2 and 3)
- The default storage folder for USB is 'USB – (Default)', and the protocol is stored in the path 'USB:WAllInOneCyclerWProtocols'.



Figure 25. The path of file that is stored in the USB drive

- When the protocol is saved in the USB, new folder cannot be created.
- If the user creates a sub folder under 'USB:WAllInOneCyclerWProtocols' in a PC or copied the protocol file to the USB on the 'Data' Menu of 'Setting' (refer to pages 48 to 50, 'Copying a file to an USB'), 'USB – folder name' is displayed on the screen and it can be selected on saving.

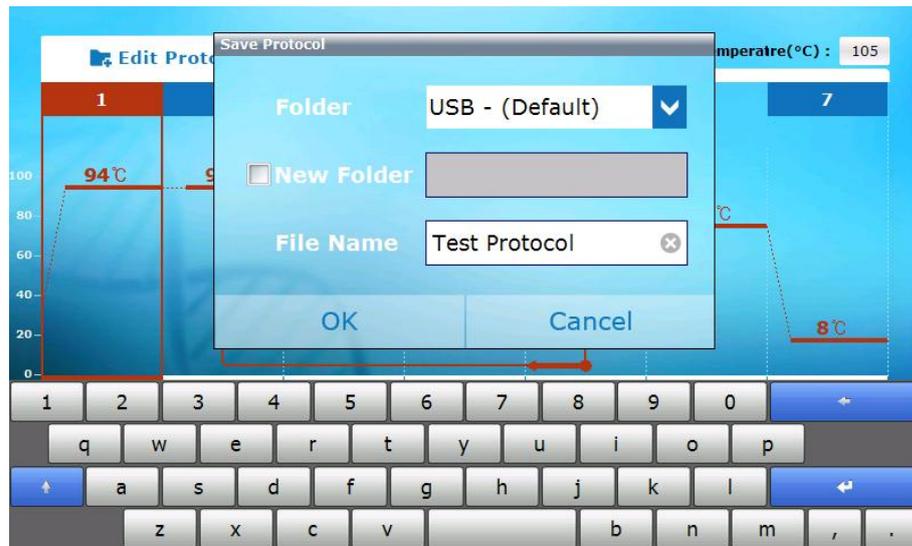


Figure 26. Select USB to save the protocol

h) Press 'OK' to save.

### (3) Opening the Saved Protocol

#### 1) 'Open Protocol' menu

- a) If you touch the 'Open Protocol' icon of 'Home' Menu, the screen displays the 'Open Protocol' screen.

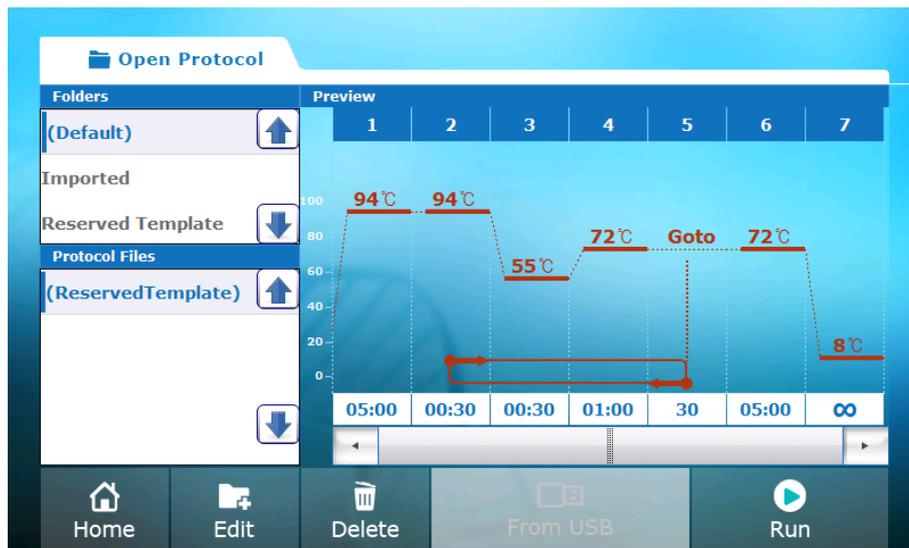
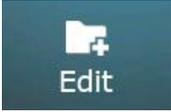
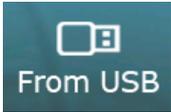
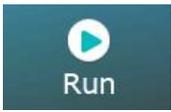


Figure 27. 'Open Protocol' screen of AllInOneCycler™

- b) Select the folder by touching the folder name from the 'Folders' selection window on the upper left side of the screen. Then, select a protocol in the 'Protocol Files' window which is located below the 'Folders' window. The user can search folders and file list by pressing the  and  scroll arrows.
- c) The graph of selected protocol is displayed in the 'Preview' window in the right side of the screen.
- d) The 'Home', 'Edit', 'Delete', and 'Run' icons are displayed in the menu below.

Table 7. Icon types of the 'Open Protocol' screen

Function icon	Description
	Returns to 'Home' Menu
	Edits the selected protocol If you touch this icon, the screen displays the 'Edit Protocol' screen and the user can edit the previously saved protocol in the same way as he/she did in the 'New Protocol' Menu.
	Deletes the selected protocol Although the user can delete the selected protocol, the protocol in the 'Reserved Template' folder cannot be deleted.
	Opens the protocol that is saved in the USB. The protocol that is saved in the USB can be edited or executed.
	Starts the operation of selected protocol

## 2) Opening the protocol that is saved in the USB

- The protocol that is stored in the USB drive can be opened to edit or execute the protocol.
  - a) Insert an USB drive into the USB port on the left side of the front touch screen of *AllInOneCycler*™ or on the rear of the instrument (refer to figure 2 and 3).
  - b) A few seconds after inserting the USB drive, the color of 'From USB' icon in the middle of the screen changes and the icon becomes activated.

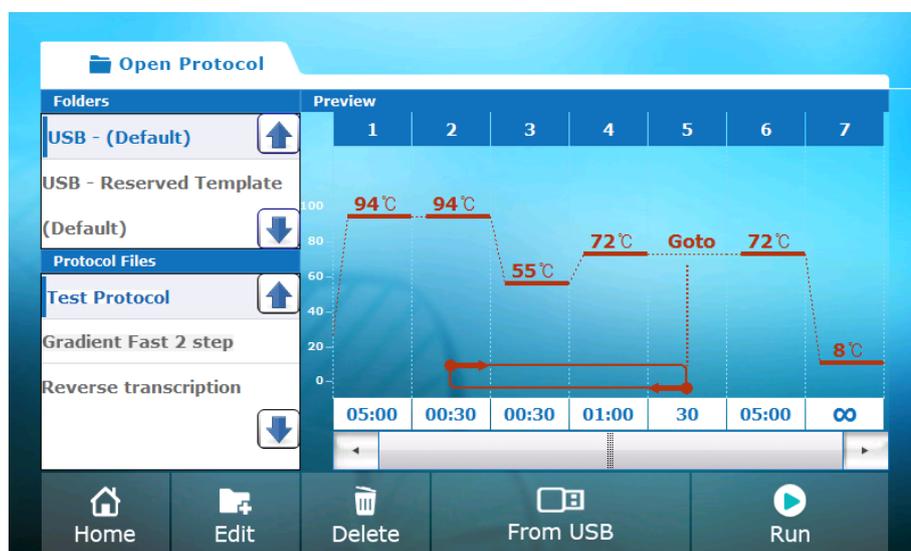


Figure 28. Opening the protocol that is saved in the USB

- c) If you touch the 'From USB' button, the list of protocols stored in the USB drive is displayed on the left side of the screen. The folder that is stored in the USB drive is displayed as 'USB – folder name' on the top part of the 'Folders' selection window and the saved folders in the instrument are displayed in the columns under the USB folder.
- d) Just like checking the protocol of the instrument, you can track the detailed experiment progress from the right screen by selecting the protocol in the 'Protocol Files' window.

## 3) Editing the saved protocol

- a) If you touch the 'Edit' icon from the 'Open protocol' Menu, the screen displays the 'Edit Protocol' screen and previously saved protocols are shown in the screen.
- b) The name of currently opened protocol is displayed in the 'protocol name' field on the upper middle part of 'Edit Protocol' screen and the list of 8 template protocols that can be selected during the setting of 'New Protocol' is displayed along with the currently selected protocol. The user can select and use the protocol from the list according to the purpose of use.
- c) Edit the protocol according to the purpose of the use. (Refer to pages 24 to 36 'Changing Protocol Settings')



Figure 29. Selecting a protocol from the 'Edit Protocol' screen

#### 4. Running a PCR protocol

- If you click on the 'Run' icon in the 'Edit Protocol' screen and the 'Open Protocol' screen the screen displays the 'Run' screen.

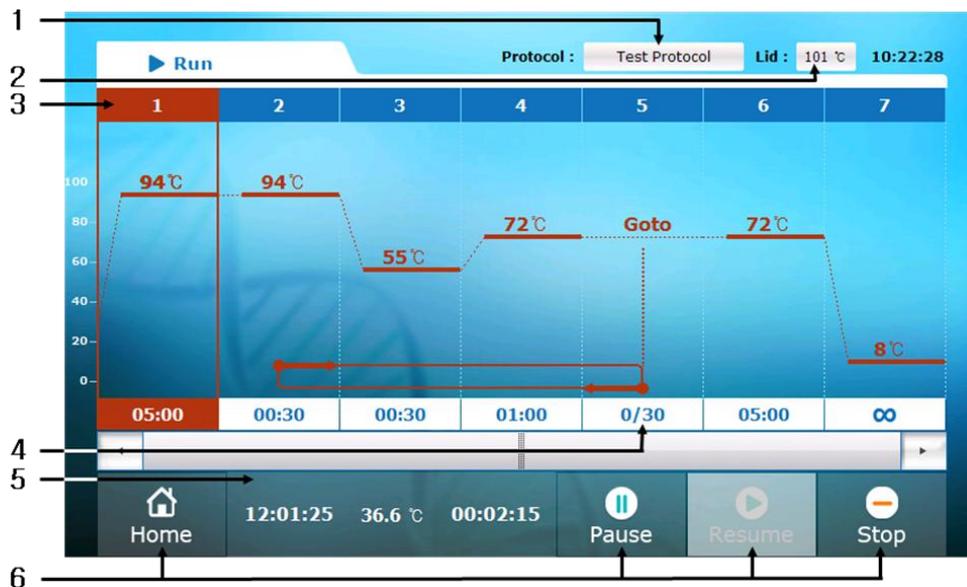
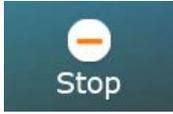


Figure 30. 'Run' screen

Table 8. 'Run' Screen Components

Component	Description	
1. Protocol Name	The name of the protocol that is currently running	
2. Lid Temperature	Displays current temperature of the hot-top	
3. Step	The currently running step is displayed by blinking appropriately and the remaining time is displayed.	
4. Repeats	The number of repetitions in the 'Goto' step is displayed as 'the number of repetitions until now / total number of repetitions'.	
5. Status messages		Displays estimated end time (H:M:S)

Component	Description	
		Displays current temperature of the block
		Displays the elapsed operation time up to this point (H:M:S) If an error occurs, an error message is displayed instead of the time.
6. Function icons		Returns to 'Home' menu.
		Pause the operation
		Resumes after the operation is paused
		Stops the operation

- If you touch the 'Home' icon, the screen displays the 'Home' menu screen. At this point, 'PCR Running' is displayed in the upper part of the screen by blinking in red and green colors. If you touch this, it returns to the 'Run' screen.

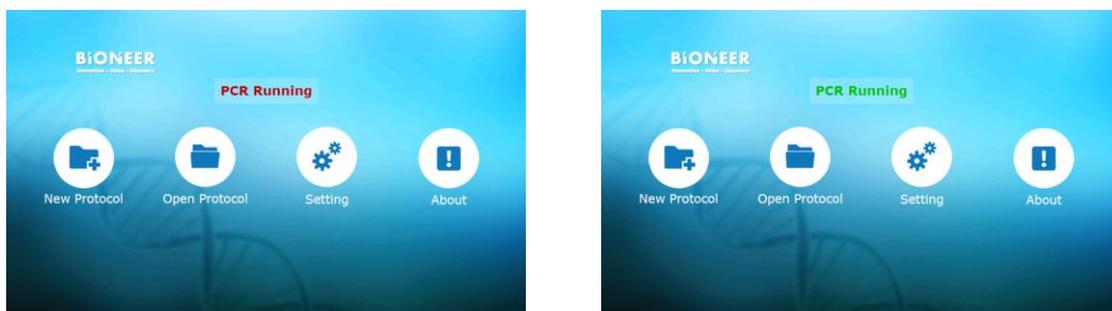


Figure 31. 'Home' menu screen while PCR is running.

- Even when it is running, the user can create a new protocol in the 'New Protocol' option or open/edit the previous protocol in the 'Open Protocol' option. However, it is not possible to run some other protocols or edit the currently running protocol.

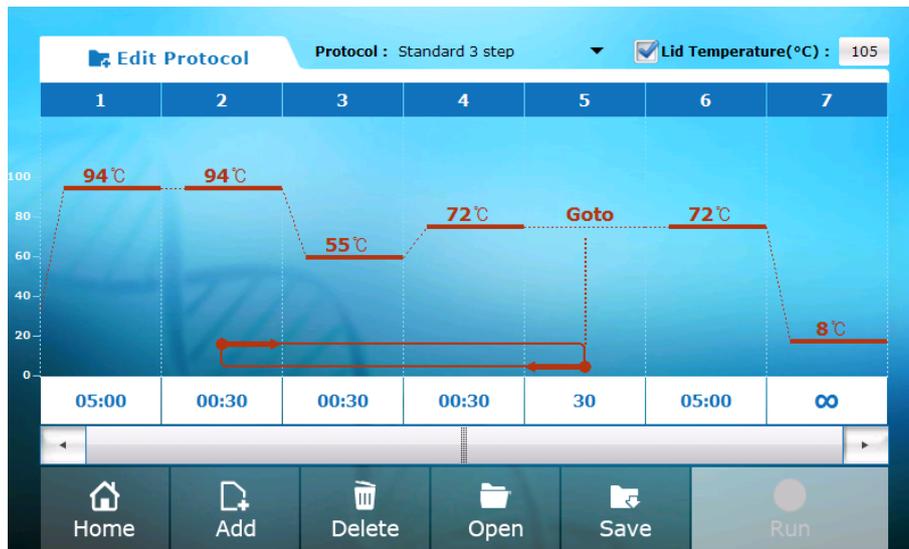


Figure 32. 'Edit Protocol' screen while PCR is running



- If you open the hot-top cover when it is running, the protocol that was running stops. Be careful, since the hot-top is extremely hot.

## 5. Taking out the tube and plate from AllInOneCycler™

- Hold the upper part of the instrument tightly until the tube (or plate) is completely separated from the sample block.
- Be careful, since the lid of the PCR tube may suddenly open when the hot-top cover is opened if the temperature of the bath block is higher than the room temperature.

## 6. Setting menu

- The settings of the instrument can be changed or checked in the 'Setting' Menu. In addition, the user can check or manage the protocol files and folders.
- If you touch the 'Setting' icon of 'Home' Menu, the screen displays the 'Setting' screen.
- There are 4 sub menus (General, Network, Data, Option) in the left side of 'Setting' screen.

### (1) General

- The user can set the name of the instrument or update the software in the 'General' Menu.

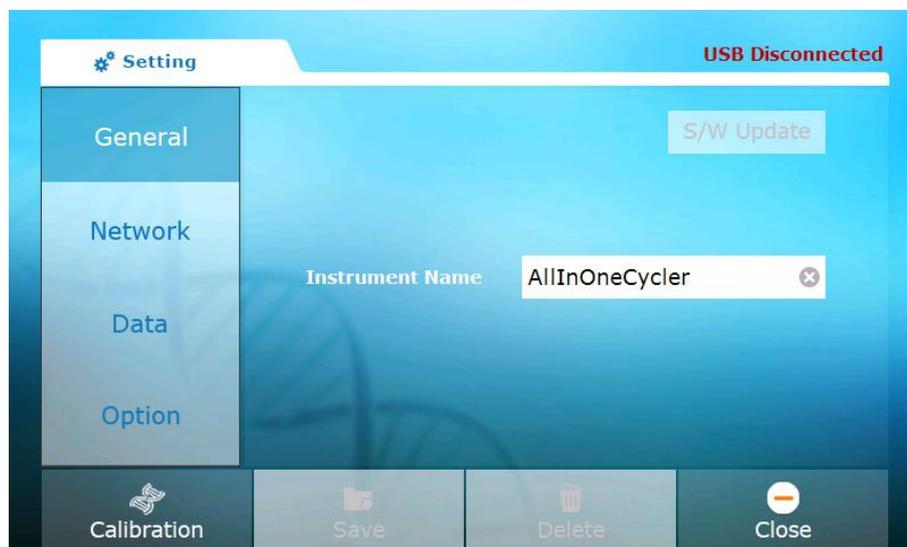


Figure 33. 'Setting' Screen of AllInOneCycler™

- 1) Software update
  - a) Before updating the software, contact the Bioneer Customer Center to check for the latest version.
  - b) Copy the latest version of installation files after creating the 'USB:WAllInOneCycler\_UpdateW' folder in the USB.
  - c) When you Insert an USB drive into the USB port on the left side of the front touch screen of AllInOneCycler™ or on the rear lower side of the instrument (refer to figure 2.3), 'USB Disconnected' message, which is displayed in red on the upper right side of 'General' menu, turns into 'USB Connected' in green. At this point of time, the 'S/W Update' button becomes activated.



Figure 34. Software update

- d) If you touch the 'S/W Update' button, the software is installed automatically and the instrument is restarted.
- 2) Changing the name of the instrument
- If you touch the instrument name window, the keyboard pops up on the lower part of the screen. Enter the name using the keyboard and apply the new name by touching the 'Enter(↵)' button.

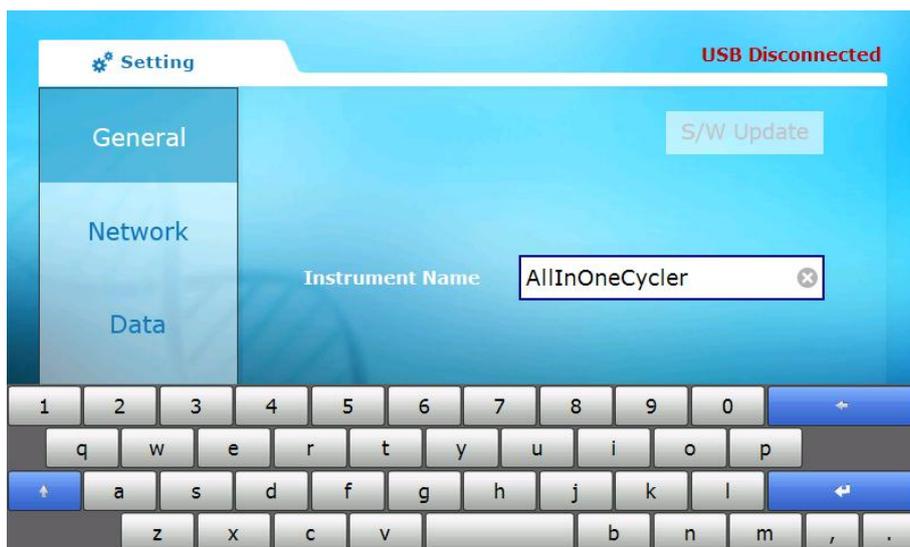


Figure 35. Instrument name input window

## (2) Network

- Setting the network values such as IP address for the remote access.

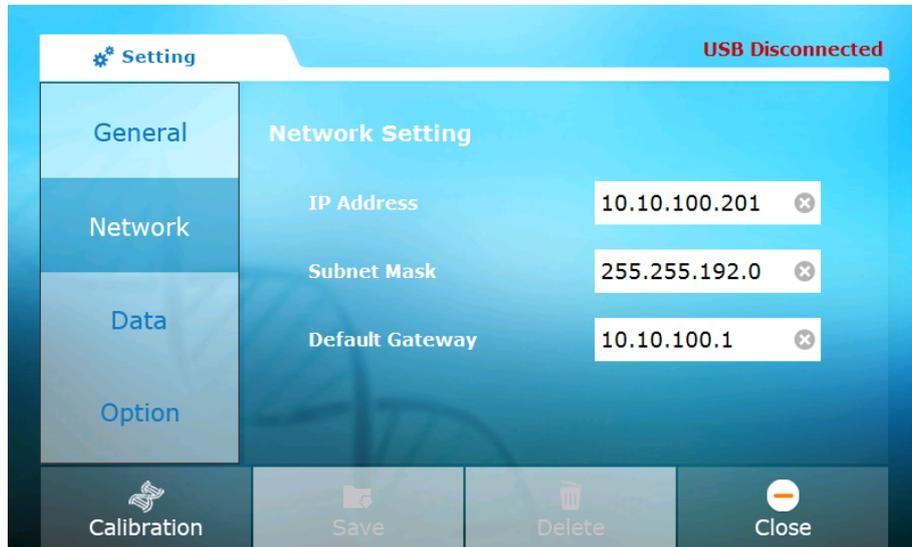


Figure 36. 'Network setting' menu

- If you touch the value you want to change, a number pad appears in the middle of the screen. Enter the value using the number pad.

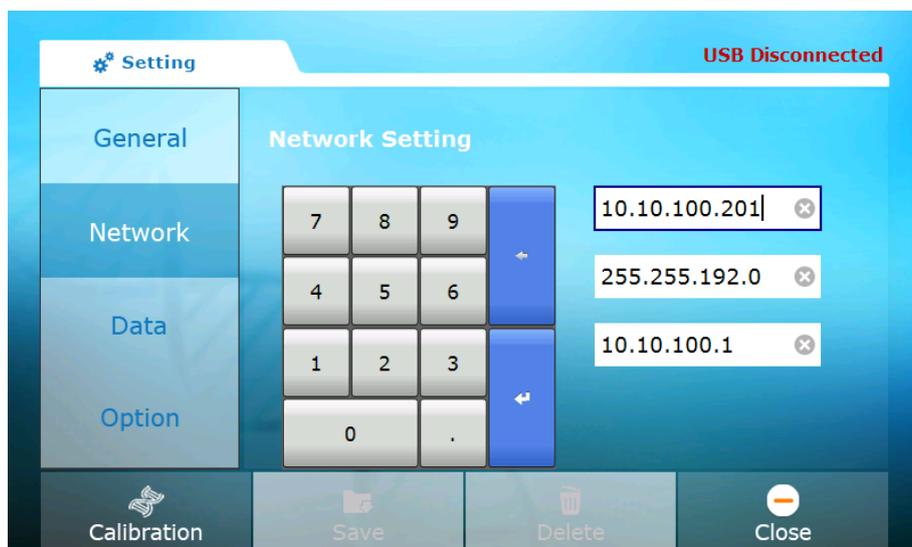


Figure 37. Changing the 'Network setting' value

### (3) Data

- The user can view and delete the protocol file from the 'Data' Admin screen and can save it in the external USB drive.

#### 1) Viewing the protocol

- a) If you touch the 'Data' button, a file manager is displayed on the right side of the screen.

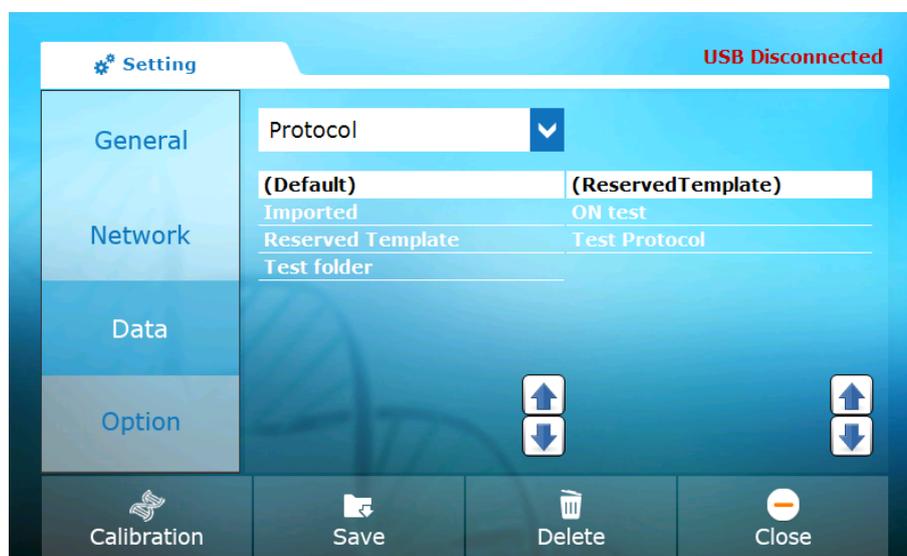


Figure 38. Data admin screen

- b) The list of folder names is displayed in the middle of the screen and if you touch any folder, the protocols in the selected folder are displayed on the left side of the screen.

- c) If you touch the file name twice to check the protocol, the detailed information of the file is displayed as shown in the screen below.

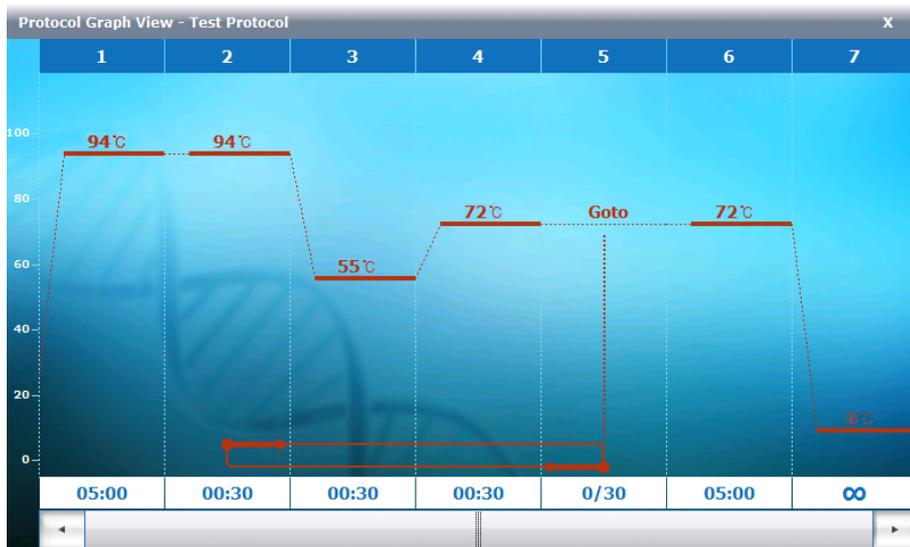


Figure 39. 'Protocol Graph View' screen of Data Menu

2) Copying a file to an USB

- Insert an USB drive into the USB port on the left side of the front touch screen of *AllInOneCycler™* or in the rear lower part of the instrument (refer to figure 2 and 3)
- After a few seconds after inserting the USB drive, the message 'USB Disconnected' in red color on the upper right side changes to 'USB Connected' in green color.

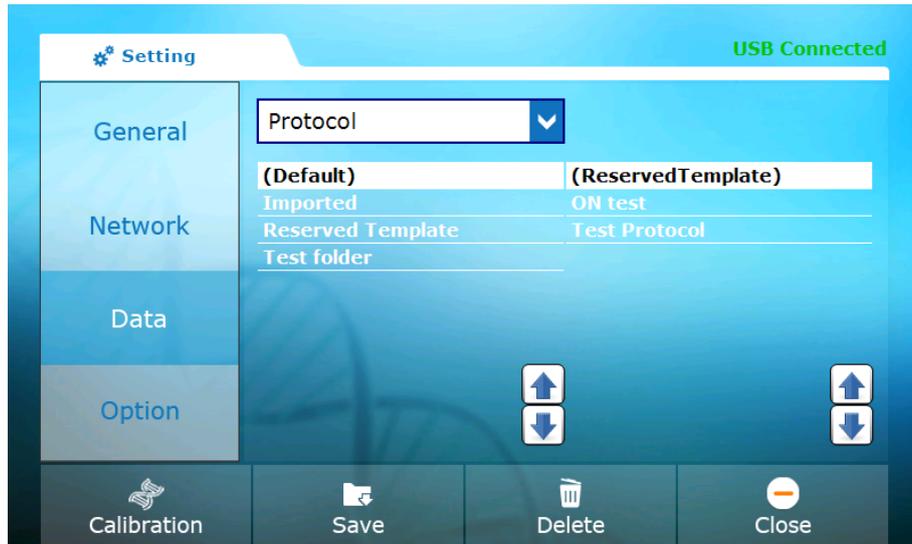


Figure 40. 'Setting' screen after inserting an USB Drive

- c) After touching and selecting the folder and file you want to save, touch the 'Save' icon in the menu on the lower part of the screen. If you just select the folder without selecting the file, the whole folder is saved.

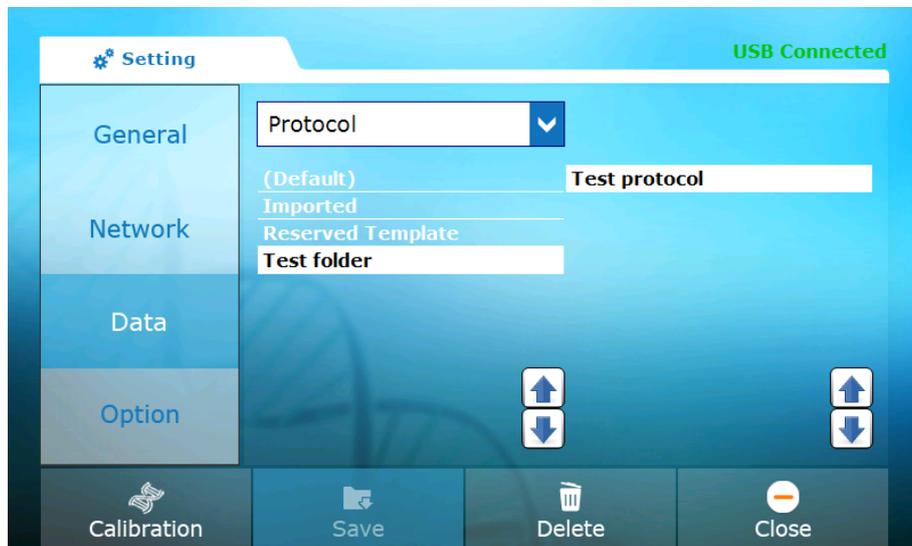


Figure 41. Selecting the protocol folder and file to save

- d) If saving is successful, the message window saying 'Completed' pops up.

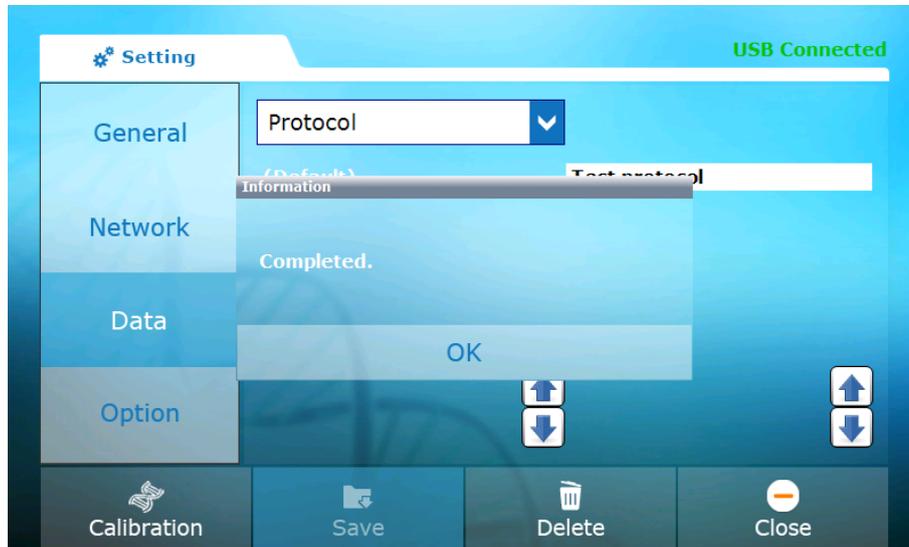


Figure 42. Message that the saving is successful

- e) A new folder named 'AllInOneCycler' is created in the USB drive. The protocol file is stored in the 'Protocols' folder under 'AllInOneCycler' and if you select the folder, the selected folder is created under 'Protocols' folder.



Figure 43. The path of file that is saved in the USB drive

## 3) Deleting a protocol

- When you delete a file, select the file and folder and touch the 'Delete' on the menu on the lower part of the screen. Then, the confirmation window asking the deletion of the file appears and the deletion is completed if you touch the 'Yes' button.

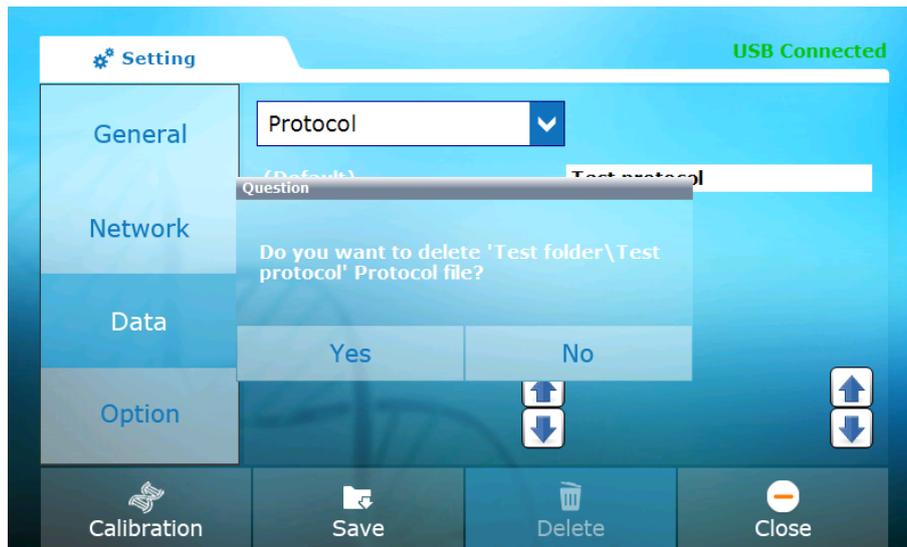


Figure 44. File deletion confirmation window

#### (4) Option

- This menu is a configuration menu for engineers and not for users.
  - Use of the mouse and date & time can be set from the menu.
- 1) Mouse connection setup
    - a) Connect an USB mouse onto the USB port on the left side of the front touch screen of *AllInOneCycler™* or on the rear lower side of the instrument (refer to figure 2 and 3).
    - b) After making the selection by checking in the 'Show Mouse' checkbox, touch the 'Save' icon in the lower part of the screen.
    - c) A mouse cursor appears on the screen and after that, the instrument can be controlled by the mouse.

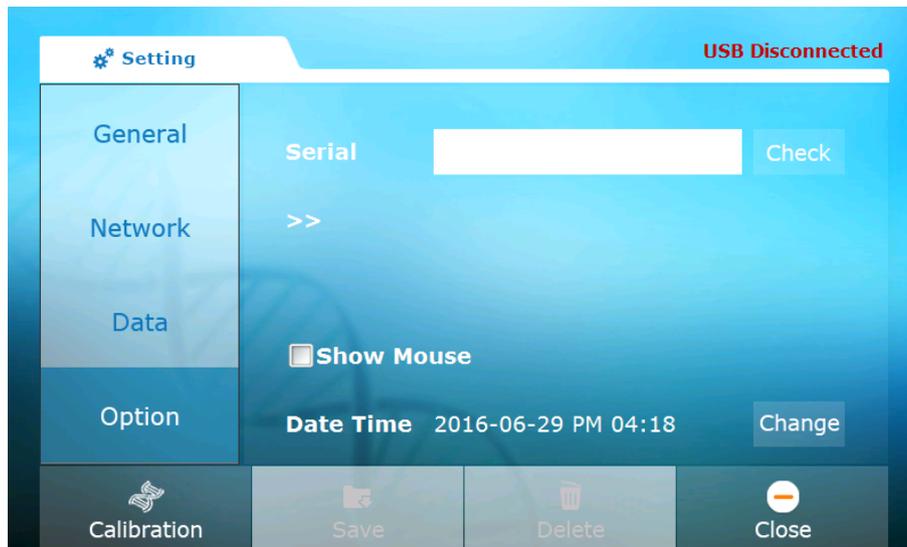


Figure 45. Option menu

- 2) Date and time setup
  - a) You can view the date and time that is setup in the Option menu and it can be changed.
  - b) To change the date and time, touch the 'Change' button.
  - c) Enter the date & time by using the number pad.
  - d) If you touch the 'OK' button, the change is applied.

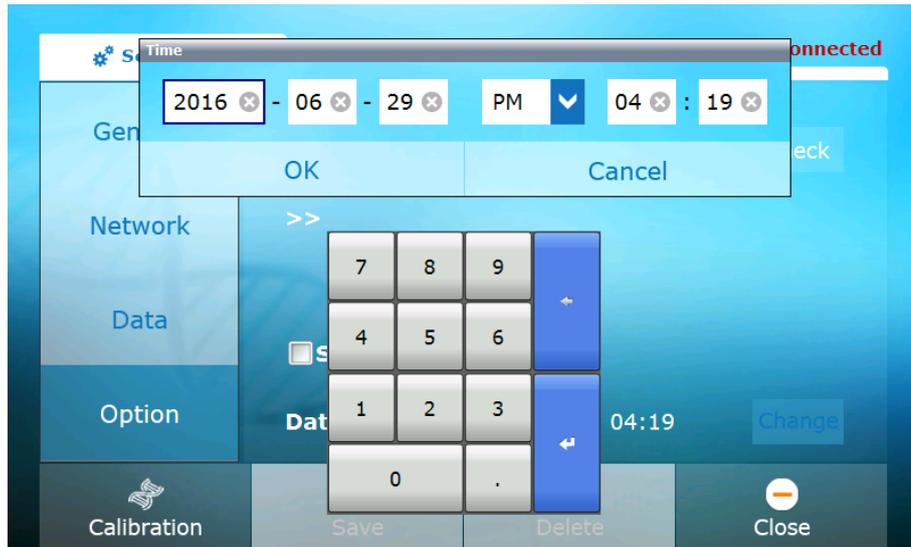


Figure 46. Date and time setting screen

## (5) Function Buttons

- 'Setting' menu has four function buttons as described in the table below.

Table 9. Function icons of 'Setting' screen

Function icons	Description
 Calibration	A function to calibrate the temperature control setting of the instrument (A function dedicated for engineers)
 Save	A function to save the current setup value or data file in the USB drive
 Delete	A function to delete a file or folder
 Close	A function to return from 'Setting' Menu to 'Home' Menu (If you do not touch the 'Save' button, the configured value is not applied.)

## 7. About menu

- Current AllInOneCycler™ software version and contact information are displayed.



Figure 47. About screen

## 8. Operation of AllInOneCycler™ Through Network

### (1) Configuration

- More than one AllInOneCycler™ instrument can be operated simultaneously using a network program.
- To operate through a network, separate PC is required.
- 'AllInOneCyclerServer.exe' and 'AllInOneCyclerManager.exe' which are mandatory programs for operating the network must be installed in the PC.

### (2) The Order of Program Operation



- For normal operation of the program, it is important to follow the procedure that is described below.
  - a) Execute the 'AllInOneCyclerServer.exe' program in the PC.
  - b) If the program is executed, the 'AllInOneCycler Server' tray icon appears on the lower right side of the task bar.

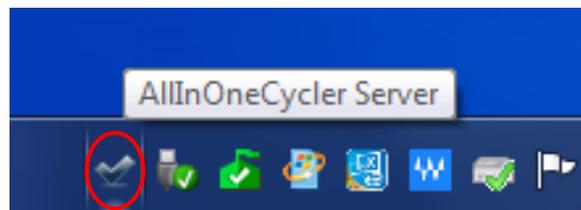


Figure 48. Execute 'AllInOneCyclerServer.exe' in the PC.

- c) If you right click on the tray icon, the server log can be viewed.

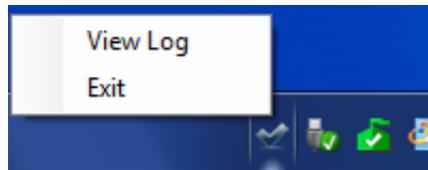


Figure 49. Display of the network connection between PC and *AllInOneCycler*™

- d) When the power of the instrument is turned on, the 'Poplar.exe' program that controls *AllInOneCycler*™ is executed automatically. After that, the network connection between the instrument and PC is configured.

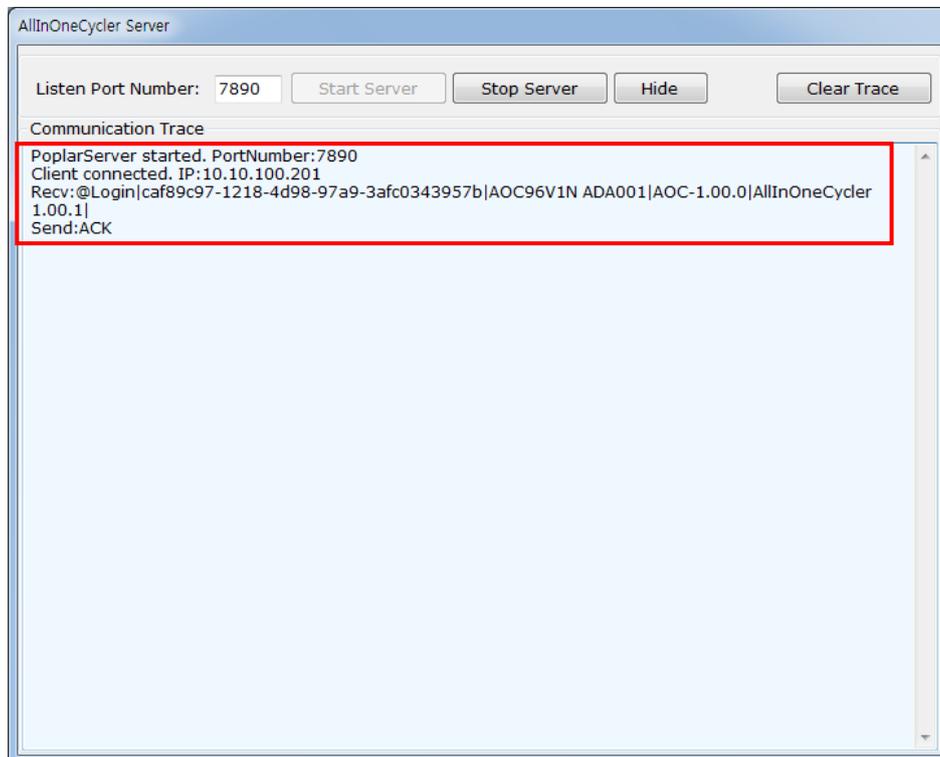


Figure 50. Display of the network connection between PC and *AllInOneCycler*™

- e) If you execute the 'AllInOneCyclerManager.exe' program in the PC, the communication connection status is displayed as shown in the screen below.

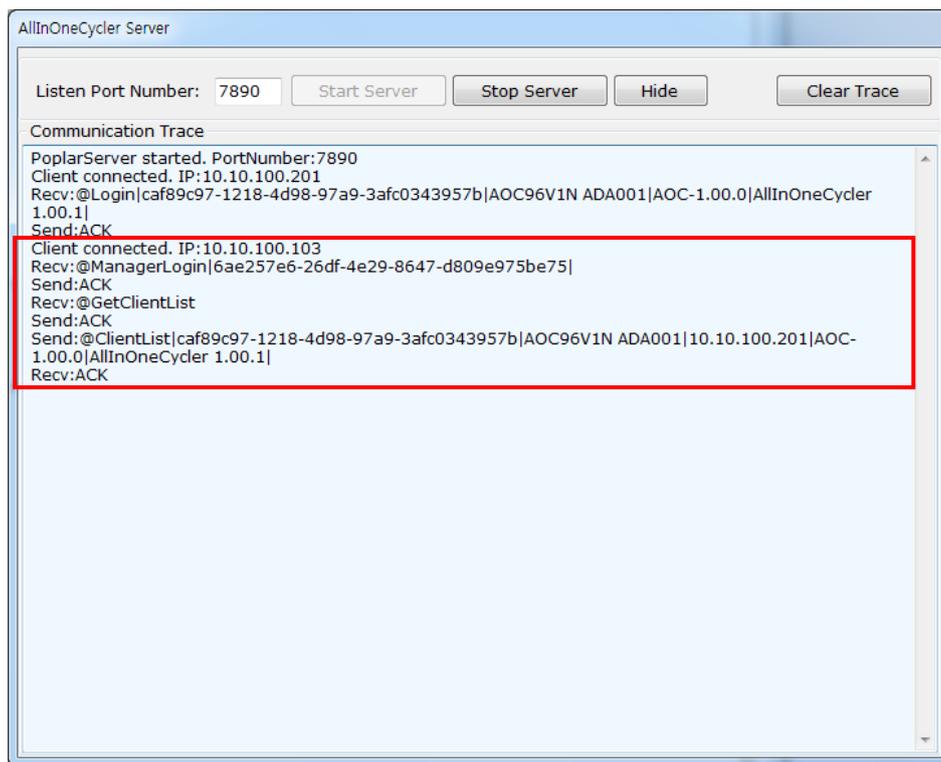


Figure 51. Display of connection status when the 'AllInOneCyclerManager.exe' program is executed in the PC

- f) When the 'AllInOneCyclerManager.exe' program executes, connected instruments are displayed as shown in the screen below.

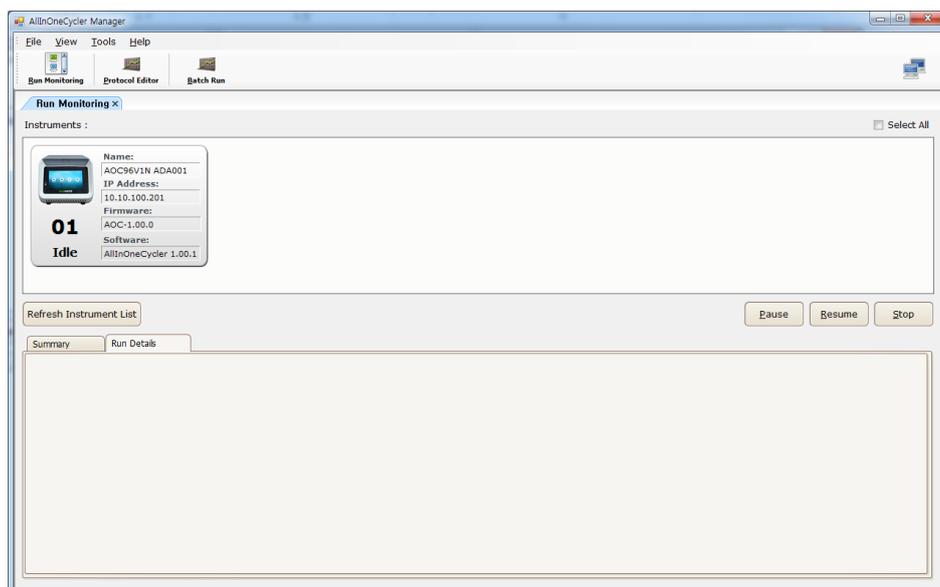


Figure 52. Display of currently connected instruments in the 'AllInOneCyclerManager.exe' window

### (3) Executing Remote PCR through Network

#### 1) Selecting a protocol

- a) Click on the 'Batch Run' icon on the ribbon menu in the upper part of the screen.

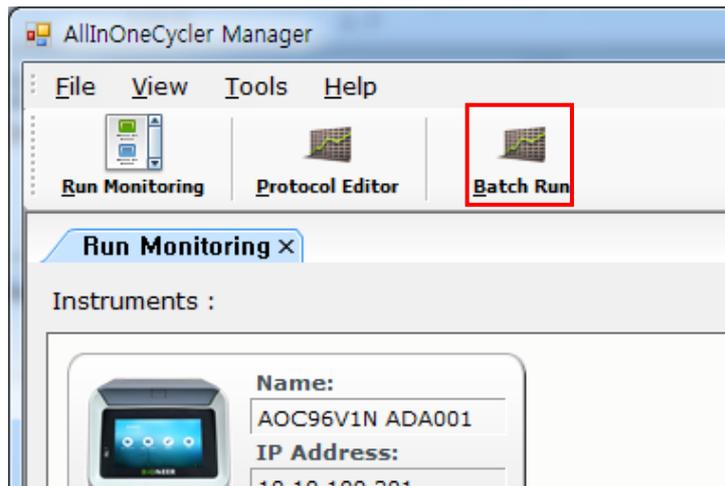


Figure 53. Ribbon menu of 'AllInOneCyclerManager.exe' program

- b) The 'Batch Run' window appears and the user can select a protocol that is stored in a PC or the instrument.

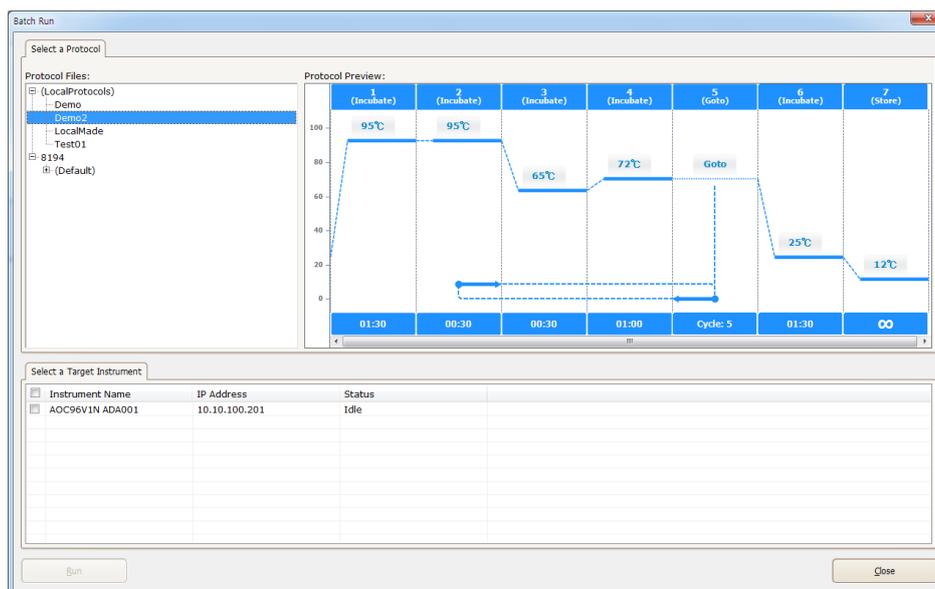


Figure 54. Select a protocol file in the 'Batch Run' window

- c) Select a protocol from the protocol file tree on the upper left side of the screen. For example, the protocol file named 'Demo2' is selected in the figure above.
- d) The graph of the selected protocol is displayed on the upper right side of the screen.

## 2) Selecting the instrument to operate

- a) Select the instrument that can be operated from the lower area of the screen.

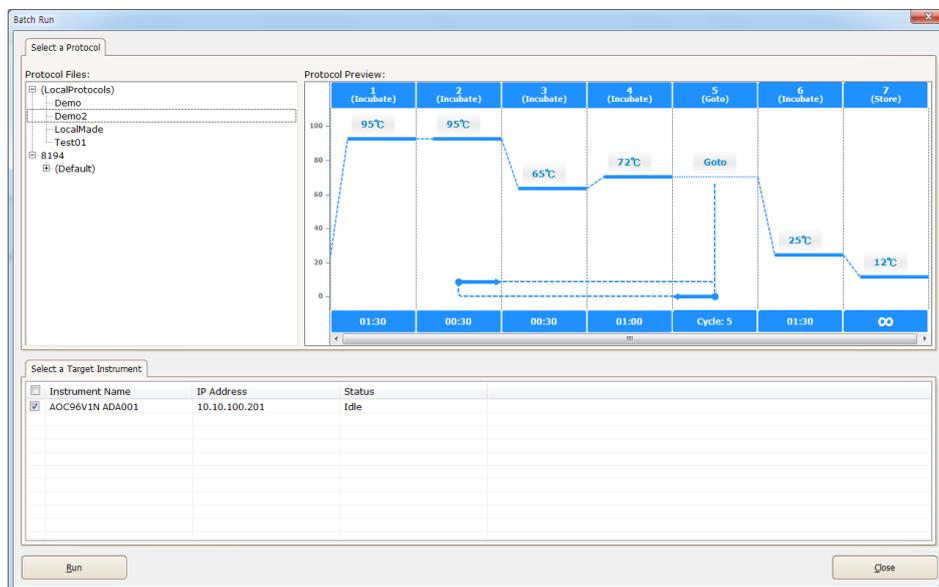


Figure 55. Select the instrument to operate from the 'Batch Run' window

- b) If you click the checkbox next to the instrument name, the 'Run' button in the lower part of the screen gets activated.

## 3) PCR operation

- a) If you click the 'Run' button, the operation confirmation message appears as shown in the following figure.
- b) If you click the 'OK', the protocol is downloaded to the selected instrument, and the protocol gets started.

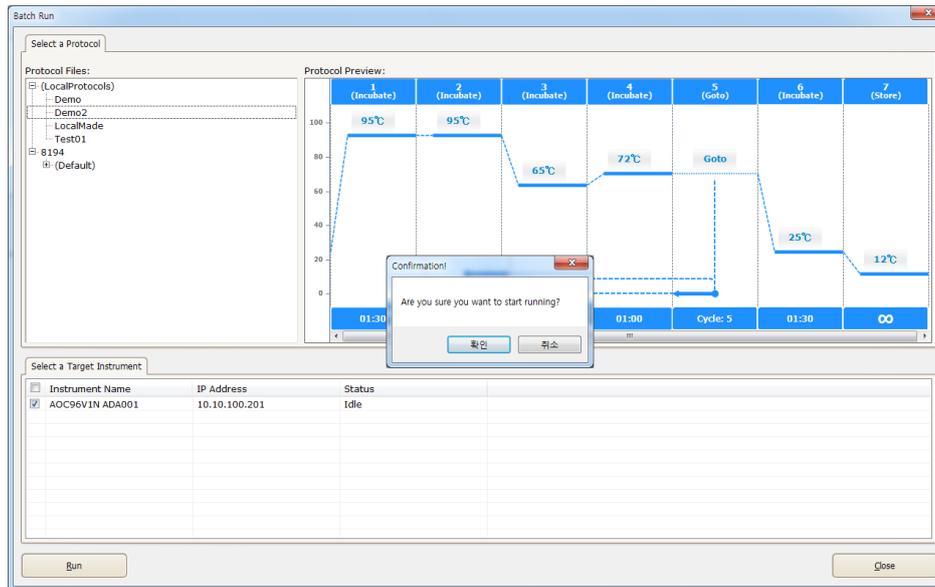


Figure 56. Message that confirms the operation of PCR in the selected instrument

#### 4) Stop

- a) When multiple instruments are operating, select the instrument to be stopped from the 'Instruments' screen in the upper part of the screen.
- b) The 'Stop' button in the lower part of the screen becomes active. In addition, the user can pause or resume the protocol that is currently running by touching the 'Pause' or 'Resume' button next to the 'Stop' button.

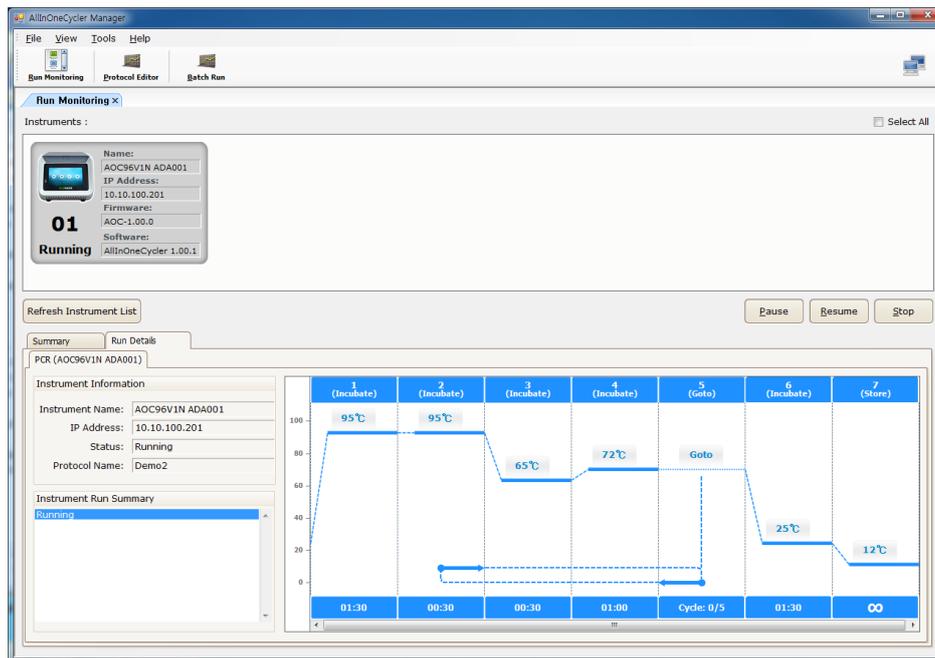


Figure 57. 'AllInOneCyclerManager.exe' program window during the operation of PCR

- c) The instrument that is selected in the Instruments screen in the upper part of the screen gets stopped when the 'Stop' button is touched as the stop signal is sent to the running instrument.

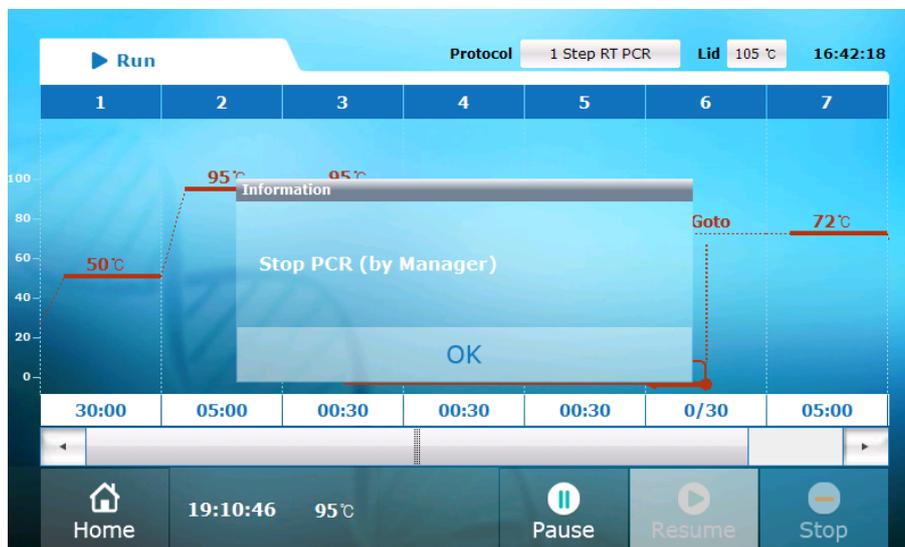


Figure 58. Stop screen of AllInOneCycler™ that is remotely controlled by a PC

- d) After stopping, touch the 'OK' button to close the confirmation window. The screen displays the 'Home' Menu if you touch the 'Home' icon.

## VII. Troubleshooting

Error	Solution
The power does not turn on.	<ol style="list-style-type: none"> <li>1. Check whether the power cord is connected to the external power.</li> <li>2. Check whether the power cord is connected to the instrument.</li> <li>3. Check whether the power switch is turned on.</li> <li>4. If the power is not turned on normally even through everything above is checked, request for inspection.</li> </ol>
The power turns on, but the system does not get initialized.	<ol style="list-style-type: none"> <li>1. Check whether the power was shut abnormally.</li> <li>2. Check whether there is any object interfering with the operation of the system, and if so, remove it.</li> <li>3. Turn on the power and check whether the system gets initialized.</li> <li>4. If it is not initialized normally even through everything above is checked, request for inspection.</li> </ol>
The LCD touch screen does not get turned on.	<ol style="list-style-type: none"> <li>1. Since it is the internal problem of the system, request for inspection.</li> </ol>
The system does not start operation even if the 'Run' button is touched.	<ol style="list-style-type: none"> <li>1. Check whether the system is normally initialized when the power is turned on.</li> <li>2. Remove any object that interferes with the closing of the hot-top cover, since the system would not be operated if any such interference is present.</li> <li>3. Check whether all parts are in correct places.</li> <li>4. Check whether any other button in the LCD touch screen works normally.</li> <li>5. If the system does not operate normally even through everything above is checked, request for inspection.</li> </ol>
Although the system operates, it does not operate according to the protocol.	<ol style="list-style-type: none"> <li>1. Check whether any object interferes with the operation of the system and if so, remove it.</li> <li>2. Check whether all the parts are in correct places.</li> </ol>

Error	Solution
	3. If it does not operate normally even through everything above is checked, request for inspection.
The Hot-top cover cannot be closed.	<ol style="list-style-type: none"> <li>1. Open the hot-top cover, and see whether it is closed automatically with its spring.</li> <li>2. If it does not operate normally even through everything above is checked, request for inspection.</li> </ol>
Although the hot-top cover is closed, the instrument does not operate.	<ol style="list-style-type: none"> <li>1. Check whether the magnet on the hot-top cover is properly assembled.</li> <li>2. If it does not operate normally even through everything above is checked, request for inspection.</li> </ol>
The hot-top cover cannot be moved.	1. Since there is a problem in hot-top cover assembly, request for inspection.
The instrument suddenly stops during operation.	<ol style="list-style-type: none"> <li>1. Check whether the power is connected properly.</li> <li>2. Check whether the power switch has been pressed by mistake.</li> <li>3. Check whether the 'Pause' button has been touched by mistake.</li> <li>4. If it does not operate normally even through everything above is checked, request for inspection.</li> </ol>
Although the system operates, an error message pops up.	<ol style="list-style-type: none"> <li>1. Check whether the wrong protocol has been used</li> <li>2. Run the same protocol once again, and check whether it operates normally.</li> <li>3. If it does not operate normally even through everything above is checked, request for inspection.</li> </ol>
Actual temperature doesn't match the configured temperature.	1. Since the temperature needs to be calibrated, request for inspection.
Cooling or heating speed is very slow.	1. Request for inspection.
It smells as if something is burning inside of the system.	<ol style="list-style-type: none"> <li>1. Disconnect the power cord, and block the external power.</li> <li>2. Request for inspection.</li> </ol>

<b>Error</b>	<b>Solution</b>
The Hot-top cover does not heat up.	1. Since there is a problem in hot-top cover assembly, request for inspection.

In case of operating multiple instruments using PC	
Error	Solution
PC software cannot control the instrument.	<ol style="list-style-type: none"> <li>1. Check the cable that connects the PC and the network hub.</li> <li>2. Check the cable that connects the instrument and the network hub.</li> <li>3. Check whether the network hub is turned on.</li> <li>4. Check the network settings of the PC.</li> <li>5. Check whether the Instrument control software is installed in the proper folder.</li> <li>6. If it does not operate normally even through everything above is checked, request for inspection.</li> </ol>
The actual operation of the instrument is different from the expectation.	<ol style="list-style-type: none"> <li>1. Check whether the 'Run' button has been touched twice.</li> <li>2. Check whether the software has been executed twice.</li> <li>3. Restart the instrument and the software.</li> <li>4. If it does not operate normally even through everything above is checked, request for inspection.</li> </ol>
Buttons or figures are not displayed in the software.	<ol style="list-style-type: none"> <li>1. Uninstall the software and reinstall.</li> </ol>

## VIII. User Maintenance

### 1. Cleaning of the main body

#### Note

- Turn off the power of *AllInOneCycler*™ Thermal Block and disconnect the power cord.
- Wait until the temperature of Hot-top cover and bath block drops back to room temperature.

#### (1) Cleaning of the LCD Touch Screen

- Clean the LCD touch screen using the cleaning solution available in the market
- Be careful not to leave any scratch on the screen

#### (2) Cleaning of the Block Well

- If you clean the product in any different method than the one recommended in the manual, it may damage the instrument. Clean the block well once a week or as necessary.



When you repair the instrument, always wear safety goggles and protective gloves. In addition, check whether the instrument is disconnected from the power before starting the maintenance.



Do not touch the hot-top cover or bath block until the temperature drops back to room temperature, since the temperature of the hot-top cover may rise to about 110 °C and the temperature of the bath block may rise to 100 °C.

- **Method to clean the well of the Block**

- 1) Open the hot-top cover.
- 2) If any tube or plate with a sample is mounted, remove it from the block.
- 3) Clean the well using a cotton swab soaked in pure isopropanol or commercial PCR DNA degradation solution. Close the hot-top cover after making sure that the cleaning solution has completely evaporated.

## 2. Cleaning the Hot-top Cover

- Clean the hot-top cover well once a month or as is necessary.



The temperature of the hot-top cover may rise to about 110 °C and the temperature of the bath block may rise to 100 °C while the instrument is in operation. It is recommended to start the cleaning operation only after the temperature of the hot-top cover or bath block drops to the room temperature.

- **Method to clean up the hot-top cover**

- (1) Open the hot-top cover.
- (2) Softly rub the heating part of the hot-top by using a cotton swab soaked in pure isopropanol or commercial PCR DNA degradation.



### **Warnings on hazardous chemical materials**

Isopropanol is a volatile liquid and it may cause the irritation of eyes, skin, or upper respiratory system if it is exposed to a human body. Repeated contact or long-term contact may become the cause of xeroderma or irritation. In addition, it may affect the central nervous system and cause symptoms like drowsiness, dizziness and headache. Be aware of MSDS and follow the precautions in handling the material.

Remove all the isopropanol that remains in the Hot-top cover.

**Note:** If the interior of the hot-top is contaminated by the amplified DNA, open up the hot-top cover and clean it with the cotton swab or cloth with bleach (concentration of about 5% is recommended). Then clean it again with a wet cloth.

- (3) Clean the interior of the hot-top well once a month or as necessary.
- (4) If the hot-top cover is contaminated by the amplified DNA, open up the hot-top cover and clean the cover with the cotton swab or cloth with isopropanol or commercial PCR DNA degradation solution. Then clean it again with a wet cloth.

### 3. Replacing the Fuse

This instrument uses two fuses with the specification of 250V, F10AL, 5×20mm.

- **Tools required for the replacement**

- 2 fuses with the specification of 250V, F10AL, 5×20mm
- 1 flat-head screwdriver (small)

- **Replacing the Fuse**

- 1) Turn off the power at the rear of *AllInOneCycler*™ and disconnect the power cord.



**Risk of electric shock**

Serous electric shock may result during the operation of high voltage instrument and it may cause physical injury or even death. To prevent the electric shock, disconnect the power cord at least one minute before use and disconnect the power supply from the external power source.

- 2) If you insert a flat-head screwdriver into the upper part of power inlet, the fuse cover can be opened.



Figure 59. Power inlet in the rear of *AllInOneCycler*™

- 3) Pull out the fuse slot and check the condition of fuses.



Figure 60. 2 fuses which are inserted

- 4) Take out the disconnected fuse from the fuse slot, and replace it with a new fuse with the specification of 250V, F10AL, 5×20mm.



Figure 61. Taking out a fuse from the slot which is disconnected



Figure 62. A fuse with the specification of 250V, F10AL, 5x20mm

- 5) Return the fuse slot to its original position under the power cord inlet and close the fuse cover.
- 6) Push the fuse cover firmly until it gets to the original position.
- 7) Connect the power cord of the instrument.

## 4. Storage Method

### Storage Condition

- (1) Temperature: 0~40°C
- (2) Relative humidity: Within the range that vapor doesn't get condensed, which is around 20 to 80%

### Storage of the Instrument

- (1) The instrument must be stored in accordance with the cautions presented in the user manual, when not in use.
- (2) It must be stored in accordance with all the storage conditions stated above.

## 5. Shipping the Instrument for Service

- (1) First of all, please inform the regional manager of customer center about the contents of the service request.
- (2) Remove the source of contamination of the instrument.



If the bath block is contaminated by radioactive material, remove the source of the contamination with a commercial decontamination agent. If contaminated material cannot be removed with a decontamination agent, Bioneer Corp. will not receive the instrument for services.

- (3) Check whether the source of contamination is completely removed.
- (4) Pack the main body of instrument in the box with the packaging materials that were supplied at the time of purchase. Do not send the accessories and power cord.
- (5) If you attach the shipping slip on the box, the instrument would be sent to the service center mentioned on the shipping slip. The repair process will take 1 to 3 weeks.

**Note:** If the service request sheet is not submitted, the repair of the instrument may be delayed.

## IX. Quality Assurance

Bioneer Corp. provides the warranty for any defects caused by the material or those that occur during the manufacturing process for 1 year from the day on which the customer receives the product. In addition, Bioneer Corp. is liable to repair the product once free of cost when any hardware defect is discovered, and the company is liable to exchange the product up to 2 times, if the same hardware defects repeat for 3 times or more. All the accessories except the main body are considered as consumable parts and they are covered for 3 months under warranty. If the defect occurs after the warranty period, Bioneer Corp. may bill the shipping and handling charges in addition to on top of the repair or exchange cost. If any dispute occurs with the customer, it would be processed according to the consumer dispute settlement regulation of Fair Trade Commission (FTC).

### 1. Limitation or Exclusion from the Warranty

- The following cases would not be covered under the warranty.
  - (1) Scratch, dent, or damage of the exterior that occurs during the delivery.
  - (2) Damages due to external factors such as an accident, abuse, fire or earthquake.
  - (3) Any unauthorized modification of any of part or product without the prior consent of Bioneer Corp.
  - (4) Damage occurred by any engineer or service provider who is not certified by Bioneer Corp.

### 2. Requesting the Warranty Service

- Before requesting the warranty service, read and understand the user manual that is supplied with the product, and then contact our on-line support or your local dealer.

## • Bioneer Worldwide

### **Bioneer Corporation**

**Address** 8-11 Munpyeongseo-ro, Daedeok-gu, Daejeon, 34302, Republic of Korea  
**Tel** +82-42-930-8777 (Korea: 1588-9788)  
**Fax** +82-42-930-8688  
**E-mail** sales@bioneer.com  
**Web** www.bioneer.com

### **Bioneer Inc.**

**Address** 1301 Marina Village PKWY, Suite 110, Alameda, CA 94501, USA  
**Tel** +1-877-264-4300 (Toll-free)  
**Fax** +1-510-865-0350  
**E-mail** order.usa@bioneer.com  
**Web** us.bioneer.com

### **Bioneer R&D Center**

**Address** Korea Bio Park BLDG #B-702, 700 Daewangpangyo-ro, Bundang-gu, Seongnam-si  
Gyeonggi-do, 13488, Republic of Korea  
**Tel** +82-31-628-0500  
**Fax** +82-31-628-0555  
**E-mail** sales@bioneer.co.kr  
**Web** www.bioneer.co.kr