



Kaneka Thermostatic Color Sensor
MyAbscope®
Instruction Manual

KN-T100901

Introduction

Thank you for purchasing MyAbscope® (Product code: KN-T100901, Product model: PAS-822-KN). To ensure long-term use of this product, be sure to read this manual carefully and fully understand the outline of this product, how to operate, and safety precautions. No part of this manual may be copied to be used by a third party without Kaneka's permission.

The contents of this manual are subject to change without prior notice.

The design, specifications, and application for this product are subject to change without prior notice.

The company names and product names described in this manual are trademarks or registered trademarks of respective companies.

Contents

Handling Precautions	3
Configuration	9
Operation Procedure	10
1. Part Names of Main Unit	10
2. Operation Procedure (Preparation)	13
3. Operation Procedure (High-temperature Treatment Unit)	19
4. Operation Procedure (Thermostatic Absorbance Measurement Unit)	26
A. Setting reaction conditions	27
B. Light intensity calibration	32
C. Preheating	34
D. Thermostatic absorbance measurement	37
E. Finishing measurement and taking out sample	40
5. Data Analysis	42
Cleaning and Storage	48
Troubleshooting	50
After-sales Service	52
Contact	52
Specifications	53
Quality Assurance	54

Handling Precautions

To ensure your safety, read and understand the following handling precautions before use.

	WARNING	Indicates that a serious injury accident* may occur if you do not follow the operating or maintenance procedure correctly.
-----------------------------------------------------------------------------------	----------------	----------------------------------------------------------------------------------------------------------------------------

* Severe injury accidents refer to loss of sight, injury, burns, electric shock, and others that have aftereffects or require hospitalization or long-term medical treatment.

- Do not disassemble this product or change the structure of this product.
Or it may cause electric shock, fuming, flaming, or failure.
- Be sure to turn off the power of the main unit when performing maintenance such as cleaning.
Or it may cause electric shock.
- If smoke or an unusual odor occurs, or water or foreign matter enters the main unit, immediately turn OFF the main unit, disconnect the power plug from the outlet, and stop using the product.
Or it may cause electric shock, fuming, flaming, or failure.
- Do not directly touch the sample ports or sample tubes during and for a while after measurement since they are hot.
Or it may cause burns.
- Do not calibrate the light intensity with the heat bonnet open. Also, do not look directly at the direct or reflected light of LED.
Or it may cause eye pain or blurred vision.
- Use the AC/DC adapter supplied with this product. Make sure that the rated power of the AC/DC adapter does not exceed the power supply capacity of the outlet.
Or it may cause burns, fuming, flaming, or failure.
- Do not cover the product with paper or cloth. Do not put anything on the main unit. Be careful so that no liquids, metals, or flammable substances enter the main unit.
Or it may cause a fire.
- Do not touch with wet hands.
Or it may cause electric shock, fuming, flaming, or failure.
- Be careful not to scratch electric wires or insulated parts with a knife or the like. Do not damage, alter, modify, forcibly bend, twist, stretch, apply heavy load to, or heat the power cable or connectors.
Using them in a damaged state may cause electric leakage, electric shock, or a fire.

- Be careful when opening the heat bonnet while the product is in operation. Since hot solution may scatter. Also, insert and remove sample tubes in a sufficiently cooled state.
Or it may cause injury or burns.

Handling Precautions

To ensure your safety, read and understand the following handling precautions before use.

 CAUTION	Indicates that a minor injury accident* may occur if you do not follow the operating or maintenance procedure correctly.
--------------------------------------------------------------------------------------------------	--------------------------------------------------------------------------------------------------------------------------

* Minor injury accidents refer to injury, burns, electric shock, and others that do not require hospitalization or long-term medical treatment.

- Do not place this product in direct sunlight.
Or it may cause fuming, flaming, or failure.
- We recommend using this product in an environment with a temperature of 20 to 30°C and a humidity of 70% or less.
Using this product in a low-temperature or high-humidity environment may cause electric leakage or failure due to condensation, and using it in a high temperature environment may cause fuming, flaming, or failure.
- Do not use this product with the main unit exposed to water or oil, in a high-humidity, flammable or corrosive atmosphere, or in a dusty place.
Or it may cause failure, fuming, or flaming.
- Do not place this product in unstable places, such as on a wobbling table, in an inclined place, and in a place with vibration.
Or it may cause failure or injury.
- If the main unit dropped, immediately turn it OFF and disconnect the power plug from the outlet.
Or it may cause fuming, flaming, or injury.
- Do not use the main unit if it dropped.
Or it may cause fuming, flaming, or injury.
- Do not use the heat bonnet if it came off the main unit.
Or it may cause burns or injury.
- Do not transport the main unit by holding the power cable or heat bonnet.
When moving or transporting the main unit, hold the handles on both sides firmly.
Or it may cause failure, fuming, or flaming.
- Remove the power plug and cables connected to external devices when moving or transporting the main unit.
Or it may cause failure, fuming, or flaming.
- Do not block the air vents. Using this product with the air vents blocked may cause failure, fuming, or flaming due to overheating.
Or it may cause failure, fuming, or flaming.

- Be sure to turn OFF the power of the main unit after use. Even after the control application screen is turned OFF, the main unit may still be in operation.
Or it may cause fuming, flaming, injury, or failure.
- Be careful not to get your fingers caught in the heat bonnet.
Or it may cause injury or burns.
- The periphery of the heat bonnet is hot while the heater is in operation. Do not touch it.
Or it may cause injury or burns.
- Exhaust air comes out from behind the heat bonnet while the cooling fan is operating. Be careful of burns.
Or it may cause burns.

Handling Precautions

Please acknowledge the following precautions before using this product.

- This product is for research use only and not designed to be applied to fields requiring high reliability, such as medical care. Be aware that Kaneka will not bear any responsibility for any loss or damage caused by using this product in such fields.
- Use the main unit in an indoor place of horizontal and pollution level 2, altitude of 2000 meters or less (overvoltage category II).
- The sample volume should be up to 500 μL /tube for the high-temperature treatment unit, and 25 to 100 μL /tube for the thermostatic absorbance measurement unit.
- Do not prepare solution on or above the main unit. Prepare solution in another place, securely close the caps of the tubes, then set the tubes to the main unit.
- Do not move this product with the fan filters removed.
- The high-temperature treatment unit and thermostatic absorbance measurement unit cannot be used simultaneously.

Safety

- Heating stops when the heater reaches a certain temperature.
 High-temperature treatment unit HeatLid*¹: 130°C, Well*²: 120°C
 Thermostatic absorbance measurement unit HeatLid: 100°C, Well: 90°C
 *1: Contact section with the tube cap inside the heat bonnet
 *2: Heating section of the tube

Light measurement

- Calibrate the light intensity for every measurement.
- Since measurement results may vary depending on the type of tube, we do not recommend using multiple types of tubes for comparative evaluation.

Cooling

- If the main unit unintentionally stops while this product is in operation, the cooling fan is not activated when the product is restarted. In this case, natural cooling is required for the main unit.

Communication/control device

- The operation of the application is checked with Nexus 9 or ZenPad 3 8.0 (Z581KL) or MediaPad M3 Lite 10 (hereinafter referred to as "tablet").
- If the application task is terminated without tapping the Stop button on the application screen, the main unit may still be in operation. Be sure to turn OFF the power of the main unit.
- If any of the following phenomena occurs during absorbance measurement, the ongoing measurement cannot be resumed and data will be lost.
 - Disconnection of Bluetooth connection

- Shutdown of the tablet
- Suspension of power supply to the main unit
- Do not use this product near medical electrical equipment such as cardiac pacemakers. Such equipment may be affected by radio waves.
- This unit only supports Bluetooth Low Energy and does not support any other wireless connections.
- This product uses the 2.4 GHz frequency band. This frequency band is used not only by industrial, scientific, and medical equipment, but also by other similar wireless stations, mobile object identifying premises radio stations requiring licenses, which are typically used in factory manufacturing lines, specific low-power radio stations requiring no licenses, amateur radio stations, and others (hereinafter referred to as “other wireless stations”). Make sure that no “other wireless stations” are not in operation nearby before using this product. If there is interference between this product and “other wireless stations,” immediately avoid radio wave interference by relocating this product or turning OFF the power of the main unit.

Configuration

- (1) Main unit 1 unit
- (2) AC/DC adapter..... 1 piece
- (3) Instruction Manual..... 1 copy
- (4) CD-ROM (containing application installation software) 1 disk
- (5) MyAbscope® Application Installation Manual 1 copy



Main unit



AC/DC adapter



Do not disassemble this product or change the structure of this product. (Or it may cause electric shock, fuming, flaming, or failure.)



Please confirm the shape and direction of the USB cable carefully and use it correctly. If you use something that does not fit in shape or size, there is a risk that the device generates heat. (Or it may cause fuming, flaming.)



During measurement or after the measurement for a while, do not touch the right and left unit and sample tube directly. (Or it may cause burns.)



During heating, there is a possibility that the solution is bumping. Be careful of burns. (Or it may cause injury or burns.)



Please read the instruction manual carefully before using this product.

Operation Procedure

1. Part Names of Main Unit

<Main unit>

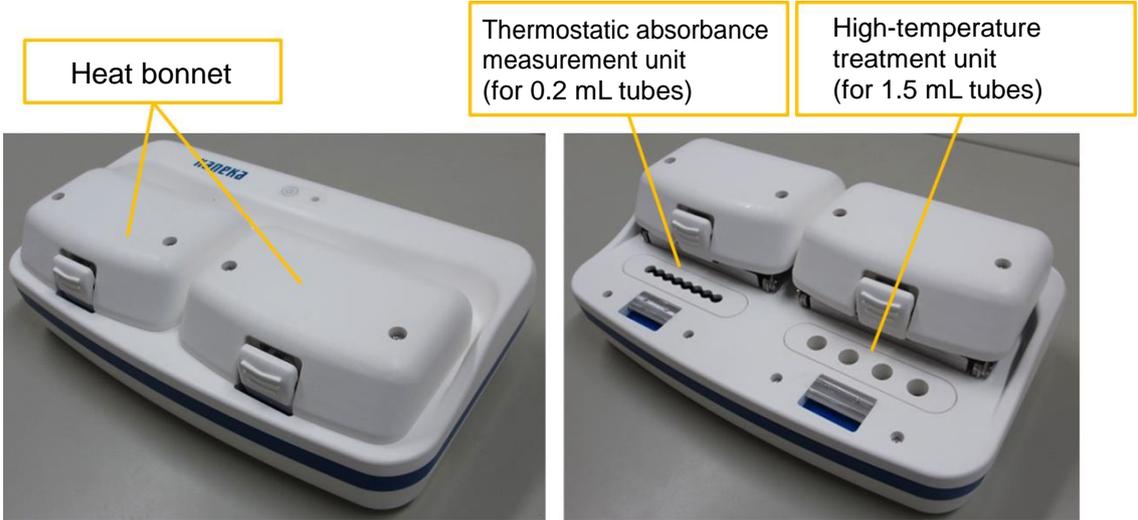


Figure 1-1: Top of main unit

<Sides of main unit>

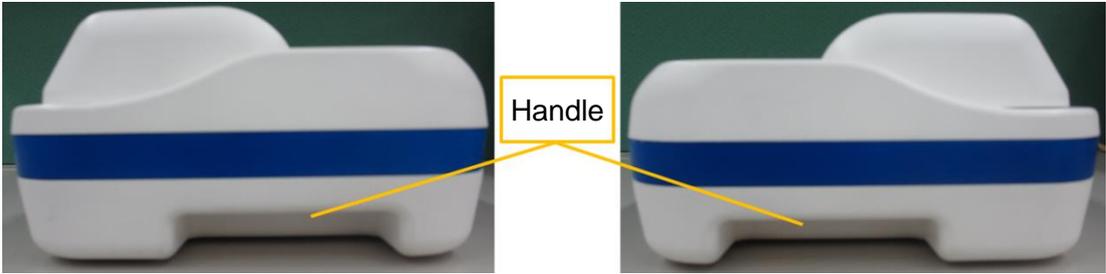


Figure 1-2: Sides of main unit

<Bottom of main unit>

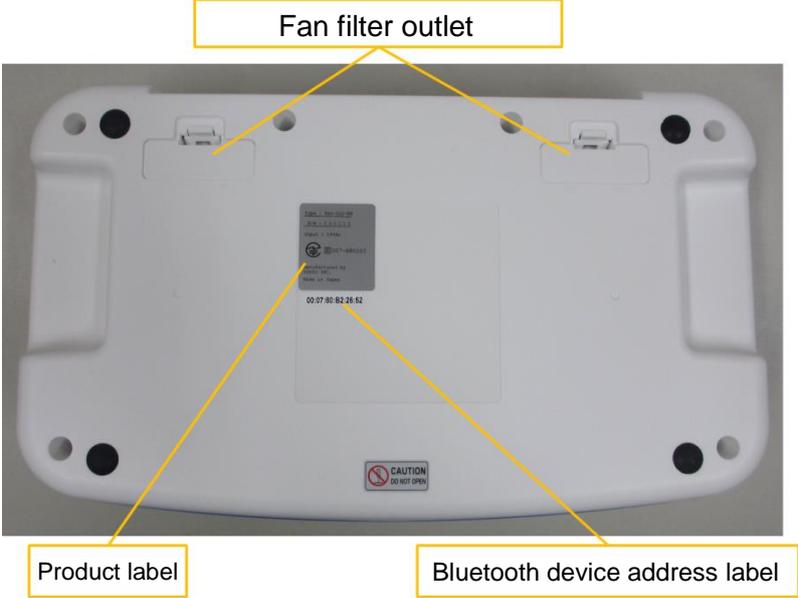
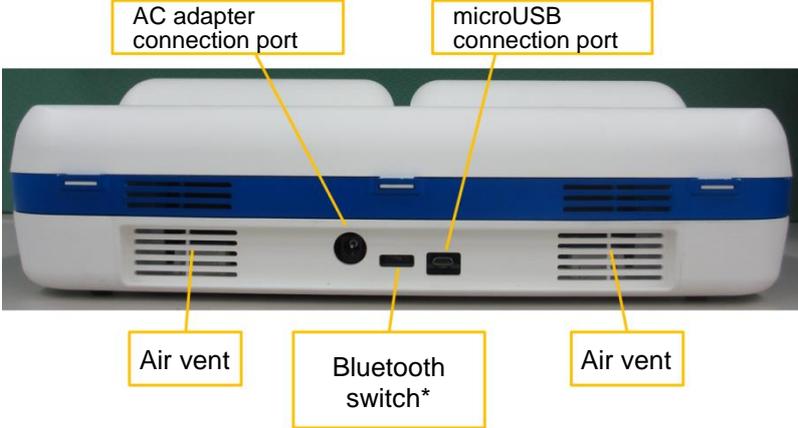


Figure 1-3: Bottom of main unit

<Back of main unit>



* Do not touch the Bluetooth switch (Left: OFF, Right: ON). Turning it OFF disables communication with the control tablet.

Figure 1-4: Back of main unit

<Power button and pilot lamp on main unit>

Pilot lamp

- Lights in red ●: The main unit is ON (Bluetooth not connected).
- Lights in blue ●: Bluetooth connection has been established between the main unit and tablet (Standby state).
- Blinks in blue ●: The main unit is in operation (Light intensity calibration, heating, or absorbance measurement).



Figure 1-5: Top of main unit

2. Operation Procedure (Preparation)

<Devices and accessories required for measurement>

- Main unit of MyAbscope
- AC/DC adapter (Type: B3, Accessory)
- Control tablet (Sold separately) * The dedicated application should be installed.
- 1.5 mL tubes (Sold separately)
- 0.2 mL tubes (8-strip) (Sold separately. Recommended tube: Kaneka Microtube (0.2 mL 8-strip tubes with flat caps))

<Starting main unit>

- (1) Connect the AC/DC adapter (19 V DC) to the main unit and outlet.
- (2) Press the Power button on the main unit. The pilot lamp beside the Power button on the main unit will light in red.

<Starting software>

- (3) Start “MyAbscope” on the tablet. For how to install the application, see MyAbscope® Application Installation Manual. Make sure that Bluetooth is ON on the tablet.



Figure 2-1: MyAbscope application

When the MyAbscope application is activated, the connection setting screen (Figure 2-2) is displayed.

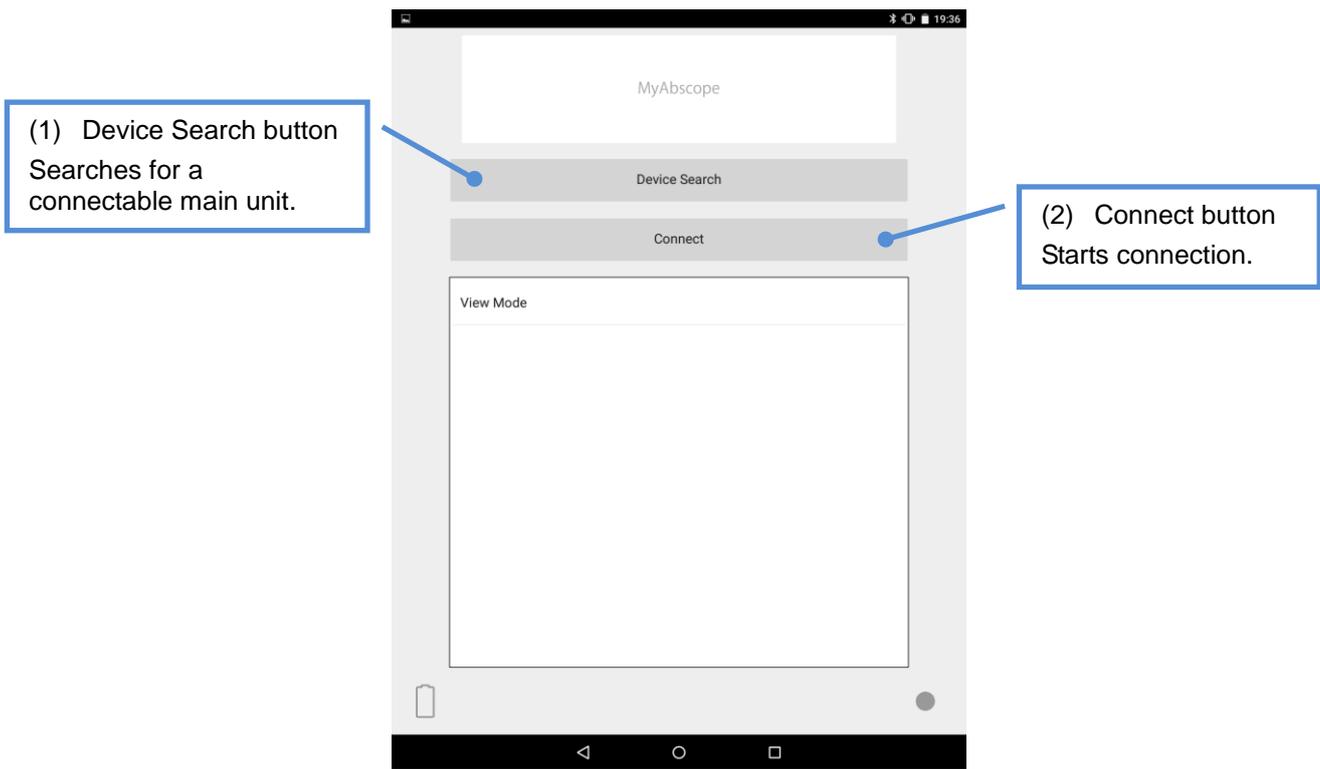


Figure 2-2: Connection setting screen

<Connecting Bluetooth device>

- (4) Tap the “Device Search” button (1) to search for a connectable main unit. If no unit is found (Figure 2-3), turn ON the power of the main unit again and tap the “Device Search” button. If found, the Bluetooth device address is displayed as shown in Figure 2-4.

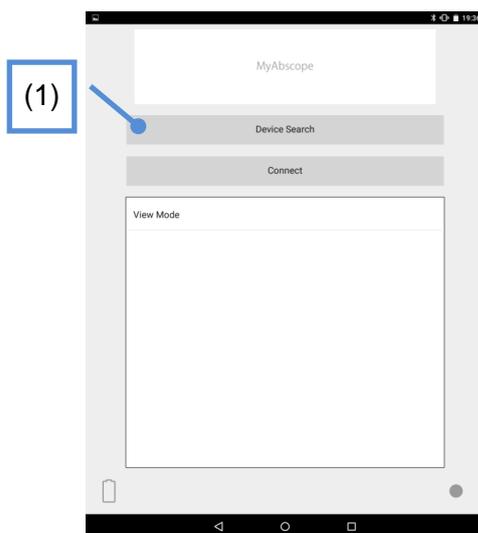


Figure 2-3: If not found

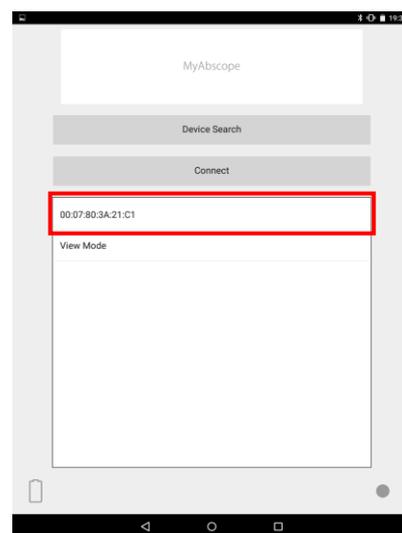


Figure 2-4: If found

- (5) Tap the same address (Bluetooth device address) as that written on the bottom of the main unit you intend to connect. The background color of the address changes (Figure 2-5) to indicate that it is selected.

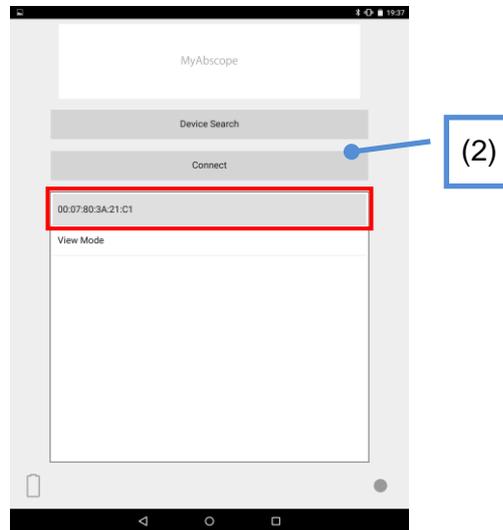


Figure 2-5: Display after the address is selected

- (6) Tap the "Connect" button (2) to start connection.
- (7) When the connection is established, a message "Connected." is displayed on the screen, then the top screen after connected is displayed. The pilot lamp beside the Power button on the main unit turns from red to blue, and the gray circle ● on the lower right of the screen changes to a green circle ● (Figure 2-6).

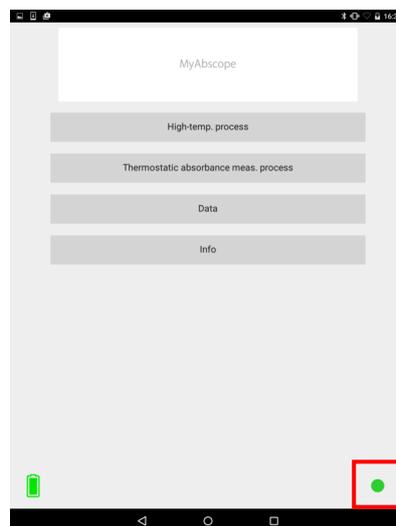


Figure 2-6: Top screen after connected

<View mode connection> (Used for checking the saved data only)

Start the main unit and software by following steps (1) to (3) above and tap “View Mode” (3). Then the background color changes (Figure 2-7) to indicate that it is selected.



Figure 2-7: Display after View Mode is selected

Tap the “Connect” button to display the top screen after connected. For how to check the data, see “5. Data Analysis” procedure on page 42.

<Top screen>

Tap the “Connect” button (2) on the connection setting screen (Figure 2-2) to establish the connection. Then the top screen (Figure 2-8) is displayed.

The screenshot shows the MyAbscope application interface. At the top, the title 'MyAbscope' is centered. Below it are four main menu items: 'High-temp. process', 'Thermostatic absorbance meas. process', 'Data', and 'Info'. At the bottom, there is a battery status indicator (a green battery icon) and a status bar with three colored dots (green, red, grey) and an application history button (a square icon). The callout boxes provide detailed descriptions for each of these elements.

(4) High-temperature treatment process button
Displays the screen for performing high-temperature treatment (Figure 3-4).

(5) Thermostatic absorbance measurement process button
Displays the screen for performing thermostatic absorbance measurement (Figure 4-2).

(6) Data button
Displays the screen for referring the saved data (Figure 5-2).

(7) Information display button
Displays the screen for performing thermostatic absorbance measurement (Figure 4-2).

Home button
Returns to the home screen.

Battery status of the main unit
 ■ Battery voltage: Normal
 ■ Battery voltage: Low
 ■ Not connected with the main unit

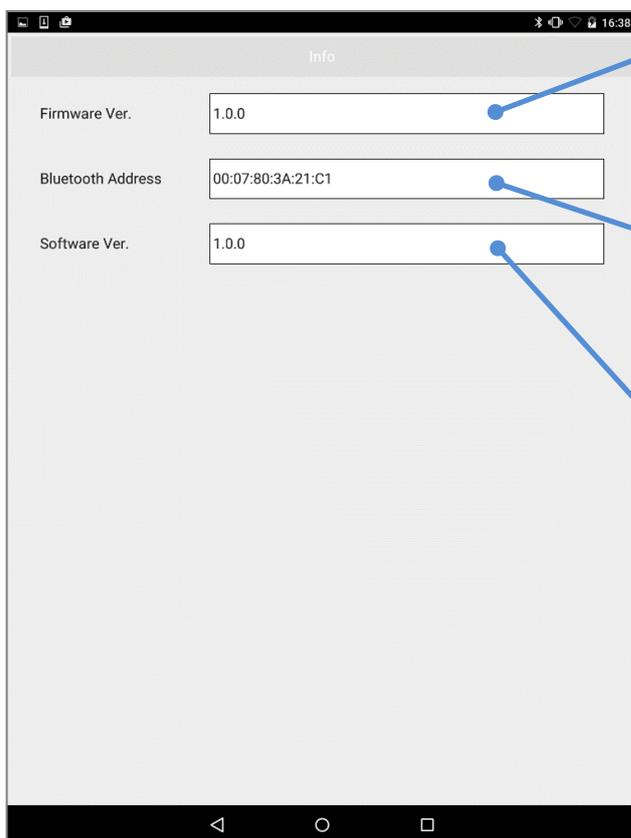
Return button
Returns to the previous screen.

Application history button
Used for checking the history of the applications used on the tablet.

● In preparation
 ● In operation
 ● Not connected

Figure 2-8: Top screen

<Information screen>



Firmware* version display field
Displays the firmware version information of the main unit connected.
Displays "N/A" when not connected.

Bluetooth address display field
Displays the Bluetooth device address of the main unit connected.
Displays "View Mode" in view mode.

Application version information display field
Displays the version information of the application being used.

* Firmware refers to the software installed in the main unit.

Figure 2-9: Information screen (when a main unit is connected)

3. Operation Procedure (High-temperature Treatment Unit)

<Main unit>

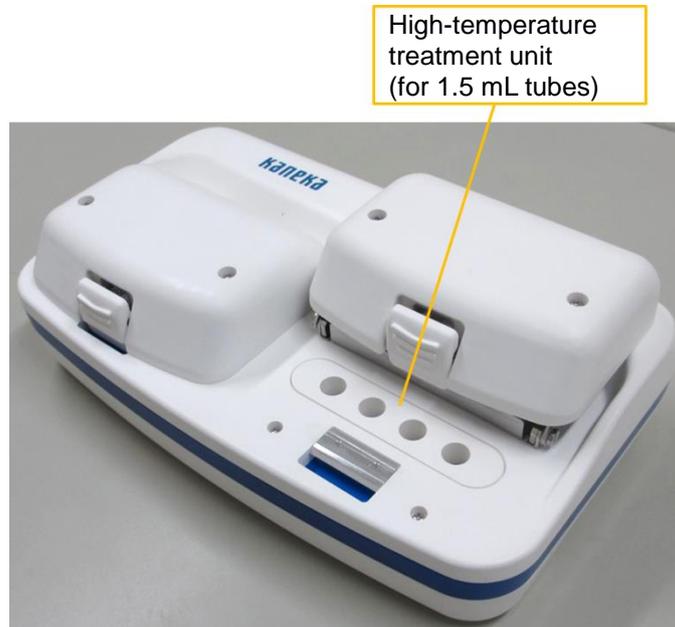


Figure 3-1: High-temperature treatment unit (Right)

Applications: DNA extraction etc.

<Setting samples>

- (1) Slowly raise the heat bonnet.



Figure 3-2: Setting a tube to the high-temperature treatment unit of the main unit

- (2) Set 1.5 mL tubes containing samples to the high-temperature treatment unit. At that time, make sure that the caps of the 1.5 mL tubes are firmly closed (Figure 3-2).
- (3) Slowly lower the heat bonnet and close it completely.



Handle the heat bonnet with care. It may be damaged by rough handling.

<Tablet operation>

- (4) Tap “High-temp. process,” the high-temperature treatment process button (Figure 3-3).

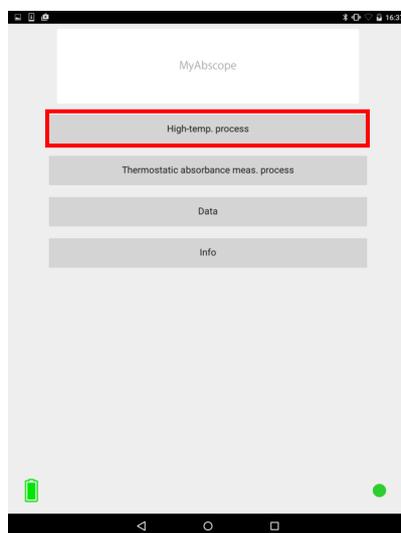
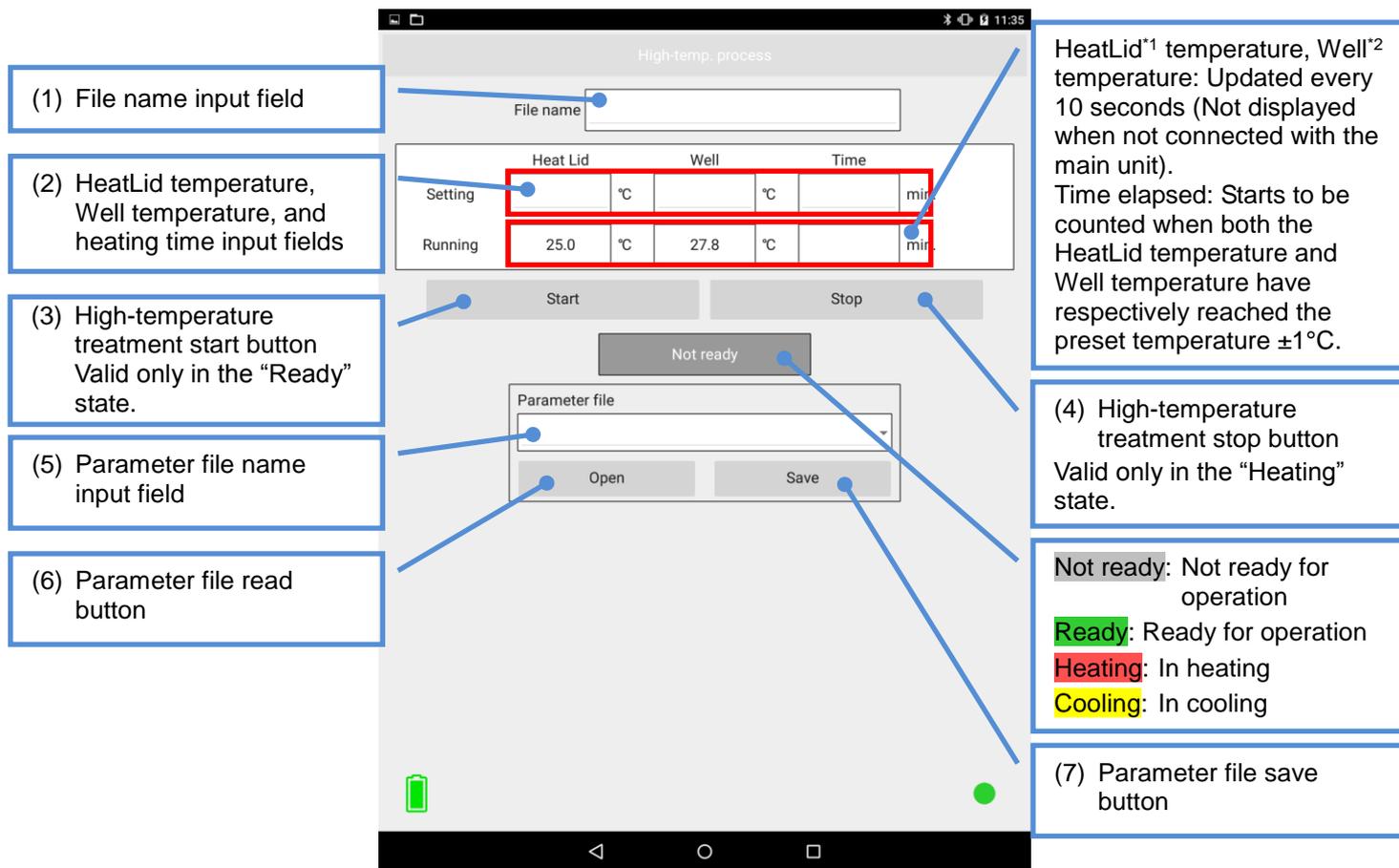


Figure 3-3: Top screen



*1: Contact with the tube cap inside the heat bonnet

*2: Heating section of the tube

Figure 3-4: High-temperature treatment process screen

- (5) Enter the CSV data storage file name in the file name input field (1).
If not entered, the CSV data storage file is automatically titled "untitled."
- (6) Set the intended values for the HeatLid temperature, Well temperature, and heating time (2). When all parameters are specified, the status indication changes to "Ready" (Figure 3-5).

(Effective range of temperature and time for high-temperature treatment process)

HeatLid temperature: Up to one decimal place in the range from 35.0 to 120.0°C

Well temperature: Up to one decimal place in the range from 35.0 to 100.0°C

Heating time: Only integers from 1 to 10 minutes

* If a value out of the above ranges is entered, an error message "Setting value is out of range." is displayed.



Figure 3-5: Indication of Ready state

(How to save settings)

To save the settings, tap the parameter file save button (7) in Figure 3-4, enter the file name on the save screen shown in Figure 3-6, then tap “Save.” If you tap “Cancel,” the file is not saved.

If a file with the same name exists, tap “Yes” on the confirmation screen shown in Figure 3-7 to overwrite it, or tap “No” to return to the parameter save screen.

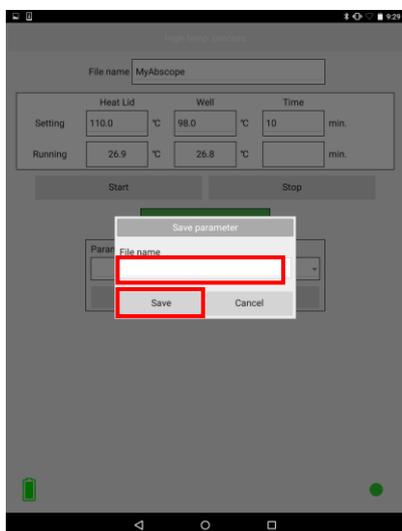


Figure 3-6: Parameter save screen

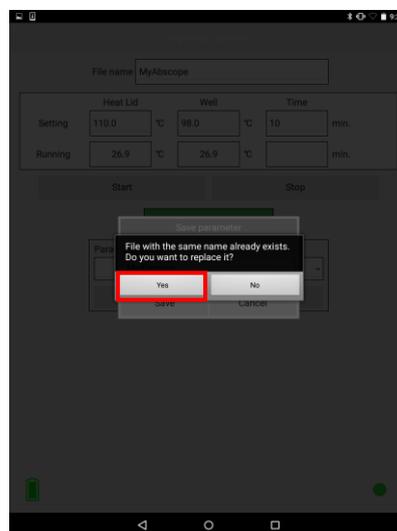


Figure 3-7: Overwrite confirmation screen

To read the settings from saved parameters, highlight the parameter file name in (5) in Figure 3-4, then tap the parameter file read button (6).

- (7) Tap “Start,” the high-temperature treatment start button, (3) in Figure 3-4 to start high-temperature treatment process. When heating starts, the status indication changes to “Heating,” the green circle ● on the lower right of the tablet screen changes to a red circle ●, and the pilot lamp beside the Power button on the main unit blinks in blue.
- (8) The HeatLid temperature and Well temperature are updated in real time every 10 seconds while being raised to the preset temperature and during high-temperature treatment (Figure 3-8).

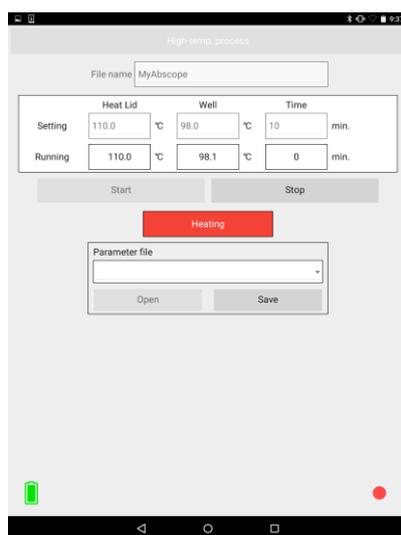


Figure 3-8: Indication of Heating state

- (9) After the preset time has elapsed, you will be informed that the data is saved as shown in Figure 3-9 on the next page. Then tap “OK.” The preset conditions are saved in the CSV format (with the file name entered in the input field (1) on the high-temperature treatment process screen, which is suffixed with “_yymmddhhmmss.csv” (see “5. Data Analysis,” (CSV file)). Three seconds after the preset time has elapsed, the cooling fan starts to operate, and the status indication changes to “Cooling” as shown in Figure 3-10. When both the HeatLid temperature and Well temperature have fallen below 35°C (within about 10 minutes or less), cooling is finished, and the status indication changes to “Ready” as shown in Figure 3-11. Confirm that the temperatures have fallen on the tablet screen.

* “yymmddhhmmss” stands for the time when the data is saved. For example, “160801133406” means that the data is saved at 13:34:06 on August 1, 2016.



Hot air may come out from the back of the heat bonnet. Be careful of burns.

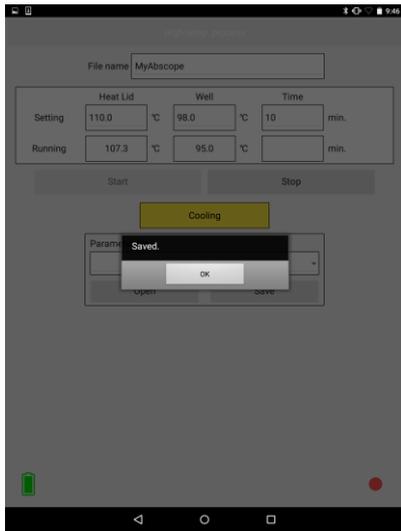


Figure 3-9: Indication of Saved state

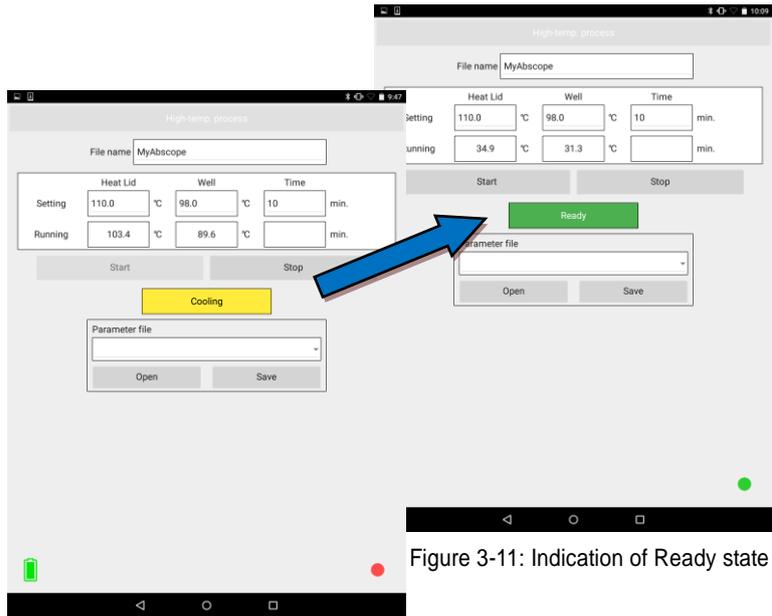


Figure 3-11: Indication of Ready state

Figure 3-10: Indication of Cooling state

(How to quit high-temperature treatment halfway)

To quit high-temperature treatment halfway, tap the high-temperature treatment stop button (4) in Figure 3-4. You will be asked “Are you sure you want to stop?” as shown in Figure 3-12. Tap “Yes” to stop, or “No” to continue the high-temperature treatment.

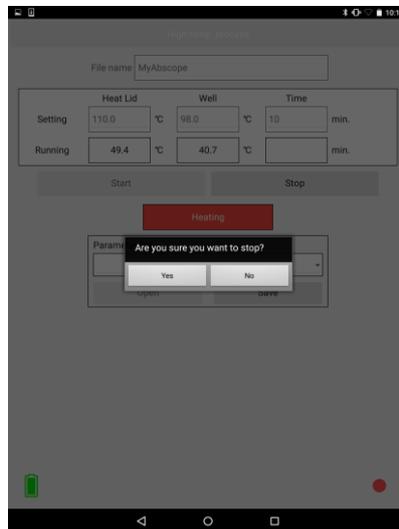


Figure 3-12: High-temperature treatment stop confirmation screen

If you tap “Yes,” you will be informed that the data is saved as shown in Figure 3-9. Then tap “OK.” The preset conditions are saved in the CSV format (with the file name entered in the input field (1) on the high-temperature process screen, which is suffixed with “_yymmddhmmss.csv.” Three seconds after you tap “Yes,” the cooling fan starts to operate and the status indication changes to “Cooling” as shown in Figure 3-10. When both the HeatLid temperature and Well temperature have fallen below 35°C, the status indication changes to “Ready” as shown in Figure 3-11.

<Taking out sample>



Figure 3-13: Taking out sample

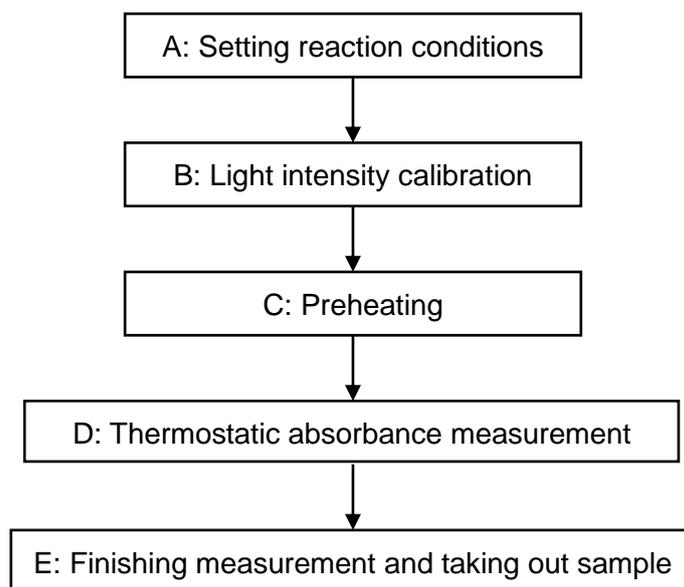
- (10) Slowly raise the heat bonnet.
- (11) Pull out the 1.5 mL tubes containing samples (Figure 3-13).



- Handle the heat bonnet with care. It may be damaged by rough handling.
- Tubes containing samples may be hot. Be careful of burns.

4. Operation Procedure (Thermostatic Absorbance Measurement Unit)

<Thermostatic absorbance measurement flow>



<Thermostatic absorbance measurement procedure>

- (1) Tap “Thermostatic absorbance meas. process” (Figure 4-1), the thermostatic absorbance measurement process button, on the top screen after this product is connected to display the thermostatic absorbance measurement process setting screen (Figure 4-2).

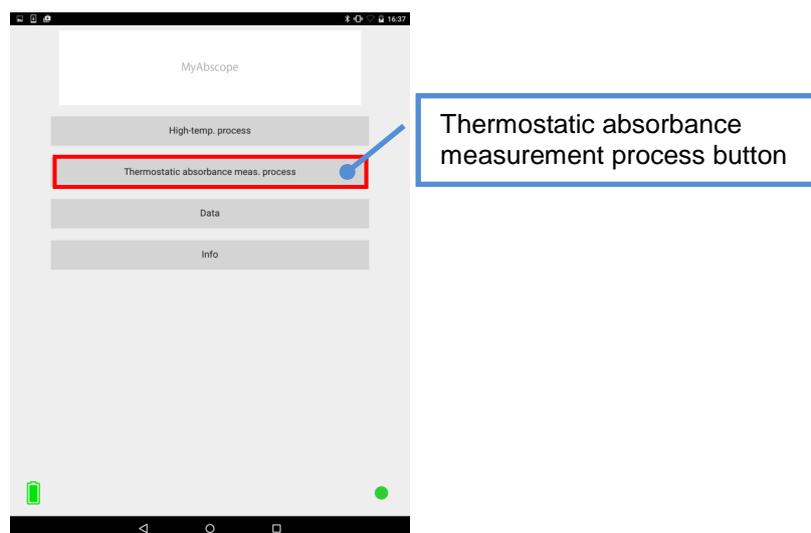


Figure 4-1: Thermostatic absorbance measurement process button on top screen

[A: Setting reaction conditions]



Figure 4-2: Thermostatic absorbance measurement process setting screen

- (2) Enter the CSV data storage file name in the file name input field (1). If not entered, the CSV data storage file is automatically titled “untitled.”

- (3) Select the (R, G, or B) sensor suitable for the wavelength region to be measured with the sensor selection buttons (2) in Figure 4-2. You can select only one sensor for one measurement.

(Reference) The (typical) absorption wavelength band of each sensor is as follows:

R: 575 to 660 nm, G: 455 to 630 nm, B: 400 to 540 nm

For example, to measure a reaction system in which a colorless solution turns into yellow, you should select the B sensor.

Color of absorbed light	Absorbed wavelength	Typical color of solution (Complementary color of absorbed light)
Violet	400~435	Yellow green
Dark blue	435~480	Yellow
Blue	480~490	Orange
Green	490~540	Red
Yellow	540~580	Violet
Orange	580~600	Blue
Red	600~660	Blue green

Diagrammatic annotations:

- A bracket on the right side of the table groups the rows for "Absorbed wavelength band of B sensor" (rows 1-4).
- A bracket on the right side of the table groups the rows for "Absorbed wavelength band of G sensor" (rows 5-6).
- A bracket on the right side of the table groups the rows for "Absorbed wavelength band of R sensor" (rows 7-8).
- A note at the bottom right states: "* The above colors are for illustrative purposes only."

Figure 4-3: Measurement wavelength band of each sensor and typical colors of sample solutions



It is not possible to set a specific wavelength.

- (4) To set thresholds, select the absorbances to be used as the thresholds (then the values higher than "High" are displayed with "+," those lower than "Low," with "-", and those between "High" and "Low," with "±"). Otherwise, tap "Next."
- (5) To set thresholds at the time of judgment, tap the threshold input field (3) in Figure 4-2 to display the numeric input screen as shown in Figure 4-4. Then select a numerical value for each channel and then tap "OK." If you set a threshold for all, it applies to all channels.

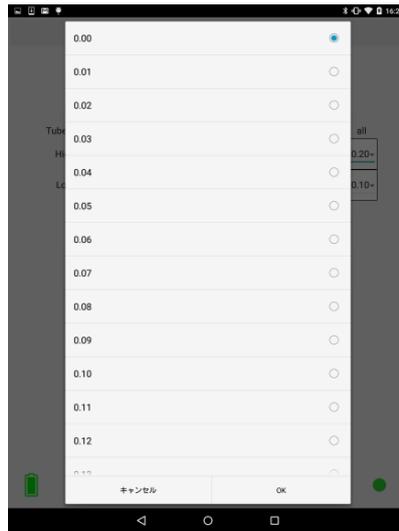


Figure 4-4: Threshold setting screen

(How to save parameters)

To save the parameters, tap the parameter file save button (6) in Figure 4-2, enter the file name on the save screen shown in Figure 4-5, then tap “Save.” If you tap “Cancel,” the file is not saved.

If a file with the same name exists, tap “Yes” on the confirmation screen shown in Figure 4-6 to overwrite it, or tap “No” to return to the parameter save screen.

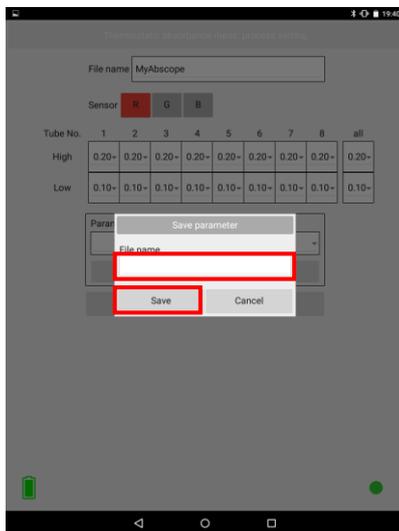


Figure 4-5: Parameter save screen

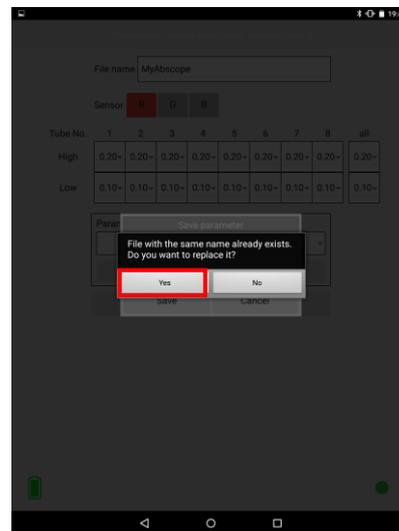


Figure 4-6: Overwrite confirmation screen

To read the saved parameters, select the parameter file name in (4) in Figure 4-2, then tap the parameter file read button in (5).

(6) Tap “Next,” the next button, (7) in Figure 4-2 to display the thermostatic absorbance measurement process screen (Figure 4-7).

Displays the file name and sensor specified on the thermostatic absorbance measurement process setting screen.

(1) Delay Time input field

(4) Light intensity calibration start button
Valid only in the “Not ready” and “Ready” states.

(6) Reaction process start button
Valid only in the “Preheating” state.

(2) HeatLid temperature, Well temperature, and heating time input fields for thermostatic absorbance measurement

(3) HeatLid temperature, Well temperature, and heating time input fields for two-step process

HeatLid temperature, Well temperature: Updated every 10 seconds (Not displayed when not connected with the main unit).
Time elapsed: Starts to be counted when both the HeatLid temperature and Well temperature have respectively reached the preset temperature $\pm 1^{\circ}\text{C}$ (for both reaction and two-step processes).

(5) Preheating start button
Valid only in the “Ready” state.

(7) Process stop button
Valid only in the “Calibration,” “Preheating,” “Preheat Complete,” and “Measuring&Heating” states.

(8) Parameter file name input field

(10) Parameter file save button

(11) Thermostatic absorbance measurement result display button

(9) Parameter file read button

Not ready: Not ready for operation
Ready: Ready for operation
Calibration: In light intensity calibration
Preheating: In preheating
Preheat Complete: Preheating completed
Measuring&Heating: In absorbance measurement
Cooling: In cooling

Figure 4-7: Thermostatic absorbance measurement process screen

(7) (1) Enter “Delay Time*.” If not specified or specified as “0,” zero adjustment and absorbance measurement will start just after the “Start” button is tapped.

* Delay time: Time taken before the start of zero adjustment and absorbance measurement

(8) Set the intended values for the HeatLid temperature, Well temperature, and heating time (2).

When all parameters are specified, the status indication changes to “Ready” (Figure 4-8). By specifying the temperature and time in (3), you can also define two-step temperature change (for example, for enzyme deactivation).

If the heating time is set to “0” or parameters are not defined at all in (3), two-step process is not performed.

(Effective range of temperature and time for thermostatic absorbance measurement unit)

They can be specified up to one decimal place in the following range:

Step 1 Heat Lid temperature: 35.0 to 80.0°C, Well temperature: 35.0 to 70.0°C,
Time (heating time): 1 to 65 minutes*

* Including Delay Time. For example, if Delay Time is set to 300 seconds, the effective range of Time (heating time) is 1 to 60 minutes.

Step2 Heat Lid temperature: 35.0 to 80.0°C, Well temperature: 35.0 to 80.0°C,
Time (heating time): 0 to 20 minutes

* If a value out of the above ranges is entered, an error message “Setting value is out of range.” is displayed.

(How to save parameters)

To save the parameters, tap the parameter file save button (10) in Figure 4-7, enter the file name on the save screen shown in Figure 4-8, then tap “Save.” If you tap “Cancel,” the file is not saved.

If a file with the same name exists, tap “Yes” on the confirmation screen shown in Figure 4-9 to overwrite it, or tap “No” to return to the parameter save screen.

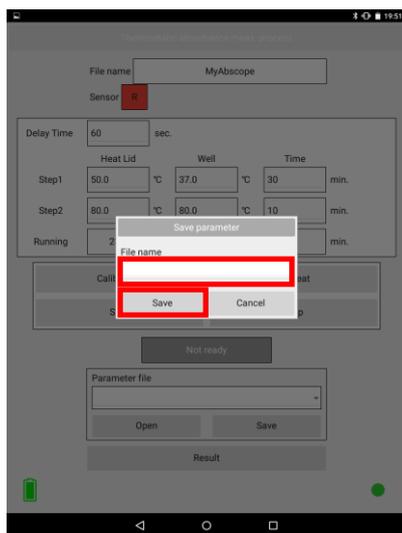


Figure 4-8: Parameter save screen

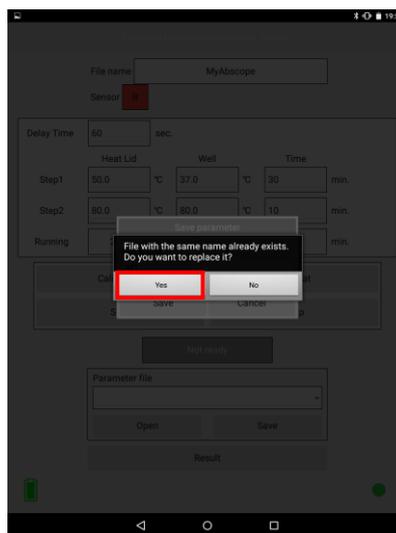


Figure 4-9: Overwrite confirmation screen

To read the saved parameters, select the parameter file name in (8) in Figure 4-7, then tap the parameter file read button in (9).

[B: Light intensity calibration]

<Main unit>



Figure 4-10: Thermostatic absorbance measurement unit (Left)

Applications: Isothermal nucleic acid amplification reaction, enzyme reaction measurement etc.

<Setting samples>

(9) Slowly raise the heat bonnet.



Figure 4-11: Setting a 0.2 mL tube to the thermostatic absorbance measurement unit

(10) Set 8-strip 0.2 mL tubes containing at least 25 μL of distilled water each to the thermostatic absorbance measurement unit (Figure 4-11). At that time, make sure that the caps of the 0.2 mL tubes are firmly closed.



If distilled water is less than 25 μL per tube, you cannot calibrate the light intensity accurately.

(11) Slowly lower the heat bonnet and close it completely.



Handle the heat bonnet with care. It may be damaged by rough handling.

- (12) Tap “Calibration,” the light intensity calibration start button, (4) in Figure 4-7 to start light intensity calibration, displaying “Calibration” (Figure 4-12). (During calibration, the pilot lamp beside the Power button on the main unit blinks in blue, and the green circle ● on the lower right of the tablet screen changes to a red circle ●. Light intensity calibration will take about three minutes.)
When the light intensity is calibrated for all channels, the indication changes from “Calibration” to “Ready.”

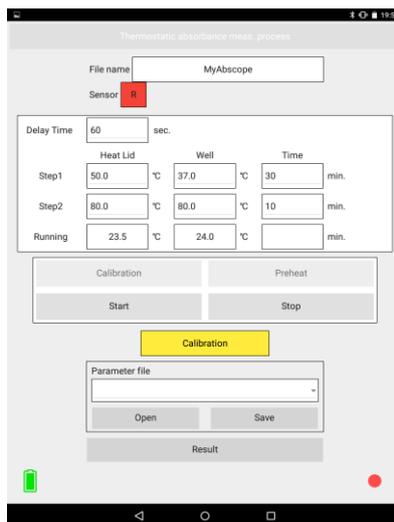


Figure 4-12: Light intensity calibration screen

(How to quit light intensity calibration halfway)

To quit light intensity calibration halfway, tap the process stop button (7) in Figure 4-7. You will be asked “Are you sure you want to stop?” as shown in Figure 4-13. Tap “Yes” to stop, or “No” to continue the light intensity calibration treatment.

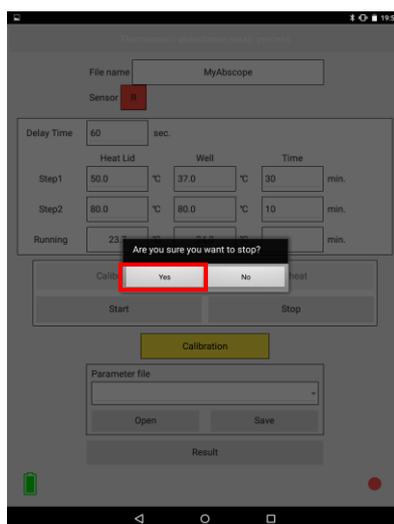


Figure 4-13: Process stop confirmation screen

- (13) Open the heat bonnet and pull out the 8-strip 0.2 mL tubes containing distilled water from the thermostatic absorbance measurement unit.

[C: Preheating]

- (14) Tap “Preheat,” the preheating start button, (5) in Figure 4-7 to start preheating, displaying “Preheating” (Figure 4-14). The Well temperature is raised to the preset temperature before the reaction. When heating starts, the pilot lamp beside the Power button on the main unit blinks in blue, and the green circle ● on the lower right of the tablet screen changes to a red circle ●. During preheating, the HeatLid temperature and Well temperature are updated every 10 seconds in the “Running” fields. When the HeatLid temperature and Well temperature have respectively reached the preset temperature, the indication changes to “Preheat Complete,” and the time elapsed is displayed (Figure 4-15).

 If absorbance measurement is not started within 15 minutes after the preset preheat temperature is reached, cooling automatically starts.

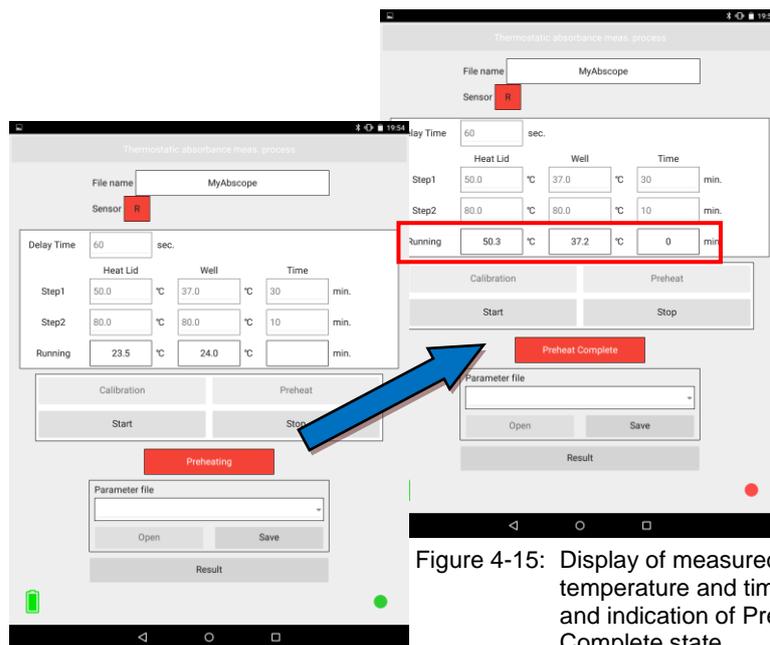


Figure 4-14: Indication of Preheating state

Figure 4-15: Display of measured temperature and time elapsed and indication of Preheat Complete state



If the thermostatic absorbance measurement start button (6) in Figure 4-7 is not tapped within 15 minutes after the preset preheat temperature is reached, you will be informed that the data is saved as shown in Figure 4-16. Then tap “OK.” Three seconds after 15 minutes have elapsed, the cooling fan starts to operate, and the status indication changes to “Cooling” as shown in Figure 4-17. When both the HeatLid temperature and Well temperature have fallen below 35°C, cooling is finished, and the status indication changes to “Ready” as shown in Figure 4-18.

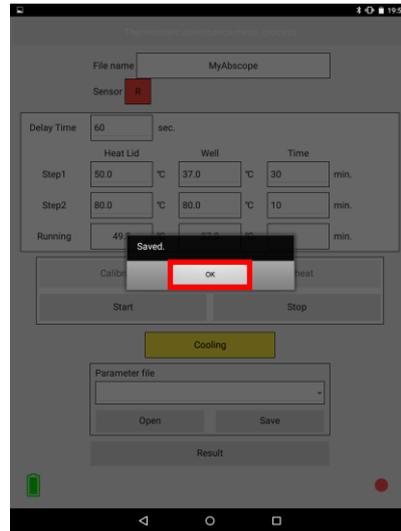


Figure 4-16: Indication of Saved state

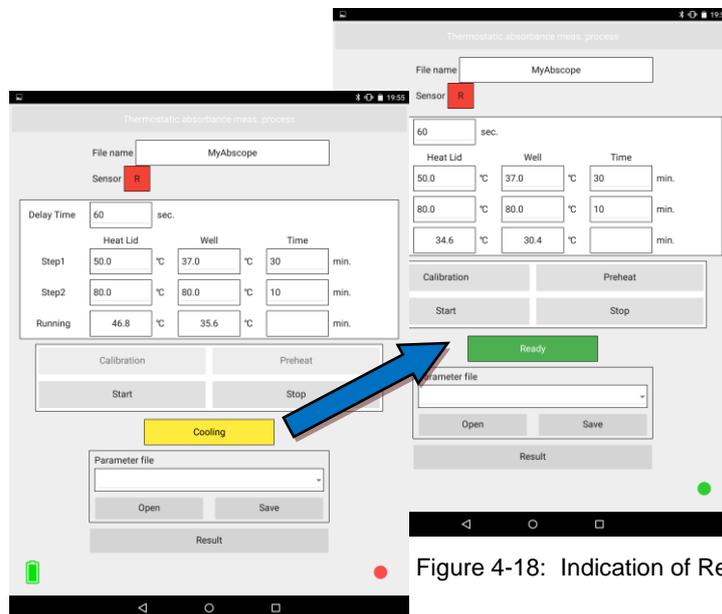


Figure 4-18: Indication of Ready state

Figure 4-17: Indication of Cooling state

(How to quit preheating halfway)

To quit preheating halfway, tap the process stop button (7) in Figure 4-7. You will be asked “Are you sure you want to stop?” as shown in Figure 4-19. Tap “Yes” to stop, or “No” to continue preheating.

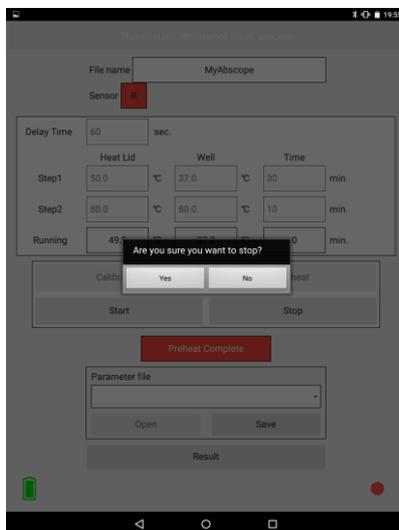


Figure 4-19: Preheating stop confirmation screen

If you tap “Yes,” you will be informed that the data is saved as shown in Figure 4-20. Then tap “OK.” The process data before the stop is saved in the CSV format (with the file name entered in the input field (1) on the thermostatic absorbance measurement process setting screen, which is suffixed with “_yymmddhhmmss.csv” (see “5. Data Analysis,” (CSV file)). Three seconds after you tap “Yes,” the cooling fan starts to operate and the status indication changes to “Cooling” as shown in Figure 4-21. When both the HeatLid temperature and Well temperature have fallen below 35°C, the status indication changes to “Ready” as shown in Figure 4-22.

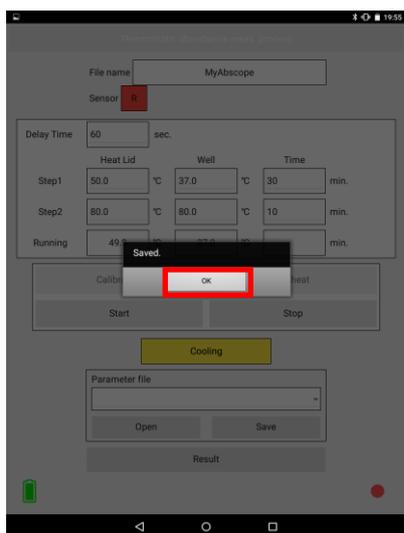


Figure 4-20: Indication of Saved state

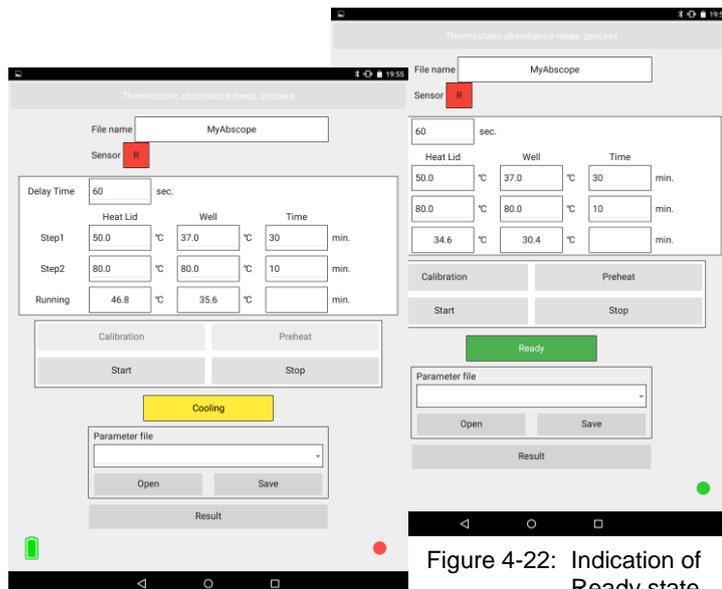


Figure 4-22: Indication of Ready state

Figure 4-21: Indication of Cooling state

[D: Thermostatic absorbance measurement]

- (15) Set the 0.2 mL tubes containing the sample to be subjected to thermostatic absorbance measurement to the thermostatic absorbance measurement unit.



If the sample volume is less than 25 μL , the absorbance cannot be measured accurately.

- (16) If you tap the reaction process start button (6) in Figure 4-7 within 15 minutes after the preset preheat temperature is reached, absorbance measurement starts after setting the initial value (zero adjustment), and the thermostatic absorbance measurement result screen is displayed (Figure 4-23). The status indication changes to “Measuring&Heating” on the setting screen (Figure 4-24 on the next page). During absorbance measurement, Abs values (up to four decimal places) are updated in real time every 20 seconds, and at the same time, the measurement results are plotted on graphs in real time (Figure 4-25 on the next page). By tapping the relevant judgment result field, you can hide the (unnecessary) graphs of unmeasured Wells (Figure 4-26 on the next page). After the first-step reaction is completed, the second-step process is automatically performed at the preset temperature and time.

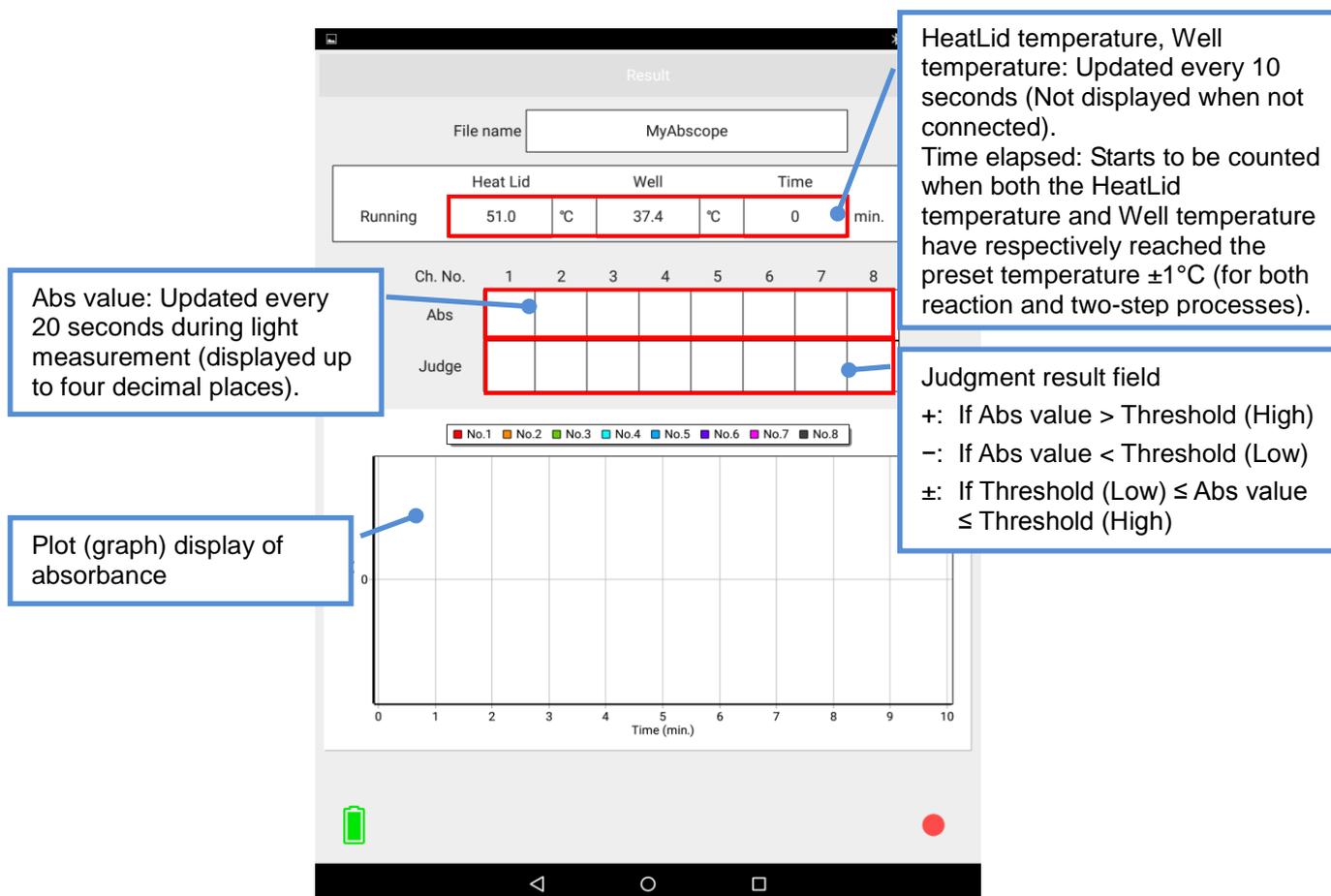


Figure 4-23: Thermostatic absorbance measurement result screen

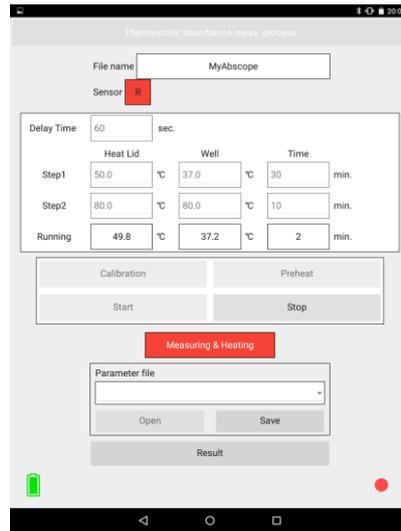


Figure 4-24: Indication of Measuring&Heating state

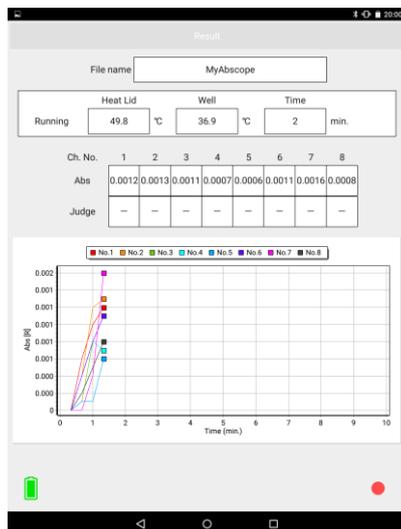


Figure 4-25: Graph display during absorbance measurement

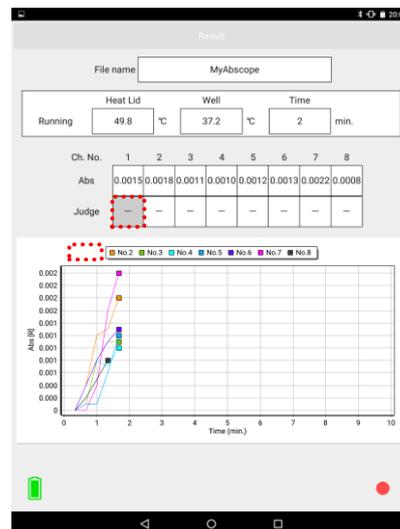


Figure 4-26: Switching show/hide for measured data

(How to quit thermostatic absorbance measurement halfway)

To quit thermostatic absorbance measurement halfway, tap the process stop button (7) in Figure 4-7. You will be asked “Are you sure you want to stop?” as shown in Figure 4-27. Tap “Yes” to stop, or “No” to continue the thermostatic absorbance measurement.

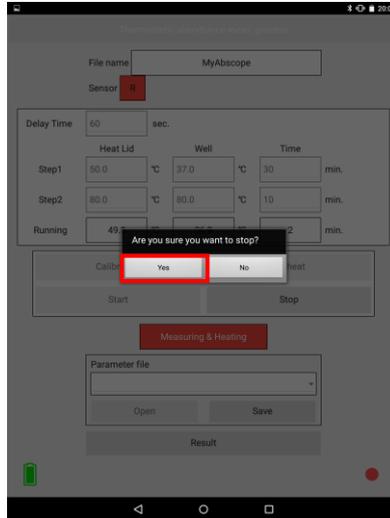


Figure 4-28: Process stop confirmation screen

If you tap “Yes,” you will be informed that the data is saved as shown in Figure 4-28. Then tap “OK.” The process data before the stop is saved in the CSV format (with the file name entered in the input field (1) on the thermostatic absorbance measurement process setting screen, which is suffixed with “_yymmddhhmmss.csv” (see “5. Data Analysis,” (CSV file)). Three seconds after you tap “Yes,” the cooling fan starts to operate and the status indication changes to “Cooling” as shown in Figure 4-29. When both the HeatLid temperature and Well temperature have fallen below 35°C, the status indication changes to “Ready” as shown in Figure 4-30.

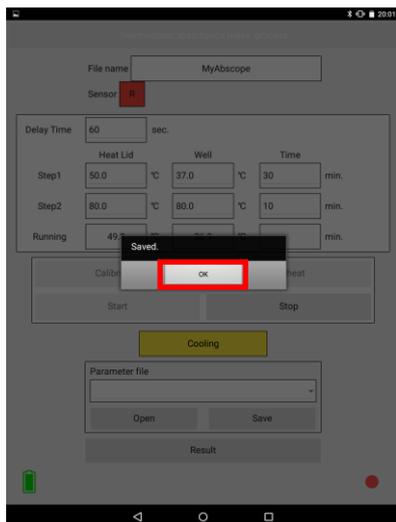


Figure 4-28: Indication of Saved state

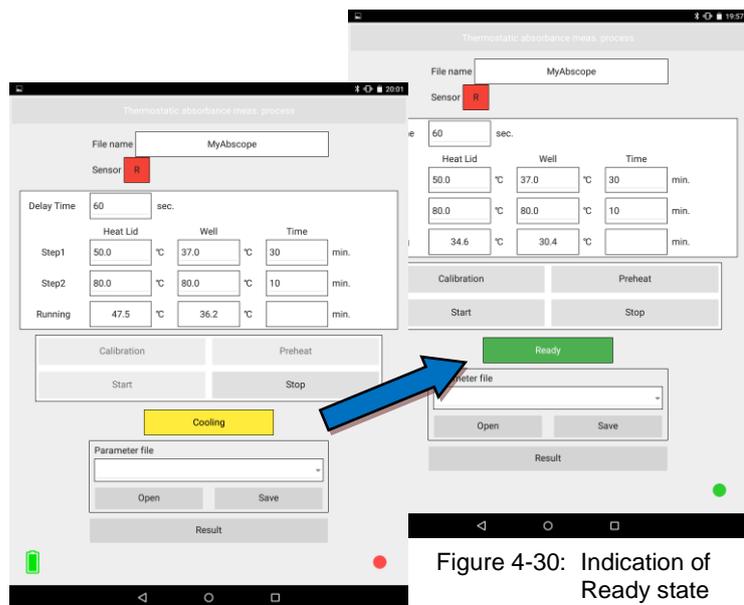


Figure 4-30: Indication of Ready state

Figure 4-29: Indication of Cooling state

[E: Finishing measurement and taking out sample]

(17) After the preset second-step process time has elapsed, you will be informed that the data is saved as shown in Figure 4-31. Then tap “OK.” The process data is saved in the CSV format (with the file name entered in the input field (1) on the thermostatic absorbance measurement process setting screen, which is suffixed with “_yymmddhhmmss.csv” (see “5. Data Analysis,” (CSV file)). Three seconds after the preset second-step process time has elapsed, the cooling fan starts to operate, and the status indication changes to “Cooling” as shown in Figure 4-32. When both the HeatLid temperature and Well temperature have fallen below 35°C (within about 10 minutes or less), cooling is finished, and the status indication changes to “Ready” as shown in Figure 4-33.

 Hot air may come out from the back of the heat bonnet. Be careful of burns.

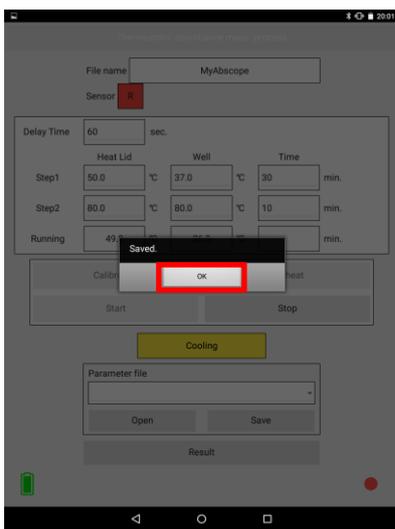


Figure 4-31: Indication of Saved state

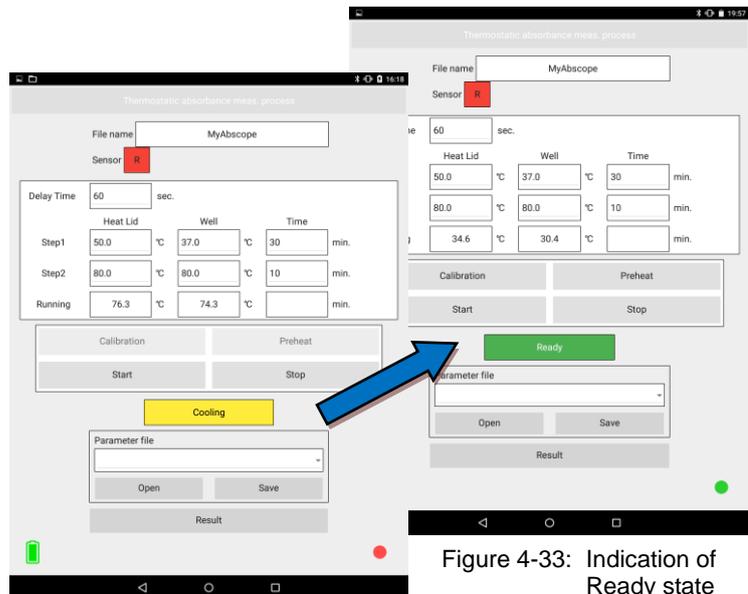


Figure 4-33: Indication of Ready state

Figure 4-32: Indication of Cooling state

<Taking out sample>

(18) Slowly raise the heat bonnet.

 Handle the heat bonnet with care. It may be damaged by rough handling.

(19) Pull out the 0.2 mL tubes containing samples (Figure 4-34).

 Tubes may be hot. Be careful of burns.



Figure 4-34: Taking tubes out of the thermostatic absorbance measurement unit

* To continue thermostatic absorbance measurement, restart it from entering the file name as described in [A: Setting reaction conditions] on page 27.

<Shutting down main unit>

(20) Press the Power button on the main unit. The pilot lamp beside the Power button on the main unit will turn OFF.

5. Data Analysis

<Confirming data on application>

- (1) Tap “Data” on the top screen (Figure 5-1). The detailed data confirmation screen is displayed as shown in Figure 5-2.

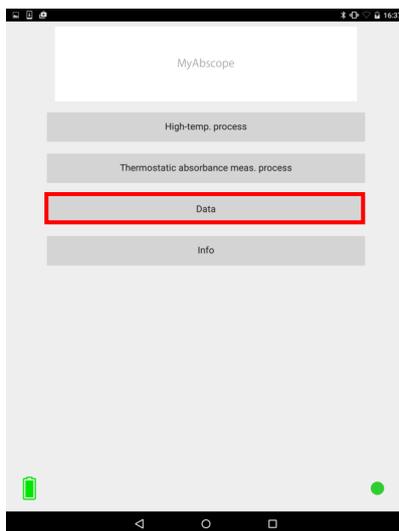
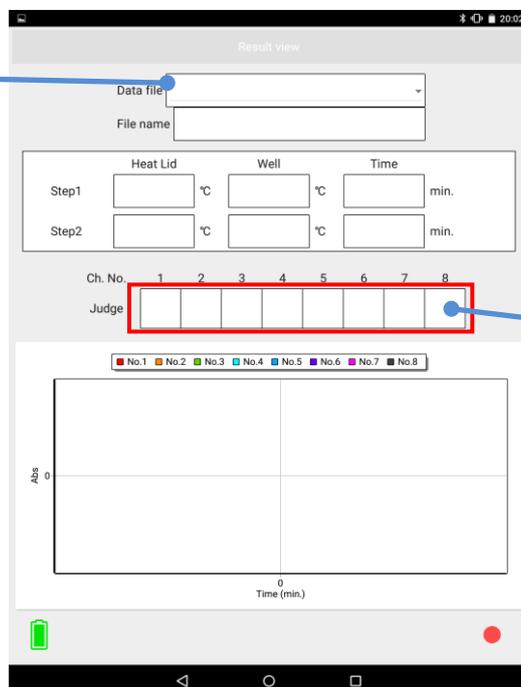


Figure 5-1: Top screen

(1) Stored data name input field



(2) Judgment result field
 +: If Abs value > Threshold (High)
 -: If Abs value < Threshold (Low)
 ±: If Threshold (Low) ≤ Abs value ≤ Threshold (High)

Figure 5-2: Detailed data confirmation screen

- (2) Tapping the stored data name input field (1) in Figure 5-2 displays the file name selection screen shown in Figure 5-3. Select the file name you want to check and tap “OK,” then the data and graphs are displayed as shown in Figure 5-4.

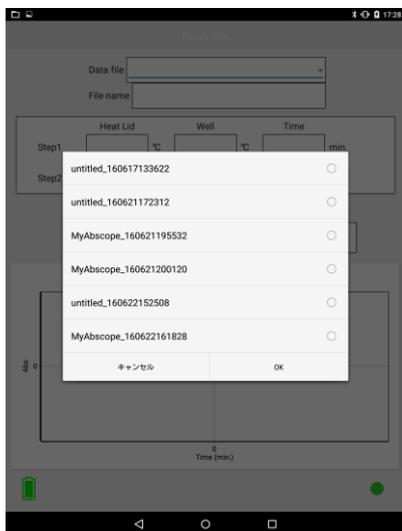


Figure 5-3: File name selection screen

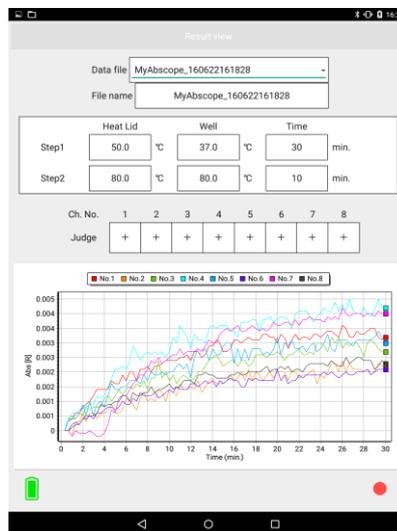


Figure 5-4: Detailed data screen

- (3) By tapping the judgment result field (2) in Figure 5-2, you can hide the graph of the relevant channel as shown in Figure 5-5. To redisplay the hidden graph, tap the relevant judgment result field again.

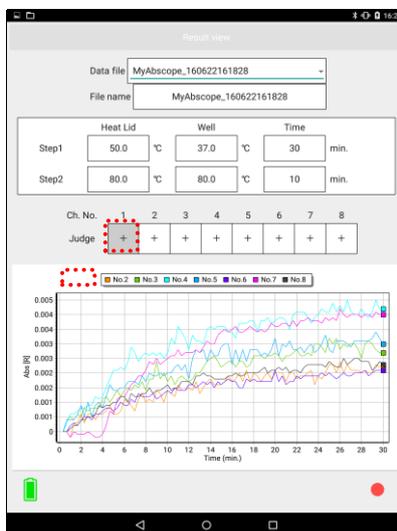


Figure 5-5: Switching show/hide for the graph of each channel

<Confirming data on PC (Windows 7 or 10)>

- (1) Connect the tablet to a PC using the accessory USB cable ferrite core is attached of the tablet. The CSV file is saved in the following internal storage folder of the tablet.

Computer¥Nexus 9¥internal storage¥Android¥data¥com.kaneka.myabscope¥files

Select “Open the device to show files” on the automatic reproduction screen shown in Figure 5-6.



Figure 5-6: Automatic reproduction screen

- (2) Open “Android” in the internal storage.

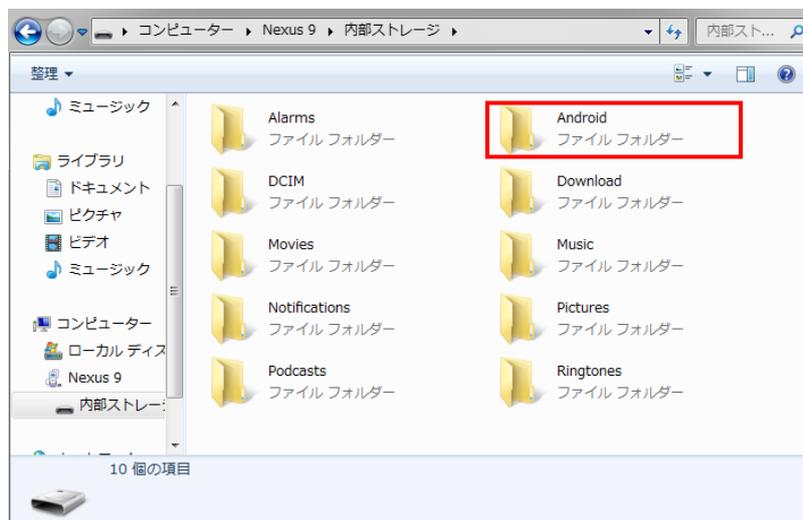


Figure 5-7: Internal storage folder

(3) Open “data” in “Android.”

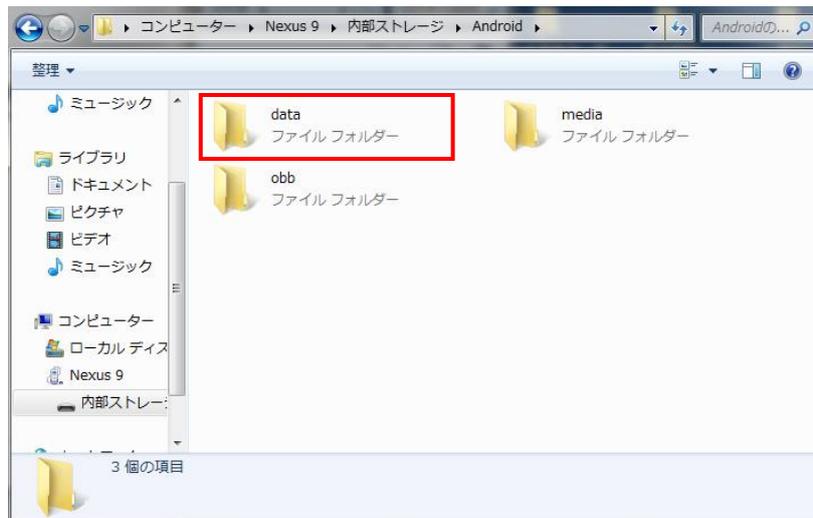


Figure 5-8: Android folder

(4) Open “com.kaneka.myabscope” in “data.”

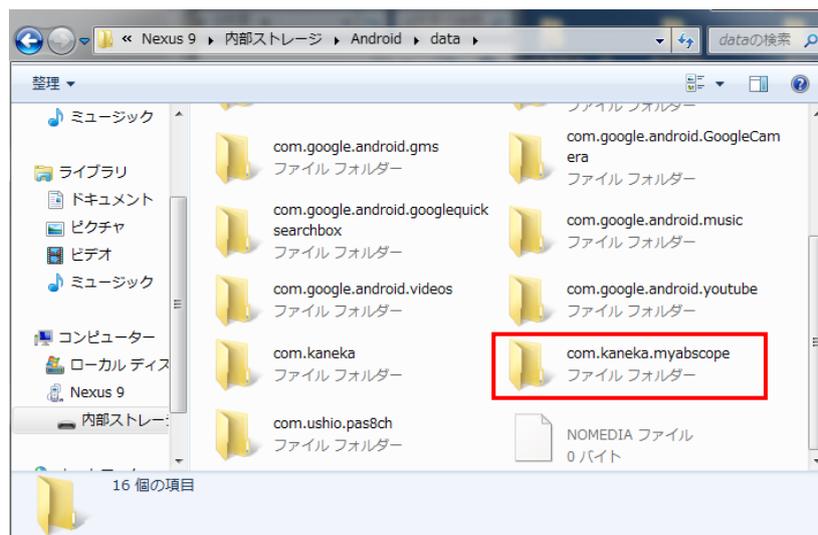


Figure 5-9: data folder

- (5) Open “files” in “com.kaneka.myabscope.”

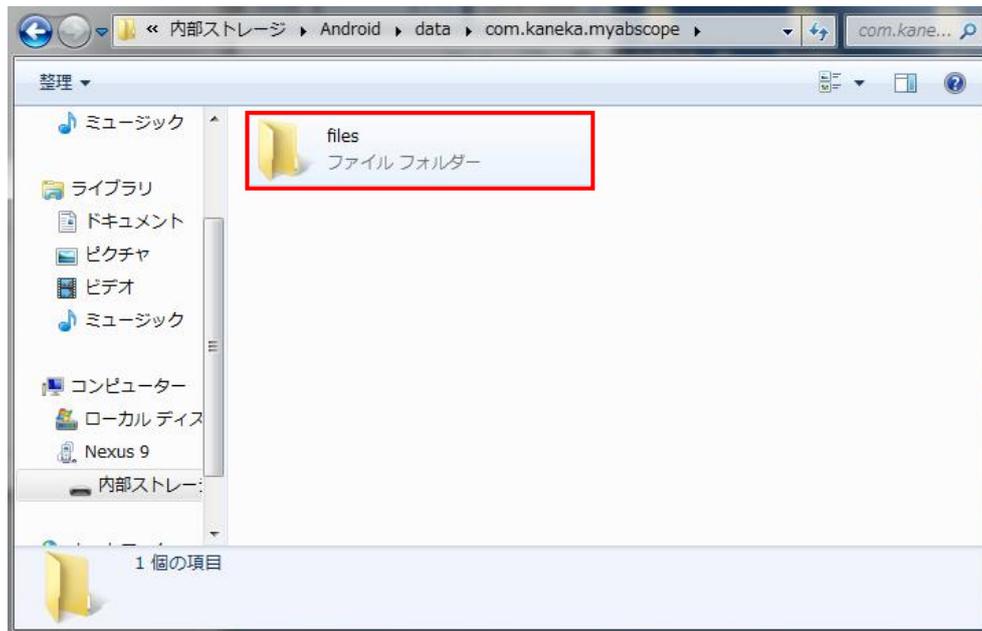


Figure 5-10: com.kaneka.myabscope folder

- (6) Open the intended CSV file in “files.”

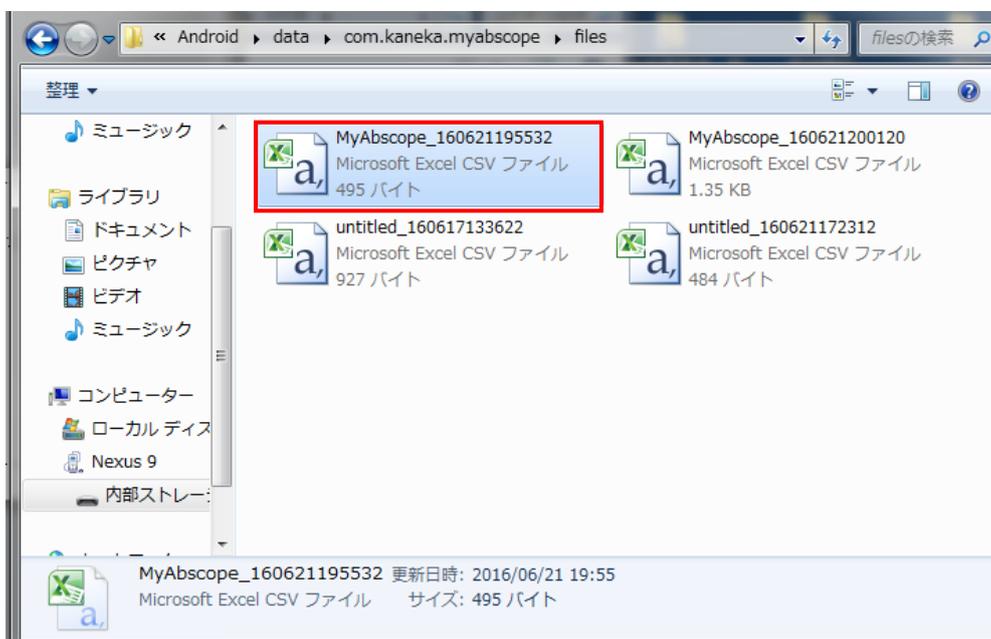


Figure 5-11: files folder

- (7) The CSV file is opened as follows: The absorbance data is shown in row 22 and after in columns A through I (enclosed with a red frame in Figure 5-12). The preset data is shown in the blue frame in Figure 5-12.

Process	Thermostatic absorbance meas. process							
Settings								
Color/Temp/R								
Delay	60 sec							
HeatLid	50 °C				80 °C			
Well	37 °C				80 °C			
Set Time	30 min				10 min			
Judgment								
Tube No.	1	2	3	4	5	6	7	8
High	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
Low	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Finish	0.0032	0.0022	0.0027	0.0042	0.003	0.0021	0.004	0.0023
Judge	-	-	-	-	-	-	-	-
Result								
10 Tube No./								
	1	2	3	4	5	6	7	8
	30124	29754	29634	29946	29520	29785	30465	29365
20 Tube No./								
	1	2	3	4	5	6	7	8
	30124	29754	29634	29946	29520	29785	30465	29365
22 Abs./Temp. Tube No./								
Time(sec.)	1	2	3	4	5	6	7	8
24	0	0	0	0	0	0	0	0
25	20	0.0003	0	0.0004	0.0003	0.0004	0	0
26	40	0.0004	-0.0002	0.0005	0.0006	0.0004	0.0002	-0.0002
27	60	0.0006	0.0003	0.0004	0.0006	0.0004	0.0003	0
28	80	0.0006	0.0003	0.0006	0.0007	0.0006	0.0002	-0.0001
29	100	0.0008	0.0006	0.0005	0.0008	0.0009	0.0004	-0.0001
30	120	0.0009	0.0003	0.0008	0.0008	0.0005	0.0005	-0.0001
31	140	0.001	0.0006	0.0007	0.0009	0.001	0.0005	0
32	160	0.0012	0.0006	0.0008	0.0009	0.0005	0.0004	-0.0001
33	180	0.0014	0.0004	0.0008	0.0012	0.0009	0.0006	-0.0002
34	200	0.0014	0.0006	0.0008	0.0011	0.001	0.0006	-0.0002
35	220	0.0014	0.0006	0.0011	0.0012	0.0008	0.0007	-0.0001
36	240	0.0014	0.0007	0.0012	0.0015	0.0012	0.0008	0.0002
37	260	0.0017	0.0009	0.001	0.0012	0.0016	0.0008	0.0007
38	280	0.0016	0.0006	0.0012	0.0021	0.0014	0.0007	0.0006

22	Abs./Temp. Tube No./								
23	Time(sec.)	1	2	3	4	5	6	7	8
24	0	0	0	0	0	0	0	0	0
25	20	0.0003	0	0.0004	0.0003	0.0004	0.0004	0	0
26	40	0.0004	-0.0002	0.0005	0.0006	0.0004	0.0002	-0.0002	0.0001
27	60	0.0006	0.0003	0.0004	0.0006	0.0004	0.0003	0	0.0002
28	80	0.0006	0.0003	0.0006	0.0007	0.0006	0.0002	-0.0001	0.0002
29	100	0.0008	0.0006	0.0005	0.0008	0.0009	0.0004	-0.0001	0.0004
30	120	0.0009	0.0003	0.0008	0.0008	0.0005	0.0005	-0.0001	0.0004
31	140	0.001	0.0006	0.0007	0.0009	0.001	0.0005	0	0.0005
32	160	0.0012	0.0006	0.0008	0.0009	0.0005	0.0004	-0.0001	0.0005
33	180	0.0014	0.0004	0.0008	0.0012	0.0009	0.0006	-0.0002	0.0006
34	200	0.0014	0.0006	0.0008	0.0011	0.001	0.0006	-0.0002	0.0009
35	220	0.0014	0.0006	0.0011	0.0012	0.0008	0.0007	-0.0001	0.0008
36	240	0.0014	0.0007	0.0012	0.0015	0.0012	0.0008	0.0002	0.0009
37	260	0.0017	0.0009	0.001	0.0012	0.0016	0.0008	0.0007	0.0009
38	280	0.0016	0.0006	0.0012	0.0021	0.0014	0.0007	0.0006	0.001

<Enlarged view>

Figure 5-12: Absorbance data recorded in a CSV file

Cleaning and Storage

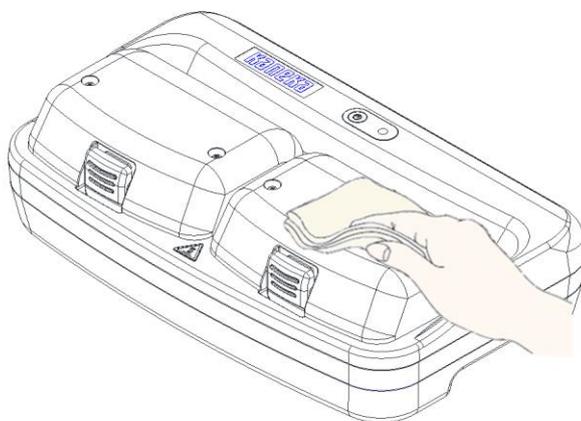


Do not wipe this product with organic solvent. Disconnect the product from the power supply before cleaning.

Cleaning

- **Main unit**

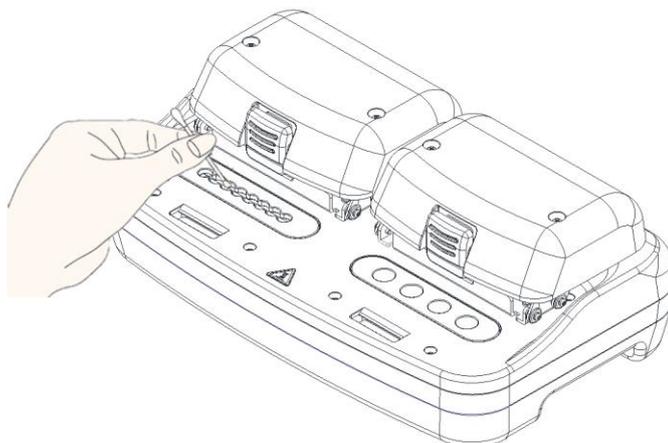
If the main unit gets dirty, gently wipe off the dirt with a clean soft cloth dampened with a neutral detergent diluted with water, then wipe off water with a clean dry soft cloth.



- **Thermostatic absorbance measurement unit**

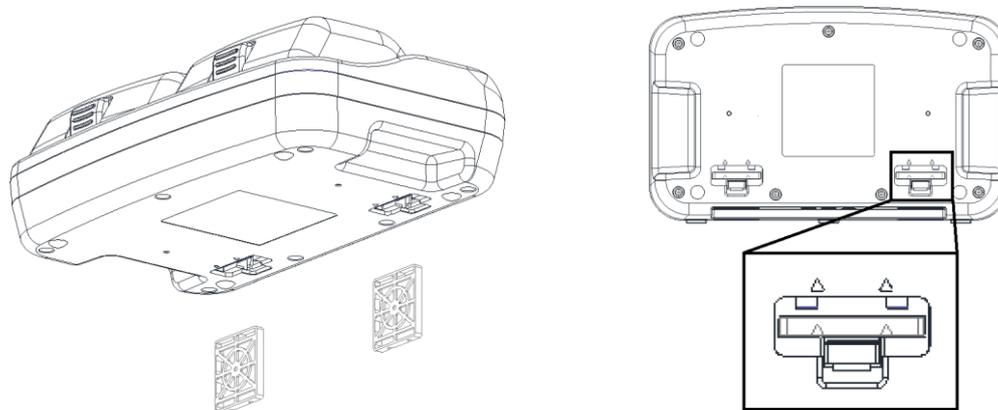
If the sample ports get dirty, gently wipe off the dirt with a clean soft cloth or cotton swabs.

If you use a hard cloth to wipe off dirt, the optical unit may be scratched, resulting in incorrect measurement.



- **Fan filter**

If the fan filter is clogged, open the filter outlet on the bottom of the main unit, take out the fan bracket, and remove the dust. After cleaning the filter, insert the fan blanket in the direction shown in the lower right figure, then close the lid.



- **Long-term storage**

If you do not use this product for a long time, firmly close the heat bonnets of the high-temperature treatment unit and thermostatic absorbance measurement unit, and store the product avoiding direct sunlight, dust, and high temperature and humidity.

Trouble shooting

Q1. It is not possible to begin treatment as the instrument stops before reaching the set temperature.

A1. If it does not reach the set temperature within twenty minutes after commencing temperature control when conducting high-temperature treatment or when measuring constant-temperature absorbance, then the heating process will automatically stop. Re-start treatment after re-starting both the instrument and the App.

Q2. The App continues to display “cooling” even after the cooling fan has stopped, and it is not possible to start the next treatment.

A2. If it continues to display “cooling” even after the cooling fan has stopped, then re-start the App.

Q3. The App does not operate properly.

A3. Make sure that the PC (Windows) you are using is connected to the instrument, and then re-start the App.

Q4. My PC is not connecting properly. (The COM Port number of the instrument is not displayed even though the COM Port Search Button has been depressed.)

A4-1. Try pressing it several times.

A4-2. Make sure that the instrument is ON.

A4-3. Make sure the Bluetooth on the instrument is OFF. It cannot connect to the PC when the Bluetooth is ON.

A4-4. Re-start both the instrument and the App.

Q5. It is not possible to properly measure absorbance.

A5-1. Check the absorption wavelength range of the sensor you are using.

A5-2. Make sure that you are using at least 25 μ l of sample solution and that the sample solution is free of bubbles and deposits.

If the tube has scratches, please use a new one.

A5-3. Samples have multiple absorption peaks, and measurements may not be possible if these peaks fluctuate individually.

Q6. Which sensor should I use for constant-temperature absorbance measurements?

A6. The absorption wavelength ranges for each sensor are listed on page 28 (on page 10 of the simple manual) . Select the sensor for which the wavelengths that increase/decrease by reaction is included in the absorption wavelength range.

Q7. Is it possible to conduct measurements using the R, G and B sensors simultaneously?

A7. It is not possible to conduct measurements simultaneously. Select one sensor for each measurement.

Q8. Heating cuts off during the pre-heating process. Why is this?

A8. If the instrument is left alone for 15 minutes after the pre-heating process has been completed, it shuts off for safety reasons.

Q9. When conducting constant-temperature absorbance measurements, is the absorbance measurement data in Step 2 saved?

A9. Absorbance measurement data is not saved in Step 2. Only Step 1 is saved.

Q10. Is light intensity calibration necessary for each measurement ?

A10. It is absolutely necessary after launching the App. It is also necessary to conduct light intensity calibration when changing the selected sensor. When conducting constant-temperature absorbance measurements in succession with the same sensor, it is not necessary to conduct light intensity calibration after the second time.

Q11. Is it possible to use batteries?

A11. The instrument is confirmed to operate using a mobile battery 23000mAh "700-BTL017BK" (manufactured by Sanwa Supply in Japan). The instrument may be unusable with some battery types.

After-sales Service

If something is wrong

- ✓ Restart the application.
- ✓ Turn OFF and then ON the main unit and tablet.
- ✓ See “Troubleshooting” above.

If the problem is not fixed even after that, or how to deal with the problem that is not described in “Troubleshooting” above, please contact your dealer.

When you contact us, please inform us of the following.

- Model
- Serial number
- Date of purchase
- Dealer
- Failure situation
- Use history

Contact

Medical Devices Solutions Vehicle, Kaneka Corporation

Email: info_dquick@kaneka.co.jp

Open: 9:00 AM to 5:00 PM (excluding Saturdays, Sundays, and national holidays)

Specifications

Item		Specifications
External dimensions		H92 x W312 x D190 (mm)
Weight		2 kg (excluding AC/DC adapter)
Power supply		AC/DC adapter 19 V DC
Measurement	Temperature setting range	<Sample chamber> Thermostatic absorbance measurement unit (with 8 wells): 35 to 70°C High-temperature treatment unit (with 4 wells): 35 to 100°C <Heat bonnet> Thermostatic absorbance measurement unit: 35 to 80°C High-temperature treatment unit: 35 to 120°C
	Temperature control accuracy	Thermostatic absorbance measurement unit (with 8 wells): 63 ± 1°C High-temperature treatment unit (with 4 wells): 95 ± 4°C
	Heating rate	Thermostatic absorbance measurement unit (with 8 wells): Reaches 63°C within 5 minutes High-temperature treatment unit (with 4 wells): Reaches 95°C within 10 minutes
	Temperature holding time setting range	Thermostatic absorbance measurement unit: 1 to 65 minutes High-temperature treatment unit: 1 to 10 minutes
	Cooling method	Cooling by internal fan
	Number of samples	Thermostatic absorbance measurement unit: 8 tubes (0.2 mL tubes) High-temperature treatment unit: 4 tubes (1.5 mL tubes)
	Measurement interval	20 seconds
	Absorbance measurement	Up to four decimal places
Sensor unit	Light source	White LED
	Detector	RGB color sensors
Minimum sample volume		25 µL
External interface		Bluetooth Low Energy (Bluetooth smart) or USB
Power	Voltage	19 V DC
	Current	2 A
	DC plug	φ5.5/2.1, L = 9, Plastic part: φ11.5 or less
Compatible device	Tablet (wireless)	Nexus 9, ZenPad 3 8.0 (Z581KL), MediaPad M3 Lite 10
	PC (wired)	Windows 7, Windows 10
Language		English
Data output	Storage format	CSV file
	Destination folder	com.kaneka.myabscope

Quality Assurance

1. The warranty period of this product is one year from the date of purchase. If a failure occurs during the warranty period, we will exchange the product for free provided that a document that shows the date of purchase is submitted.

2. Warranty exclusions
 Failure of this product caused by any of the following reasons is not covered by warranty.
 - Failure due to conditions, environments, handling, or usage other than those described in this manual, catalog, or other technical data
 - Repair or alteration by anyone other than Kaneka’s customer service personnel or those specified by Kaneka
 - Failure due to any factor other than that attributable to this product, such as the design of the customer's device or software
 - Failure due to external factors for which we are not responsible, such as natural disasters
 - Failure due to reasons that could not be predicted by the level of technology at the time of shipment
 - Failure due to noncompliance with laws, regulations, or safety standards outside Japan (such as CE, VL, and CSA) except those separately agreed with the customer

3. Disclaimer
 - Regardless of the warranty period, we will not be liable for any loss of opportunity, loss of business profits, secondary disasters, damage to machines other than this product, and employment injuries caused by the failure of this product for which we are not responsible.
 - We will not take responsibility for any loss, such as data loss and malfunction, caused by radio wave interference with devices other than this product for which we are not responsible.

4. Others
 - Service parts for this product are stored until five years have elapsed from discontinuation.

Date of purchase	
Dealer	
	Phone: ()