Lumitester Smart



Instruction Manual

Thank you very much for purchasing our product.
This Instruction Manual must be read carefully to operate this product safely and properly.
This Instruction Manual should be kept for future reference.

Kikkoman Biochemifa Company

kikkoman

About Lumitester Smart

Measure! **Easy to use.**



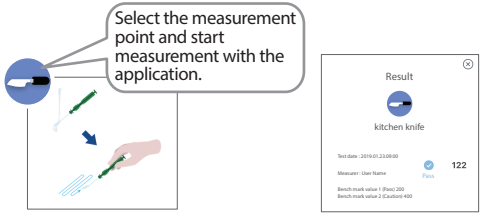
① Power ON (press & hold) ➡ ② Insert the reagent ➡ ③ START

Ready-to-use application "Lumitester"

Start! **Anyone can immediately start hygiene management.**

It assists setup for the measurement target depending on the industry.



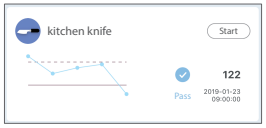


The measurement result and pass/fail at the measurement point can be easily understood.

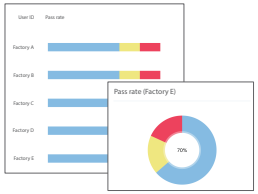
View! The measurement result is easy to see.



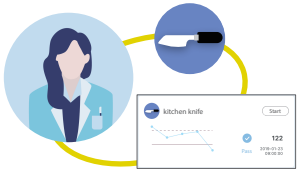
The Application and PC Software are easy to set up and use.



The trend history of the test point is displayed to check the improvement effect at a glance.



Pass rate of past measurement data can be understood at a glance.



What was measured when, where, and by whom can be managed in combination with the measurement data.

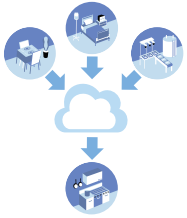
Save! Data are stored in the cloud.



Data are stored in the cloud so there is no need to worry about malfunction of smart devices.



The inspection results are saved in the cloud and can be viewed from multiple smart devices.

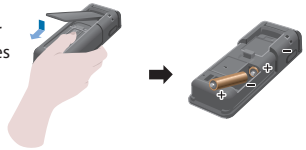


Grouping allows data sharing by remote sites.

Measurement workflow

Prepare the product

Remove the cover and place batteries



Swab test



Swab | Insert reagent | Start measurement

Package contents



1 Lumitester Smart



1 Strap



2 size AA alkaline batteries (for operation check)



1 USB cable



3 cleaning brushes



1 Quick manual

Table of Contents

1. Names and Functions 3
1-1. Product 3
1-2. Display Unit 4
1-3. Operation button 5
2. For safe and proper use 6
3. Setup 8
3-1. Prepare the product 8
3-1-1. How to attach the strap 8
3-1-2. How to use the stand 8
3-1-3. How to insert batteries 9
3-1-4. Bluetooth ON/OFF switching 10
3-2. Preparation for the Application and Software 11
3-2-1. Application installation for connection to smartphone/tablet (pairing) 12
3-2-2. PC software/driver installation for connection to PC 15
4. Operation Method 19
4-1. Prepare the reagent 19
4-2. Measurement procedure 19
4-3. Measurement data check 23
5. Product Setup 24
5-1. BLE Pairing Mode (Connection to 2nd or later smartphone/tablet) 25
5-2. Temperature Compensation (Temperature compensation setting) 26
5-3. Self-Check (Self-diagnosis) 27
5-4. Switch Sensitivity (Switch sensitivity adjustment) 29
5-5. Contrast (Display contrast adjustment) 29
5-6. Information (Product information) 30
5-7. Data Clear (Measurement data deletion) 30
5-8. Initialization (Restoration to factory setting) 31
6. Maintenance 32
6-1. Maintenance of the main body 32
6-2. Maintenance of measurement chamber 32
6-3. Replacement of batteries 33
7. Troubleshooting 34
7-1. List of Error Codes 35
7-2. Other problems and countermeasures 36
8. Specifications 37
9. External View 38
10. After-sales Service 39

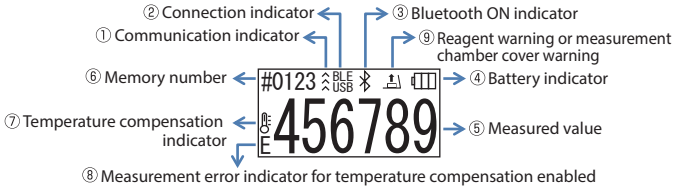
1 Names and Functions

1-1. Product



① Display Unit	Panel that displays the results of measurement, the mode number, etc. Refer to "1-2. Display Unit" (→P4).
② Operation Unit	Panel for measurements or setting operation. Refer to "1-3. Operation button" (→P5).
③ Power Button	Turns ON/OFF the power. Displays the setup menu.
④ Stand	Used to set the product in an upright position.
⑤ Measurement chamber	Chamber where reagent is inserted.
⑥ USB port	Cover for the USB connector. Connector that is used for PC connection.
⑦ Measurement chamber cover	Cover for measurement chamber.
⑧ Battery cover	Cover used to insert and remove batteries and switch Bluetooth ON/OFF.

1-2. Display Unit



① Communication indicator	Indicates communication with smartphone, tablet, and/or PC.
② Connection indicator	Indicates connection with smartphone, tablet, and/or PC. Target: Bluetooth — Display: BLE Target: USB — Display: USB
③ Bluetooth ON indicator	Indicates that the Bluetooth ON/OFF switch of the product is ON.
④ Battery indicator	Displays the remaining battery level. Battery indicator: Full — Display:  Battery indicator: High — Display:  Battery indicator: Medium — Display:  Battery indicator: Low battery — Display: 
⑤ Measured value	The measured value is displayed up to 6 digits with right justification.
⑥ Memory number	Shows the measured data number with # + 4 digits.
⑦ Temperature compensation indicator	Indicates that the temperature compensation setting is ON.
⑧ Measurement error indicator for temperature compensation enabled	If the temperature compensation is ON, the error code "E047" or "E048" is displayed at the temperature 40°C or higher or 10°C or lower, respectively, during measurement countdown, and the measurement result without temperature compensation is displayed with the error "E".
⑨ Reagent warning or measurement chamber cover warning 	Indicates that you must close the measurement chamber cover, or remove or insert the reagent. Display:  — Instruction: Insert the reagent or close the measurement chamber cover. Display:  — Instruction: Remove the reagent.

1-3. Operation button



Power button (side)

Turns ON/OFF the product's power or displays the setup menu.

START button

Starts measurement and determines the input.

Up/Down button

Used to select a setup item or view past data.

To adjust the sensitivity of the START and/or up/down buttons, refer to "5-4. Switch sensitivity" (→P29).

Caution

- As the START and up/down buttons adopt electrostatic capacity switches, they may not react when operated by a wet hand or through a thick glove.

2 For safe and proper use

- This product is designed for ATP Swab Test. Do not use this product for any other use. Please read carefully for proper usage of the product.

Please read this section carefully beforehand to use the product correctly. The warning messages listed here indicate important safety issues as well as failures and malfunctions.

⚠ Caution Failure to properly handle the product may lead to injuries or damages.

⃠ Prohibited Indicates what must NOT be done to use the product.

⚠ Caution

 Do not disassemble or remodel the product. Fire, electric shock, or failure may occur.	 Do not expose the instrument to water or operate it with wet hands. Failure to do so may cause electric shock or malfunction.
 Do not push nor rub the display and operation panel with hard or sharp objects. Injury or failure may occur.	 Do not use batteries other than the specied ones (size AA alkaline batteries or charged size AA nickel-hydride batteries). It could cause re, injury, or failure.
 Do not apply organic solvent to clean the product. Fire, electric shock, or failure may occur.	 Remove the batteries when the product is to be stored for an extended period of time. Failure to do so may cause liquid leak and burst.
 Do not use nor store the product exposed to direct sunlight, dust, and/or high temperature/humidity. Fire or failure may occur.	 Do not place the product where it gets hot (near the fire, near the heater, or under the scorching sun). Fire, burn, or failure may occur.

For proper use



Do not apply too much force to the stand and/or measurement chamber cover, or move the product while they are open. The stand and/or the measurement chamber cover may be damaged.



Do not drop nor apply excess impact.

Failure to do so may cause malfunction or poor precision for measurements.

Precautions for measurement



Perform measurement in upright position.

Otherwise failure or low measurement precision may occur due to reagent leakage.



Do not move the product during measurement.

Otherwise measurement error may occur.



Be sure to remove the reagent after measurement.

Failure to do so may lead to liquid leak.



Do not use nor store the product in locations subject to large variations in temperature.
Do not use nor store the product in locations directly exposed to wind from air-conditioning equipment.

Allow the product to stand for 30 minutes or longer at room temperature before use when the product is moved from a hot or cold location.
Otherwise measurement error may occur.

[About disposal]

Conform to disposal regulations established by your local government when disposing of the product and accessories.

3 Setup

3-1. Prepare the product

3-1-1. How to attach the strap

Attach the strap as shown below.

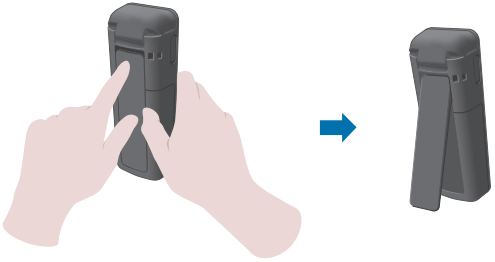


Caution

- Do not swing the product holding the strap.
  Failure to do so may cause malfunction or poor precision for measurements.

3-1-2. How to use the stand

Press "PUSH" to deploy the stand.



To close the stand, press the lower end of the stand to the original position.

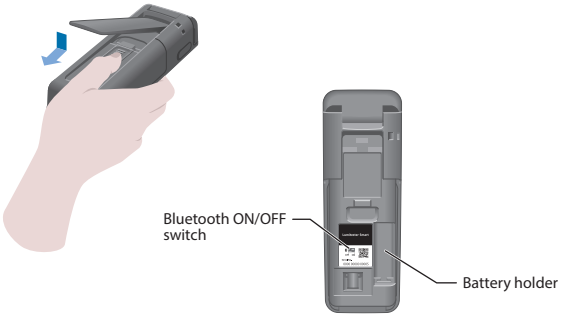
Caution

- Do not hold the product while the stand is open.
  Otherwise the stand may be damaged.

3-1-3. How to insert batteries

To open/close the battery cover

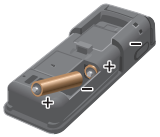
① Press "PUSH" to deploy the stand.
② Press the mark on the battery cover to remove the cover.



③ Attach the battery cover again.

Place the batteries

Insert two new size AA alkaline batteries or two charged size AA nickel-hydride batteries, paying attention to polarities.



Replacement of batteries



5 seconds after remaining battery amount is displayed with low battery, the power is automatically turned off. Replace the batteries.
After removing the batteries, the clock count continues for 60 seconds.
Please replace the batteries within 60 seconds.

Caution

- Do not mistake the polarities of batteries.
- Do not mix batteries of different manufacturers or models, or new and used batteries.
- Do not use an alkaline battery after its validity date has expired.
- Follow the instruction manual for the batteries used.
- Size AA batteries back up the clock of the product. In cases when the batteries are dead or when the batteries are removed while the power is on, the clock may be initialized. In this case, adjust the clock.
- Conform to disposal regulations established by local governments when disposing of batteries.
- Remove the batteries when the product is to be stored for an extended period of time. Failure to do so may cause liquid leak and burst.

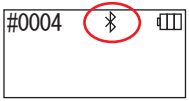
3-1-4. Bluetooth ON/OFF switching

Battery holder and Bluetooth ON/OFF switch are located inside the battery cover.
The factory shipment setting of the Bluetooth ON/OFF switch is OFF.

To link the Application with a smartphone and/or a tablet, set the Bluetooth ON/OFF switch ON.
Connection with a smartphone, tablet, and/or PC allows automatic synchronization of time and date and timestamping of measurement data.

① If Bluetooth is not used, slide the Bluetooth ON/OFF switch to OFF.
The Bluetooth is OFF unless Bluetooth ON is indicated on the display unit.





Caution

- Radio frequency bands and communication methods that can be used are defined for each country. In some countries, registration of wireless devices may be mandatory. Refer to the website below for countries where Bluetooth can be used.
  http://biochemifa.kikkoman.co.jp/e/support/dl/smart
  In a country not listed below, set the Bluetooth switch OFF.
- Bluetooth cannot be used to connect to a PC. Please use the provided USB cable.

3-2. Preparation for the Application and Software

Connecting the product to a smartphone, tablet, and/or PC allows storage of measurement data in the cloud for measurement evaluation, graph generation, and sharing by multiple smart devices.

Connection to smartphone and/or tablet



3-2-1. Application installation for connection to smartphone/tablet (pairing)

Connection to PC

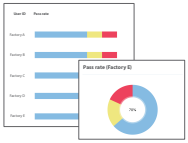


3-2-2. PC software/driver installation for connection to PC

What you can do with the Application and Software



Pass/fail of measurement data can be easily understood



Pass rate of past measurement data can be understood at a glance



Sharing results by multiple smart devices using cloud

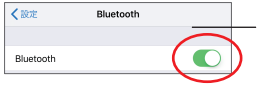
3-2-1. Application installation for connection to smartphone/tablet (pairing)

Installing the Application

<Use Environment>

■Supported OS and model (as of Sep. 2018)

Smartphone or tablet with Android 5.x or later, or iOS 10.x or later.



① Turn ON the Bluetooth of the smartphone or tablet.



② Download the Application through QR code or URL to the smartphone or table.

http://biochemifa.kikkoman.co.jp/e/support/dl/smart

The application is free of charge.

Caution

• Communication fee may be charged by downloading the application.

Initial connection between smartphone and/or tablet and the product

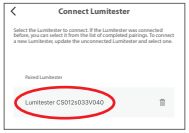


① Run the Application and follow the instructions on the screen to set up.

If you use the Application for the first time, please register.
If you have ID and password, type them in to log in.

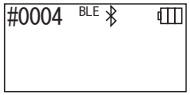


② On the device connection screen shown, turn on the power of the product.



⑤ Select the product's serial number on the application screen.

It allows automatic synchronization of time and date and timestamping of measurement data.



⑥ When the connection is established, the product displays BLE on the status indicator.

⑦ The Application displays the Home Screen and the smartphone/tablet and the product are ready to use.

For details of the Application, refer to Help.

Caution

- While the communication distance using Bluetooth technology is approximately up to 10m, it may vary due to obstacles (e.g. human body, metal, wall) and/or radio wave conditions.
- Bluetooth communication can be used with this product only with the dedicated application.

To connect the 2nd and subsequent smartphones and/or tablets, refer to "5. Product Setup" "5-1. BLE Pairing Mode (Connection to 2nd or later smartphone/tablet)"(→P25).

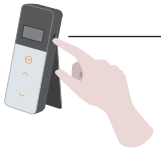
Connection between smartphone and/or tablet and the product for the 2nd time onward



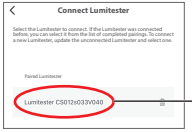
① On the Application's Home Screen, open the menu.



② Select the icon to display the connection screen with the product.



③ Press and hold the product's Power button for a while.
When "Lumitester" is displayed, it is ready for measurement after countdown.



④ The Application screen shows the serial numbers. Selecting a serial number of a product you wish to connect starts connection.



⑤ When the connection is established, the product displays BLE on the status indicator.

⑥ When the application displays the Home Screen the smartphone/tablet and the product are ready to use.

3-2-2. PC software/driver installation for connection to PC

Preparation of Software installation

① If you have other programs running, close all of them.
If you are using other USB devices, disconnect all of them.
Do not connect the provided USB cable until instructed to do so.

② If you have "Lumitester" already, uninstall it before installation.

<Use Environment>

■Supported OS and model (as of Sep. 2018)

PC or tablet with Windows 7 (32-bit/64-bit) or Windows 10 (32-bit/64-bit) installed.

Caution

- This Software allows data transfer data from the product to your PC and set up various measurement conditions from your PC to the product. Do not use this product for any other application.
- Insert the batteries to the product before connecting it with a PC. Without the batteries, the product may not start up.
- Read the Instruction Manuals of your PC, before installing this Software.
- Disconnect the product from the PC before starting up or shutting down the operating system. If you start-up, shut down, or restart your PC while the PC is connected, the operating system may not start up or shut down properly, or the product may not be recognized correctly.
- Connect the product with the PC by using the provided USB cable.
  Since polarities may differ between USB cables, using a USB cable other than the provided one may cause the malfunction of the product.
- This Software is designed to be used alone. Please note that if you use this Software in conjunction with other applications, we cannot guarantee proper operation.
- Do not disconnect the USB cable while data is being loaded or written. It may result in malfunction or data corruption.
- Connect the product directly to the USB port of the PC. Using a USB hub may cause incorrect operation.
- When connecting the product to the PC, use the USB port in which the USB driver has been installed. It is necessary to install the USB driver for each USB port.
  In rare cases, the product may not be recognized even after connection to a USB port. In this case, disconnect the USB cable and then reconnect it.

Software Installation

① Download the ZIP file of Lumitester from our website or the following URL.
http://biochemifa.kikkoman.co.jp/e/support/dl/smart

② Use your unzip application to deploy the ZIP file.

③ Run (double-click) "setup.exe".

④ The installer program starts.

⑤ Click "Next".

⑥ Check the installation destination folder (initial setting: Program Files). If you wish to install the Software in a folder other than this, click "Browse" and specify the installation destination, and click "OK". Click "Next".

⑦ Read the Software License Agreement, and click "I agree" then "Next".

⑧ When the installation is ready to start, click "Next".

⑨ When the installation is complete, click "Close".

⑩ The application icons are generated on the desktop and the Start menu.

Caution

- If an unknown issuer warning appears during installation, click "OK" to proceed.

PC-product initial connection and driver installation

① Run the Software and follow the instructions on the screen to set up.

If you use the Application for the first time, please register.
If you have ID and password, type them in to log in.

② On the Home Screen, connect the product and your PC via the USB cable.





③ When the USB cable is connected, "USB" appears on the full screen of the display unit. You cannot operate any button at this time.

④ The driver installation automatically starts.



⑤ When the connection is complete, the screen displays the serial number of the product on the display unit.

⑥ "Lumitester" is displayed and it is ready for measurement after countdown.
The product displays USB on its status indicator.

It allows automatic synchronization of time and date and timestamping of measurement data.

• For details of the software, refer to Help.

Caution

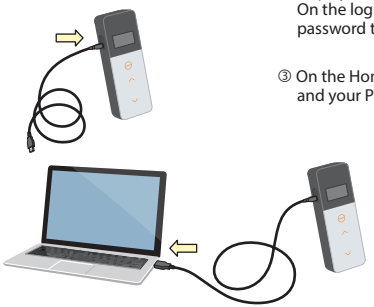
- Use the USB cable provided for the product.
- Insert the batteries before connecting the product with a PC.
- The display panel shows "USB" and key operation is disabled while the product is connected to a PC. When you pull out the USB cable, the display "USB" is cleared and the power is turned off.
- Close the USB cover securely when the USB cable is not connected.

Re-connection to PC once connected



① Double-click "Lumitester.exe" to run the Software.

② Follow the instructions of the Software to display the Home Screen.
On the login screen, type in your ID and password to log in.



③ On the Home Screen, connect the product and your PC via the USB cable.



④ When the connection is complete, "Lumitester" is displayed and it is ready for measurement after countdown.

The product displays USB on its status indicator.

4 Operation Method

4-1. Prepare the reagent

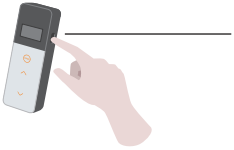
① Take out the reagent from the refrigerator (2 to 8°C). Allow the reagent to stand at room temperature.



Caution

- Do not use cold reagent. Failure to do so may result in lower measured value.

4-2. Measurement procedure



① Press and hold the product's Power button for a while.
"Lumitester" is displayed and it is ready for measurement after countdown.



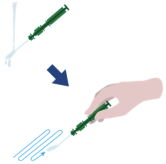
Caution

When the buzzer sounds with the reagent warning blinking, open the measurement chamber cover and remove the reagent.

When the buzzer sounds with the measurement chamber cover warning blinking, close the measurement chamber cover.



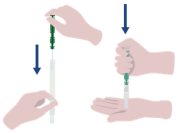
② Remove the swab stick of the reagent.



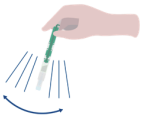
③ Soak the cotton swab in tap water (washing water) and swab the test target.

Caution

- If a disinfectant such as alcohol remains on the surface swabbed, it may interfere with the measurement. In this case, clean the surface with water or remove the disinfectant with paper towels before swabbing the surface.



④ Put the swab stick back into the main tube. And then put the tip of the tube on your hand and push the swab stick downwards to break the capsule in the tube.



⑤ Shake the whole reagent tube repeatedly so that all remaining liquid in the capsule falls into the reaction tube and dissolves the reagent in the tube.



⑥ Open the measurement chamber cover and place the reagent in the chamber.



⑦ Close the measurement chamber cover and press START.
The measurement starts. The measurement result is displayed after countdown.

Caution

- If the signal is unstable during measurement, it may take a longer time.
- Perform measurement in upright position. Liquid leakage may occur and it may cause malfunction or interfere with accurate measurement.



⑧ Remove the reagent from the measurement chamber.

When the measurement is complete, press and hold the Power button to turn off the power.

- When the product has not been operated for 10 minutes, the power is automatically turned off.
- An error is notified by sound if the reagent is not removed from the measurement chamber.
  Be sure to remove the reagent after measurement. Failure to do so may cause malfunction or interfere with accurate measurements.

- The measurement range is 0 to 999999. If the measured value exceeds 999999, 999999 blinks on the display.
- Data numbers are #0001 to #2000. Data numbers are increased by one for every measurement. When memory number surpasses #2000, the data number becomes #0001 and the data are overwritten.

Caution

When the reagent warning blinks and the buzzer sounds after pressing START button, no reagent has been placed in the measurement chamber.
In order to cancel the measurement, press START button again.
When the reagent warning blinks and the buzzer sounds after measurement, the reagent has been placed in the measurement chamber.

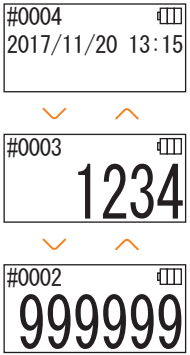
Open the measurement chamber cover and remove the reagent.
When the buzzer sounds with the measurement chamber cover warning blinking, close the measurement chamber cover.

- AUTO ZERO calibration is performed after the measurement is complete and the measurement chamber cover is closed. In case of large variations in temperature, allow an interval of 10 seconds or longer before starting the next measurement.

You can transfer measurement data from the product to a smartphone and/or tablet to manage the measurement targets.

4-3. Measurement data check

- The measurement data are automatically saved up to 2000 items and can be checked by the product.
- Connection with a smartphone, tablet, and/or PC allows automatic loading of measurement data to save in the cloud.
- After loading the data and selecting a measurement target for the measurement data, pass/fail judgment of the data can be performed.



① Press and hold the Power button. When "Lumitester" is displayed and it is ready for measurement after countdown.

② Press Up or Down button to view past data.

Pressing the Up button shows data of the previous memory number (old data). Pressing the Down button shows data of the next memory number (new data).

- Normally memory data is not erased while the power is off. However, when the measurement is continued with low battery level, or when the batteries are removed while the power is on, the memory data may be erased. We are not responsible for damage caused when memory data is erased.

Caution

If the number of data items exceed 2000, data are overwritten from the oldest one. Use the Application or PC Software to save data to a smartphone, tablet, and/or PC, or clear data as needed.

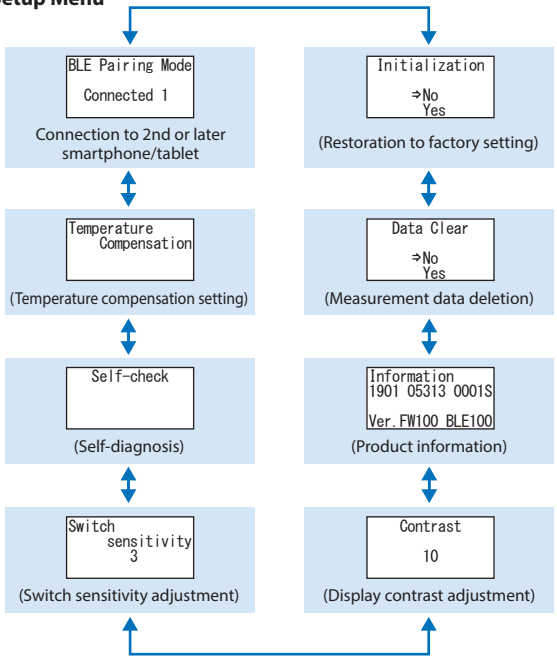
5 Product Setup

You can configure the product settings.

① Press and hold the Power button for 5 seconds or longer and go to the setup menu.

② Pressing the Up or Down button switches the setting item.

Setup Menu



③ Select a setup item and press START.

④ Pressing the Power button terminates the setup and the screen returns to the measurement screen.

5-1. BLE Pairing Mode (Connection to 2nd or later smartphone/tablet)

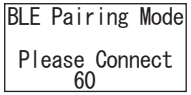
You can perform pairing between smartphone and/or tablet and the product.
Pairing can be performed for one product with up to 8 smartphones or tablets.
Note that you cannot connect to more than one smartphone or tablet at the same time.



① Press and hold the Power button for 5 seconds or longer and display the Setup screen. Then press Up/Down button to select "BLE Pairing Mode" and press START.
The number after "Connected" indicates the number of smartphones and tablets already registered.
If the number is 8, you can select "All Clear" only.



② After selecting, press START to show the screen shown below.
Press Up/Down to select either "New Connection" or "All Clear", and press START.



③ When "New Connection" is selected and START is pressed, the screen shown below appears.
When the pairing is complete or countdown is finished, the screen returns to the Setup screen.
The product displays BLE on its status indicator if a smartphone or a tablet is connected.

Caution

When "All Clear" then "Yes" is selected, all the registered smartphones will be deleted. In this case, you must delete the registration of the product on which you performed "All Clear".

5-2. Temperature Compensation (Temperature compensation setting)

The reagent has a characteristic in which luminescence varies depending on the temperature.

The temperature compensation is a function that corrects the temperature characteristic of the reagent by measuring the temperature of the product.

The temperature compensation is OFF by default.

The range of the temperature compensation is +10 to +40°C.



① Press and hold the Power button for 5 seconds or longer and display the Setup screen. Then press Up/Down button to select "Temperature Compensation" and press START.



② Select availability of temperature compensation using Up/Down buttons, and then press START.



③ Selecting "On" displays the temperature compensation status.

- Even if the temperature compensation is ON, the error code "E047" or "E048" is displayed at the temperature 40°C or higher or 10°C or lower, respectively, during measurement countdown, and the measurement result without temperature compensation is displayed with the error "E".
- If the temperature compensation is ON, the measurement time at +10 to +13°C is 20 seconds.

Caution

Allow the product and reagent to stand for 30 minutes or longer at room temperature before use.
Do not use the product in locations subject to large variations in temperature. Failure to do so may cause poor precision for measurements.

5-3. Self-Check (Self-diagnosis)

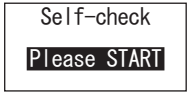
Keep the measurement chamber clean. Failure to do so may cause poor precision for measurements.

The self-check is a function to confirm the degree of contamination in the measurement chamber.

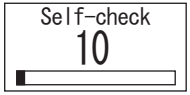
The temperature range of the self-check is +20 to +30°C.



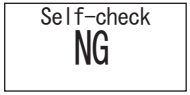
① Press and hold the Power button for 5 seconds or longer and display the Setup screen. Then press Up/Down button to select "Self-check" and press START.



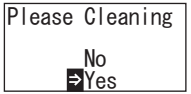
② Press START to start the self-check.



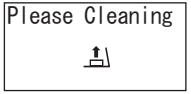
③ The check result is displayed after countdown. If "OK" is displayed, the result is normal. Press START to return to the Setup screen.



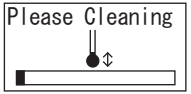
④ If "NG" is displayed, clean the measurement chamber. Press START to go to the Cleaning screen.



⑤ To perform cleaning of the measurement chamber, press START then "Yes". If "No" is selected, the screen returns to the Setup screen.



⑥ Open the measurement chamber cover if closed.



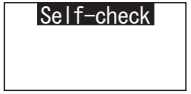
⑦ Opening the measurement chamber cover starts countdown and the interior of the measurement chamber emits light. Clean the measurement chamber.

Maintenance of measurement chamber

1. Thoroughly wipe the locations that emit light in the measurement chamber with the provided cleaning brush soaked with ethanol.
2. Close the measurement chamber cover.

Caution

- Do not pour ethanol into the measurement chamber.
- Do not apply ethanol to any part except for the measurement chamber.
- Do not use the product until it dries.



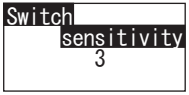
⑧ To make sure that the measurement chamber is clean, start the self-check steps from ① again.

Caution

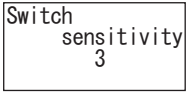
- If the temperature error is displayed, self-check is aborted. Turn the power off once, and allow the product to stand for 30 minutes or longer at room temperature before self-check.
- If "NG" is still displayed even after cleaning, check the model and the serial number affixed inside the battery cover, and then contact the dealer or us.

5-4. Switch Sensitivity (Switch sensitivity adjustment)

You can adjust sensitivity of START and Up/Down buttons.



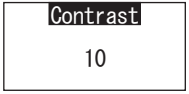
① Press and hold the Power button for 5 seconds or longer and display the Setup screen. Then press Up/Down button to select "Switch sensitivity" and press START.



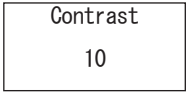
② Press Up/Down buttons to adjust the switch sensitivity.The adjustment range is 1 to 10.
Pressing START adjusts the sensitivity and returns to the Setup screen.

5-5. Contrast (Display contrast adjustment)

You can adjust the contrast of the display panel.



① Press and hold the Power button for 5 seconds or longer and display the Setup screen. Then press Up/Down button to select "Contrast" and press START.



② Press Up/Down buttons to adjust the contrast. The adjustment range is 1 to 10.
Pressing START adjusts the sensitivity and returns to the Setup screen.

5-6. Information (Product information)

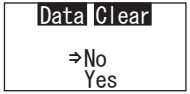
You can view product serial number, Software version (Ver.FW), and Bluetooth software version (BLE).



① Press and hold the Power button for 5 seconds or longer and display the Setup screen. Then press Up/Down button to select "Information".

5-7. Data Clear (Measurement data deletion)

You can delete all data.



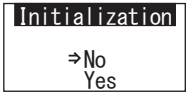
① Press and hold the Power button for 5 seconds or longer and display the Setup screen. Then press Up/Down button to select "Data Clear" and press START.



② Select Yes using Up/Down buttons, and press START. All the past measurement data will be deleted.

5-8. Initialization (Restoration to factory setting)

Time and date, past measurement data, and Bluetooth registration are deleted and the product is reset to the factory shipment status. The calibration data are reset to the factory shipment status.



① Press and hold the Power button for 5 seconds or longer and display the Setup screen. Then press Up/Down button to select "Initialization" and press START.



② Select Yes using Up/Down buttons, and press START.

The time and date cannot be set with this product alone. To set the time and date, an application-installed smartphone/tablet or software-installed computer must be connected.
The time and date can then be set automatically.

6 Maintenance

6-1. Maintenance of the main body

If the product becomes contaminated, wipe with a dry cloth or soft paper such as tissue paper.

If the product becomes heavily contaminated, wipe with a soft cloth soaked with rubbing alcohol or diluted mild detergent solution.

Caution

- Do not spill liquids, reagents, organic solvents, etc. over the product.
  If any liquid is spilled on the product, wipe the liquid off immediately, remove the batteries, and allow the product to dry for 24 hours or longer indoors.



6-2. Maintenance of measurement chamber

If the reagent is spilled in the measurement chamber, clean the measurement chamber.

In addition, clean the measurement chamber approximately once every six months.

Perform self-check as needed. For self-check, refer to "5-3 Self-Check" (→P27).

① Turn the power off.
② Open the measurement chamber cover.
③ Thoroughly wipe the bottom and the side of the measurement chamber with the provided cleaning brush soaked with ethanol.
④ Close the measurement chamber cover.

Caution

- Do not pour ethanol into the measurement chamber.
- Do not apply ethanol to any part except for the measurement chamber.
- Do not use the product until it dries.

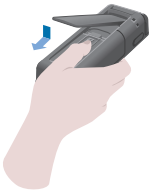
6-3. Replacement of batteries



5 seconds after the remaining battery level displays low battery, the power is automatically turned off. Replace with new batteries.

The clock count continues for 60 seconds after removing the batteries. Please replace the batteries within 60 seconds.

① Press "PUSH" to deploy the stand.
② Remove the battery cover.



③ Insert two new size AA alkaline batteries or two charged size AA nickel-hydride batteries, paying attention to polarities.
④ Replace the battery cover.



Caution

- Do not mistake the polarities of batteries.
- Do not mix batteries of different manufacturers or models, or new and used batteries.
- Do not use an alkaline battery after its validity date has expired.
- Follow the instruction manual for the batteries used.
- Size AA batteries back up the clock of the product. When the batteries are dead or removed while the power is on, the clock may be initialized. In this case, adjust the clock.
- Conform to disposal regulations established by local governments when disposing of batteries.
- Remove the batteries when the product is to be stored for an extended period of time. Failure to do so may cause liquid leak and burst.

7 Troubleshooting

Warning

When abnormality is observed, turn off the power immediately, and remove the batteries as soon as possible.

Disconnect the USB cable if being used, and then remove the batteries.

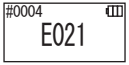
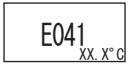
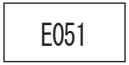
When abnormality is observed such as malfunction, burning smell, fuming etc., there is a danger of fire and burst. Make sure that fumes are extinguished, and contact the dealer or us. Never repair the product by yourself, as this is very dangerous.

Error code displays for indicating operation mistakes and problems.

7-1. List of Error Codes

The details of Error codes and countermeasures are described below.

When the error code is still displayed after countermeasures are taken, check the model and serial No. affixed inside the battery cover, and contact the dealer or us.

Error codes	Details	Countermeasures
 E011 to 019 Memory error	Shows error in memory data that might be caused by the removal of batteries while memory data is written or read.	Turn the power off once, and then turn it on again. If the same error is still displayed, perform "5-7. Data Clear" (→P30).
 E021 to 029 Measurement error	Shows error in measurement that might be caused under locations subject to large variations in temperature.	Turn the power off. Allow the product to stand for 30 minutes or longer at room temperature before use when the product is moved from a hot or cold location.
	Shows error in measurement that might be caused under locations such as exposure to direct sunlight.	Turn the power off, and move the product to a location not exposed to direct sunlight.
	Shows error in measurement that might be caused under locations such as loose closure of chamber cover.	Close the measurement chamber cover securely.
 E031 to 039 Calibration error	Shows error in calibration that might be caused under locations subject to large variations in temperature.	Turn the power off. Allow the product to stand for 30 minutes or longer at room temperature before use when the product is moved from a hot or cold location.
	Shows error in calibration that might be caused under locations such as exposure to direct sunlight.	Turn the power off, move the product to a location not exposed to direct sunlight.
	Shows error in calibration that might be caused under locations such as loose closure of Chamber cover.	Close the measurement chamber cover securely.
 E040 to 049 Temperature error	Shows error in temperature that might be out of range.	Turn the power off, and move the product to a location with a temperature of +5 to +40°C. When temperature compensation is ON, use the product within the temperature range (+10 to +40°C).
	Shows error in temperature that might be caused under locations subject to large variations in temperature.	Turn the power off. Allow the product to stand for 30 minutes or longer at room temperature before use when the product is moved from a hot or cold location.
 E051-059 Product error	Shows error in product that might be caused by malfunctions of electric parts.	Turn the power off once, and then turn it on again.

7-2. Other problems and countermeasures

The details of problems, causes, and countermeasures other than those for error displays are described below.

When the normal condition is not recovered after the countermeasure is taken, when any problem other than these occurs, or when requesting repairs, check the model and the serial No. affixed inside the battery cover, and then contact the dealer or us.

Details	Possible causes	Countermeasures
Power cannot be turned on.	Batteries are not inserted. Batteries are drained.	Insert new batteries. Refer to "6-3. Replacement of batteries" (→P33).
Power cannot be turned off.	The product is not operating normally due to a malfunction of electronic parts.	Reinsert the batteries again.
	The USB cable is connected. Key operation is not accepted while the product is connected to a PC.	Exit the control software, and then disconnect the USB cable.
Power is automatically turned off.	Batteries are drained.	Insert new batteries. Refer to "6-3. Replacement of batteries" (→P33).
	When the product has not been operated for 10 minutes, the power is automatically turned off.	This is not a malfunction.
Measured values seemed to be lower.	The measurement chamber is contaminated.	Perform "6-2. Maintenance of measurement chamber" (→P32).
Water hazard.	The surface of the product was exposed to water.	Turn the power off immediately and wipe away water from the product. Detach the battery cover, remove the batteries, and dry the product with the operation panel turned upward and the measurement chamber cover opened. Allow the product to stand at room temperature for approximately 24 hours.
	Water has entered the measurement chamber.	Turn the power off immediately and remove the reagent. Wipe off water with the cleaning brush, and dry the product with the operation panel turned upward and the measurement chamber cover opened. Allow the product to stand at room temperature for approximately 24 hours. Refer to "6-2. Maintenance of measurement chamber" (→P32).

8 Specifications

Name	Lumitester Smart
Detecting method	Integration employing a photodiode
Dark noise	10 RLUs or less
Detection reagent	Dedicated disposable type
Measurement range	0 to 999999 RLUs
Temperature compensation range	+10 to +40°C
Measurement time	10 seconds (If the Temperature compensation is ON, the measurement time at +10 to +13°C is 20 seconds.)
Display	Organic LED
AUTO ZERO calibration	Built-in
Auto power-off	10 minutes
Clock	Built-in: date and time Valid only when the Application is connected (automatic synchronization)
Measurement data	RLU
Interface	USB, Bluetooth LE (Ver.4.1)
Number of memory data points	2000
Ambient temperature range	+5 to +40°C
Ambient humidity range	20 to 85%Rh (free from condensation)
Storage temperature range	-10 to +50°C
Storage humidity range	20 to 90%Rh (free from condensation)
Protective structure	IEC-IP-X0 (protection class against water: no protection)
Power supply	Two size AA alkaline batteries or two size AA nickel-hydride batteries
Dimensions	Approx. 65mm (W) x 176mm (H) x 40mm (D)
Mass	Approx. 255 g (without batteries)

9 External View



Unit: mm
Protrusions not included

10 After-sales Service

Warranty

The period of warranty for Lumitester Smart is one year from the date of purchase. However, in EU member states where EU Directive 1999/44/EC is in effect, it is two years from the date of purchase.
To confirm the starting date of the warranty, please keep documents (such as a delivery bill) which can validate the date of purchase.
If a malfunction occurs during the warranty period, we will carry out either a charge-free repair or provide replacement parts.
However, compensation is limited to malfunctions arising from defects in the material of this product or in manufacturing.
In addition, please be advised that the following are not covered by the warranty even during the compensation period.

① When there is no document or record that can validate the date of purchase.

② Regardless of whether a defect exists or not, the loss of record contents as a result of being unable to display or load to a PC the memory data and settings data.

③ Any failure or damage, or any other loss incurred by operating or using the product contrary to what is described in the instruction manual, being careless when using, modifying or any other remodeling of this product, or being affected by a natural disaster beyond human control.

The scope of indemnification for failure of this product is limited to indemnification covered by this warranty section and indemnification of any other loss or damage including indirect or special loss or damage, is not included in the scope of indemnification.

Repairs

When the warranty period ends, the product is repaired subject to charges if its functions can be maintained through repairs.
For repairs, inform us of the serial number and the details of the symptom.
We will make efforts to repair the product as soon as possible. However, in the following cases please be aware that repairs may require extended periods of time, incur significant cost, or may be impossible.

① When an extended period of time has elapsed after purchase.

② When the manufacture of repair parts has been discontinued.

③ When significant damage is found.

④ When modifications are found.

⑤ When malfunctions cannot be reproduced by us.

⑥ When repairs are found to be difficult.

For performance improvement purposes, specifications may change without notice.

Trademark

- Lumitester is a registered trademark of Kikkoman Corporation.
- Windows is a registered trademark of Microsoft Corporation, U.S.A.
- Bluetooth® is a registered trademark owned by Bluetooth SIG, Inc.

Kikkoman Corporation uses them based on the licenses.

Issued by:

Kikkoman Biochemifa Company
2-1-1, Nishi-Shinbashi, Minato-ku, Tokyo 105-0003, Japan
TEL:+81-3-5521-5481 FAX:+81-3-5521-5498
http://biochemifa.kikkoman.co.jp/e/

2019.01 59-2756-0