

# 【RICOH EH Environment Sensor D201/D202】

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**User's Manual**    Read this manual through before starting to use the product.



Solid-State Dye-Sensitized Solar Cells

## **RICOH EH Environment Sensor D201/D202**

Powered by indoor lighting, this self-sustaining environmental sensor enables temperature and humidity management with no need for wiring.



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# 1. Safety Considerations



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## 1-1. Safety signs and symbols

The following safety symbols are used in this manual:


 Caution	 Prohibition
 General mandatory action sign	 Keep children away
 No disassembly	


Note the following signs and accompanying instructions in this manual and on the product. They are intended to prevent you and others from personal injury or property damage.

 <b>Warning</b> Neglecting the instructions under this sign can cause death or severe injuries.
 <b>Caution</b> Neglecting the instructions under this sign can cause injuries or property damage.

## 1-2. Example

The following are examples of safety signs:

	The triangle with an exclamation means you need to use caution.
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	The circle with a slash means prohibition. The pictogram in the circle displays what is prohibited. (The left figure means “No disassembly”).
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## 1-3. Safety Instructions

For your safety, observe the instructions below when using or handling the products (sensors and relays):

### ■ When using the products



## Warning



- Risk of explosion, fire, and burns. Do not use the products near flammable gas, solvents like gasoline, benzene, or thinner, or their containers.



- Risk of accidents. Do not use the products where their use is restricted or prohibited, for instance, on an airplane.



- Risk of explosion, fire, and injury. Do not use, store, or leave the products in a high-temperature environment, for instance, near an open flame, under direct sunlight, or in a car under the scorching sun.



- Do not put the products in a microwave or pressurized vessel.



- Do not spray volatile chemicals (such as benzene or thinner) or insecticide onto the products.



- Do not use the products in the event of an unusual smell, smoke, or overheating. Immediately switch off the products and contact RICOH or your local RICOH dealer.



- When a foreign object (such as metal, water, or any other liquid) has entered the sensor, immediately turn off the switch.

When a foreign object (such as metal, water, or any other liquid) has entered the relay, immediately remove it from the AC adapter.

Contact RICOH and do not continue to use the sensor or relay.



- The supplied AC adapter is for the RICOH EH relay for Wi-Fi™ only. Do not use it with any other product.

- Use the supplied AC adapter only. Using any other AC adapter can cause fire or electric shock.



- Do not install or store the products and accessories where infants and young children can reach.



- Do not disassemble, repair, or modify the products. The sensor contains a lithium-ion cell.



- When disconnecting the power cord from the wall outlet, always pull the plug, not the cord. Pulling the cord can damage the power cord. Use of damaged power cords could result in fire or electric shock.



- Be sure to disconnect the AC adapter from the wall outlet at least once a year and check for the following:
  - There are burn marks on the adapter.
  - The prongs on the adapter are deformed.If you find any of the above, contact RICOH. Continuing to use the products can cause fire or electric shock.



- Remove the USB power cable from the AC adapter and inspect it for the following at least once a year:
  - Exposed or disconnected core wire
  - Torn or dented sheath
  - Power turns on and off when the cable is bent
  - Heating in parts of the cable
  - Visible damage on the cableIf you find any of the above, contact RICOH. Continuing to use the products can cause fire or electric shock.



- Risk of a smoke, fire, or electric shock. When inserting the power plug into the electrical outlet, make sure it is inserted all the way.



- Watch out for leaks from the lithium-ion cell in the sensor. The leaking liquid can cause burns when it comes in contact with the skin. In the event the liquid is on your skin, immediately rinse it off with water, but do not use soap. Contact RICOH and do not continue to use the sensor.



- Be sure to locate the relay as close as possible to a wall outlet. This will allow easy disconnection of the power cord in the event of an emergency.



- <<Not applicable to the RICOH EH Environment Sensor D202>>
  - Risk of electric shock. Do not let the products get wet or operate the products with wet hands.



- Do not place the relay near water like in front of an open window where rainwater may enter. Fire or electric shock could result from spillage or if such objects or substances fall inside this relay.



## Caution



- Be sure to disconnect the AC adapter from the wall outlet and clean the prongs and the area around the prongs at least once a year.
- Allowing dust to build up on the adapter constitutes a fire hazard.



- Keep the relay away from humidity and dust. Otherwise a fire or an electric shock might occur.



- To prevent the products (sensors and relays) from malfunction, observe the instructions below:

- Do not apply a strong shock.
- Do not use or store the products in unintended orientation (upside-down, for instance).
- Use the products within the guaranteed operating temperature range.
- Avoid low and high temperatures when storing the products.



## **2. Other Information Regarding the Sensors and Relay**

### **2-1. Notes on Handling**

- The RICOH EH Environment Sensor 201 and the RICOH EH Relay for Wi-Fi™ are not waterproof, water resistant, or shock resistant.
- The RICOH EH Environment Sensor 202 is rated IP44 (waterproof and dustproof).
- A dirty surface of the solar cell can hinder power generation. If you find any foreign object on the light receiving surface, immediately wipe it away.
- Do not rub the light receiving surface of the solar cell with force. When wiping off a foreign object, gently do so.
- Do not press, bend, or twist the surface of the solar cell, as it can cause damage.
- The products are for indoor use only. Do not use them outdoors.
- Avoid direct sunlight. The recommended intensity of illumination is 1500 lx or less under LED or fluorescent light.
- Do not install the relay with its AC adapter port facing upward.
- Do not use the products in an acidic or alkaline environment.
- When not in use, store the products in a dark place at room temperature (for instance, in a drawer or a cardboard box).
- Do not apply a strong force on the switch. The switch is small and easily breaks.
- Make sure that the relay is connected to network equipment that is installed and managed properly. Protect the relay from illegal alterations by a malicious third party. When using a PC to update the relay or set it up via a web browser, do so on a dedicated network that allows the relay to be accessed only by an eligible PC.
- The sensor contains a lithium-ion cell. Do not remove or replace the cell on your own.

### **2-2. Notes on Radio Waves**

This section provides notes on the use of radio waves.

#### **■ Notes on radio interference**

The products can adversely affect other electronic components nearby (and vice versa). A nearby TV or radio, in particular, can cause noise. If that is the case, take any of the following measures:

- Install the products as far away as possible from the TV or radio.
- Change the orientation of the TV or radio antenna.
- Connect the products to an AC outlet different from that used for the TV or radio.

### **2-3. Disposal and Recycling**

For the disposal or recycling of the products, contact RICOH.

## **3. Disclaimers**

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### **3-1. Information Security**

- Properly manage the password to the relay. Update them regularly.  
RICOH shall not be responsible for any damage related to security key or password leaks.

### **3-2. Information Security**

- RICOH shall not be responsible in any way for a fall or breakage of an environment sensor installed by the user.

### **3-3. Others**

- Do not disassemble or modify the products, nor remove any part from the products. All warranty shall be void if the products are disassembled or modified or a part is removed.
- RICOH shall not be responsible in any way for damage due to the use of the products or inability to use the products.
- Do not switch on the products where radio waves influence other equipment or where the use of radio equipment is prohibited. For instance, do not switch on the products near a heart pacemaker, near medical electronic instruments, on board a plane, or at a hospital. Radio waves from the products can influence other equipment.
- Do not use the products as data acquisition tools for critical devices that require special quality and reliability and whose breakdown or malfunction can risk human lives and physical injury (for instance, space and aeronautical devices, atomic power control systems, traffic control equipment, transportation equipment, combustion equipment, safety devices, and life-support devices).

## 4. Product Overview

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### 4-1. Product Components

There are six product components:

1. RICOH EH Environment Sensor D201
2. RICOH EH Environment Sensor D202
3. RICOH EH Relay for Wi-Fi™
4. AC adapter for the relay and USB power cable
5. RICOH EH Sensor for Android™
6. RICOH EH Sensor for Windows®10

\* The apps are downloadable at the following URL:

<https://industry.ricoh.com/en/dye-sensitized-solar-cell/>

### 4-2. Connection Modes and Communication Distances

The products have two connection modes as described below. \*The package does not include the smartphone, tablet, and PC.

1. Direct mode (For Android™ devices. In this mode, an Android™ device directly receives data from the sensor(s).)
2. Gateway mode (For Windows® PCs. In this mode, a Windows PC receives data from the sensor(s) via a relay.)

The maximum communication distance depends on the devices and modes:

1. Between an Android device and a sensor (Direct mode): Approx. 30 m without obstacles
2. Between a relay and a sensor (Gateway mode): Approx. 30 m without obstacles
3. Between a relay and a PC (Gateway mode): Approx. 50 m without obstacles

\* The communication distances are affected by the environment, for instance, by obstacles.

\* The above distances assume the following settings: 6 db signal intensity (maximum) and 3 consecutive transmissions.

\* A long distance between the devices can adversely affect communications, causing data to be lost.

### 4-3. Overview of the Products

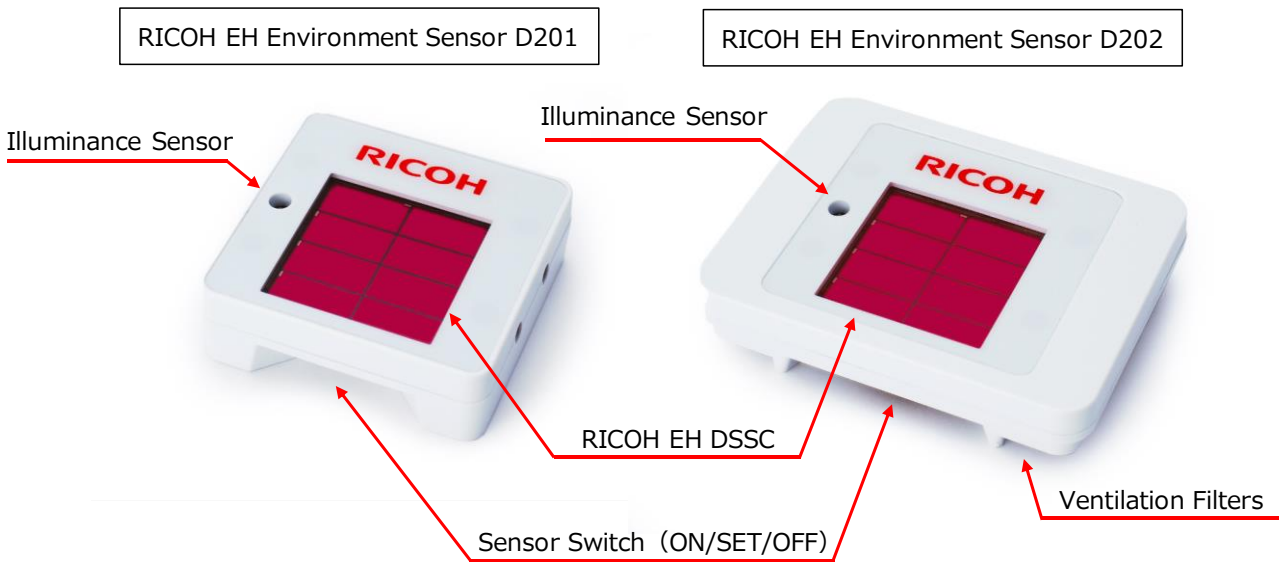
RICOH EH Environment Sensor D201/D202 detects temperature, humidity, atmospheric pressure, and ambient light, and sends the information to an Android device or Windows PC via Bluetooth® Low Energy (BLE). The D201/D202 runs on a dye-sensitized solar cell (RICOH EH DSSC) and a built-in lithium-ion cell. The Android™ or Windows® app displays the temperature, humidity, atmospheric pressure, and illumination, as well as the voltage of the built-in lithium-ion cell, makes graphs, logs data, and issues an alert in the event of an exceeded threshold.

In Direct mode, an Android™ device can receive data from up to 15 environment sensors.

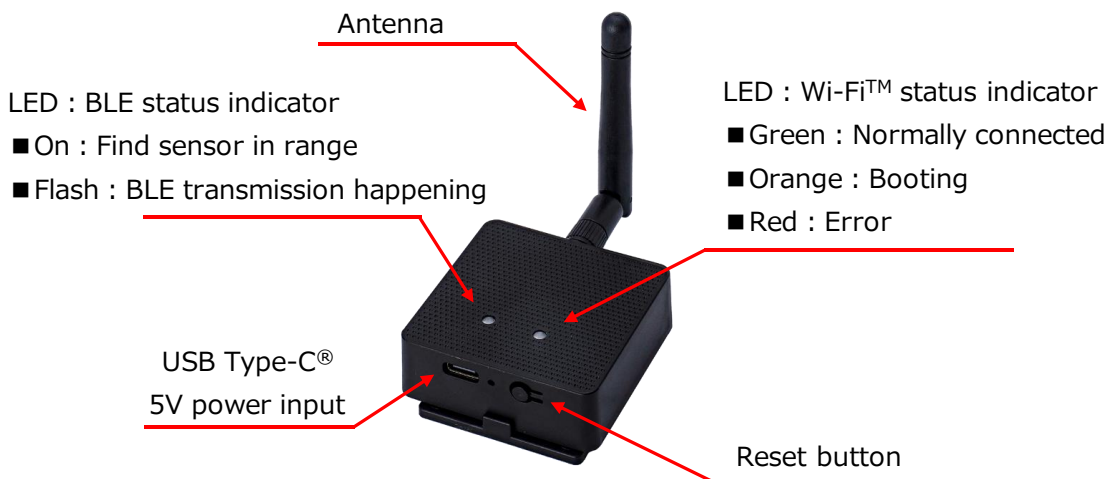
In Gateway mode, a relay can receive data from up to 15 environment sensors, and up to 6 relays can be connected to a Windows PC. (That is, a Windows PC can receive data from up to 90 environment sensors via 6 relays.)

\*The Bluetooth® wordmark and logotype are a registered trademark of Bluetooth SIG, Inc. Ricoh is licensed to use the wordmark and logotype.

### 4-4. Parts and Functions



RICOH EH Relay for Wi-Fi™



## 4-5. Required Illumination and Charging Performance

### 4-5-1. Illumination required for different sensing intervals

Under certain illumination, the D201/D202 sensor continues to operate without a drop in the voltage of the lithium-ion cell. The required illumination depends on the sensing interval as listed in the table below.

Illumination required to retain power balance		Sensing interval (sec)		
		5	60	300
24-H illumination (lx)	0	-	-	-
	50	-	-	-
	75	-	-	✓
	100	-	✓	✓
	125	-	✓	✓
	150	-	✓	✓
	200	-	✓	✓
	250	✓	✓	✓
	300	✓	✓	✓
	400	✓	✓	✓
	600	✓	✓	✓
	800	✓	✓	✓
	1000	✓	✓	✓

- \* The table above assumes the following settings: 6 dB signal intensity (maximum) and 3 consecutive transmissions.
- \* The table above assumes room temperature. Higher illumination will be required for a higher temperature.

### 4-5-2. Charging performance

When the voltage of the lithium-ion cell drops below the lower operating limit (approx. 1.8 V), the cell can be recharged under the following conditions:

- 200 lx: It takes approx. 4 hours until the cell can restart the sensor. It takes approx. 30 hours until the cell voltage reaches 2.3 V.
- 400 lx: It takes approx. 2 hours until the cell can restart the sensor. It takes approx. 15 hours until the cell voltage reaches 2.3 V.
- It takes more than 150 hours under 1500 lx for the cell to be charged fully (approx. 2.7 V).

**●Important: Set the sensor switch to OFF while charging.**

The above hours are calculated assuming that the sensor switch is set to OFF. Once the voltage has reached the lower operating limit, the battery cannot be sufficiently charged with the switch set to ON. (With the switch set to ON, it would take more than five hours under 800 lx until the cell can restart the sensor.)

#### **4-5-3. Operating time in dark places**

The sensor is designed to last for the following periods in complete darkness:

Approx. 4 days when the initial voltage is 2.3 V

Approx. 13 days when the initial voltage is 2.4 V

Approx. a month or longer when the initial voltage is 2.7 V (full)

- \* The operating time depends on the settings, including sensing intervals and signal intensity.
- \* The above operating time is calculated assuming a 300 sec sensing interval, 6 dB signal intensity, and 3 consecutive transmissions.

## 5. Datasheets

This section provides the datasheets for the products.

### 5-1. Datasheet for RICOH EH Environment Sensor D201/D202

Item	Description	
Model	RICOH EH Environment Sensor D201	RICOH EH Environment Sensor D202
Power supply	RICOH EH DSSC (28 mm × 32 mm)	
Items measured	Temperature, humidity*, ambient light, atmospheric pressure, voltage of built-in lithium-ion cell *D202 is less responsive to abrupt changes in humidity than D201.	
Measurement range and resolution	Temperature: -30°C to 60°C, 0.1°C Humidity: 0%RH to 100% RH, 0.1% RH Atmospheric pressure: 300 hPa to 1100 hPa, 0.1 hPa Ambient light: 0 lx to 10000 lx, 0.1 lx Voltage: 1.70 V to 2.80 V, 0.01 V	
Measurement accuracy	Temperature: ±1°C Humidity: ±3% RH Atmospheric pressure: ±1 hPa Ambient light: ±15% (for information only) Voltage: ±0.1 V	
Sensing interval	5 to 600 sec (as designated on Android™ app)	
Wireless format	Bluetooth® Low Energy	
Conditions for continuous operation	8 hours/day under a 200 lx neutral white LED (when the sensing interval is 300 sec)	
Operating environment	-30°C to 60°C Indoor use only (1500 lx illumination or less)	
Dimensions	W43mm × D41mm × H14mm	W60mm × D47mm × H14mm
Weight	19 g	23 g
Waterproofing and dustproofing	None	IP44

## 5-2. Datasheet for RICOH EH Relay for Wi-Fi™

Item	Description
Power supply	AC adapter, USB Type-C® Input voltage: 100 V/240 V 50-60 Hz Output voltage: 5 VDC Output current: 1A
Operating environment	Relay unit: -20°C to 60°C AC adapter: 0°C to 40°C
Wi-Fi™	802.11b/g/n (2.4 GHz band) WPA/WPA2/WPA2 enterprise
Dimensions	W54 mm × D54 mm × H19 mm (not including external antenna)
Weight	54 g
Firmware version	IGS03W-RI-v1.0.9.0

\*Note that the operating temperature range differs for the sensor, relay, and AC adapter.

## 5-3. Datasheet for the RICOH EH Sensor for Android™

Item	Description
Supported OS	Android™ OS 9.0 or later
Required function	Bluetooth® LE (Bluetooth® 5.0) or higher
# of sensors connected	Up to 15
Alert	Designated for each item sensed
Data capacity	Log data: 25 KB approx. (one day per sensor at 300 sec sensing interval) *Can be stored in main memory or an SD card of the Android device

## 5-4. Datasheet for the RICOH EH Sensor for Windows®

Item	Description
Supported OS	Windows®10 Pro/Home
CPU	Intel® Atom™ x5-Z8350 or higher
# of sensors connected	15 per relay (up to 6 relays, 90 sensors)
Alert	Designated for each item sensed
Data capacity	Log data: 25 KB approx. (one day per sensor at 300 sec sensing interval)



## 6. Using the Sensors—Direct Mode Using Android™ Device

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### 6-1. Preparation

#### 6-1-1. Required devices

To use Direct mode, prepare the following devices:

- RICOH EH Environment Sensor D201 or D202
- A tablet or smartphone with Android™ OS

#### 6-1-2. Required features and verified Android™ devices

Operation in Direct mode requires Android™ OS 9.0 or later and Bluetooth® 5.0 or later.

Operation has been verified on the following devices:

Tablets

- Lenovo Tab M8
- NEC LAVIE Tab E TE508

Smartphones

- SHARP sense4
- SHARP AQUOS sense 3
- SONY Xperia 8 Lite

#### 6-1-3. Installing the app on Android™ device

1. Access the Environment Sensor Download website and download the RICOH EH Environment Sensor App for Android™.
2. Copy the downloaded file to the Android™ device.
3. Open the copied downloaded file.  
(On most Android devices, go to the Settings menu and use the Storage function.)
4. The installer starts and displays notes on installation. Tap [Continue] to proceed.
5. An installation confirmation message is shown. Tap [Install].
6. The app icon is created, and installation is completed.

### 6-2. Overview of RICOH EH Environment Sensor App for Android™

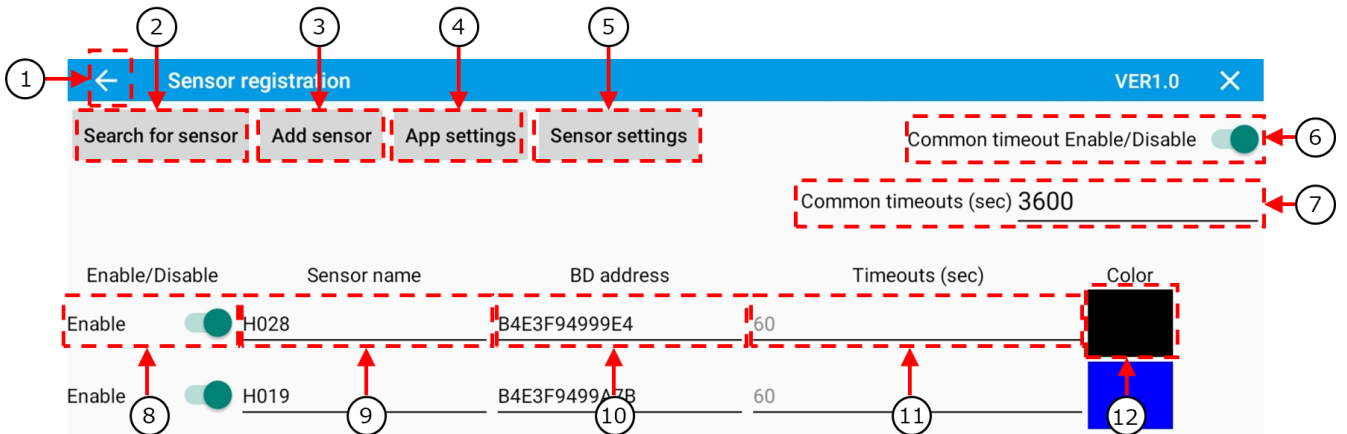
The app has three functions: sensor registration, sensor reception, and log reading.

When the app is used for the first time, the sensor registration function is automatically started because no sensor has been registered.

\*For more information, see Section 6-3, *Sensor Registration*; Section 6-4, *Sensor Reception*; and Section 6-5, *Log Reading*.

## 6-3. Sensor Registration

### 6-3-1. Sensor registration pane



- ① Tap the arrow to move to the *Received data* pane (see Section 6-4-1).
- ② Tap this button to move to the *Sensor search* pane (see Section 6-3-2).
- ③ Tap this button to add a blank sensor settings field.
- ④ Tap this button to move to the *App settings* pane (see Section 6-3-3).
- ⑤ Tap this button to move to the *Sensor settings* pane (*Sensor search* pane) (see Section 6-3-4).

- ⑥ Use this toggle switch to enable and disable common timeout.

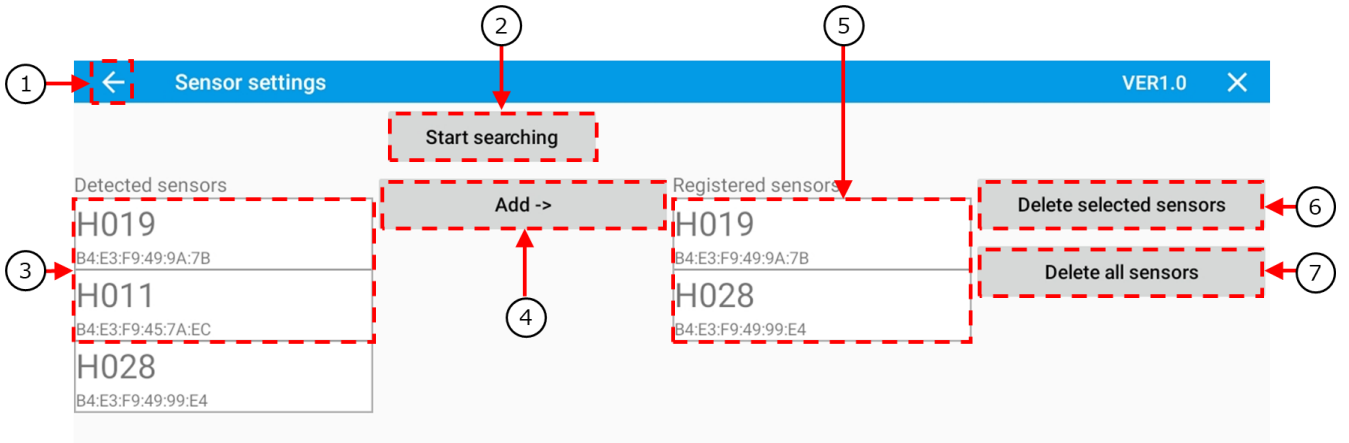
The timeout function displays “Error” if no data has been received from any sensor in the designated lapse of time.

When common timeout is enabled, the timeout time common to all sensors is set in ⑦.

When common timeout is disabled, the timeout time is independently set for each sensor in ⑪.

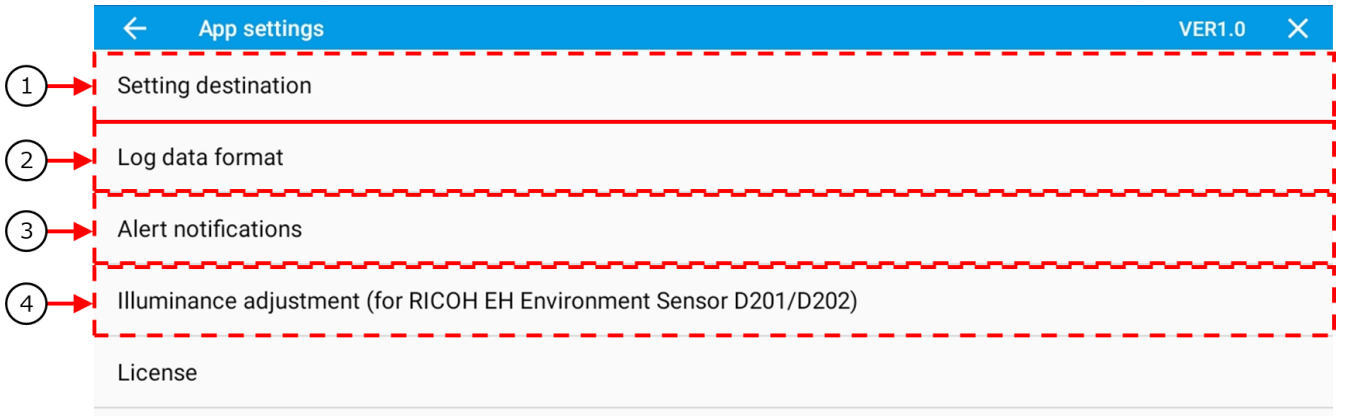
- ⑦ With ⑥ enabled, “Error” will be displayed if no data has been received from any sensor in the designated lapse of time.
- ⑧ Use this toggle switch to enable and disable the registration on the *Received data* pane (see Section 6-4-1).
- ⑨ This field shows the sensor name. You can designate a unique name for each sensor.
- ⑩ Designate the BD address of each sensor. An invalid BD address will be cleared when a different pane is opened, and the registration will be invalidated.  
\*When typing a BD address directly, omit the colons (:).  
\*When a sensor is registered through a search for sensors, the BD address is automatically entered.
- ⑪ With ⑥ disabled, “Error” will be displayed if no data has been received from the sensor in the designated lapse of time.
- ⑫ Tap this button to move to the *Color settings* pane (see Section 6-3-6).

### 6-3-2. Sensor search pane



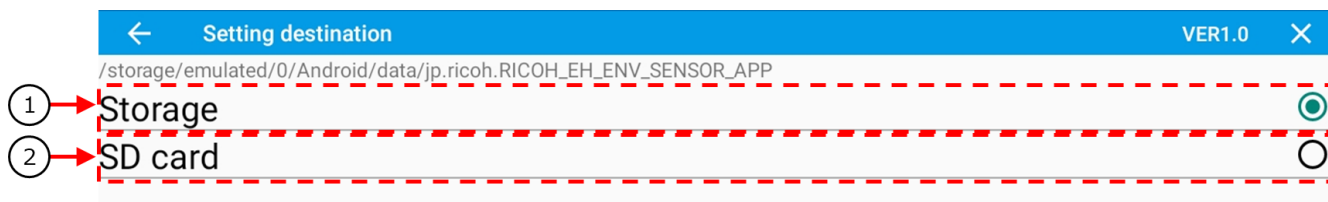
- ① Tap the arrow to move to the *Sensor registration* pane (see Section 6-3-1).
- ② *Start search* displayed: No sensor search is in progress. Tap the button to start searching for sensors.  
*Stop search* displayed: Sensor search is in progress. Tap the button to stop the search.
- ③ This field shows the device name (local name) and BD address of the environment sensors found through the search (②).
- ④ Tap and select sensors in the ③ field, and tap this button to add them to the whitelist. When a sensor is selected, the search will stop.
- ⑤ This field shows the sensors registered to the whitelist (the list of sensors selected for data sensing).
- ⑥ Tap and select sensors in the ⑤ field, and tap this button to delete them from the whitelist.
- ⑦ Tap this button to delete all the sensors in the ⑤ field from the whitelist.

### 6-3-3. App settings pane



- ① Tap the button to move to the *App settings* pane (log data save area) (see Section 6-3-1①).
- ② Tap the button to move to the *App settings* pane (log data format) (see Section 6-3-1②).
- ③ Tap the button to move to the *App settings* pane (alert notification) (see Section 6-3-1③).
- ④ Tap the button to move to the *App settings* pane (illuminance adjustment) (see Section 6-3-1④).

### 6-3-3①. App settings pane (log data save area)



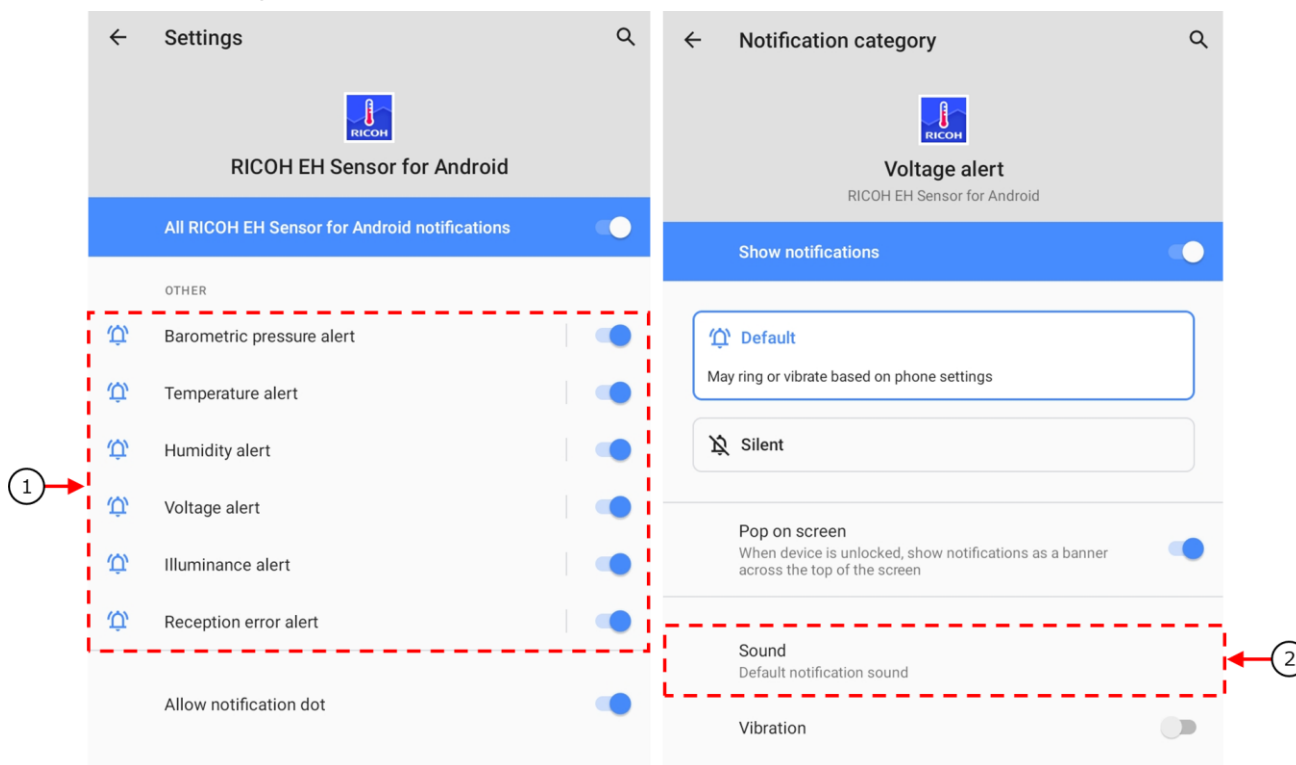
- ① Select this radio button to store the log file in the following folder in the internal storage of the Android device: `Android\data\jp.ricoh.RICOH_EH_ENV_SENSOR_APP`.
- ② Select this radio button to store the log file on the SD card.  
The default folder is `(SD card)\Android\data\jp.ricoh.RICOH_EH_ENV_SENSOR_APP`. You can designate a different folder on the SD card.

### 6-3-3②. App settings pane (log data format)



- ① Select this radio button to open a dialogue and designate an arbitrary log storage interval.  
\*Saved log file name: `yyyy_MM_dd_HH_start time_storage interval.csv`
- ② Select this radio button to save logs at intervals of one day.  
\*Saved log file name: `yyyy_MM_dd.csv`

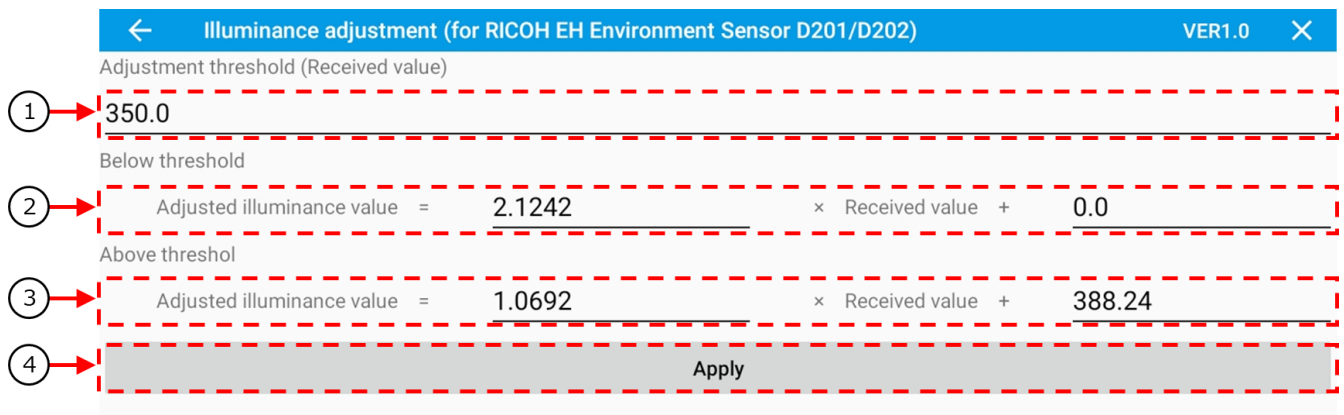
### 6-3-3③. App settings pane (alert notification)



- ① Use the toggle switches to enable and disable notifications.
- ② Tap to change notification sound settings.

### 6-3-3④. App settings pane (illuminance adjustment)

The designated values are used to adjust illuminance data from RICOH EH Environment Sensors.

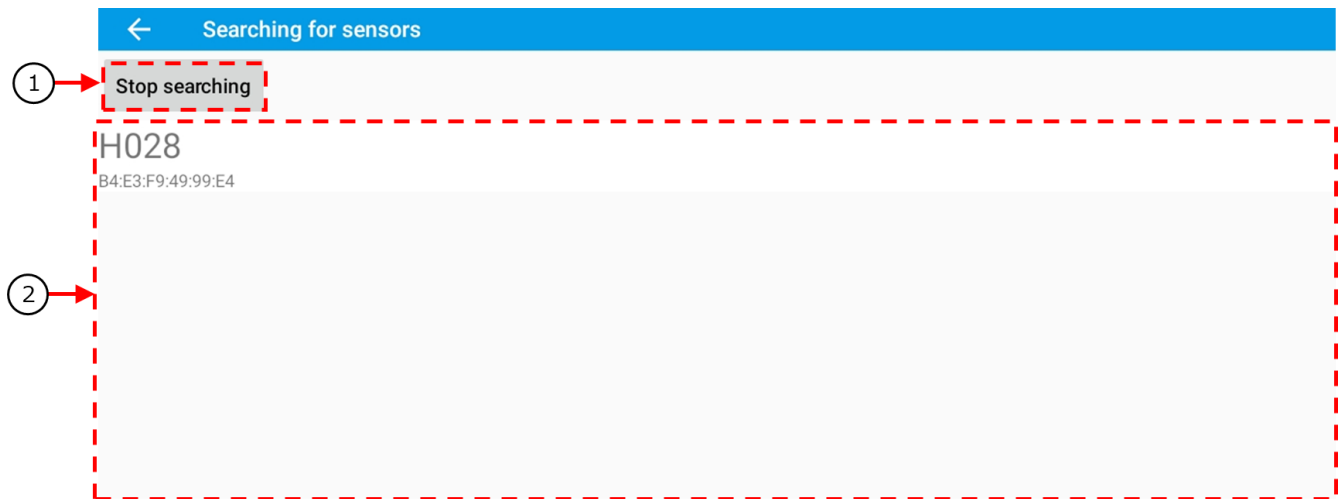


- ① Designate a threshold for choosing the adjustment formula for the received data (illuminance) from ② and ③.
- ② Designate the value for the adjustment formula applied when the received data (illuminance) is less than the threshold (①).
- ③ Designate the value for the adjustment formula applied when the received data (illuminance) is equal to or greater than the threshold (①).
- ④ Tap this button to return to the previous pane.

\*The illuminance adjustment setting allows you to deal with varying operating environments. In a general illuminance environment, you can use the default adjustment formula.

### 6-3-4. *Sensor settings* pane (*Sensor search* pane)

Use this pane to connect your Android™ device with environment sensors via Bluetooth® and change the sensing intervals and transmission strength settings.



① This button indicates the search communication status. Tap the button to start and stop the search for nearby environment sensors that are connectable.

To make an environment sensor connectable, set the switch on the sensor from OFF to SET (see Section 4-4, *Parts and Functions*).

**●Note: To change sensor settings, make sure that the sensor switch is set to SET.**

To put the switch from ON to SET, do not directly do so. Instead, put it in the OFF position first, wait five seconds, then put it in the SET position.

To put the switch back in the ON position after finishing the configuration, first put it in the OFF position, wait five seconds, then put it in the ON position.

If the switch is in the SET position, the sensor maintains bidirectional connection with the Android™ device. This increases power consumption and causes voltage to drop significantly over a long period. After finishing sensor configuration, make sure that the switch is set to OFF (or ON).

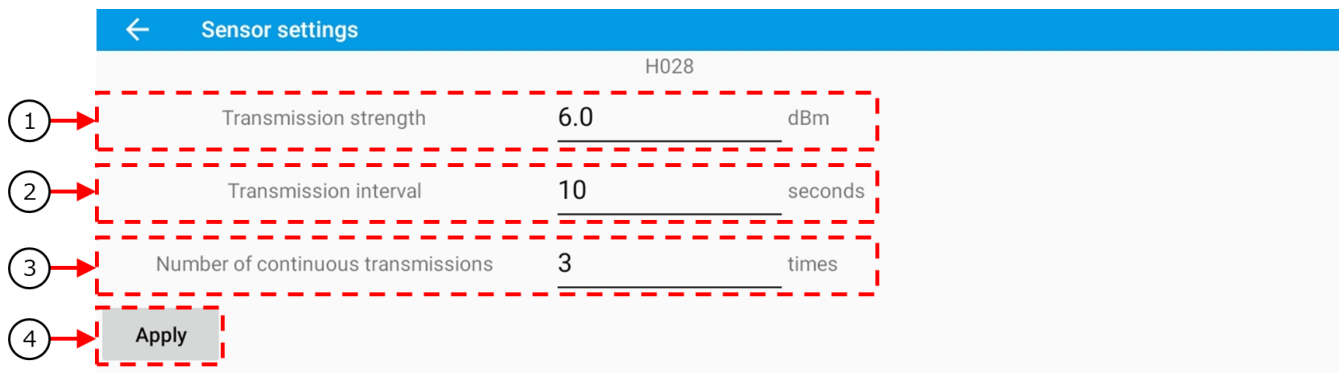
② This field shows the device name (local name) and BD address of the environment sensor found through the search (①).

Tap a device name to connect to the corresponding sensor.

Once connection is successful, the “Connected” message is shown at the bottom of the pane and the *Sensor settings* (Sensor settings) pane will open (see Section 6-3-5).

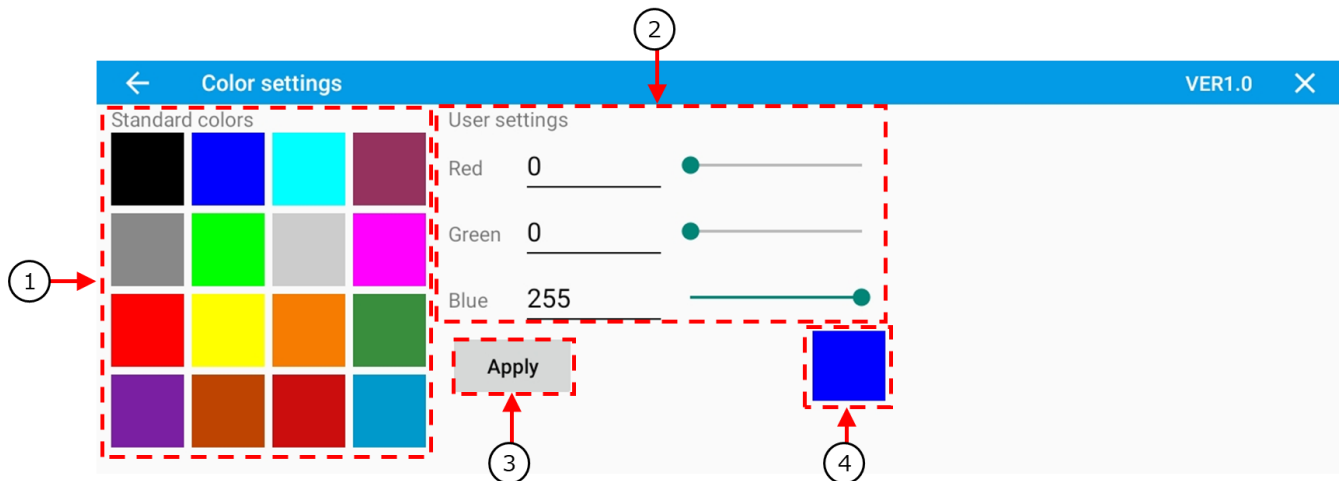
You may occasionally see the “Failed” message. If that is the case, tap the sensor to reconnect.

### 6-3-5. Sensor settings pane (Sensor settings pane)



- ① Use this field to designate transmission strength (up to 6.0 dBm).  
The smaller the value, the lower the power consumption and the attained illuminance required for continuous operation, but the higher the percentage of data losses in relation to communication distances. (The losses depend on the operating environment.)
- ② Use this field to designate the transmission cycle (up to 600 seconds).  
The smaller the value, the more the sensing data, but the higher the power consumption and the attained illuminance required for continuous operation.
- ③ Use this field to designate the transmission repeat times (up to 10).  
The smaller the value, the lower the power consumption and the attained illuminance required for continuous operation, but the higher the percentage of data losses in relation to communication distances.
- ④ Tap this button to write the values of ① to ③ to the connected sensor.

### 6-3-6. Color settings pane



- ① Tap a color, and the previous pane will be opened with the tapped color reflected.
- ② Use this field to designate RGB values (0 to 255) to make a color of your preference.
- ③ Tap this button, and the previous pane will be opened with the color in ② reflected.
- ④ This field shows the color corresponding to the RGB values set in ②.

## 6-4. Sensor Reception

### 6-4-1. Received data pane

Sensor name	Date/Time	Temperature	Humidity	Illuminance	Barometric pressure	Voltage
H028 B4:E3:F9:49:99:E4	29/07/2022 10:59:33	24.4°C	50.1%	0.2lx	1014.6hPa	2.62V
H019 B4:E3:F9:49:9A:7B	29/07/2022 10:59:39	22.9°C	52.4%	706.6lx	1014.5hPa	2.71V

- ① This field displays the device names and addresses of the sensors on the whitelist.  
Tap a device name to open the *Parameter graphs per sensor* pane (see Section 6-4-2) for that sensor.
- ② Tap this button to open the *Alert settings* pane (see Section 6-4-7).  
On the *Received data* pane, values exceeding the threshold and the corresponding device names are shown in red as shown in the figure above.
- ③ Tap this button to open the *Sensor registration* pane (see Section 6-3-1).
- ④ Tap this button to open the *Read log data* pane (see Section 6-5-1).
- ⑤ These fields represent parameter names.  
Tap a parameter name (Temperature, Humidity, Illuminance, Barometric pressure, or Voltage) to open the *Sensor graphs per parameter* pane (see Section 6-4-3) for that parameter.
- ⑥ These fields show the last parameter values received from each sensor. “Not received” will be displayed if no data has yet been received from the relevant sensor.

\*The illuminance value shown here has been calculated from the received data using the adjustment formula. For more information, see Section 6-3-3④, *App settings* pane (illuminance adjustment).

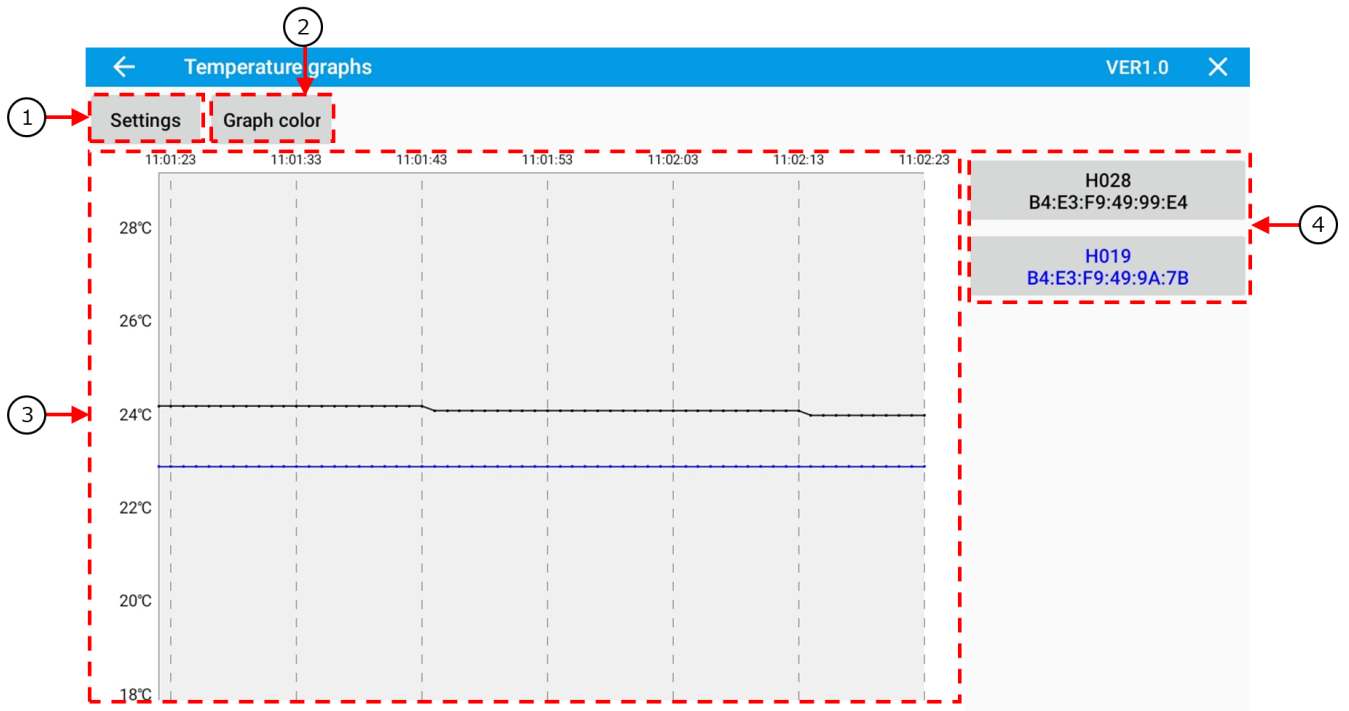


## 6-4-2. Graphs pane



- ① This field shows the following information for the selected sensor: time of last reception, sensor name, BD address, RSSI value upon last reception, and communication status.  
Tap this field to open the *Log data list* pane (see Section 6-4-4).
- ② Tap this button to open the *Graph drawing settings* pane (see Section 6-4-5).
- ③ This field shows the graphs of the information received from the selected sensor. The scope of each graph depends on the settings on the *Graph drawing settings* pane (see Section 6-4-5). Tap a graph to open the *Sensor graphs per parameter* pane for that parameter (see Section 6-4-3). The thresholds designated on the *Alert settings* pane (see Section 6-4-7) is shown as a dashed line (red for the upper threshold and blue for the lower threshold).

### 6-4-3. Sensor graphs per parameter pane



- ① Tap this button to open the *Graph drawing settings* pane (see Section 6-4-5).
- ② Tap this button to open the *Color settings* pane (see Section 6-4-6).
- ③ This field shows the graphs of information received from the sensors on the whitelist regarding the selected parameter.  
The colors of the graph lines correspond to the colors of the device names and addresses shown in field ④.
- ④ This field shows the device names and addresses of the sensors on the whitelist. The colors of the letters correspond to the colors of the lines in the graph ③. Tap a device name/address to open the *Graphs* pane (see Section 6-4-2) for that sensor.

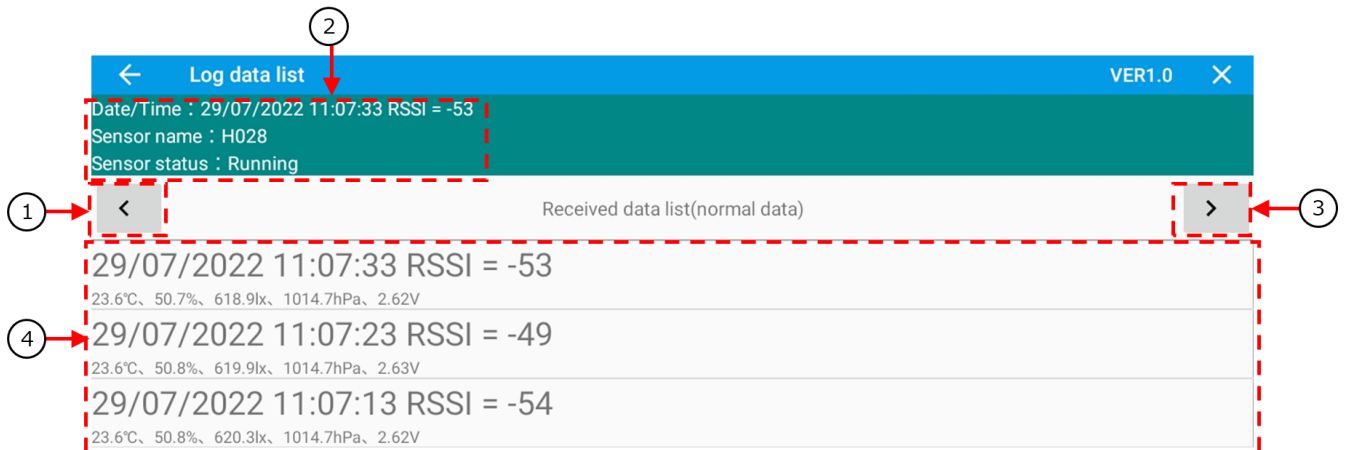
## 6-4-4. Log data list pane

### 6-4-4①. Log data list pane (all data)



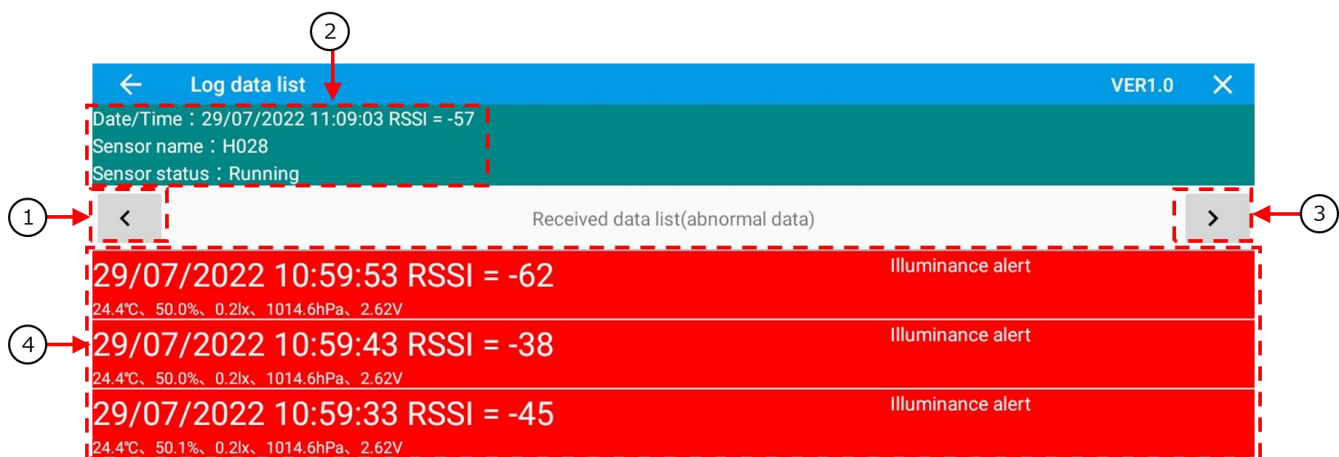
- ① Tap this arrow to open the *Log data list* pane (normal data) (see Section 6-4-4②).
- ② This field shows the following information for the selected sensor: time of last reception, sensor name, BD address, RSSI value upon last reception, and communication status.
- ③ Tap this arrow to open the *Log data list* pane (abnormal data) (see Section 6-4-4③).
- ④ This field shows the log of all the information received from the selected sensor (reception time, RSSI value, temperature, humidity, barometric pressure, illuminance, and voltage).

### 6-4-4②. Log data list pane (normal data)



- ① Tap this arrow to open the *Log data list* pane (abnormal data) (see Section 6-4-4③).
- ② This field shows the following information for the selected sensor: time of last reception, sensor name, BD address, RSSI value upon last reception, and communication status.
- ③ Tap this arrow to open the *Log data list* pane (all data) (see Section 6-4-4①).
- ④ This field shows the log of normal information received from the selected sensor (reception time, RSSI value, temperature, humidity, barometric pressure, illuminance, and voltage).

### 6-4-4③. Log data list pane (abnormal data)



- ① Tap this arrow to open the *Log data list* pane (all data) (see Section 6-4-4①).
- ② This field shows the following information for the selected sensor: time of last reception, sensor name, BD address, RSSI value upon last reception, and communication status.
- ③ Tap this arrow to open the *Log data list* pane (normal data) (see Section 6-4-4②).
- ④ This field shows the log of error information received from the selected sensor (reception time, RSSI value, temperature, humidity, barometric pressure, illuminance, and voltage).

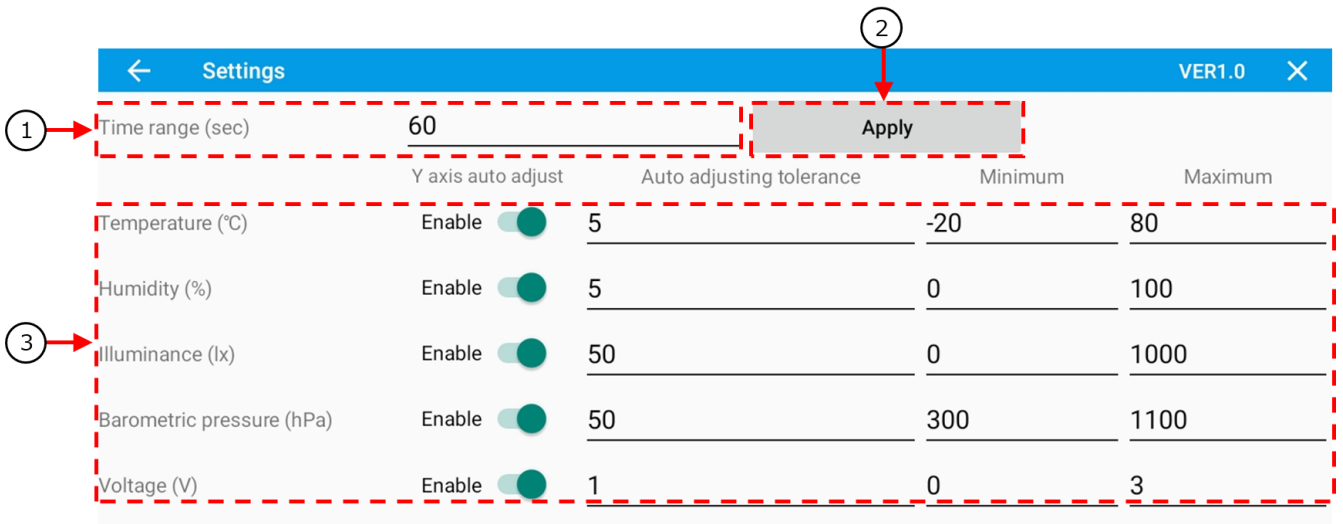
### 6-4-4④. Log file contents

DATA1	DATA2	DATA3	DATA4	DATA5	DATA6	DATA7	DATA8	DATA9	DATA10	DATA11	DATA12	DATA13	DATA14
Time	Sensor name	BD address	RSSI	Temperature (°C)	Humidity (%)	Illuminance (lx)	Barometric Pressure (hPa)	Voltage (V)	Temperature alert	Humidity alert	Illuminance alert	Barometric pressure alert	Voltage alert
28/07/2022 19:20:42	H019	B4:E3:F9:49:9A:7B	-43	23.2	51.9	642.7	1014.0	2.71					
28/07/2022 19:20:43	H028	B4:E3:F9:49:99:E4	-34	23.6	50.8	632.2	1014.0	2.61	NG				
28/07/2022 19:20:52	H019	B4:E3:F9:49:9A:7B	-41	23.2	51.8	643.4	1013.9	2.71	NG				
28/07/2022 19:20:53	H028	B4:E3:F9:49:99:E4	-37	23.6	50.7	632.2	1014.1	2.61	NG	NG			
28/07/2022 19:21:02	H019	B4:E3:F9:49:9A:7B	-44	23.2	51.6	629.1	1014.0	2.71	NG	NG			
28/07/2022 19:21:03	H028	B4:E3:F9:49:99:E4	-40	23.6	50.7	629.8	1014.0	2.61	NG		NG	NG	NG
28/07/2022 19:21:12	H019	B4:E3:F9:49:9A:7B	-45	23.2	51.6	642.7	1014.0	2.72			NG	NG	NG
28/07/2022 19:21:13	H028	B4:E3:F9:49:99:E4	-34	23.6	50.7	632.2	1014.1	2.61			NG		
28/07/2022 19:21:22	H019	B4:E3:F9:49:9A:7B	-42	23.2	51.5	630.8	1014.0	2.71					
.	.	.	.	.	.	.	.	.	.	.	.	.	.
.	.	.	.	.	.	.	.	.	.	.	.	.	.
.	.	.	.	.	.	.	.	.	.	.	.	.	.
.	.	.	.	.	.	.	.	.	.	.	.	.	.

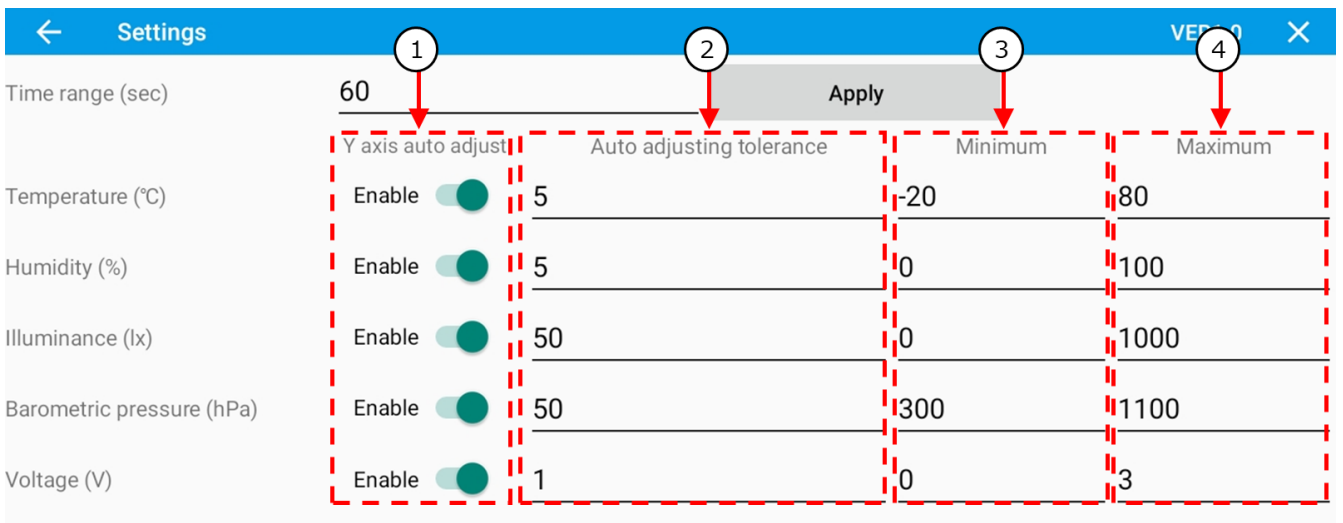
The log files are in CSV format. They contain DATA1 to DATA14 above, separated by commas, for each data reception from a sensor.

The log files are generated at the intervals designated on the *App settings* pane (log data format) (see Section 6-3-3②).

**6-4-5. Graph drawing settings pane**

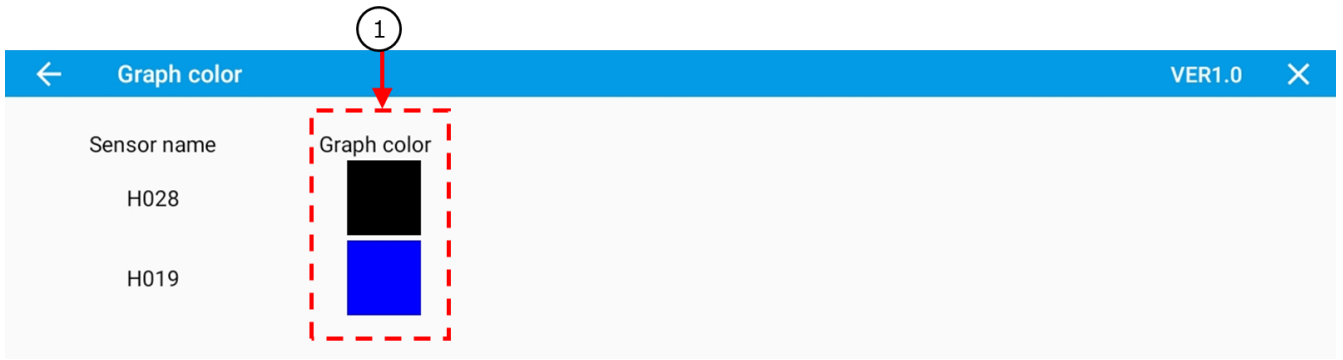


- ① Use this field to designate the scope of the X-axis common to all graphs.  
\*The recommended upper limit is three days or so (250,000 seconds approx.) as the processing capability of the display terminal is limited.
- ② Tap this button to return to the previous pane.
- ③ Use this field to designate the scope of the Y-axis of the graphs for each parameter. See the figure below.



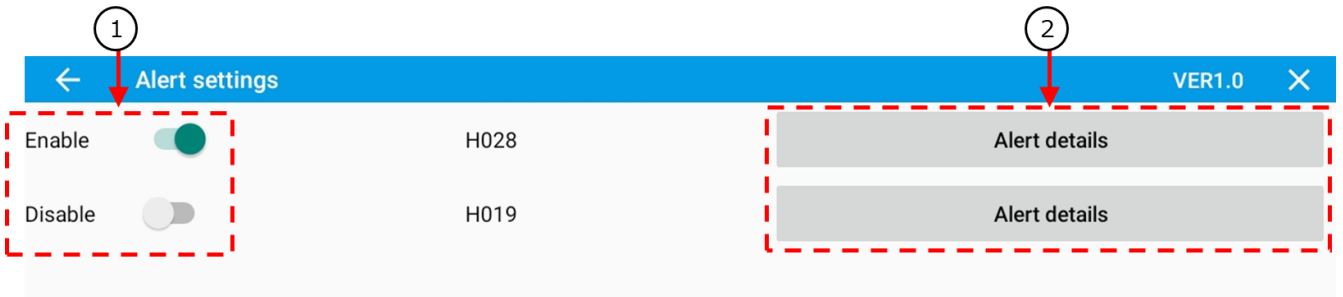
- ① Set this toggle switch to “Enable” to have the scope of the Y axis (maximum and minimum values) adjusted automatically.  
Set this toggle switch to “Disable” to use the settings in ③ and ④.
- ② When the toggle switch ① is set to “Enable,” the following minimum and maximum values are designated:  
Minimum value: Minimum value received within the scope of the graph – Value designated in ②  
Maximum value: Maximum value received within the scope of the graph + Value designated in ②
- ③ Use this field to designate the minimum value of the graph used when the toggle switch ① is set to “Disable.” Do not designate a value exceeding the maximum value.
- ④ Use this field to designate the maximum value of the graph used when the toggle switch ① is set to “Disable.” Do not designate a value lower than the minimum value.

#### 6-4-6. Select sensor to set color pane

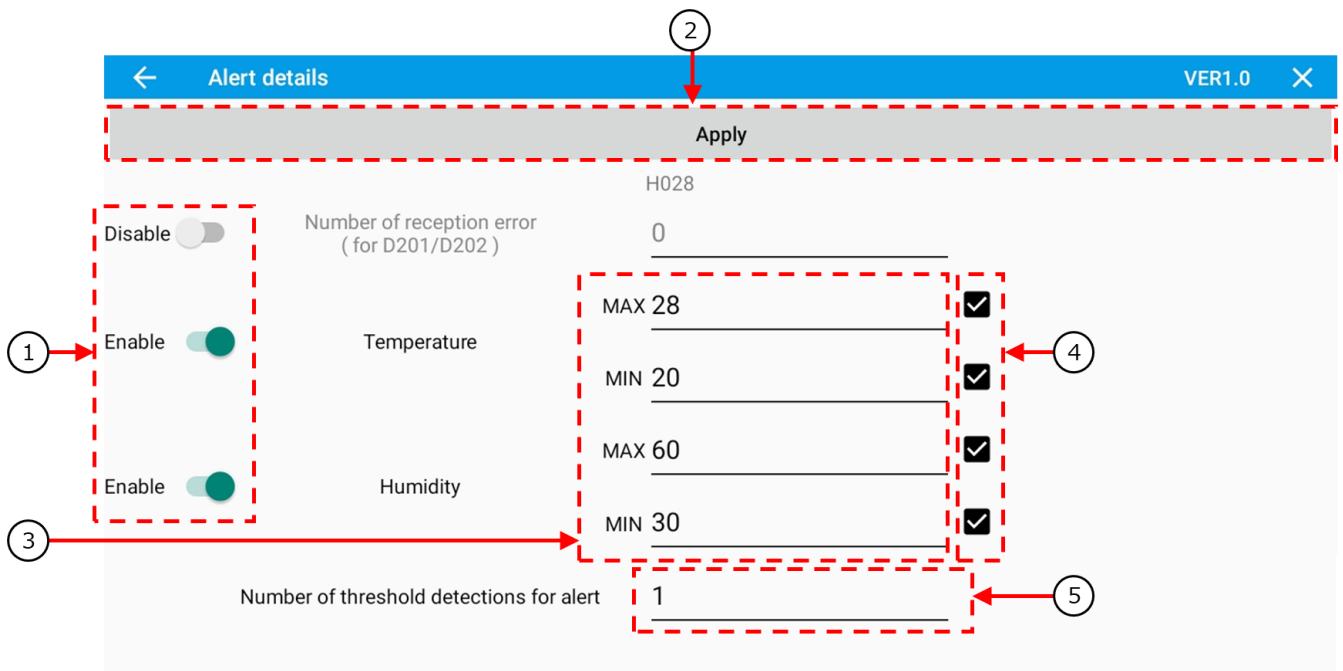


① Tap this button to open the *Color settings* pane (see Section 6-3-6).

#### 6-4-7. Alert settings pane



- ① Set this toggle switch to “Enable” to have the designated thresholds monitored. Set this toggle switch to “Disable” to leave the designated thresholds unmonitored.
- ② Tap this button to open the *Alert settings (detail)* pane below.



- ① Use this toggle switch to enable and disable the entries in ③ and ④.
- ② Tap this button to apply the settings and return to the previous pane.
- ③ Use these fields to designate the maximum and minimum values of the parameters. (Applicable parameters are from Barometric pressure to Luminance.)
- ④ Check off both boxes to have both the upper and lower thresholds monitored. Check one box to have either threshold monitored.
- ⑤ Designate the number of occurrences (cumulative) of errors. \*Designate 0 to leave the threshold unmonitored.

The number of occurrences means how many times a value exceeding the thresholds is consecutively received, regardless of the sensing interval.

An alert is issued when the number of occurrences is reached.

An alert is issued repeatedly; it is issued every time the number of occurrences is reached.

The cumulative count will be reset when a value in the normal range is received even once.

■ Designating thresholds for the number of reception interruptions

At the top of the *Alert settings* pane, there is a field for designating the threshold for the number of interruptions, which is used to trigger a sensor data loss notification.

This function monitors the sensor data for losses and issues a notification as described below.

This function monitors the value of the transmission counter in the sensor data.

The receiving device compares the latest transmission counter value with the previous one. If the difference exceeds the designated threshold, a reception error is assumed, and an error notification is shown.

The smaller the designated threshold for the number of interruptions, the shorter the interruption time to trigger a notification.

Note that this function issues a notification when the data is received following the interruption.

To have an error message shown immediately upon a data loss, use the timeout function on the *Sensor registration* pane (see Section 6-3-1).

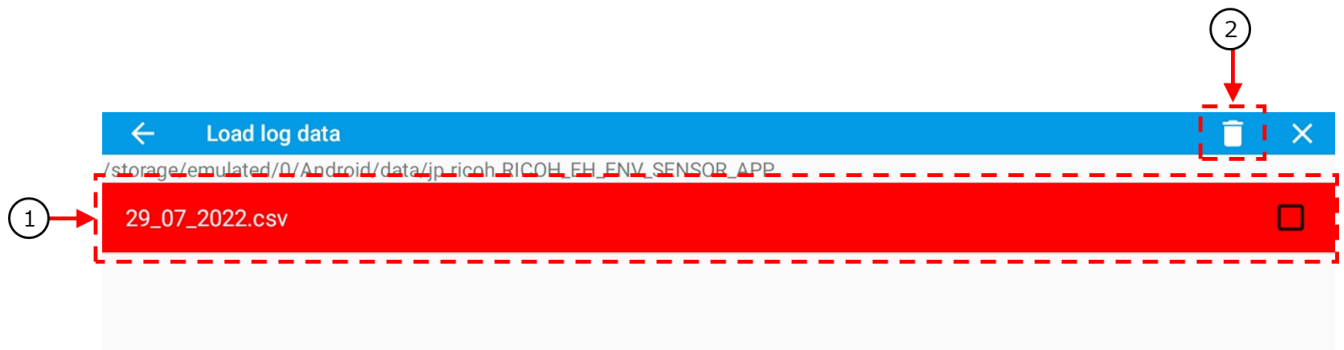
Example) The sensing interval is 5 seconds, and the designated number of interruptions is 10.

An interruption continuing for 50 seconds (5 seconds × 10) will cause an interruption notification to be reported upon the next data reception.

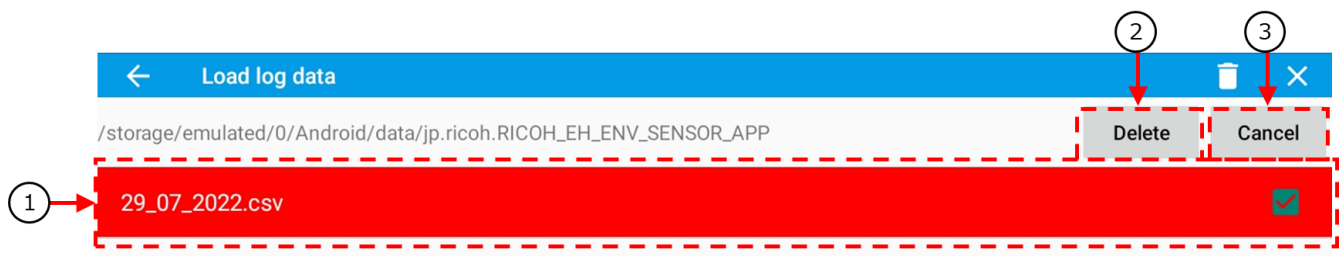


## 6-5. Log Reading

### 6-5-1. Read log data pane

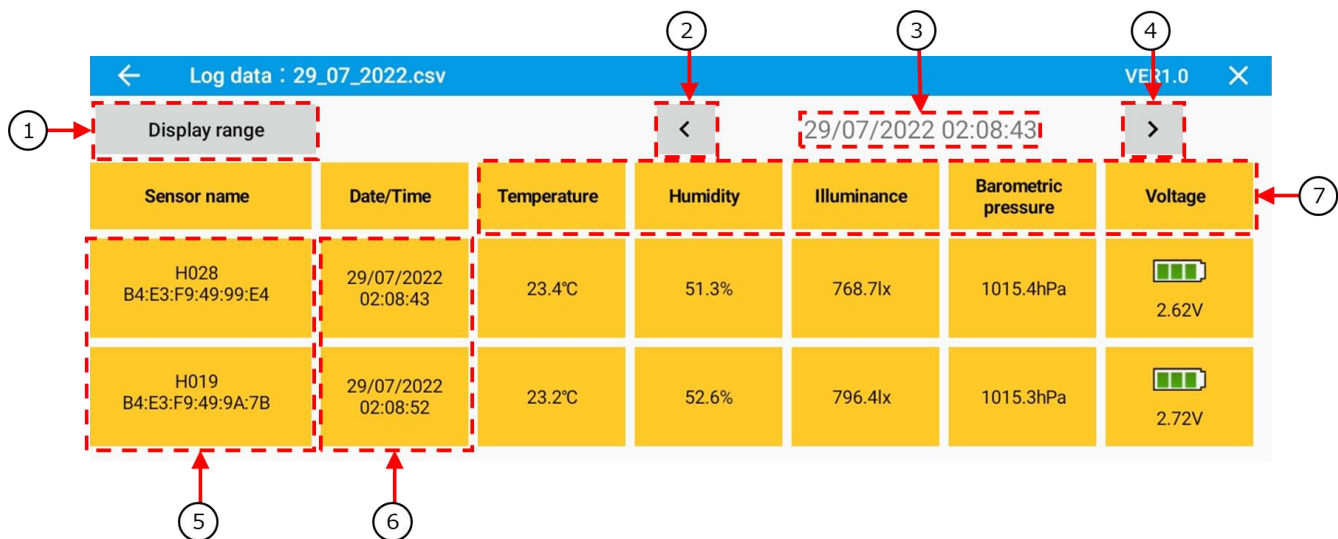


- ① Tap the CSV file name to load its data and open the *Log data* pane (Past CSV data) (see Section 6-5-2).
- ② Tap this icon to open the *Delete* pane below.



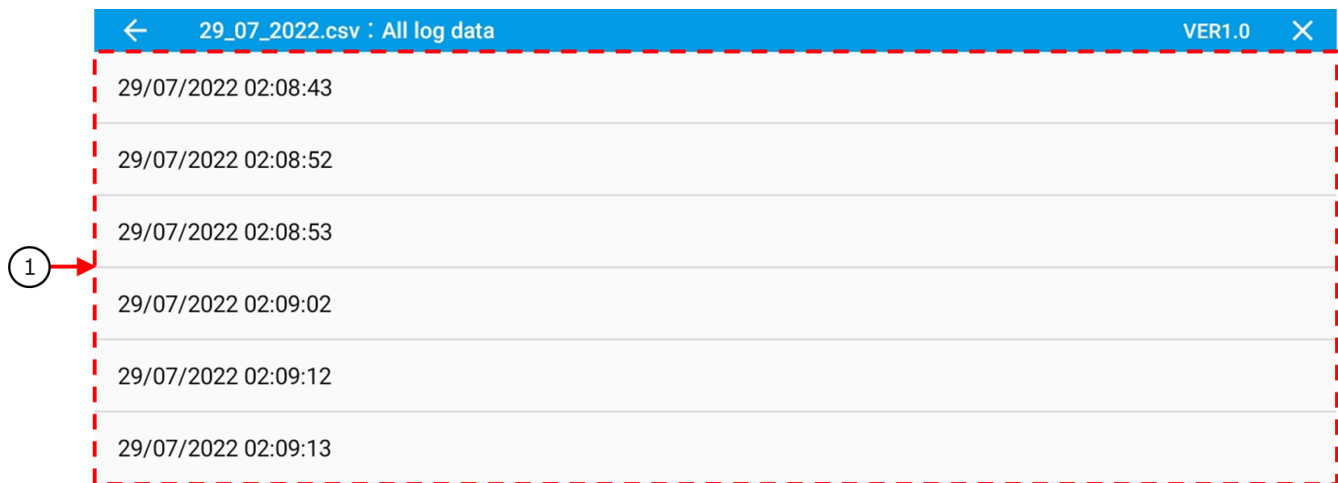
- ① Tap the file name to check off the checkbox on the right.
- ② Tap this button to delete the checked CSV file(s) and return to the previous pane.
- ③ Tap this button to return to the previous pane without making changes.

### 6-5-2. Log data pane (Past CSV data)



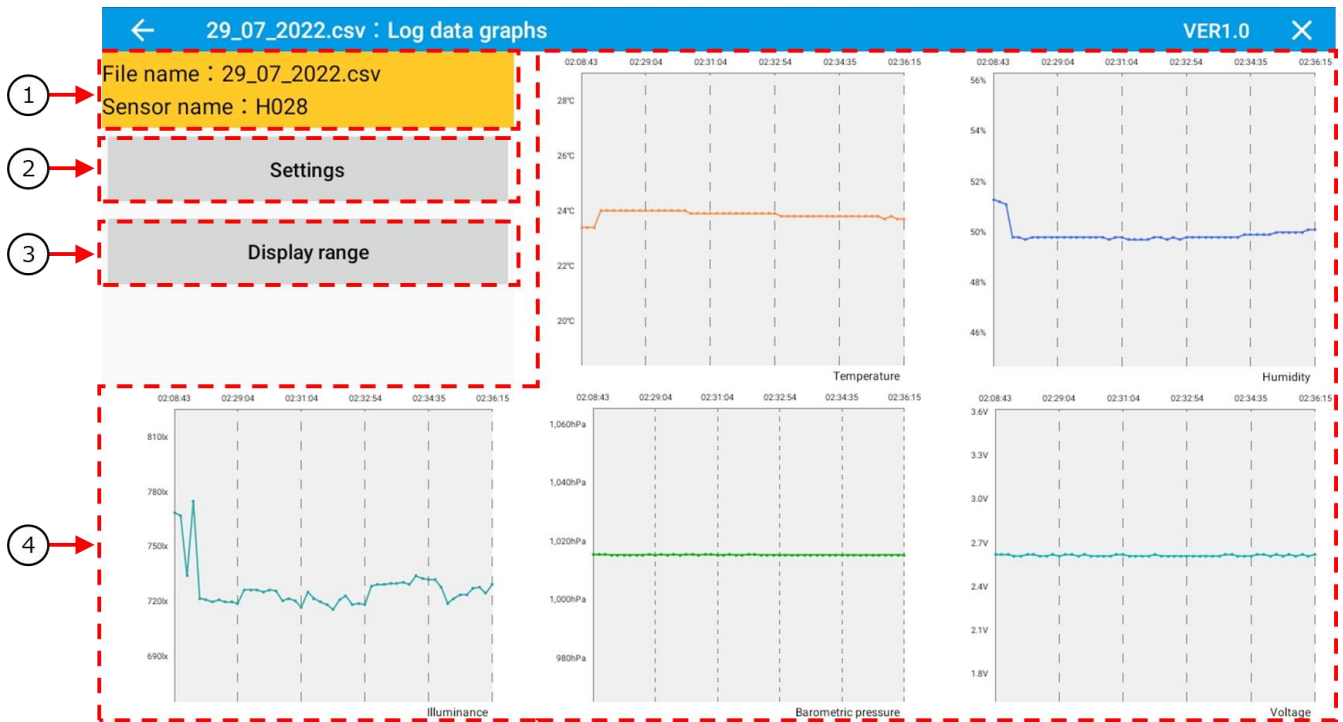
- ① Tap this button to open the *Graph range setting* pane (past CSV data) (see Section 6-5-6).
- ② Tap this arrow to toggle the values shown in field ③.
- ③ Tap this button to open the *Reception time list* pane (past CSV data) (see Section 6-5-3).
- ④ Tap this arrow to toggle the values shown in field ③.
- ⑤ Tap this button to open the *Graph* pane (past CSV data) (see Section 6-5-4).
- ⑥ Tap this button to open the *Log data list* pane (past CSV data) (see Section 6-5-8).
- ⑦ Tap this button to open the *Sensor graphs per parameter* pane (past CSV data) (see Section 6-5-5).

### 6-5-3. Reception time list pane (Past CSV data)



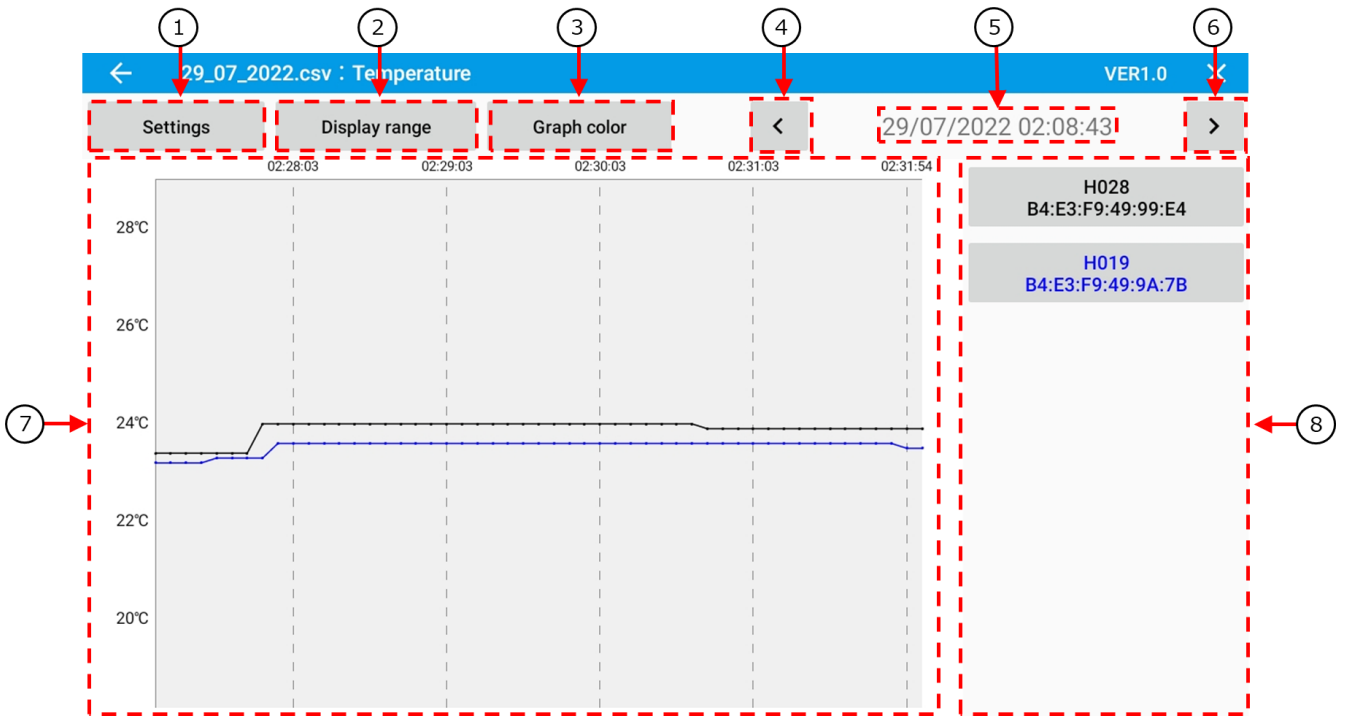
- ① This pane lists the reception times of the data in the loaded CSV file. Tap a time to set it as the start time of the graphs on the *Sensor graphs per parameter* pane (past CSV data) (see Section 6-5-6).

## 6-5-4. Graphs pane (Past CSV data)



- ① This field shows the CSV file name and device name for the selected sensor.  
Tap this field to open the *Log data list* pane (past CSV data) (see Section 6-5-8).
- ② Tap this button to open the *Graph drawing settings* pane (past CSV data) (see Section 6-5-7).
- ③ Tap this button to open the *Graph range setting* pane (past CSV data) (see Section 6-5-6).
- ④ This field shows the graphs of the data received from the selected sensor. Tap a graph to open the *Sensor graphs per parameter* pane (Past CSV data) for that parameter (see Section 6-5-5).  
The scope of each graph depends on the settings on the *Graph drawing settings* pane (Past CSV data) (see Section 6-5-7).

**6-5-5. Sensor graphs per parameter pane (Past CSV data)**



① Tap this button to open the *Graph drawing settings* pane (past CSV data) (see Section 6-5-7).

② Tap this button to open the *Graph range setting* pane (past CSV data) (see Section 6-5-6).

③ Tap this button to open the *Select sensor to set color* pane (see Section 6-4-6).

④ Tap this arrow to toggle the values shown in field ⑤.

⑤ Tap this button to open the *Reception time list* pane (past CSV data) (see Section 6-5-3).

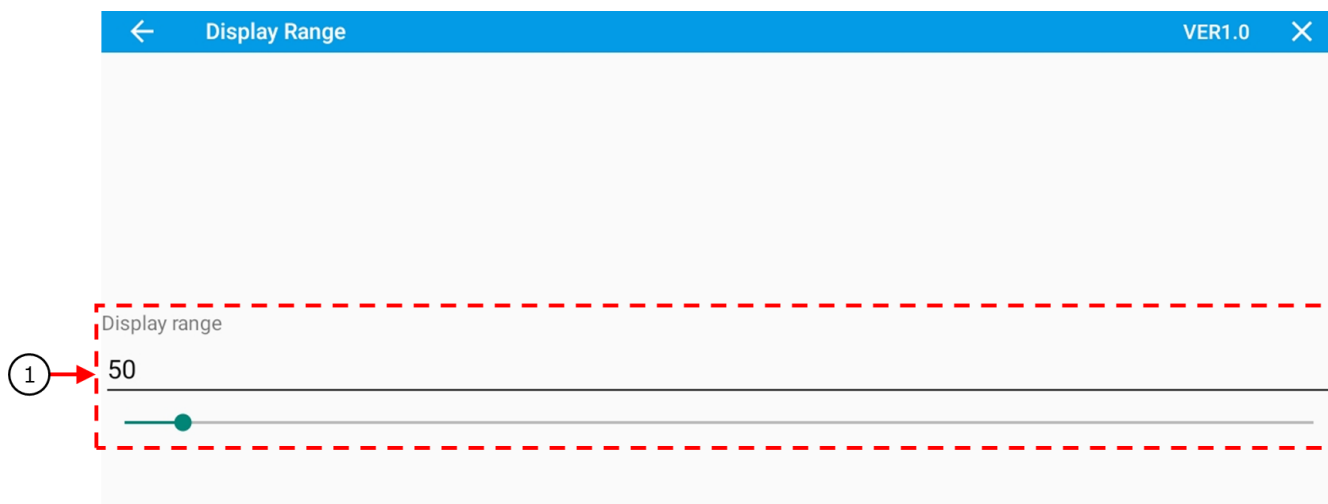
⑥ Tap this arrow to toggle the values shown in field ⑤.

⑦ This field shows the graphs of information received from the sensors regarding the selected parameter.

The starting time of each graph is based on field ⑤, and the scope of each graph depends on the settings on the *Graph drawing settings* pane and the *Graph range settings* pane. The colors of the graph lines correspond to the colors of the device names and addresses shown in field ⑧.

⑧ This field shows the device names and addresses of the sensors. The colors of the letters correspond to the colors of the lines in the graph ⑦. Tap a device name/address to open the *Parameter graphs per sensor* pane (Past CSV data) (see Section 6-5-4) for that sensor.

### 6-5-6. Graph range setting pane (Past CSV data)



- ① Use this field to designate the number of data items to be displayed. The range is between 50 and 1000.

\*Note that this is the number of data items. The time axis of the displayed graph varies with the sensing interval of the relevant past data.

### 6-5-7. Graph drawing settings pane (past CSV data)

	①	②	③	④
	Y axis auto adjust	Auto adjusting tolerance	Minimum	Maximum
Temperature (°C)	Enable <input checked="" type="checkbox"/>	5	-20	80
Humidity (%)	Enable <input checked="" type="checkbox"/>	5	0	100
Illuminance (lx)	Enable <input checked="" type="checkbox"/>	50	0	1000
Barometric pressure (hPa)	Enable <input checked="" type="checkbox"/>	50	300	1100
Voltage (V)	Enable <input checked="" type="checkbox"/>	1	0	3

- ① Set this toggle switch to “Enable” to have the scope of the Y axis (maximum and minimum values) adjusted automatically.

Set this toggle switch to “Disable” to use the settings in ③ and ④.

- ② When the toggle switch ① is set to “Enable,” the following minimum and maximum values are designated:

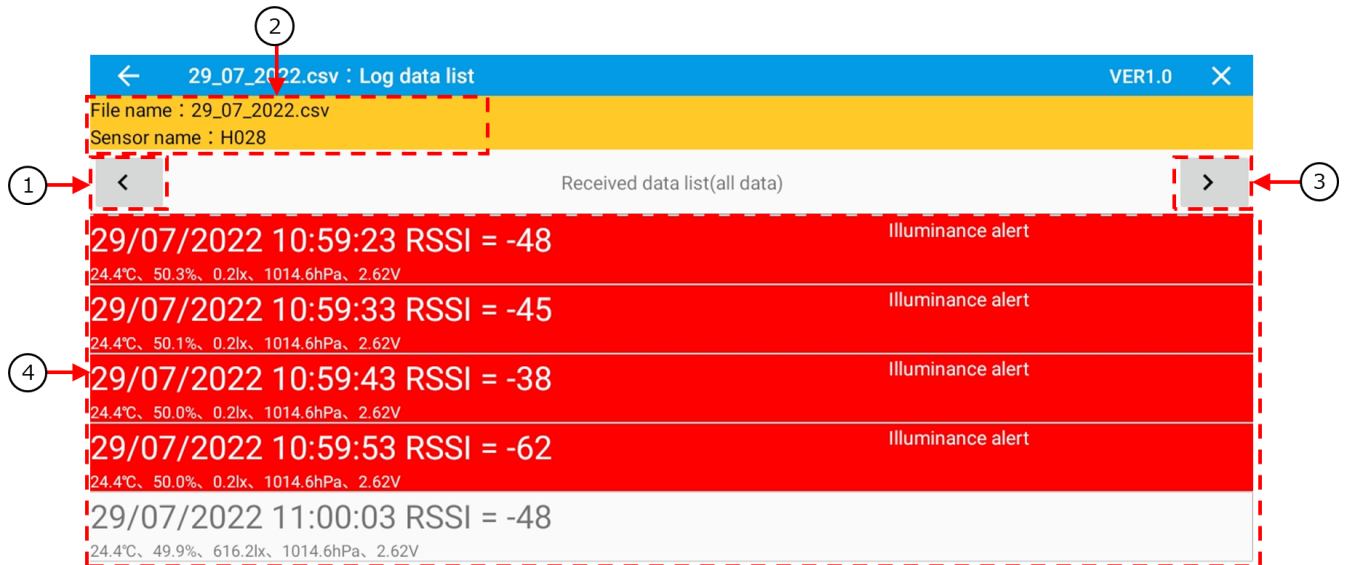
Minimum value: Minimum value received within the scope of the graph – Value designated in ②

Maximum value: Maximum value received within the scope of the graph + Value designated in ②

- ③ Use this field to designate the minimum value of the graph used when the toggle switch ① is set to “Disable.” Do not designate a value exceeding the maximum value.
- ④ Use this field to designate the maximum value of the graph used when the toggle switch ① is set to “Disable.” Do not designate a value lower than the minimum value.

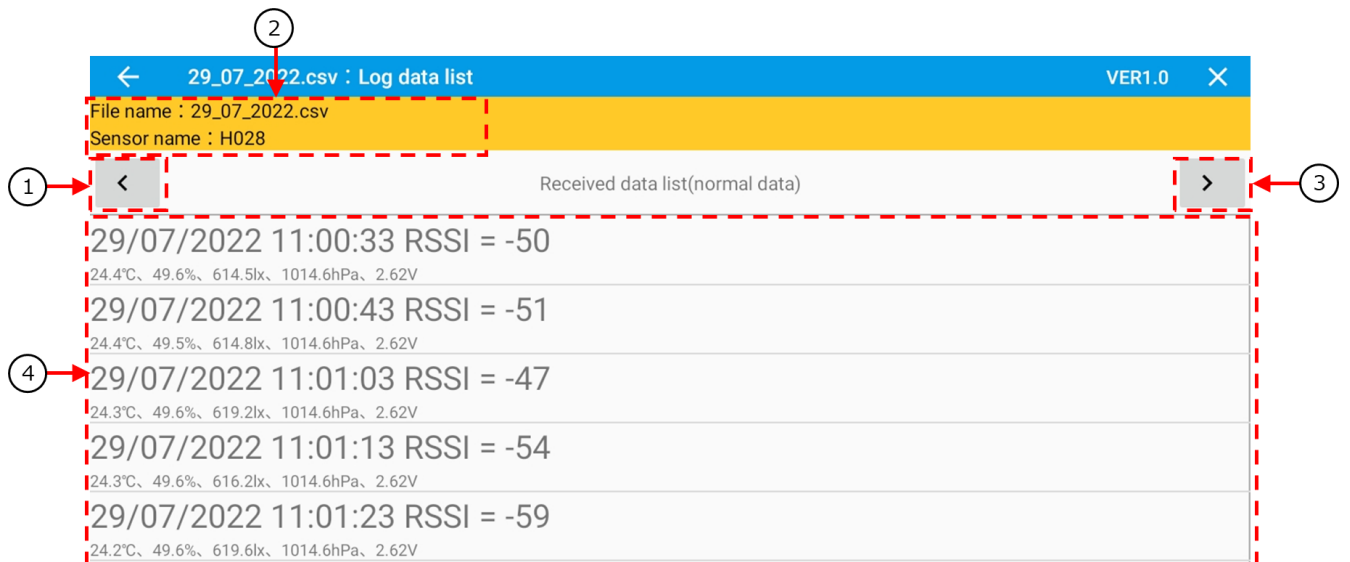
## 6-5-8. Log data list pane (Past CSV data)

### 6-5-8①. Log data list pane (all data)



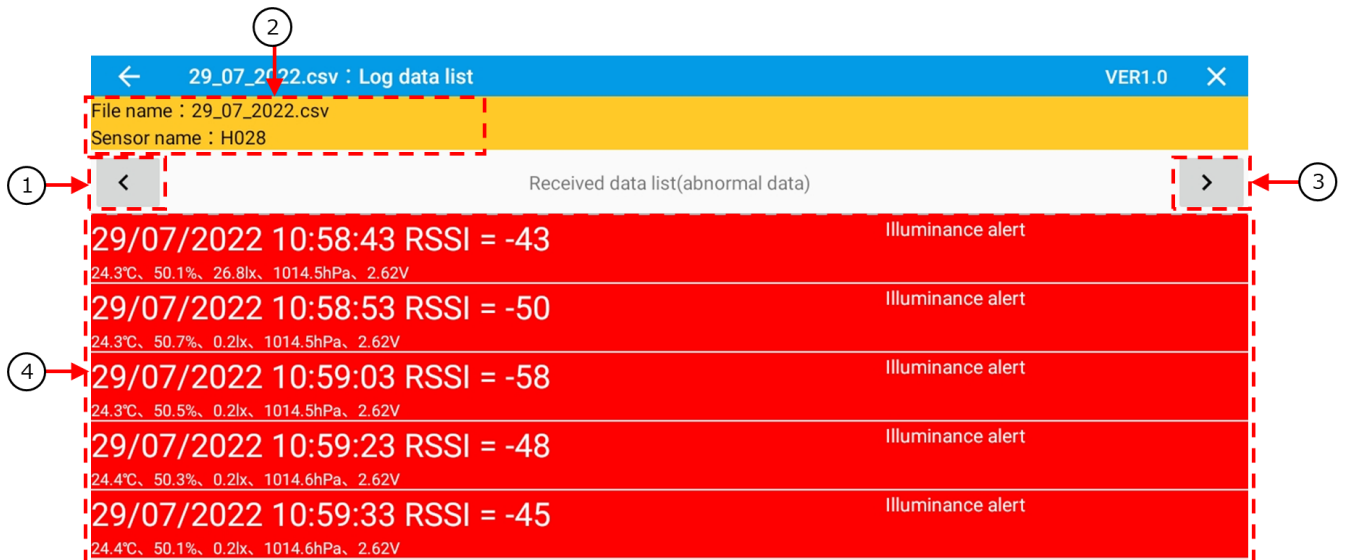
- ① Tap this button to open the *Log data list* pane (normal data) (see Section 6-5-8②).
- ② This field shows the CSV file name and device name for the selected sensor.
- ③ Tap this button to open the *Log data list* pane (abnormal data) (see Section 6-5-8③).
- ④ This field shows the log of all the information received from the selected sensor (reception time, RSSI value, temperature, humidity, barometric pressure, illuminance, and voltage). Tap a row to show the data on the *Log data* pane (Past CSV data) (see Section 6-5-2).

### 6-5-8②. Log data list pane (normal data)



- ① Tap this button to open the *Log data list* pane (abnormal data) (see Section 6-5-8③).
- ② This field shows the CSV file name and device name for the selected sensor.
- ③ Tap this button to open the *Log data list* pane (all data) (see Section 6-5-8①).
- ④ This field shows the log of normal information received from the selected sensor (reception time, RSSI value, temperature, humidity, barometric pressure, illuminance, and voltage). Tap a row to show the data on the *Log data* pane (Past CSV data) (see Section 6-5-2).

### 6-5-8③. Log data list pane (abnormal data)



- ① Tap this button to open the *Log data list* pane (all data) (see Section 6-5-8①).
- ② This field shows the CSV file name and device name for the selected sensor.
- ③ Tap this button to open the *Log data list* pane (normal data) (see Section 6-5-8②).
- ④ This field shows the log of error information received from the selected sensor (reception time, RSSI value, temperature, humidity, barometric pressure, illuminance, and voltage). Tap a row to show the data on the *Log data* pane (Past CSV data) (see Section 6-5-2).

## 7. Using the Sensors—Gateway Mode on Windows®

### 7-1. Preparation

#### 7-1-1. Required devices

To use Gateway mode, prepare the following devices:

- RICOH EH Relay for Wi-Fi™
- A tablet or PC with Windows® OS

#### 7-1-2. Windows® version

Operation in Gateway mode requires Windows®10.

#### 7-1-3. Installing the app on Windows®

1. Access the Environment Sensor Download website, and download the RICOH EH Environment Sensor App for Windows®.
2. Double-click the Setup file (shown below) to start the installer.



3. Select the folder and user.
4. Click OK to proceed with the installation.
5. The app icon is created, and installation is completed.

## 7-2. Configuring the RICOH EH Relay for Wi-Fi™

### 7-2-1. Relay hardware

■ For the functions of the relay hardware, see Section 4-4, *Parts and Functions*.

#### ■ Reset button

To load factory defaults to reset the hardware, connect the supplied USB Type-C™ cable to the relay and AC adapter, connect the AC adapter to a wall socket, and hold down the reset button (for five seconds or longer) until the network status LED turns off. As you release the button, the relay will restart with the factory defaults loaded.

#### ■ Configuration pane access lock

The relay has a security lock feature: access to the configuration pane will be automatically locked in 15 minutes after the relay has been plugged in and you can no longer log in. To configure the relay, do so within 15 minutes after the relay has been plugged in. If you need to configure the relay after 15 minutes have passed, unplug the relay, and restart it.

The defaults for Username and Password are shown on the sticker supplied with the product.



## 7-2-2. Connecting the relay and the PC

To configure the relay, connect it to the PC via Wi-Fi.

Plug in the relay and it will be available as a Wi-Fi access point for connection from a PC.

### **●Important: Notes on relay connection**

Protect the relay from illegal alterations by a malicious third party. When configuring it, use a dedicated network that allows the relay to be accessed only by an eligible PC.

The SSID of the relay is in the format below.

**SSID: iGS03M ■■ ■■**

\*The squares (■) are the lower four digits of the MAC address shown on the back panel of the relay.

On the PC, select the above SSID and enter the security key to set up a Wi-Fi connection. The default security key is as shown below.

**Initial SSID security key: r000920431778**

### **●Important: Managing SSID security key**

You can change the SSID security key (see Section 7-2-3., *Configuring the relay*).

Change the security key under appropriate management to prevent illegal access.

\*Make sure that you remember the new security key; without it the relay cannot be reconnected later. Take a note of the security key as necessary.

If you forget the security key, you will have to return the entire relay configuration to factory defaults. If that is the case, use the reset button (see Section 7-2-1., *Relay hardware*).

### 7-2-3. Configuring the relay

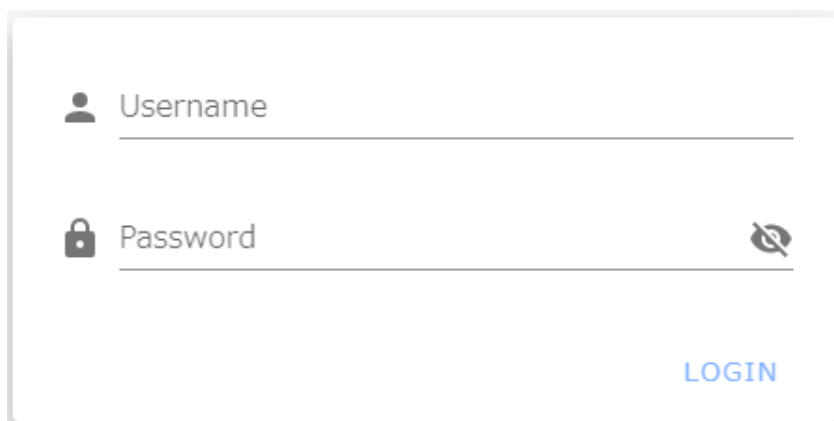
#### ■Log in

Make sure that your PC is connected to the relay via Wi-Fi. On your web browser, enter the IP address below in the address bar to connect to the Web Configuration window.

**IP address: 192.168.10.1**

\*Recommended web browser: Google Chrome

Once the connection is successful, the following log-in dialogue box will be displayed:

A log-in dialogue box with a white background and a thin grey border. It contains two input fields: the top one is labeled 'Username' with a person icon to its left; the bottom one is labeled 'Password' with a lock icon to its left and a 'show/hide' icon (an eye with a slash) to its right. A blue 'LOGIN' button is positioned in the bottom right corner of the box.

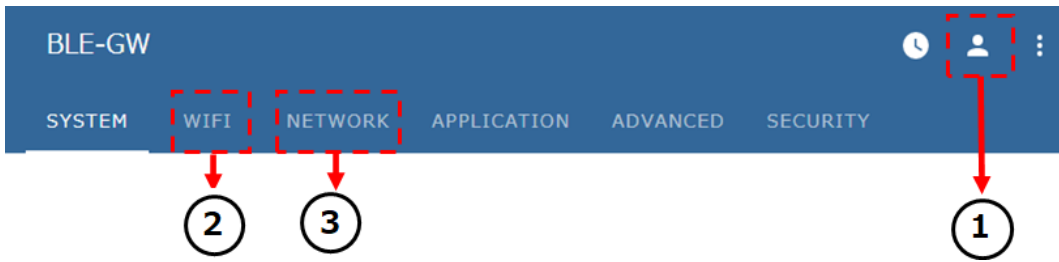
The default username and password are as follows:

**Username: ricoh-eh-dssc**

**Password: ricoh-eh-dssc**

Once you have successfully logged in, the following menu bar will be displayed:

[Menu bar]



**●Important: Managing log-in password**

You can change the password to log in to the Web Configuration window as described below.

Change the password under appropriate management to prevent illegal access.

\*Make sure that you remember the new password, or you can no longer access the Web Configuration window. Record the password as necessary.

If you forget the password, you will have to return the entire relay configuration to factory defaults. If that is the case, use the reset button (see Section 7-2-1., *Relay hardware*).

■Changing the password to the Web Configuration window

1. In the top-right corner of the menu bar, click the User icon (①).
2. The following dialogue box will be displayed.

A dialog box titled 'Change Password'. It contains three input fields, each with a password icon (an eye with a slash) to its right. The fields are labeled 'Enter current password', 'Enter new password', and 'Enter new password again'. At the bottom of the dialog box, there are two buttons: 'CANCEL' and 'SAVE'.

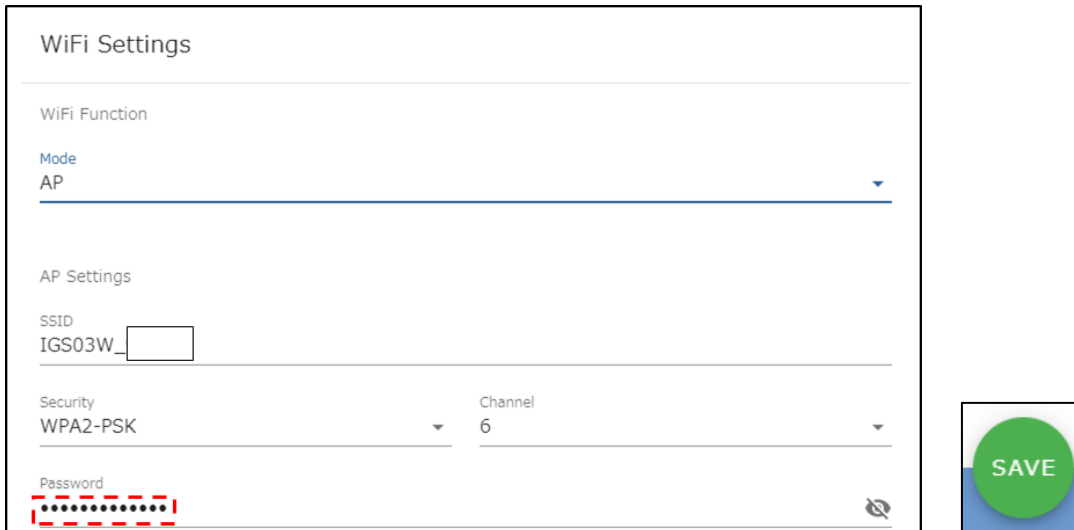
3. Fill in the three fields and click SAVE.

**●Important: Managing the log-in password**

Do not use a password that can easily be guessed by a third party. For instance, do not use your date of birth or name for your password.

### ■ Changing the SSID security key

1. On the menu bar, click WIFI (@).
2. The WiFi Settings dialogue box will be displayed. In the bottom-left corner, locate the Password section (shown in a red dotted frame in the figure below). Type the new security key and click the SAVE button at the bottom right.
3. The REBOOT button will be shown below the menu bar. Click the REBOOT button to restart the relay and complete the security key change.



WiFi Settings

WiFi Function

Mode  
AP

AP Settings

SSID  
IGS03W

Security  
WPA2-PSK

Channel  
6

Password  
.....

SAVE

### ● **Important: Managing SSID security key**

Do not use a security key that can easily be guessed by a third party. For instance, do not use your date of birth or name for your security key.

### 7-2-4. Configuring the relay (when connecting only one relay)

Once you have finished the steps described in Sections 7-2-1 and 7-2-3, you are ready to connect your PC to the D201/D202 sensor(s) via one relay. Proceed to Section 7-3, *Registering Relays and Sensors*.

When you connect just one relay directly to your PC, use the same IP address as that used for configuring the relay via a web browser.

**Default IP address of the relay: 192.168.10.1**

## 7-2-5. Configuring the relays (when connecting multiple relays) \*Up to six relays can be connected to a Windows PC.

To connect multiple relays, you need to prepare an access point before connection. For each of the relays to connect, check the MAC address printed on the back panel. On the network the access point belongs to, assign a unique IP address to each MAC address via DHCP. (Fixed DHCP)

### ■Configuring Station mode

1. On the menu bar described in Section 7-2-3, *Configuring the Relay*, click WIFI (②).

WiFi Function

The screenshot shows the WiFi Function configuration screen. At the top, there is a 'Mode' dropdown menu with 'Station' selected, indicated by a red arrow and a circled '1'. Below it is an 'AP' dropdown menu. The 'SSID' field is empty, indicated by a red arrow and a circled '3'. The 'Security' field is set to 'WPA2-PSK', indicated by a red arrow and a circled '4'. The 'Password' field is masked with dots, indicated by a red arrow and a circled '5'. A 'SCAN' button is visible on the right, indicated by a red arrow and a circled '2'. There is also a small icon of a key in the bottom right corner.

2. In the Mode field (①) above, change AP to Station.
3. Click SCAN (②) to select the access point to connect to.

\* If the target access point is not displayed after SCAN is clicked, you can type the SSID directly in the SSID field (③). When an access point has been selected through SCAN, nothing needs to be entered in the SSID field (③).

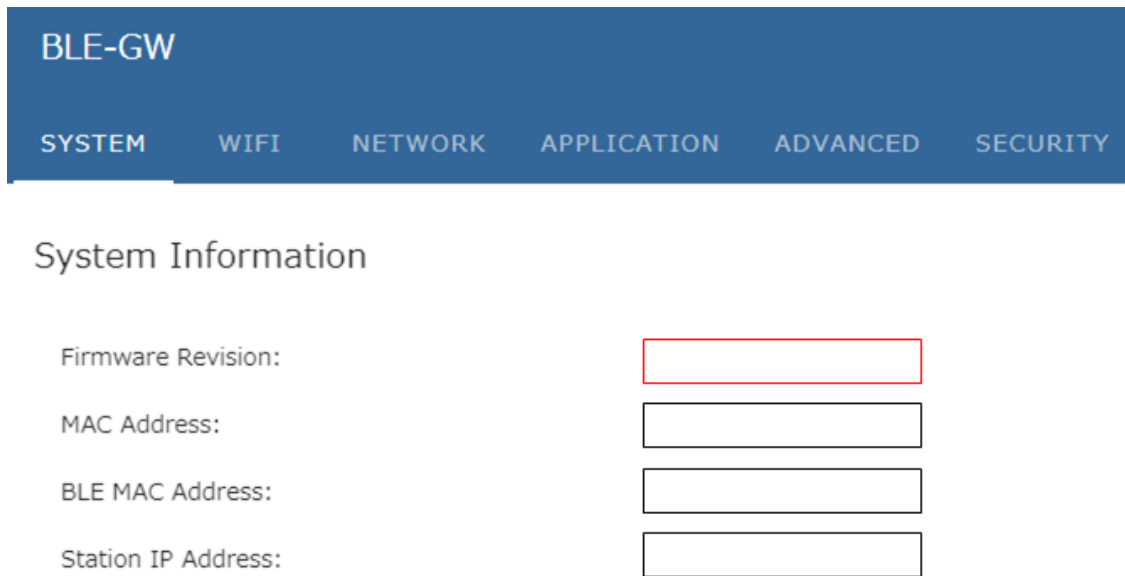
### ●**Note: Access point to connect to**

Protect the relay from illegal alterations by a malicious third party. Connect the relay to a proper access point under your management.

4. The entry to the Security field (④) is automatically detected and selected when the access point is selected through SCAN (②). To manually type the SSID (③), select and designate the Security setting on your own.
5. In the Password field (⑤), type the password corresponding to the selected access point.
6. Click the SAVE button that appears at the bottom right, and then click the REBOOT button that appears under the menu bar. This completes the configuration of Station mode.
7. Using the IP address assigned for fixed DHCP on the access point side, configure the RICOH EH Environment Sensor App for Windows® (see Section 7-3).
8. Repeat steps 1 to 7 for each relay individually.

## 7-2-6. Checking the relay firmware revision

When you log in as described in Section 7-2-3, *Configuring the relay*, the following pane is displayed first:



The screenshot shows a web interface for a BLE-GW device. At the top, there is a dark blue header with the text "BLE-GW" in white. Below the header is a navigation menu with six tabs: "SYSTEM", "WIFI", "NETWORK", "APPLICATION", "ADVANCED", and "SECURITY". The "SYSTEM" tab is currently selected and highlighted. Below the navigation menu, the "System Information" section is displayed. It contains four rows of labels and input fields:

Firmware Revision:	<input type="text"/>
MAC Address:	<input type="text"/>
BLE MAC Address:	<input type="text"/>
Station IP Address:	<input type="text"/>

The firmware revision of the relay is shown in the red frame.

For the latest firmware revision, check the datasheets on page 16 of this manual.

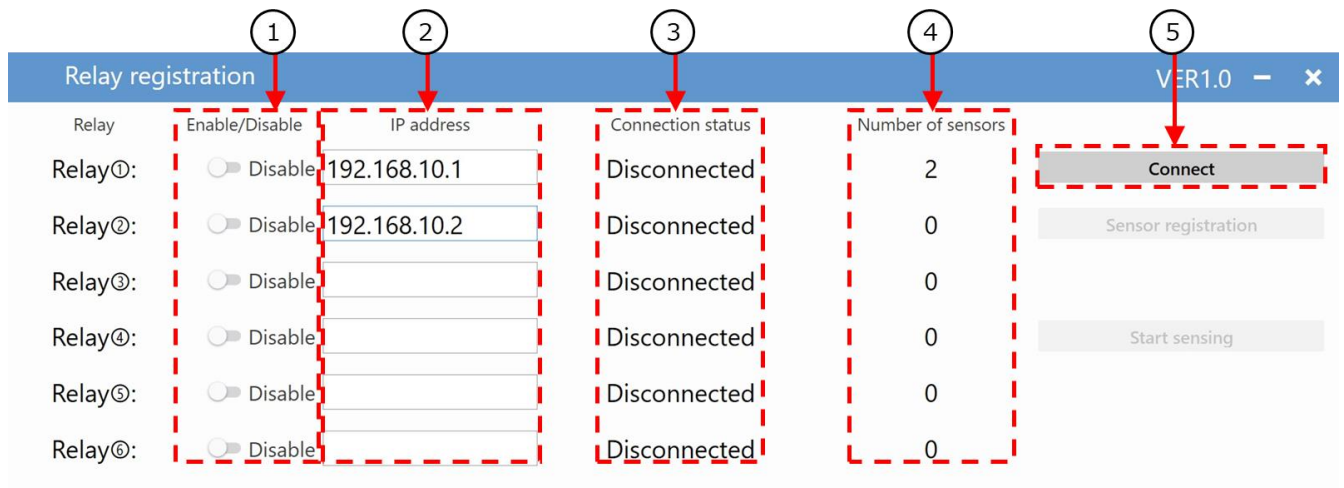
## 7-3. Overview of RICOH EH Environment Sensor App for Windows®

The app has three functions: sensor registration, sensor reception, and log reading.

When the app is used for the first time, the sensor registration function is automatically started because no sensor has been registered.

## 7-4. Sensor Registration

### 7-4-1. Relay registration pane (Disconnected)



- ① Use the toggle switches to enable and disable the connection to the relays corresponding to the IP addresses (②).
- ② Use this field to assign an IP address to each relay.
- ③ This field shows the status of communication with each relay.
- ④ This field shows the number of environment sensors registered to each relay.
- ⑤ Tap this button to start connection to the relays. The PC will be connected only to those relays for which a valid IP address is designated in the IP address field (②) and the toggle switch (①) is set to Enable. Once connection has been established with one or more relays, the status of the *Relay registration* pane will become “connected” (see Section 7.4.2).

\* An invalid IP address will be cleared when the button (⑤) is tapped, and the registration of the corresponding relay will be invalidated. If the same IP address is assigned to multiple relays, that for the relays of greater numbers will be invalidated.

## 7-4-2. Relay registration pane (Connected)

Relay	Enable/Disable	IP address	Connection status	Number of sensors	
Relay①:	<input checked="" type="radio"/> Enable	192.168.10.1	Connected	2	Disconnect (1)
Relay②:	<input type="radio"/> Disable	192.168.10.2	Disconnected	0	Sensor registration (2)
Relay③:	<input type="radio"/> Disable		Disconnected	0	
Relay④:	<input type="radio"/> Disable		Disconnected	0	Start sensing (3)
Relay⑤:	<input type="radio"/> Disable		Disconnected	0	
Relay⑥:	<input type="radio"/> Disable		Disconnected	0	

- ① Tap this button to disconnect the relays.

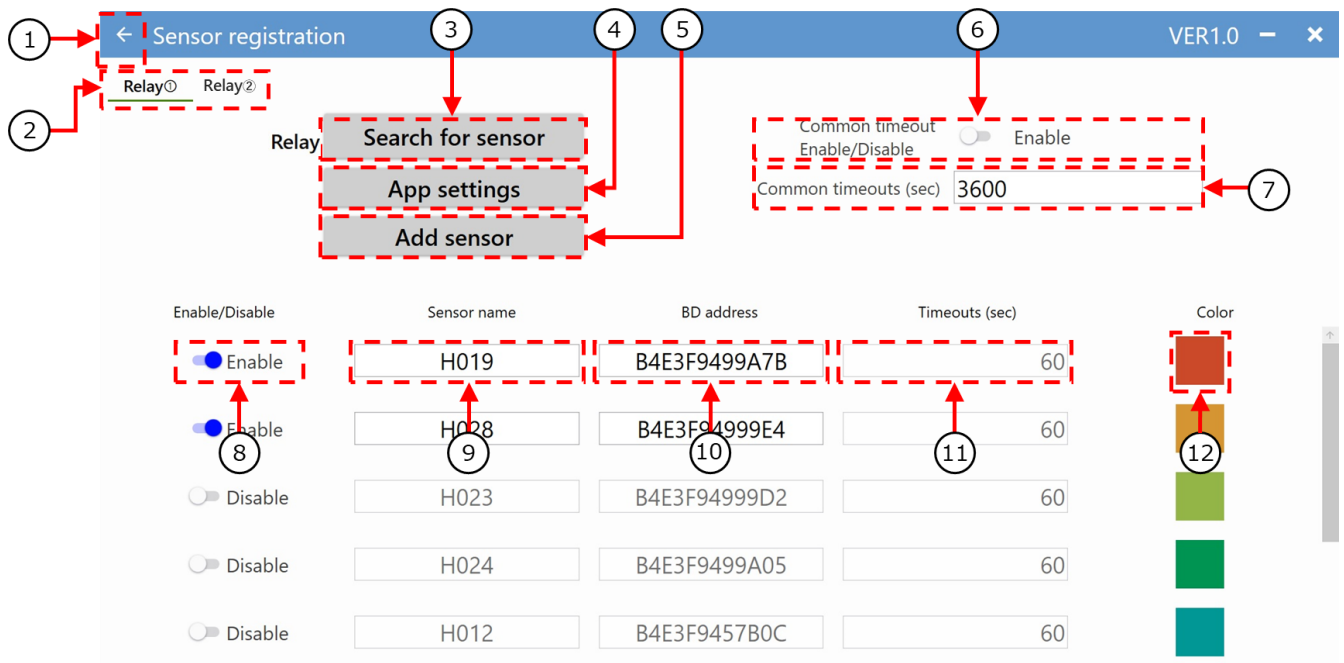
Once the relays are disconnected, the status of the *Relay registration* pane will become “unconnected.”

- ② Tap this button to open the *Sensor registration* pane (see Section 7-4-3).
- ③ When the relays are connected and at least one relay has at least one sensor registered to it, tapping this button will open the *Received data* pane (connected) (see Section 7-5-2).

\*Upon start of the communication, relays with no sensor registered are disconnected and invalidated.



### 7-4-3. Sensor registration pane



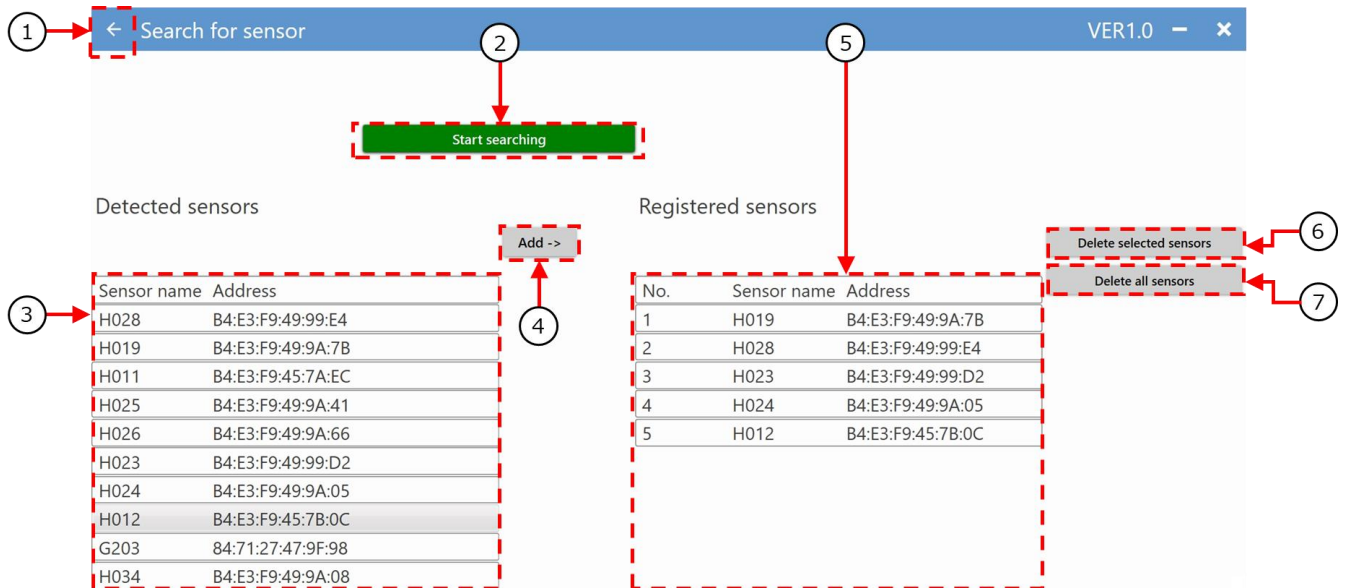
- ① Tap this button to open the *Relay registration* pane (see Section 7-4-1).
- ② Tap to select the relay to configure.
- ③ Tap this button to open the *Sensor search* pane (see Section 7-4-4).
- ④ Tap this button to open the *App settings* pane (see Section 7-4-5).
- ⑤ Tap the Add button to add a blank sensor settings field.
- ⑥ Use this toggle switch to enable and disable common timeout.
 

When common timeout is enabled (Common timeout ON), the value in ⑦ is used for reception interruption judgment.

When common timeout is disabled (Common timeout OFF), the value in ⑪ is used for reception interruption judgment.
- ⑦ When common timeout is enabled with the toggle switch ⑥, the timeout value in this field is used for reception interruption judgment.
- ⑧ Use this toggle switch to enable and disable registration of the BD address of the sensor shown in ⑨.
- ⑨ This field shows the sensor name. You can designate a unique name for each sensor.
- ⑩ Designate the BD address of each sensor. An invalid BD address will be cleared when a different pane is opened, and the registration will be invalidated.
 

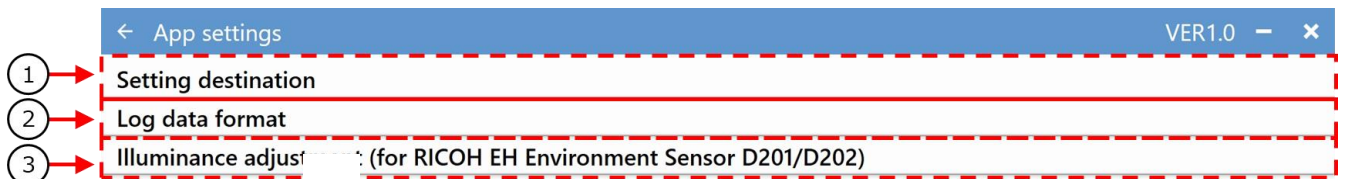
\*When typing a BD address directly, omit the colons (:).
- ⑪ When common timeout is disabled with the toggle switch ⑥, the timeout value in this field is used for reception interruption judgment.
- ⑫ Tap this button to open the *Select sensor to set color* pane (see Section 7-4-6).

### 7-4-4. Sensor search pane



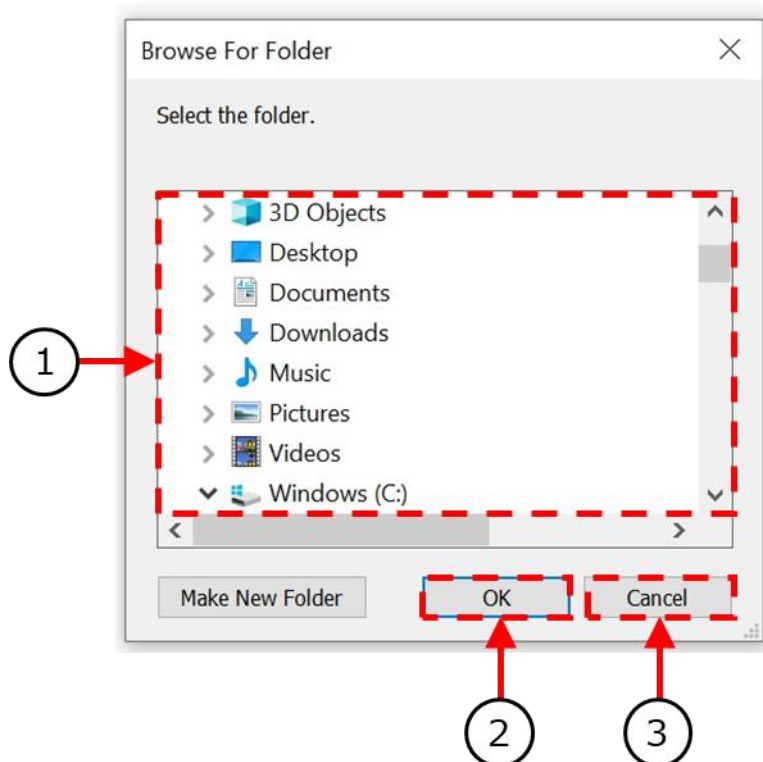
- ① Tap this arrow to open the *Sensor registration* pane (see Section 7-4-3).
- ② *Start search* displayed: No sensor search is in progress. Tap the button to start searching for sensors.  
*Stop search* displayed: Sensor search is in progress. Tap the button to stop the search.
- ③ This field shows the device name (local name) and BD address of the environment sensors found through the search (②).
- ④ Tap and select sensors in the ③ field, and tap this button to add them to the whitelist. When a sensor is selected, the search will stop.
- ⑤ This field shows the sensors registered to the whitelist (the list of sensors selected for data sensing).
- ⑥ Tap and select sensors in the ⑤ field, and tap this button to delete them from the whitelist.
- ⑦ Tap this button to delete all the sensors in the ⑤ field from the whitelist.

### 7-4-5. App settings pane



- ① Tap this field to open a dialogue box for designating the storage location. For more information, see Section 7-4-5①, *App settings (log data save area)*.
- ② Tap this field to open the *App settings* pane (log data format) (See Section 7-4-5②).
- ③ Tap this field to open the *App settings* pane (illuminance adjustment) (See Section 7-4-5③).

#### 7-4-5①. App settings (log data save area)



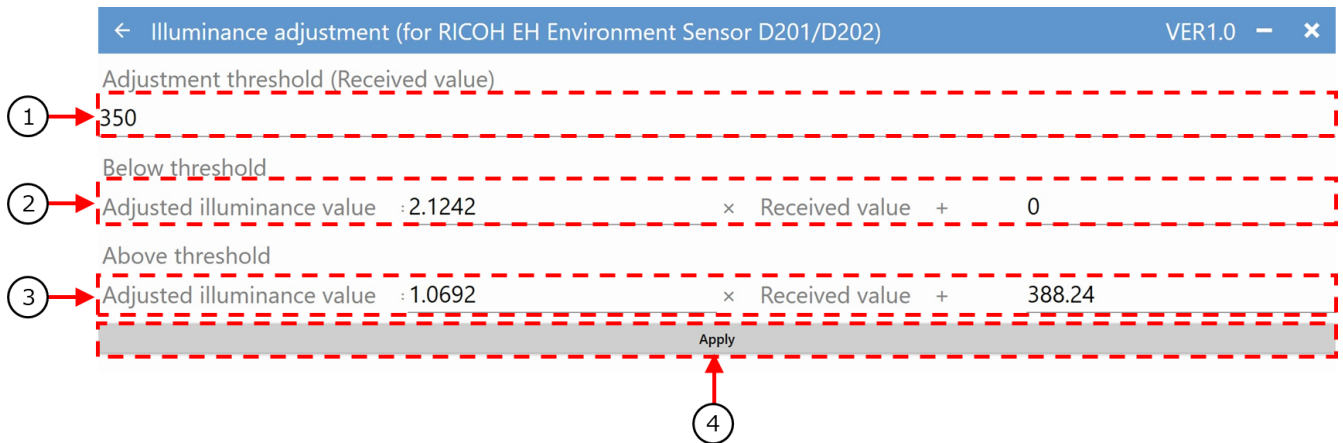
- ① Select the folder to store the log file in.
- ② Tap OK to enable the selection in ① and close the dialogue box.
- ③ Tap Cancel to close the dialogue box without making changes.

#### 7-4-5②. App settings (log data format)



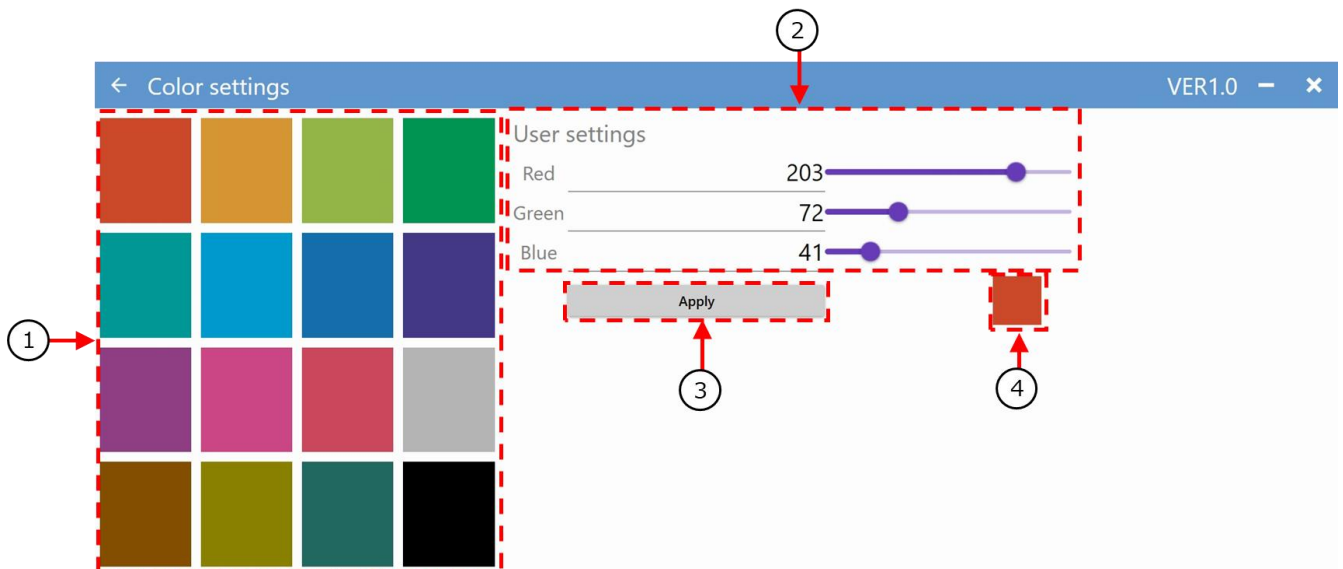
- ① Tap this field to store the log in the yyyy\_MM\_dd\_HH.csv format.
- ② Tap this field to store the log in the relayX\_yyyy\_MM\_dd.csv (X = ① to ⑥) format.
- ③ Tap this field to store the log in both the yyyy\_MM\_dd\_HH.csv and relayX\_yyyy\_MM\_dd.csv (X = ① to ⑥) formats.

### 7-4-5③. App settings pane (illuminance adjustment)



- ① Designate a threshold for choosing the adjustment formula for the received data (illuminance) from ② and ③.
- ② Designate the value for the adjustment formula applied when the received data (illuminance) is less than the threshold (①).
- ③ Designate the value for the adjustment formula applied when the received data (illuminance) is equal to or greater than the threshold (①).
- ④ Tap this button to return to the previous pane.

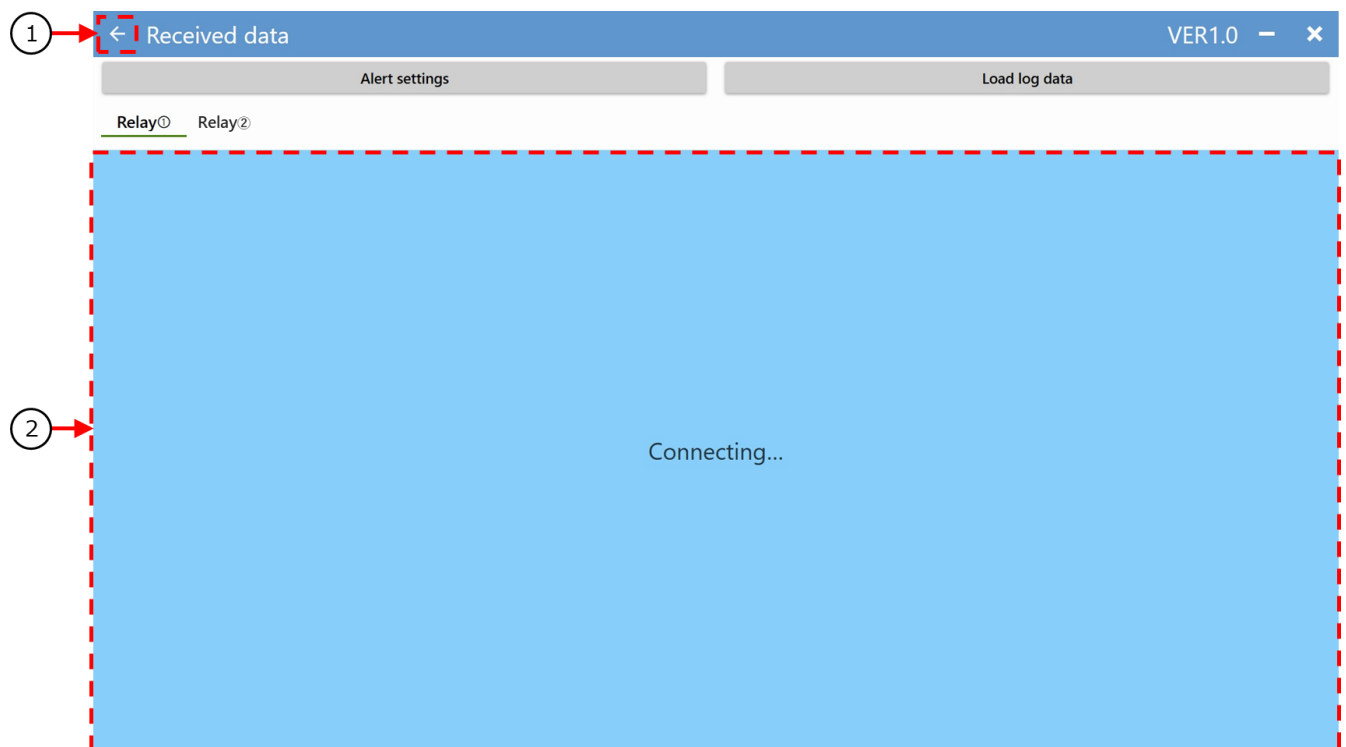
### 7-4-6. Color settings pane



- ① Tap a color, and the previous pane will be opened with the tapped color reflected.
- ② Use this field to designate RGB values (0 to 255) to make a color of your preference.
- ③ Tap this button, and the previous pane will be opened with the color in ② reflected.
- ④ This field shows the color corresponding to the RGB values set in ②.

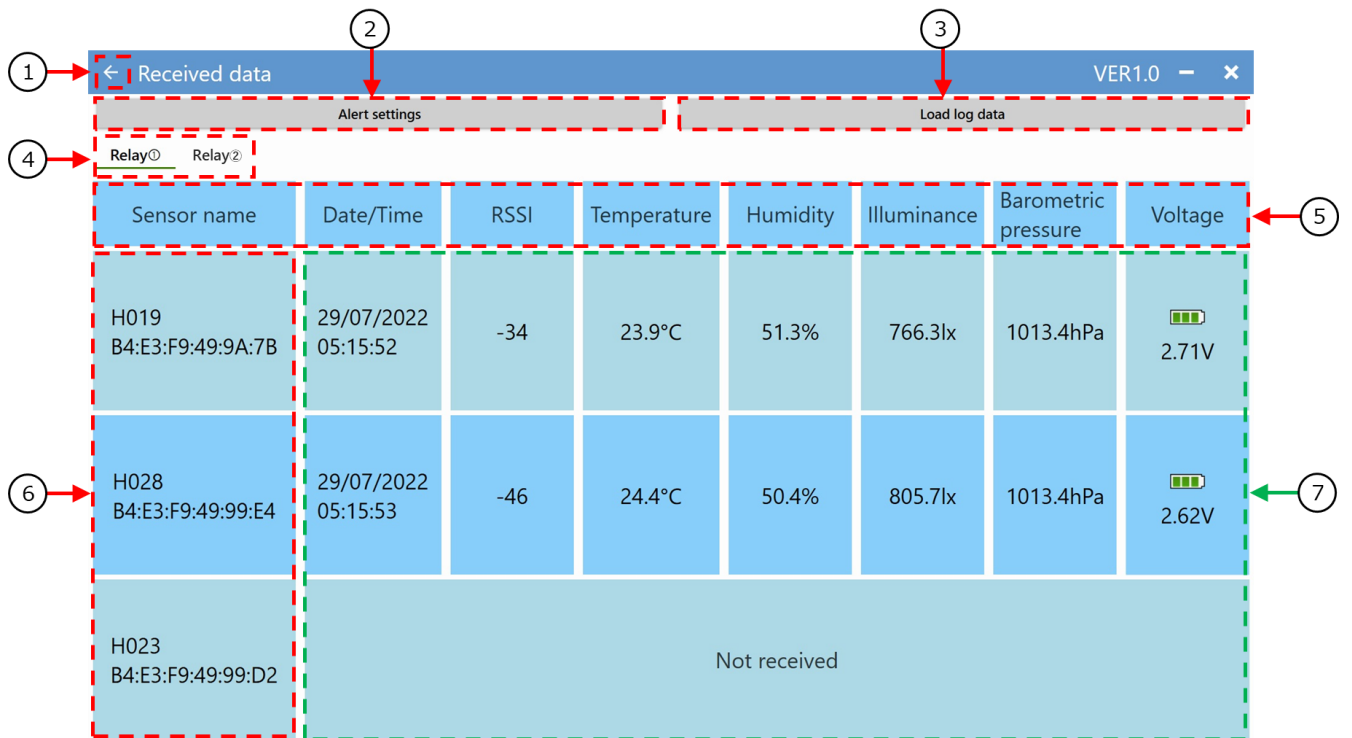
## 7-5. Data Reception

### 7-5-1. Received data pane (connecting)



- ① Tap this arrow to open the *Relay registration* pane (see Section 7-4-1).
- ② This field indicates the progress of connection to the relays.

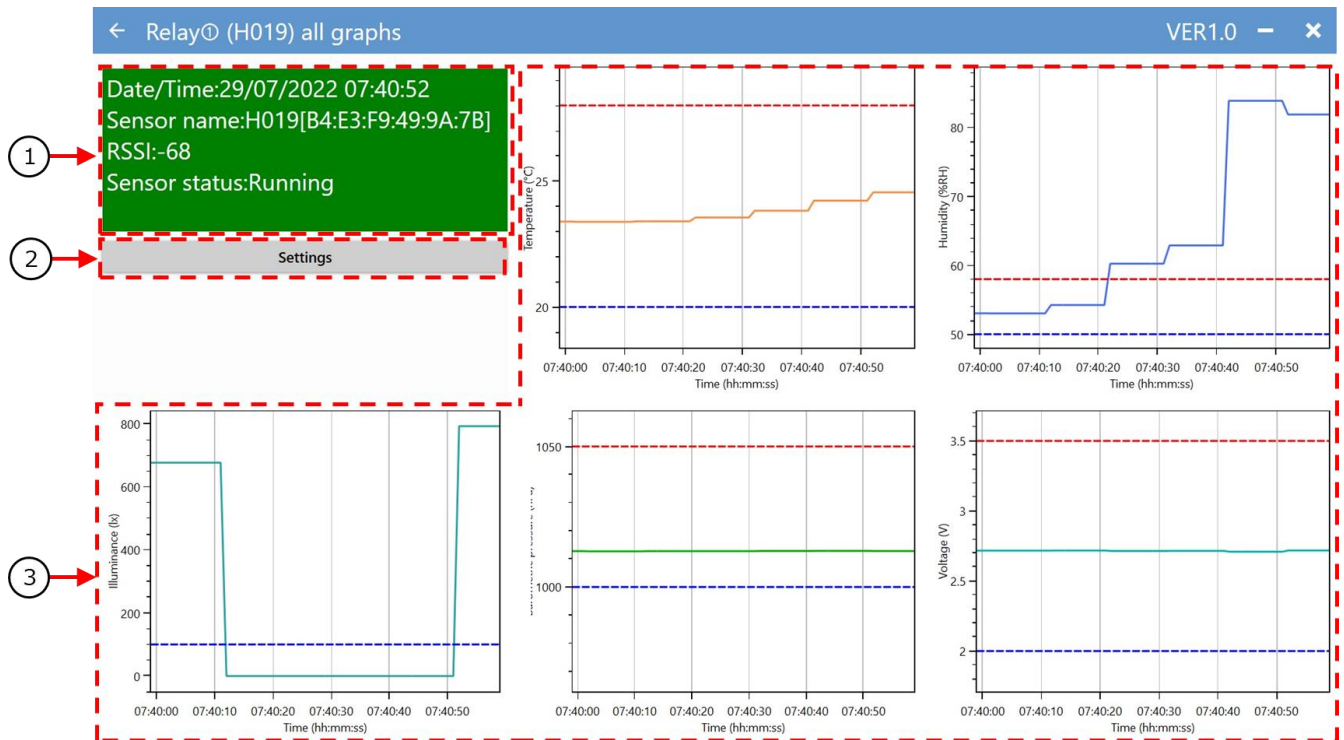
## 7-5-2. Received data pane (connected)



- ① Tap this arrow to open the *Relay registration* pane (see Section 7-4-1).
- ② Tap this button to open the *Alert settings* pane (see Section 7-5-8).
- ③ Tap this button to open the *Read log data* pane (see Section 7-6-1).
- ④ Tap to select the relay to be displayed.
- ⑤ These fields represent parameter names.  
Tap a parameter name (Temperature, Humidity, Illuminance, Barometric pressure, or Voltage) to open the *Sensor graphs per parameter* pane (see Section 7-5-4) for that parameter.
- ⑥ This field displays the device names and addresses of the sensors on the whitelist.  
Tap a device name to open the *Graphs* pane (see Section 7-5-3) for that sensor.
- ⑦ These fields show the last parameter values received from each sensor. “Not received” will be displayed if no data has yet been received from the relevant sensor.

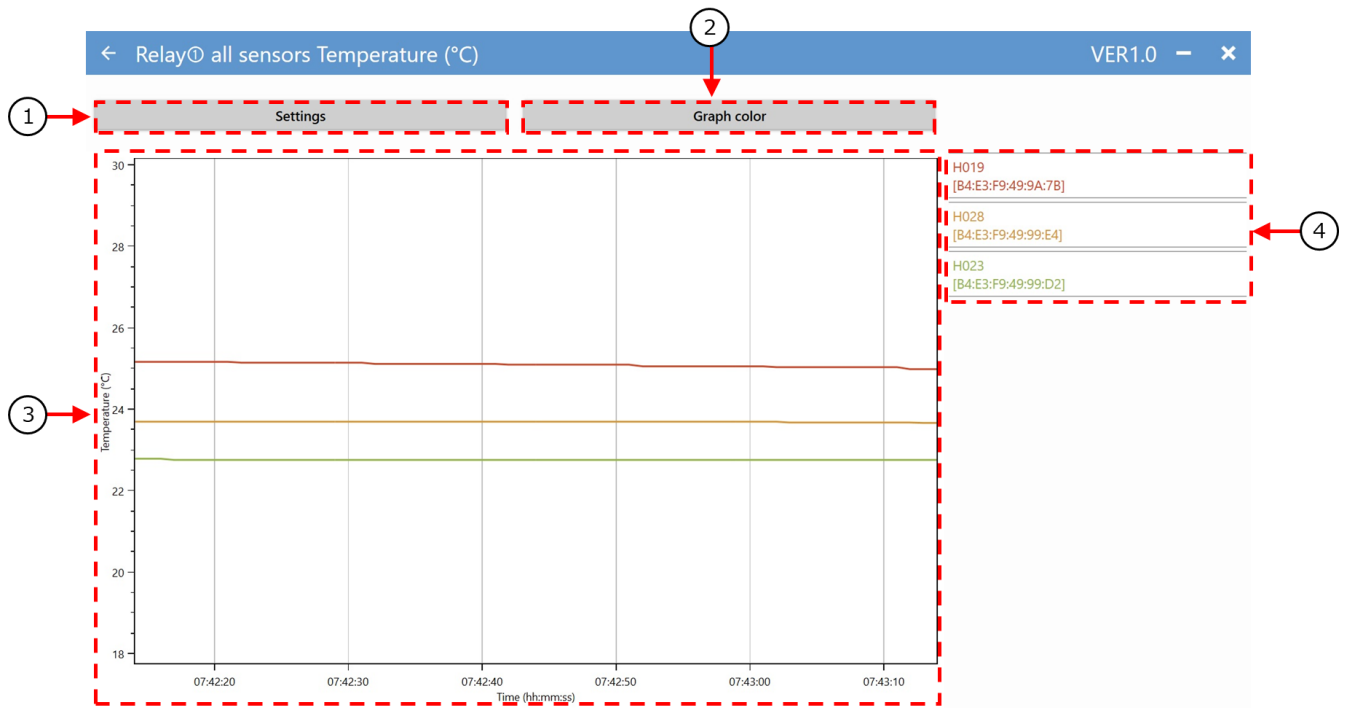
\*The illuminance value shown here has been calculated from the received data using the adjustment formula. For more information, see Section 7-4-5③, *App settings* pane (illuminance adjustment).

### 7-5-3. Graphs pane



- ① This field shows the following information for the selected sensor: time of last reception, sensor name, BD address, RSSI value upon last reception, and communication status.  
Tap this field to open the *Log data list* pane (see Section 7-5-5).
- ② Tap this button to open the *Graph drawing settings* pane (see Section 7-5-6).
- ③ This field shows the graphs of the information received from the selected sensor. The scope of each graph depends on the settings on the *Graph drawing settings* pane (see Section 7-5-6). Tap a graph to open the *Sensor graphs per parameter* pane for that parameter (see Section 7-5-4). The thresholds designated on the *Alert settings* pane (see Section 7-5-8) is shown as a dashed line (red for the upper threshold and blue for the lower threshold).

### 7-5-4. Sensor graphs per parameter pane

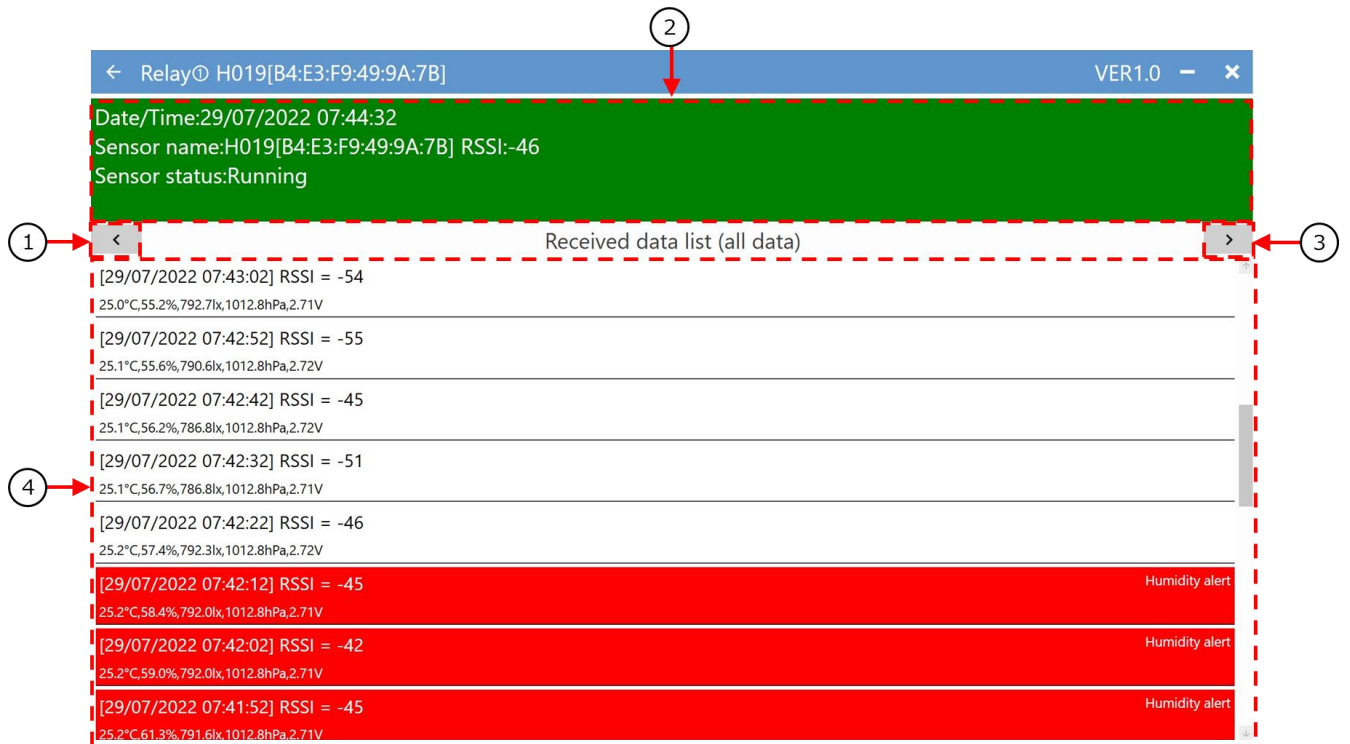


- ① Tap this button to open the *Graph drawing settings* pane (see Section 7-5-6).
- ② Tap this button to open the *Color settings* pane (see Section 7-5-7).
- ③ This field shows the graphs of information received from the sensors on the whitelist regarding the selected parameter.  
The colors of the graph lines correspond to the colors of the device names and addresses shown in field ④.
- ④ This field shows the device names and addresses of the sensors on the whitelist. The colors of the letters correspond to the colors of the lines in the graph ③. Tap a device name/address to open the *Graphs* pane (see Section 7-5-3) for that sensor.



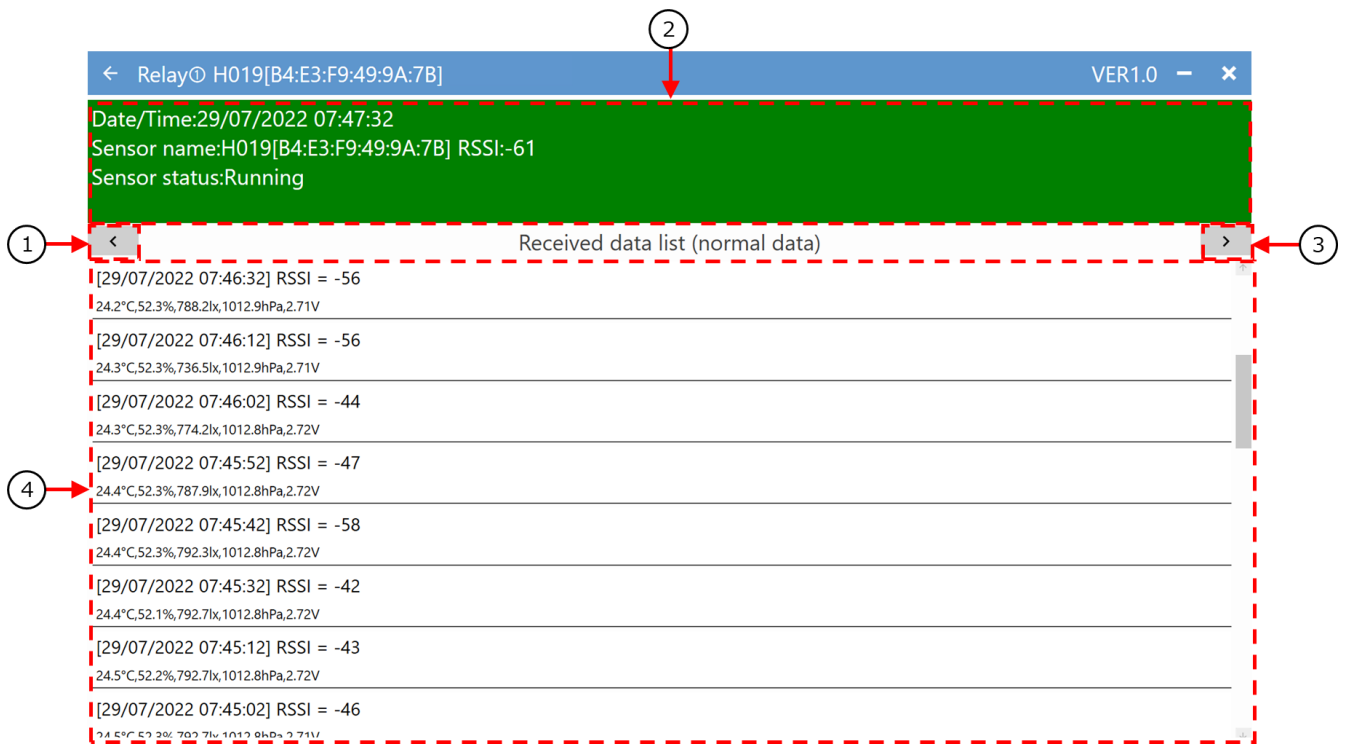
## 7-5-5. Log data list pane

### 7-5-5① Log data list pane (all data)



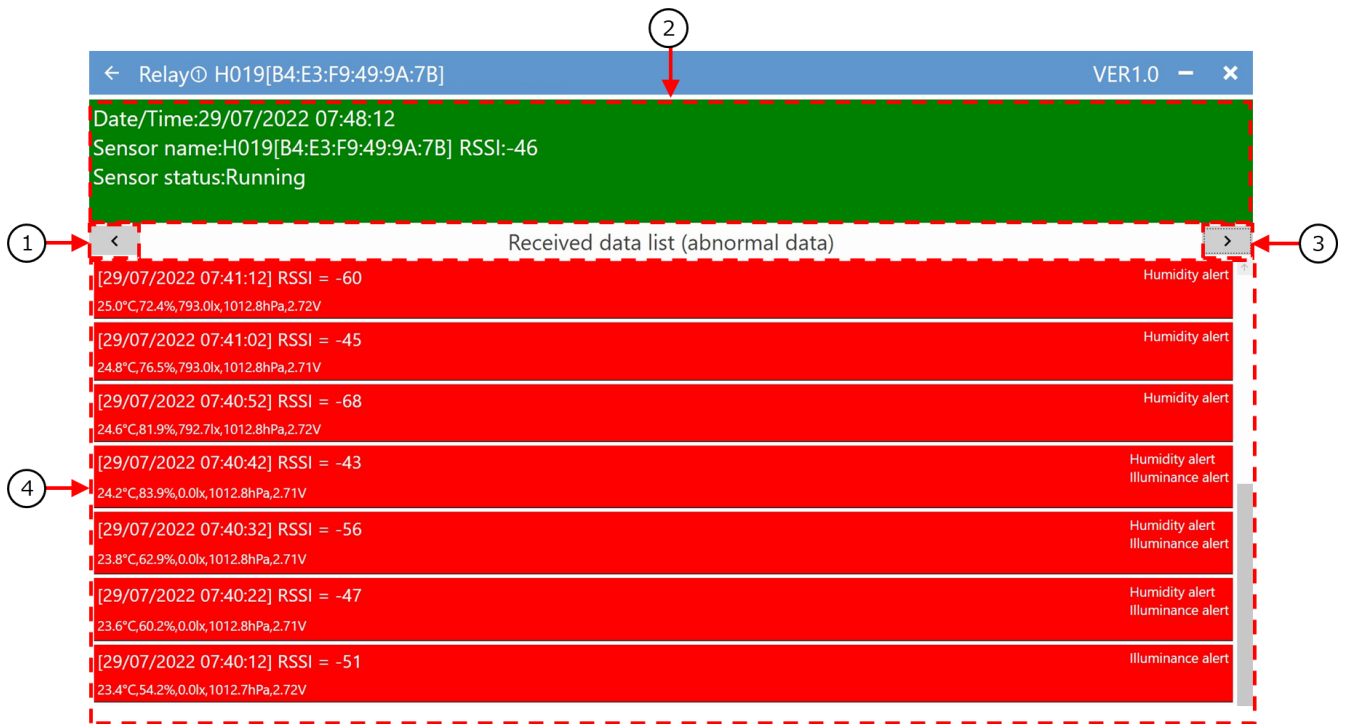
- ① Tap this arrow to open the *Log data list* pane (normal data) (see Section 7-5-5②).
- ② This field shows the following information for the selected sensor: time of last reception, sensor name, BD address, RSSI value upon last reception, and communication status.
- ③ Tap this arrow to open the *Log data list* pane (abnormal data) (see Section 7-5-5③).
- ④ This field shows the log of all the information received from the selected sensor (reception time, RSSI value, temperature, humidity, barometric pressure, illuminance, and voltage).

### 7-5-5②. Log data list pane (normal data)



- ① Tap this arrow to open the *Log data list* pane (abnormal data) (see Section 7-5-5③).
- ② This field shows the following information for the selected sensor: time of last reception, sensor name, BD address, RSSI value upon last reception, and communication status.
- ③ Tap this arrow to open the *Log data list* pane (all data) (see Section 7-5-5①).
- ④ This field shows the log of normal information received from the selected sensor (reception time, RSSI value, temperature, humidity, barometric pressure, illuminance, and voltage).

### 7-5-5③. Log data list pane (abnormal data)



- ① Tap this arrow to open the *Log data list* pane (all data) (see Section 7-5-5①).
- ② This field shows the following information for the selected sensor: time of last reception, sensor name, BD address, RSSI value upon last reception, and communication status.
- ③ Tap this arrow to open the *Log data list* pane (normal data) (see Section 7-5-5②).
- ④ This field shows the log of error information received from the selected sensor (reception time, RSSI value, temperature, humidity, barometric pressure, illuminance, and voltage).

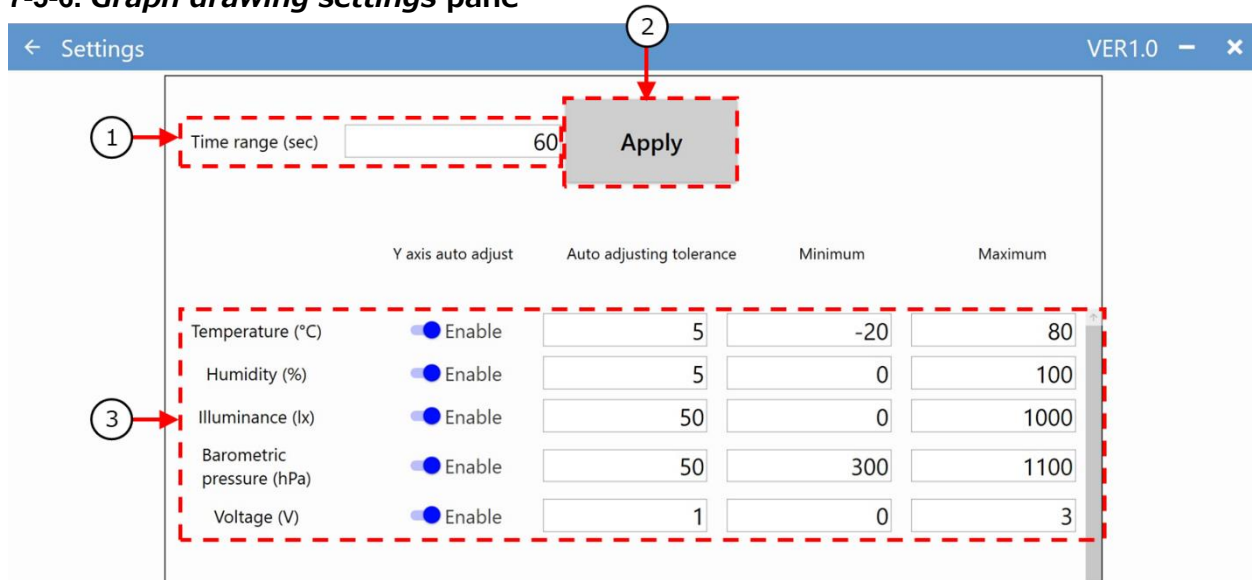
### 7-5-5④. Log file contents

DATA1	DATA2	DATA3	DATA4	DATA5	DATA6	DATA7	DATA8	DATA9	DATA10	DATA11	DATA12	DATA13	DATA14
Time	Sensor name	BD address	RSSI	Temperature (°C)	Humidity (%)	Illuminance (lx)	Barometric Pressure (hPa)	Voltage (V)	Temperature alert	Humidity alert	Illuminance alert	Barometric pressure alert	Voltage alert
28/07/2022 19:20:42	H019	B4:E3:F9:49:9A:7B	-43	23.2	51.9	642.7	1014.0	2.71					
28/07/2022 19:20:43	H028	B4:E3:F9:49:99:E4	-34	23.6	50.8	632.2	1014.0	2.61	NG				
28/07/2022 19:20:52	H019	B4:E3:F9:49:9A:7B	-41	23.2	51.8	643.4	1013.9	2.71	NG				
28/07/2022 19:20:53	H028	B4:E3:F9:49:99:E4	-37	23.6	50.7	632.2	1014.1	2.61	NG	NG			
28/07/2022 19:21:02	H019	B4:E3:F9:49:9A:7B	-44	23.2	51.6	629.1	1014.0	2.71	NG	NG			
28/07/2022 19:21:03	H028	B4:E3:F9:49:99:E4	-40	23.6	50.7	629.8	1014.0	2.61	NG		NG	NG	NG
28/07/2022 19:21:12	H019	B4:E3:F9:49:9A:7B	-45	23.2	51.6	642.7	1014.0	2.72			NG	NG	NG
28/07/2022 19:21:13	H028	B4:E3:F9:49:99:E4	-34	23.6	50.7	632.2	1014.1	2.61			NG		
28/07/2022 19:21:22	H019	B4:E3:F9:49:9A:7B	-42	23.2	51.5	630.8	1014.0	2.71					
.	.	.	.	.	.	.	.	.	.	.	.	.	.
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.	.	.	.	.	.	.	.	.	.	.	.	.	.

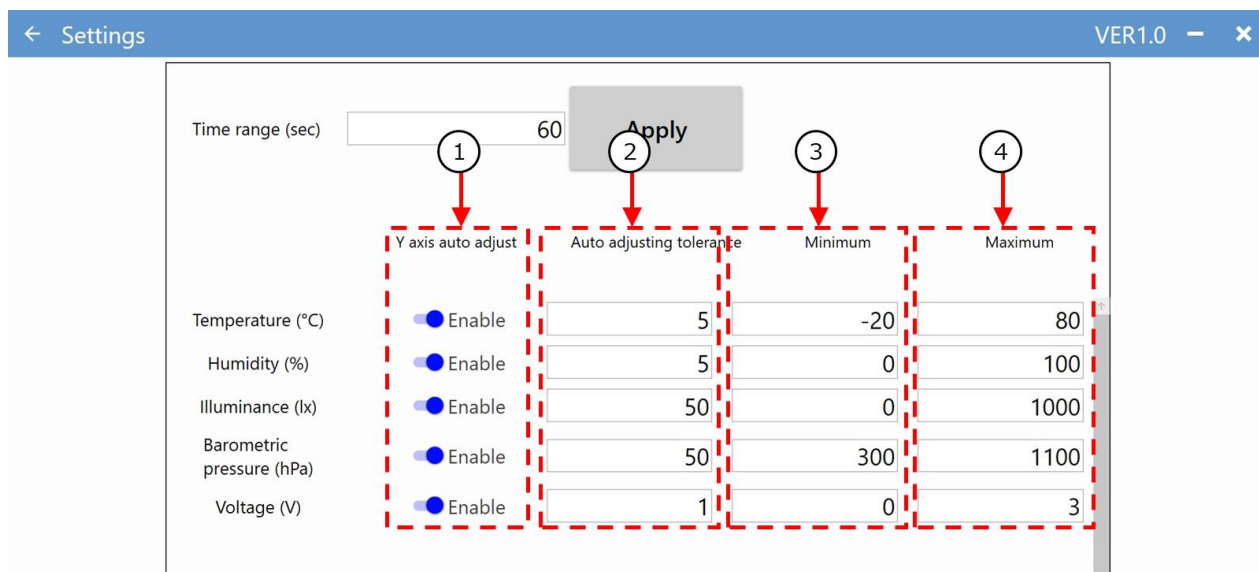
The log files are in CSV format. They contain DATA1 to DATA14 above, separated by commas, for each data reception from a sensor.

The log files are generated at the intervals designated on the *App settings* pane (log data format) (see Section 7-4-5②).

## 7-5-6. Graph drawing settings pane

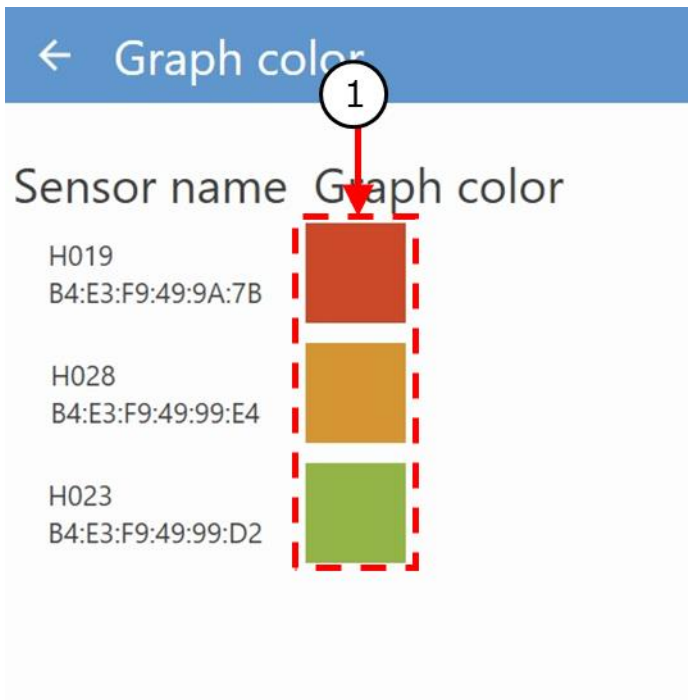


- ① Use this field to designate the scope of the X-axis common to all graphs.  
\*The recommended upper limit is three days or so (250,000 seconds approx.) as the processing capability of the display terminal is limited.
- ② Tap this button to return to the previous pane.
- ③ Use this field to designate the scope of the Y-axis of the graphs for each parameter. See the figure below.



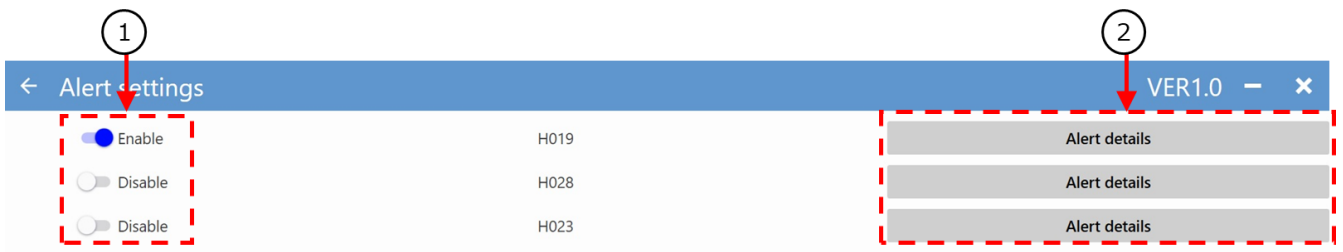
- ① Set this toggle switch to “Enable” to have the scope of the Y axis (maximum and minimum values) adjusted automatically.  
Set this toggle switch to “Disable” to use the settings in ③ and ④.
- ② When the toggle switch ① is set to “Enable,” the following minimum and maximum values are designated:  
Minimum value: Minimum value received within the scope of the graph – Value designated in ②  
Maximum value: Maximum value received within the scope of the graph + Value designated in ②
- ③ Use this field to designate the minimum value of the graph used when the toggle switch ① is set to “Disable.” Do not designate a value exceeding the maximum value.
- ④ Use this field to designate the maximum value of the graph used when the toggle switch ① is set to “Disable.” Do not designate a value lower than the minimum value.

### 7-5-7. Select sensor to set color pane

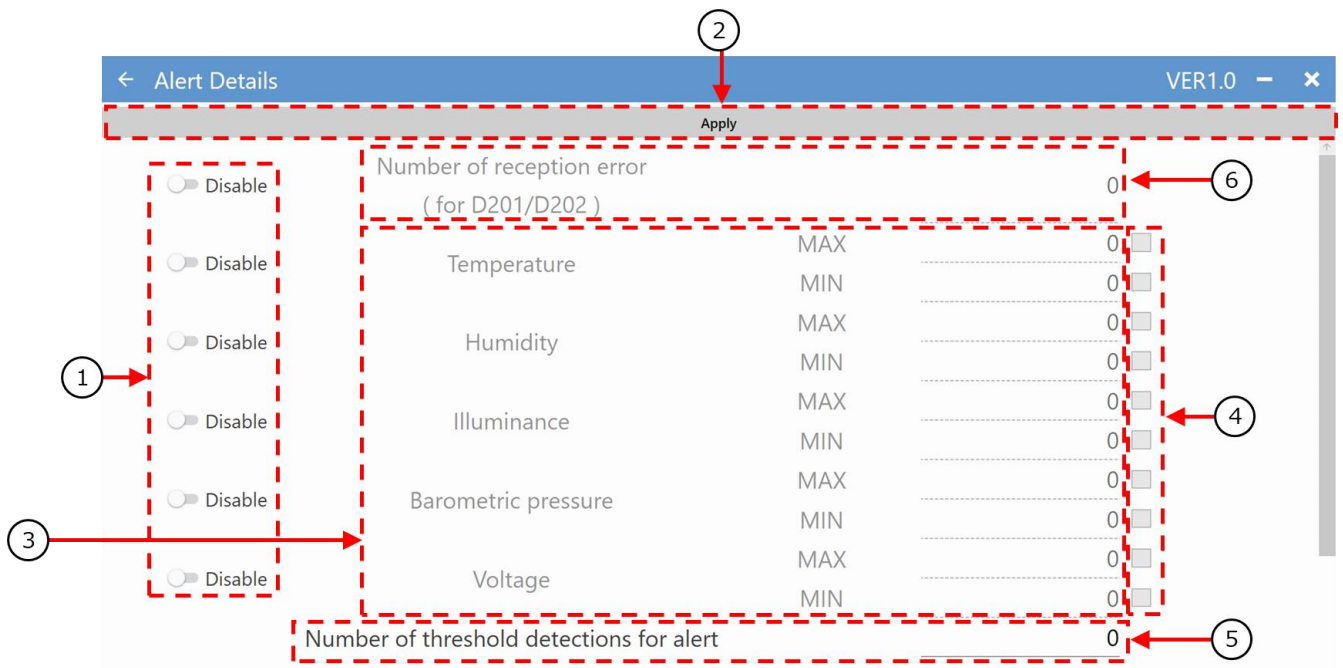


- ① Tap this button to open the *Color settings* pane (see Section 7-4-6).

### 7-5-8. Alert settings pane



- ① Set this toggle switch to “Enable” to have the designated thresholds monitored. Set this toggle switch to “Disable” to leave the designated thresholds unmonitored.
- ② Tap this button to open the *Alert settings (detail)* pane below.



- ① Use this toggle switch to enable and disable the entries in ③ and ④.
- ② Tap this button to apply the settings and return to the previous pane.
- ③ Use these fields to designate the maximum and minimum values of the parameters. (Applicable parameters are from Barometric pressure to Luminance.)
- ④ Check off both boxes to have both the upper and lower thresholds monitored. Check one box to have either threshold monitored.
- ⑤ Designate the number of occurrences (cumulative) of errors. \*Designate 0 to leave the threshold unmonitored.

The number of occurrences means how many times a value exceeding the thresholds is consecutively received, regardless of the sensing interval.

An alert is issued when the number of occurrences is reached.

An alert is issued repeatedly; it is issued every time the number of occurrences is reached.

The cumulative count will be reset when a value in the normal range is received even once.

- ⑥ Use this field to designate the threshold for the number of reception interruptions.

This function monitors the value of the transmission counter in the sensor data.

The receiving device compares the latest transmission counter value with the previous one. If the difference exceeds the designated threshold, a reception error is assumed, and an error notification is shown.

The smaller the designated threshold for the number of interruptions, the shorter the interruption time to trigger a notification.

Note that this function issues a notification when the data is received following the interruption.

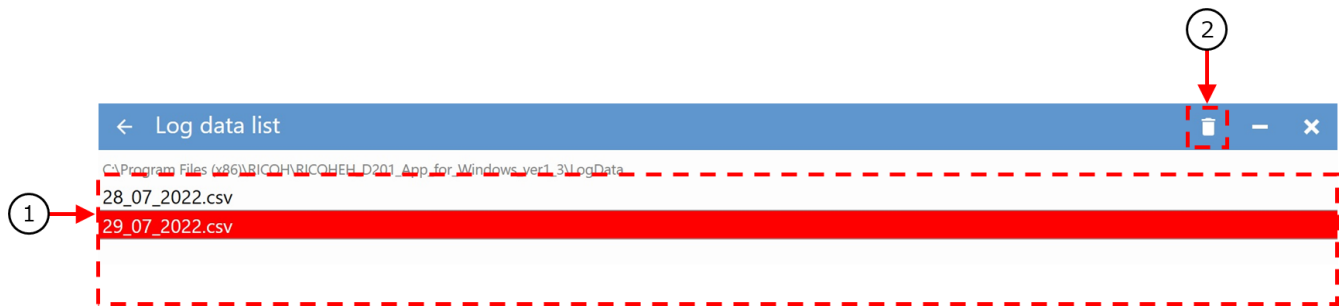
To have an error message shown immediately upon a data loss, use the timeout function on the *Sensor registration* pane (see Section 7-4-3).

Example) The sensing interval is 5 seconds, and the designated number of interruptions is 10.

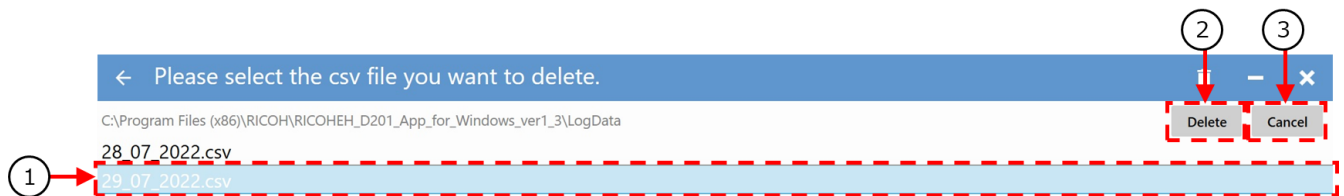
An interruption continuing for 50 seconds (5 seconds × 10) will cause an interruption notification to be reported upon the next data reception.

## 7-6. Log Reading

### 7-6-1. Read log data pane

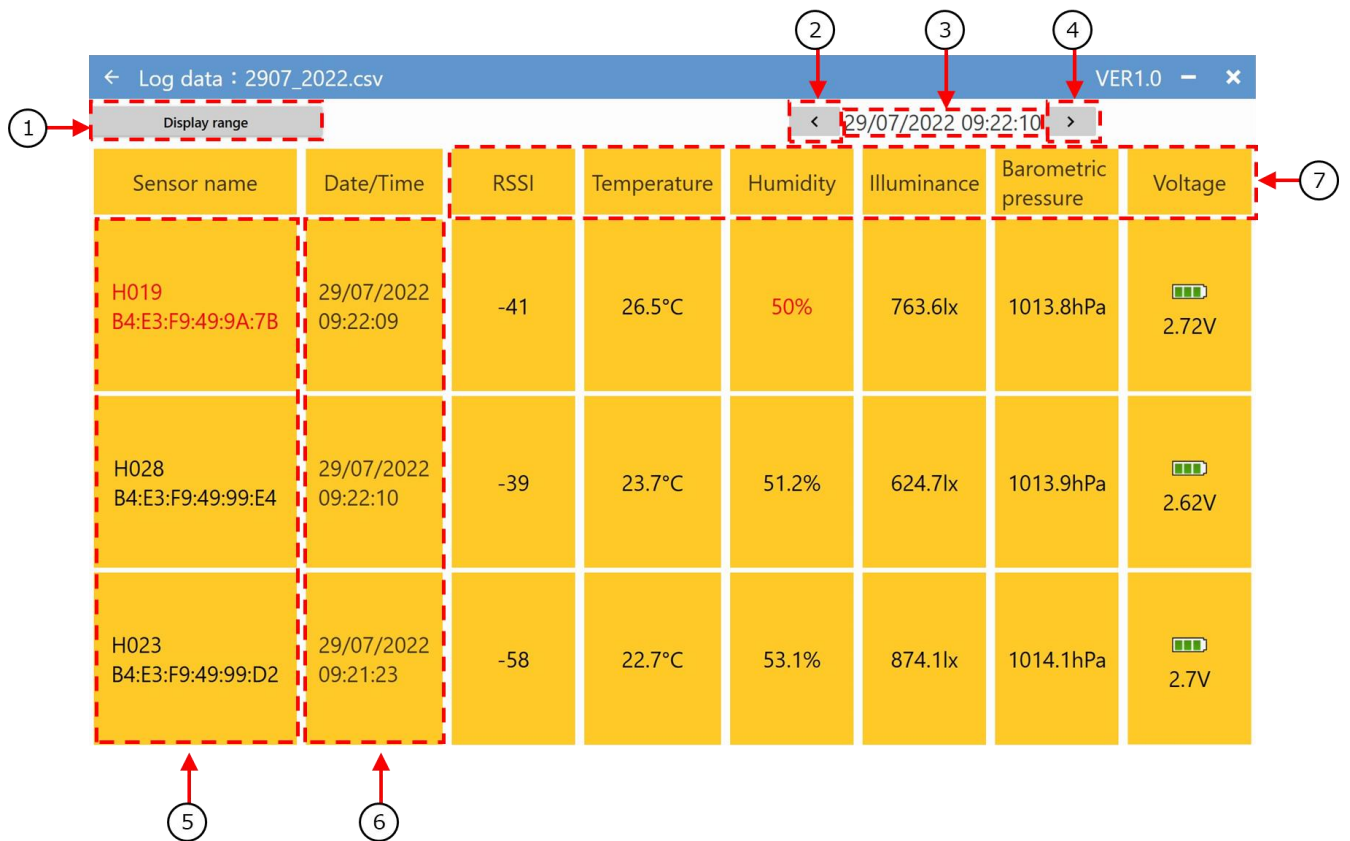


- ① Tap the CSV file name to load its data and open the *Log data* pane (Past CSV data) (see Section 7-6-2).
- ② Tap this icon to open the *Delete* pane below



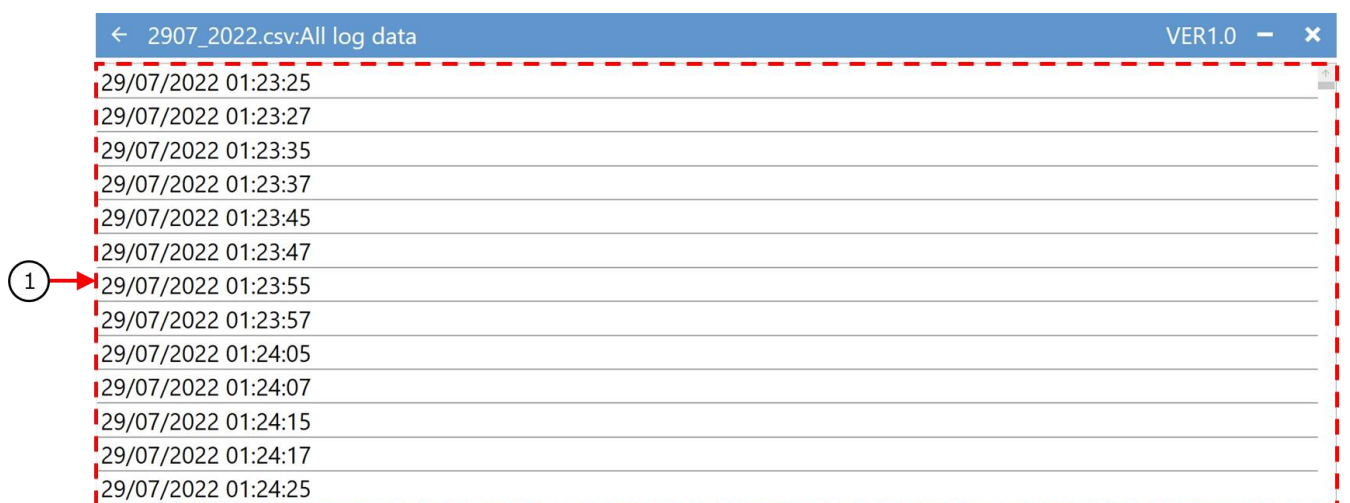
- ① Tap and select a CSV file. The background color of the selected CSV file name will change.
- ② Tap this button to delete the selected CSV file(s) and return to the previous pane.
- ③ Tap this button to return to the previous pane without making changes.

## 7-6-2. Log data pane (past CSV data)



- ① Tap this button to open the *Graph range setting* pane (past CSV data) (see Section 7-6-6).
- ② Tap this arrow to toggle the values shown in field ③.
- ③ Tap this button to open the *Reception time list* pane (past CSV data) (see Section 7-6-3).
- ④ Tap this arrow to toggle the values shown in field ③.
- ⑤ Tap this button to open the *Graph* pane (past CSV data) (see Section 7-6-4).
- ⑥ Tap this button to open the *Log data list* pane (past CSV data) (see Section 7-6-8).
- ⑦ Tap this button to open the *Sensor graphs per parameter* pane (past CSV data) (see Section 7-6-5).

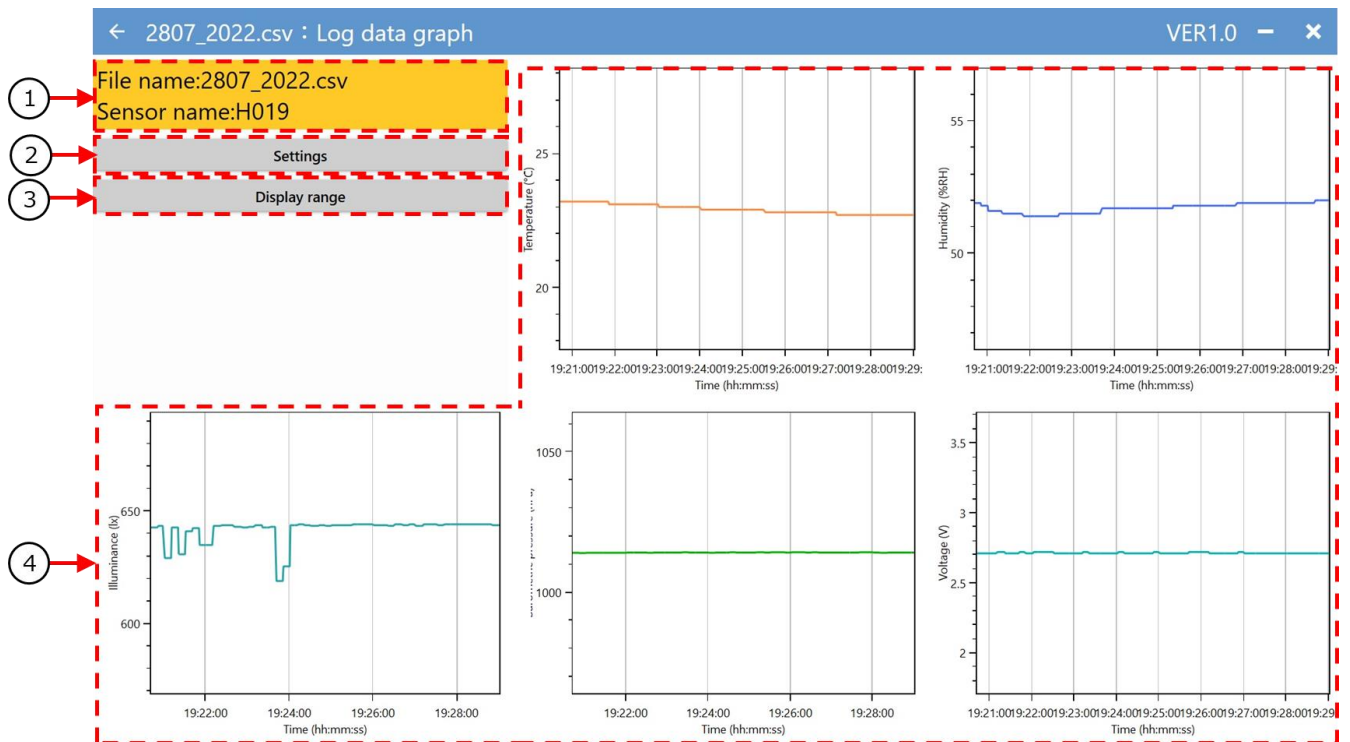
## 7-6-3. Reception time list pane (past CSV data)



- ① This pane lists the reception times of the data in the loaded CSV file. Tap a time to set it as the start time of the graphs on the *Sensor graphs per parameter* pane (past CSV data) (see Section 7-6-5).

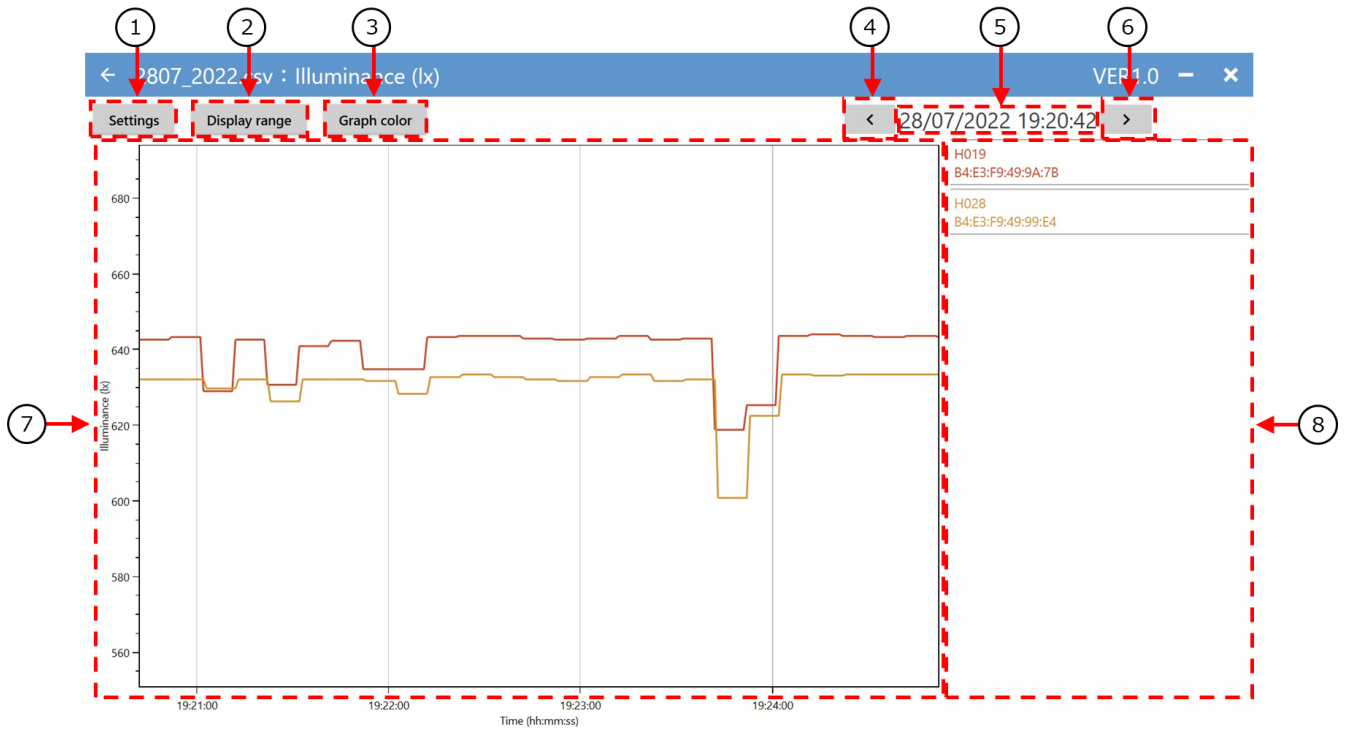


## 7-6-4. Graphs pane (past CSV data)



- ① This field shows the CSV file name and device name for the selected sensor.  
Tap this field to open the *Log data list* pane (past CSV data) (see Section 7-6-8).
- ② Tap this button to open the *Graph drawing settings* pane (past CSV data) (see Section 7-6-7).
- ③ Tap this button to open the *Graph range setting* pane (past CSV data) (see Section 7-6-6).
- ④ This field shows the graphs of the data received from the selected sensor. Tap a graph to open the *Sensor graphs per parameter* pane (Past CSV data) for that parameter (see Section 7-6-5).  
The scope of each graph depends on the settings on the *Graph drawing settings* pane (Past CSV data) (see Section 7-6-7).

### 7-6-5. Sensor graphs per parameter pane (past CSV data)

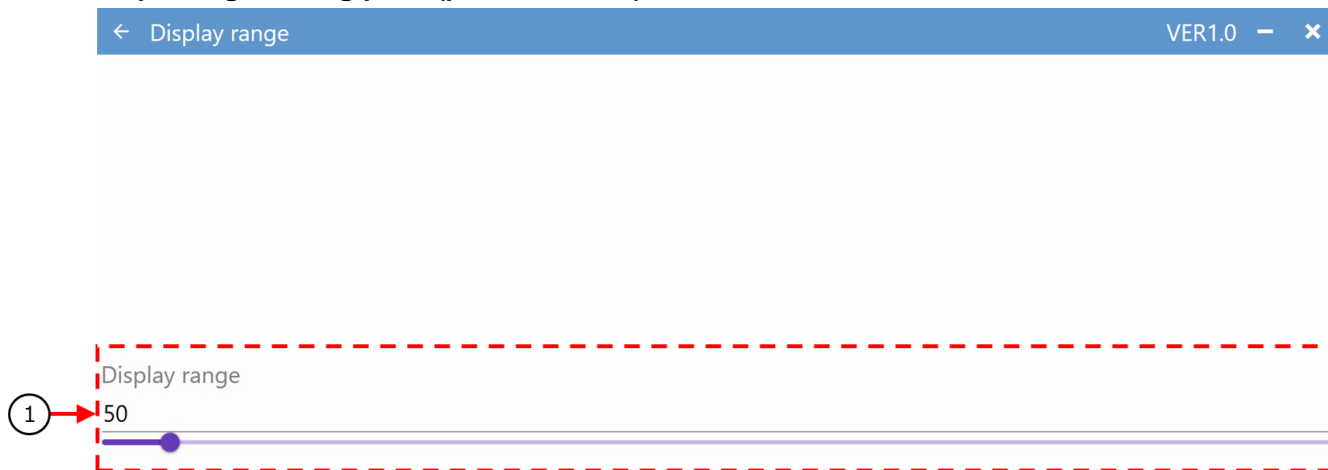


- ① Tap this button to open the *Graph drawing settings* pane (past CSV data) (see Section 7-6-7).
- ② Tap this button to open the *Graph range setting* pane (past CSV data) (see Section 7-6-6).
- ③ Tap this button to open the *Select sensor to set color* pane (see Section 7-5-6).
- ④ Tap this arrow to toggle the values shown in field ⑤.
- ⑤ Tap this button to open the *Reception time list* pane (past CSV data) (see Section 7-6-3).
- ⑥ Tap this arrow to toggle the values shown in field ⑤.
- ⑦ This field shows the graphs of information received from the sensors regarding the selected parameter.

The starting time of each graph is based on field ⑤, and the scope of each graph depends on the settings on the *Graph drawing settings* pane and the *Graph range settings* pane. The colors of the graph lines correspond to the colors of the device names and addresses shown in field ⑧.

- ⑧ This field shows the device names and addresses of the sensors. The colors of the letters correspond to the colors of the lines in the graph ⑦. Tap a device name/address to open the *Parameter graphs per sensor* pane (Past CSV data) (see Section 7-6-4) for that sensor.

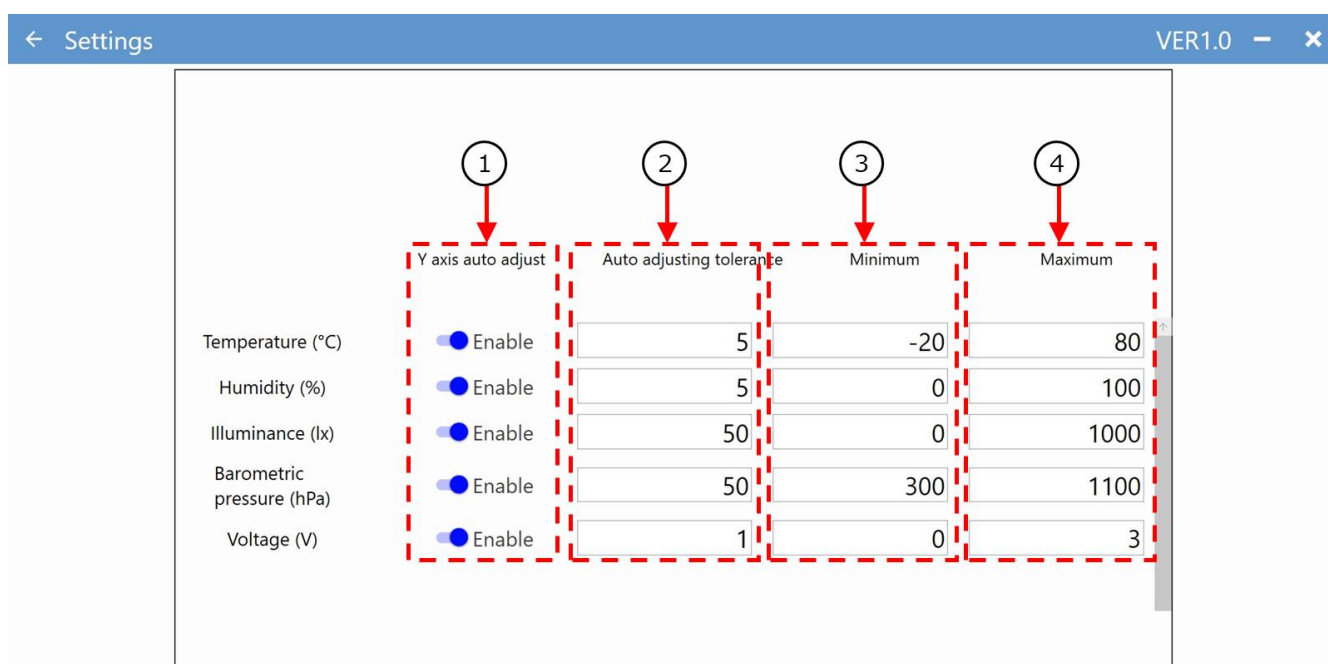
## 7-6-6. Graph range setting pane (past CSV data)



- ① Use this field to designate the number of data items to be displayed. The range is between 50 and 1000.

\*Note that this is the number of data items. The time axis of the displayed graph varies with the sensing interval of the relevant past data.

## 7-6-7. Graph drawing settings pane (Past CSV data)



- ① Set this toggle switch to “Enable” to have the scope of the Y axis (maximum and minimum values) adjusted automatically.

Set this toggle switch to “Disable” to use the settings in ③ and ④.

- ② When the toggle switch ① is set to “Enable,” the following minimum and maximum values are designated:

Minimum value: Minimum value received within the scope of the graph – Value designated in ②

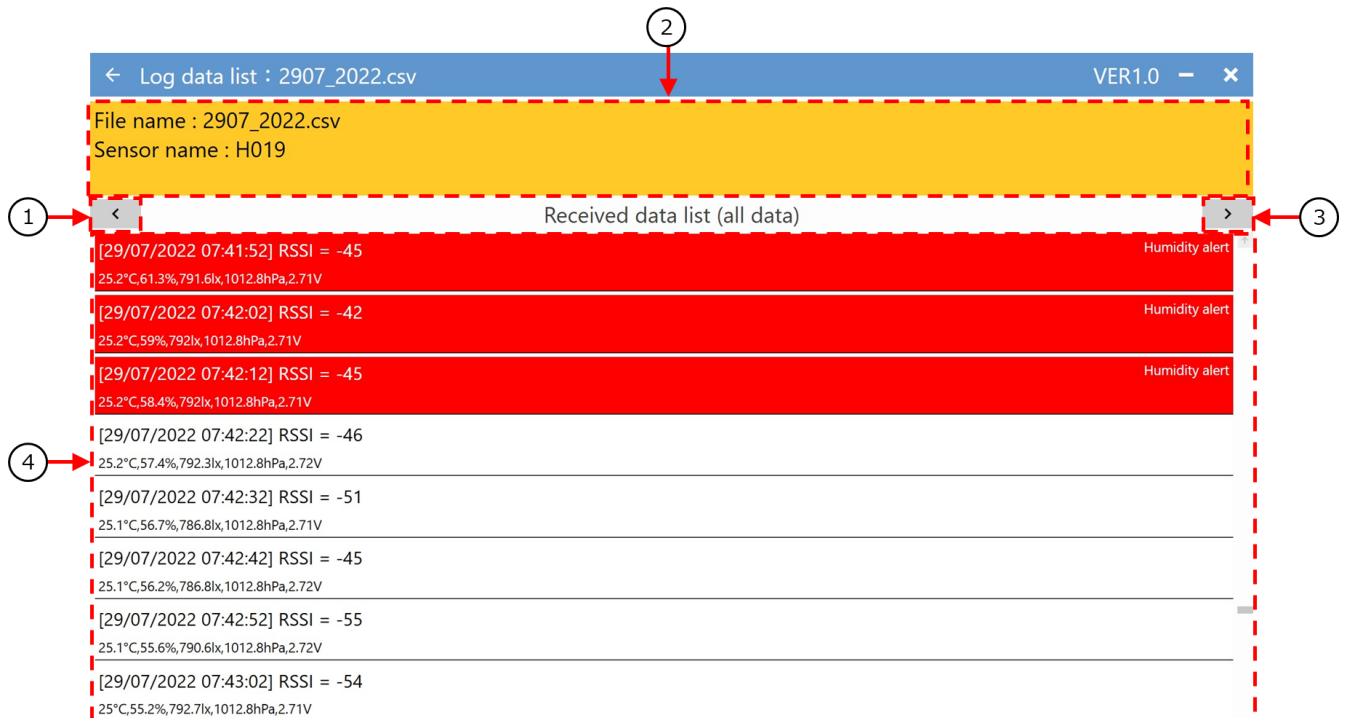
Maximum value: Maximum value received within the scope of the graph + Value designated in ②

- ③ Use this field to designate the minimum value of the graph used when the toggle switch ① is set to “Disable.” Do not designate a value exceeding the maximum value.

- ④ Use this field to designate the maximum value of the graph used when the toggle switch ① is set to “Disable.” Do not designate a value lower than the minimum value.

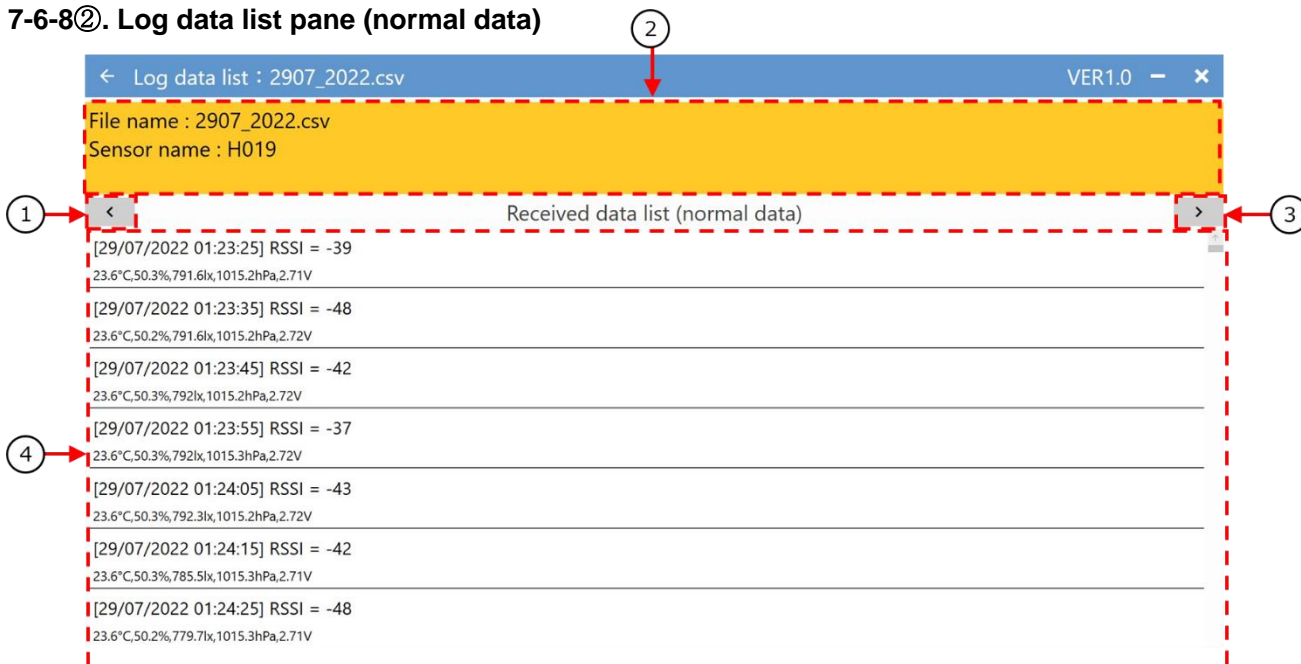
## 7-6-8. Log data list pane (past CSV data)

### 7-6-8①. Log data list pane (all data)



- ① Tap this button to open the *Log data list* pane (normal data) (see Section 7-6-8②).
- ② This field shows the CSV file name and device name for the selected sensor.
- ③ Tap this button to open the *Log data list* pane (abnormal data) (see Section 7-6-8③).
- ④ This field shows the log of all the information received from the selected sensor (reception time, RSSI value, temperature, humidity, barometric pressure, illuminance, and voltage). Tap a row to show the data on the *Log data* pane (Past CSV data) (see Section 7-6-2).

### 7-6-8②. Log data list pane (normal data)



- ① Tap this button to open the *Log data list* pane (abnormal data) (see Section 7-6-8③).
- ② This field shows the CSV file name and device name for the selected sensor.
- ③ Tap this button to open the *Log data list* pane (all data) (see Section 7-6-8①).
- ④ This field shows the log of normal information received from the selected sensor (reception time, RSSI value, temperature, humidity, barometric pressure, illuminance, and voltage). Tap a row to show the data on the *Log data* pane (Past CSV data) (see Section 7-6-2).

### 7-6-8③. Log data list pane (abnormal data)



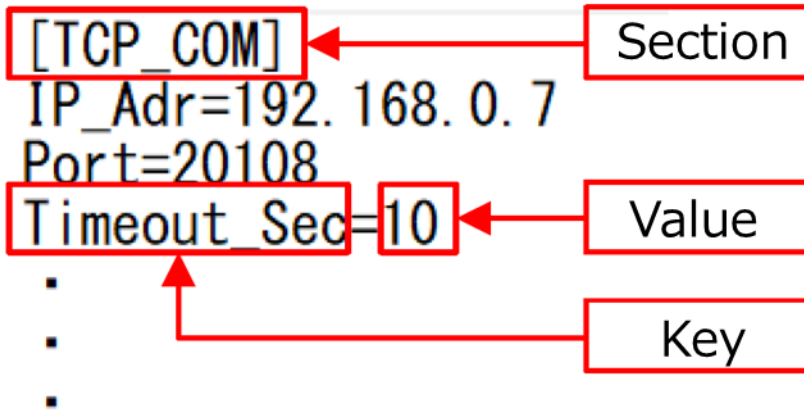
- ① Tap this button to open the *Log data list* pane (all data) (see Section 7-6-8①).
- ② This field shows the CSV file name and device name for the selected sensor.
- ③ Tap this button to open the *Log data list* pane (normal data) (see Section 7-6-8②).
- ④ This field shows the log of error information received from the selected sensor (reception time, RSSI value, temperature, humidity, barometric pressure, illuminance, and voltage). Tap a row to show the data on the *Log data* pane (Past CSV data) (see Section 7-6-2).

## 7-7. App Settings File

A settings file, Setting.ini, is created and saved in the Setting folder under the application installation folder. The settings file contains the number of logs displayed and the number of connection retries that triggers an error message.

The Setting.ini file is in the INI file format\* as shown below.

\*In the INI file format, the values for keys are designated with “=” under sections indicated by “[ ]” as shown below.



## 8. Troubleshooting

In the event of an operation problem or possible device failure, check the table below and try the solutions. If the solutions do not work, contact your local RICOH dealer or the contact point shown in this user's manual.

Device	Symptoms	Probable causes and solutions
Sensor	Data is not received at the designated sensing intervals. (There are data omissions.)	<p>The signal intensity may not be strong enough due to the environment or a long communication distance. Try the following:</p> <ol style="list-style-type: none"> <li>1. Check the RSSI value. Position the device, relay, and sensor close to each other and check the operation. For stable communications, the RSSI value must be around -80 dBm or greater.</li> <li>2. Change the settings of the D201/D202, specifically the signal intensity and the number of consecutive transmissions. Increasing those values lowers the data omission rate. (Note that increasing those values also increases the illumination required for continuous operation.)</li> </ol>
	The target sensor is not listed during sensor registration.	Turn off the sensor, and then turn it on again. (The sensor initiates Wi-Fi connection just after it is turned on.)
	The app has ceased to receive data.	The lithium-ion cell voltage of the D201/D202 may be low. Turn off the D202/D202, and put it under light to charge the cell (see Section 4.5.2, <i>Charging performance</i> ).
	Something is wrong with the sensor data.	<p>Continue receiving data for some time and see if the values become appropriate.</p> <p>The sensor can be unstable immediately after it is turned on. The values can be inappropriate (very occasionally) when the D201/D202 receives data for the first time immediately after it is turned on.</p>
	Changes in humidity are not displayed in real time.	<p>This may be normal. The D202 is less responsive to changes in humidity than the D201.</p> <p>This is because the D202 has a tight seal for waterproofing.</p> <p>When the D202 is moved to a significantly different environment, it can take several tens of minutes for the sensed values to stabilize.</p>

Device	Symptoms	Probable causes and solutions
	The voltage has dropped although data reception has been off.	<p>Check the sensor switch. If the switch is in the SET position, the D201/D202 maintains bidirectional connection with the Android™ device.</p> <p>This increases power consumption and causes voltage to drop significantly over a long period. After finishing D201/D202 configuration, make sure that the switch is set to OFF (or ON).</p>
Android™ device	The D201/D202 cannot be configured properly. (For instance, the sensing interval cannot be changed although the switch is in the SET position.)	<p>Make sure that the switch is operated properly.</p> <p>To put the switch from ON to SET, do not directly do so. Instead, put it in the OFF position first, wait five seconds, then put it in the SET position.</p> <p>To put the switch back in the ON position after finishing the configuration, first put it in the OFF position, wait five seconds, then put it in the ON position.</p>
	Data cannot be received.	<p>Make sure that the <i>Received data</i> pane is shown. Data is received only while the <i>Received data</i> pane is shown on the device.</p> <p>Data is not received while the <i>View CSV</i>, <i>Sensor settings</i>, or any other pane is shown.</p>
Windows® PC Relay	A “Connection failed” message is shown during an attempt to connect to the relay.	<p>The app has failed to connect to the relay.</p> <p>Check the following:</p> <ul style="list-style-type: none"> <li>- Check that the IP address of the relay is designated correctly.</li> <li>- Check that the relay is on. If it is on, unplug it and then plug it in again.</li> <li>- When multiple relays are connected, check that the target relay is connected to the same Wi-Fi router as the PC.</li> </ul>
	A “Search communications error!” message is shown upon starting to search for the environment sensors.	<p>The relay has failed to start or stop communications when searching for the environment sensors.</p> <p>Restart and reconnect the relay in the same way as above (unplug it and then plug it in again).</p>
	A “Failed to register sensors to the relay” message is shown.	<p>The app has failed to register the sensors to the relay. If the message persists, return to the <i>Relay registration</i> pane, or exit the app to disconnect it from the relay and restart the relay by unplugging then plugging it in again.</p>



Device	Symptoms	Probable causes and solutions
	A “Relay failed to initiate communications with sensor” message is shown.	The relay has failed to initiate communications with the sensor(s). If the message persists, return to the Relay registration pane, or exit the app to disconnect it from the relay and restart the relay by unplugging then plugging it in again.

## **9. If you have questions regarding the products**

If you have questions regarding the products, first check the information on the RICOH website. You can also contact RICOH via the website.

Overview of the products:

<https://industry.ricoh.com/en/dye-sensitized-solar-cell/>

Contact point:

Energy Harvesting Business Center RICOH Futures BU

RICOH EH Environment Sensor D201/D202 User's Manual

Issued on: Aug. 1, 2022      Rev.1.00

Issued by: Energy Harvesting Business Center RICOH Futures BU