



Hardware User Manual

Hitachi Contactless Vein Authentication Unit C-1 **PC-KCC300**

- To ensure the correct use of this product, read this user manual carefully and be sure that you fully understand its contents.
- After reading through this manual, keep it in a readily accessible place so that you can refer to it when necessary.

Notices

Important Notices

- No part of this publication may be reproduced or transmitted in any form or by any means, electronic or mechanical, including photocopying and recording, or stored in a database or retrieval system for any purpose without permission of Hitachi, Ltd. (hereinafter referred to as "Hitachi").
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- In the case of any errors, inaccuracies, or omissions in the contents of this document, please contact your distributor.
- Hitachi assumes no responsibility for any losses (including lost earnings and other indirect losses) by this product itself or using this product.

Product Reliability

- This product is designed and manufactured for use in general office environments. Avoid using this product for the application require extremely high reliability for life or property (such as controlling chemical plants, medical instruments, emergency contact, etc.). Hitachi assume no responsibility for any accidents caused by using this product for such purposes.
- Hitachi does not guarantee that this product will operate together with other authentication systems.

Regulations and Measures

- ICES-003 Statements
- This Class B digital apparatus complies with Canadian ICES-003.
- Cet appareil numérique de la classe B est conforme à la norme NMB-003 du Canada.
- Federal Communications Commission (FCC) Statement

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:(1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

FCC CAUTION

Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

The USB cable and the AC adapter supplied in the package must be used in order to meet FCC emission limits.

Note: This equipment has been tested and found to comply with the limits for a class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. There is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

Exports Regulations

- Before exporting the product, verify legal requirements in each country in addition to U.S. regulations for export control, and make all necessary arrangements accordingly. The above applies to attachments and software surrounding the device as well. Contact your distributor should you have any concerns.

Disposal

- When disposing of this product, follow all regional and local laws. Also consult regulations regarding the material of each component.
- Before disposing of this product, delete the settings for the IP address and other information that specified on the unit.

Hazardous substance table for China

有毒有害物质或者元素

部件名称	铅 (Pb)	水银 (Hg)	镉 (Cd)	六价铬 (Cr (VI))	多溴联苯 (PBB)	多溴二苯醚 (PBDE)
印刷线路板	×	○	○	○	○	○
机箱	○	○	○	○	○	○
连接线缆	○	○	○	○	○	○
光学部件	○	○	○	○	○	○
USB 线缆	○	○	○	○	○	○

○：表示该有毒有害物质在该部件所有均质材料中的含量均在 GB/T26572-2011 规定的限量要求以下。

×：表示该有毒有害物质至少在该部件的某一均质材料中的含量超出 GB/T26572-2011 规定的限量要求。

备注：以上部件中，部分含有有毒有害物质超过是由于目前行业技术水平所限，暂时无法实现替代或减量化。

Notices Regarding Safe Use

The following are rules to be observed to prevent physical or property damage to users and other people.

■ Meaning of indication

 WARNING	Indicates the existence of danger that can result in death or serious injury.
 CAUTION	Indicates the existence of danger that can result in minor or moderate injury.
IMPORTANT	Indicates important points or restrictions on use.

■ Meaning of icon

 Prohibited action	 Follow instructions	 Prohibit disassembly	 Remove power plug
 Prohibit handling with wet hands	 Attention of fire or smoke	 Attention of electric shock	

WARNING



■ Handling of the AC adapter and the AC cord

Observe the following guidelines when using the AC adapter and the AC cord to prevent fire, electric shock, or burns.

- Do not modify and disassembly.
- Do not place anything on the AC adapter and AC cord.
- Do not use the AC adapter and AC cord for anything other than its specified equipment.
- Do not place the AC Adapter and the AC cord near heating equipment.
- Do not use or store the AC adapter and AC cord in a hot environment.
- Do not apply a strong impact to the modules, such as dropping.
- Do not get the AC adapter and the AC cord wet, and do not handle with wet hands.
- Check the voltage rating before you connect the AC adapter to an electrical outlet to ensure that the required voltage and frequency match the available power source.
- Do not plug or unplug without holding the power plug.
- Do not place any objects near the outlet to unplug AC cord easily.
- Do not pull or press the AC cord.
- Do not bend, twist, or bundle the AC cord.

WARNING



■ Repair, modification, and disassembly

Do not repair, modify, or disassemble this product. It causes fire, electric shock, or burns.



■ Abnormal heat, smoke, sounds, or odors

If an abnormal heat, smoke, sound, or odor occurs, turn the power off and unplug the AC cord from the outlet to prevent fire or electric shock.



■ Use in a humid or dusty place

Do not use this product near a place where water is used (such as a bathroom, lavatory, sink, or laundry area), near a humid place (such as a basement room or swimming pool), or in a place with large amounts of dust or oily smoke. In such places, the degradation of electric insulation causes a fire or electric shock.



■ Sharing a single outlet

Do not put many loads on one electrical outlet. Because it causes overheating of AC cord and a fire. And the overload cause cutoff of a circuit breaker and cause malfunction of other devices.



■ Poor electrical contacts or piled up dust around the power plug

Poor electrical contact or piled up dust by incorrect handling can cause a fire or overheating.

- Insert the power plug completely.
- Before inserting the power plug, make sure that it is free of dust or water droplets. If there is any dust or if there are any water droplets on the power plug, wipe the plug by using a dry cloth, and then insert the power plug.
- Do not use a loose outlet.



■ Use of accessories

Only use the AC adapter, AC cord and the USB cable attached to this product or only use specified equipment by Hitachi. Using other AC adapters, AC cords, and USB cables cause fire or overheat because voltage, current, and electrical polarity may be different from attached accessories or specified equipment by Hitachi.

WARNING



■ Ground connection (AC Adapter: PC-KCC300-AC1 only)

Connect ground before connecting the AC cord to the AC adapter. When disconnect ground, unplug the AC cord from outlet first.



■ Plastic bags used for packaging

Keep the plastic bags used to packing this product, including bubble wrap, away from babies and children to prevent suffocation or accidental ingestion.

CAUTION



■ Use for unintended purposes

Do not use this product for unintended purposes, such as for use as a step or bookend to prevent break or fall resulting in injury or failure.



■ Use in an unstable place

Do not place this product in an unstable place, such as an inclined or confined place to prevent break or fall resulting in injury or failure.



■ Signal cables

- Route the cables without strain and route the cable to prevent it catch on anyone's legs. Incorrect routing causes the cable broken or injury by fall down the devices. Data may also be lost.
- Do not place a heavy object on the cables. Do not route the cables near heaters. Failure to heed this instruction might result in the cable jackets melting, which might cause connected devices to fail.



■ Do not block ventilation holes

This unit has ventilation holes on its bottom side to prevent increases in internal temperature. Do not block these holes to prevent increasing internal temperature that cause smoke or malfunction.

- Do not attach adhesive tape or similar things to the bottom of this unit.
- Do not put this unit on a cloth, carpet, or other object which may close the ventilation holes on the bottom.

CAUTION



■ Power for use

Use 100 - 240 V 50/60Hz AC power for this product. Other AC power cause overheat or degradation of internal parts and cord.



■ External impacts

Do not expose this product to excessive impacts, such as those caused by dropping or hitting the product. It causes malfunction due to deformation or degradation of internal parts.



■ Contact with connection terminals

Do not touch connection terminals with your hand or metal. Do not insert foreign objects such as wires. Do not place this product in a space where metallic substances are scattered. It may cause malfunction due to smoke or poor contact.



■ Corrosive gases

Do not place this product in a space where air or oily smoke that contains corrosive gas (such as sulfurous acid gas, hydrogen sulfide gas, chlorine gas, or ammonia gas) or salt. In such a place, these gasses chemically corrode the surface or internal parts of this product and it cause malfunction of this product.



■ Preventing foreign objects from entering the unit

To prevent foreign objects from entering the unit, observe the following rules. Failure to heed these rules might result in an increase of the internal temperature due to the accumulated foreign objects themselves or a short circuit caused by such objects, resulting in a failure.

- Do not put foreign objects into the ventilation holes.
- Do not place water containers (such as vases and glass pots) or small metallic pieces (such as pins and clips) on the unit.
- Do not use this unit with its covers removed.

CAUTION



■ Extreme change in temperature

Moving this product between places that differ greatly in temperature cause condensation on the surface or inside of this product. To prevent malfunction caused by condensation, keep no using about 30 minutes until temperature of this product become approximately same as external temperature.



■ Aluminum electrolytic capacitors

The lifetime of aluminum electrolytic capacitors used in this AC adapter is 5years.

(Definition of 5 years is 8 hours / day, 25 days / month). If use this AC adapter over than this lifetime, it causes smoking by dropping electrolyte or dry-out electrolyte of the capacitors. To avoid these risks, do not use this AC adapter over 5 years. If use over 8 hours / day, the lifetime become shorter than 5 years.



■ Radio interference

If this product is used near a radio or a television set receiver in a domestic environment, it may cause radio interference. In such cases, try the following actions:

- Keep away this product from the radio or the television set as much as possible.
- Change the orientation of the antenna of the radio or the television set.
- Use a different outlet from the radio or the television set.



■ Static electricity

This product is a precision instrument. To prevent troubles caused by static electricity, discharge static electricity from your body before touching this product.

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1.1 Introduction

Thank you for purchasing a Hitachi Contactless Vein Authentication Unit. This instruction manual describes the hardware of the Hitachi Contactless Vein Authentication Unit C-1. For details about the software functions, see the Hitachi Contactless Vein Authentication Unit C-1 middleware manual.

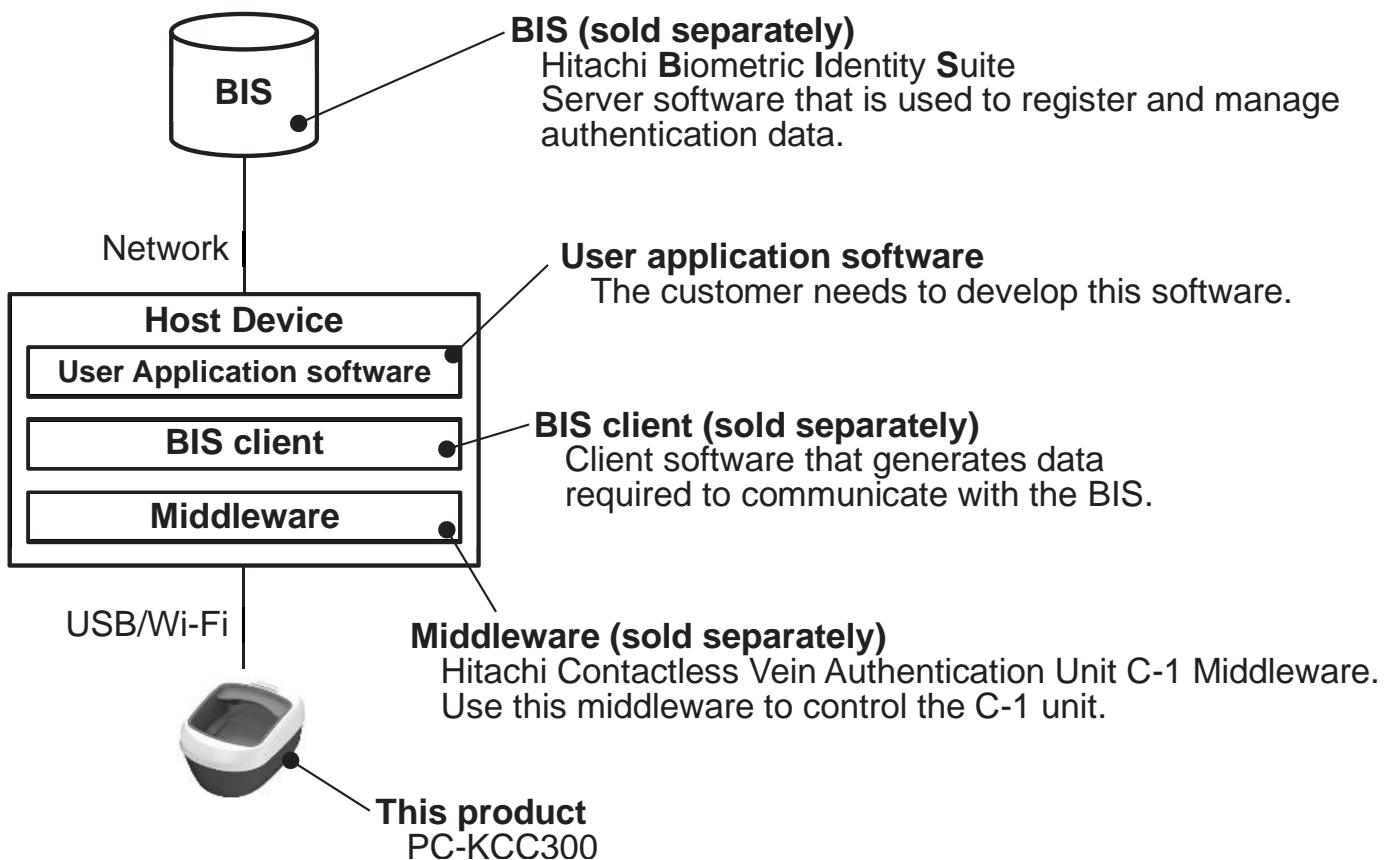
1.2 Accessories

The following lists the accessories that are bundled with this product. Confirm that you have all these accessories. The rightmost column indicates the quantity.

- Main unit 1 pcs
- USB cable (Type-A to Type-C, 1.8 m) 1 pcs
- AC adapter 1 pcs
- AC cord 1 pcs
- AC adapter User Manual 1 sheet

1.3 Configuration

This section shows the system configuration in which this product can be used. To use this product, the customer needs to additionally purchase the middleware, Hitachi Biometric Identity Suite (BIS), and BIS client, as well as develop user application software that controls this product via the BIS client.

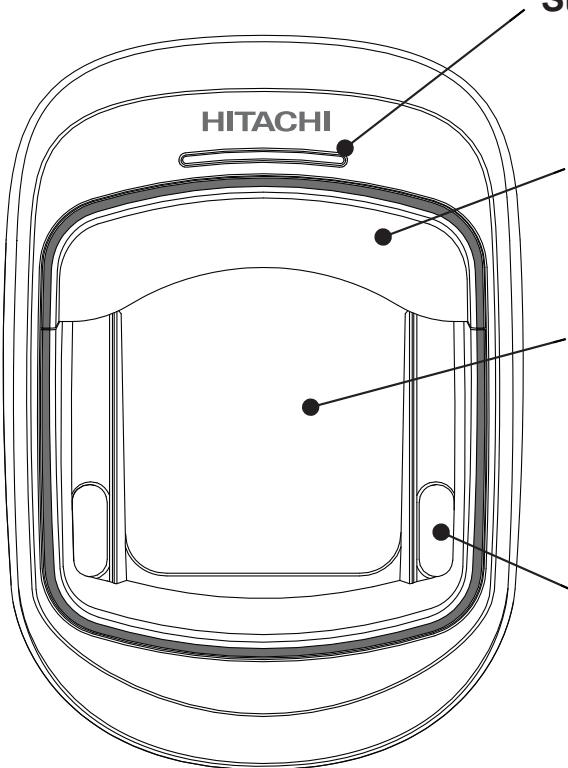


IMPORTANT

- User application software controls any operation of the unit, changing the color of the status LED, playing back sound, and other operations by using the BIS client and the middleware. Guidance information should be displayed on an optional monitor, etc. by user application software. For details, see the instruction manuals of the BIS, BIS client, and middleware.

1.4 Components

Top view:



Status LED

Indicates the status of the unit. There are blue, red, and green LED and there LED's emission can be mixed.

Finger rest

The transparent table on which to place the fingers. Place the fingertips in this area.

Capturing area

A finger vein image or barcode can be captured in the area surrounded in green line.

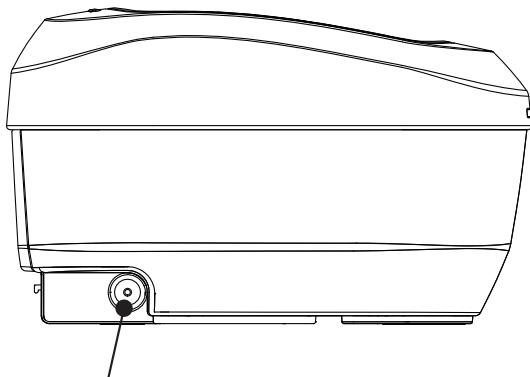
Capturing LED (x4)

These LEDs turn on while capturing finger vein or barcode.

IMPORTANT

- Each of the LEDs used for the status LED has an individual variation of emission strength. This variation cause difference of each unit's mixed color. If want to prevent this difference, using single color only (blue, red, green) is recommended for indication.
- The capturing LED can emit green or near-infrared light. Note that near-infrared light is invisible to the human eye. The brightness of the capturing LED is automatically adjusted and cannot be controlled via the software.

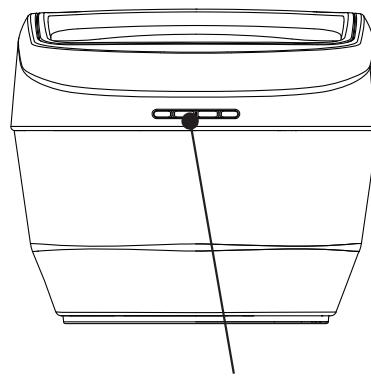
Left-side view:



DC-IN

Connect the provided AC adapter to this terminal.

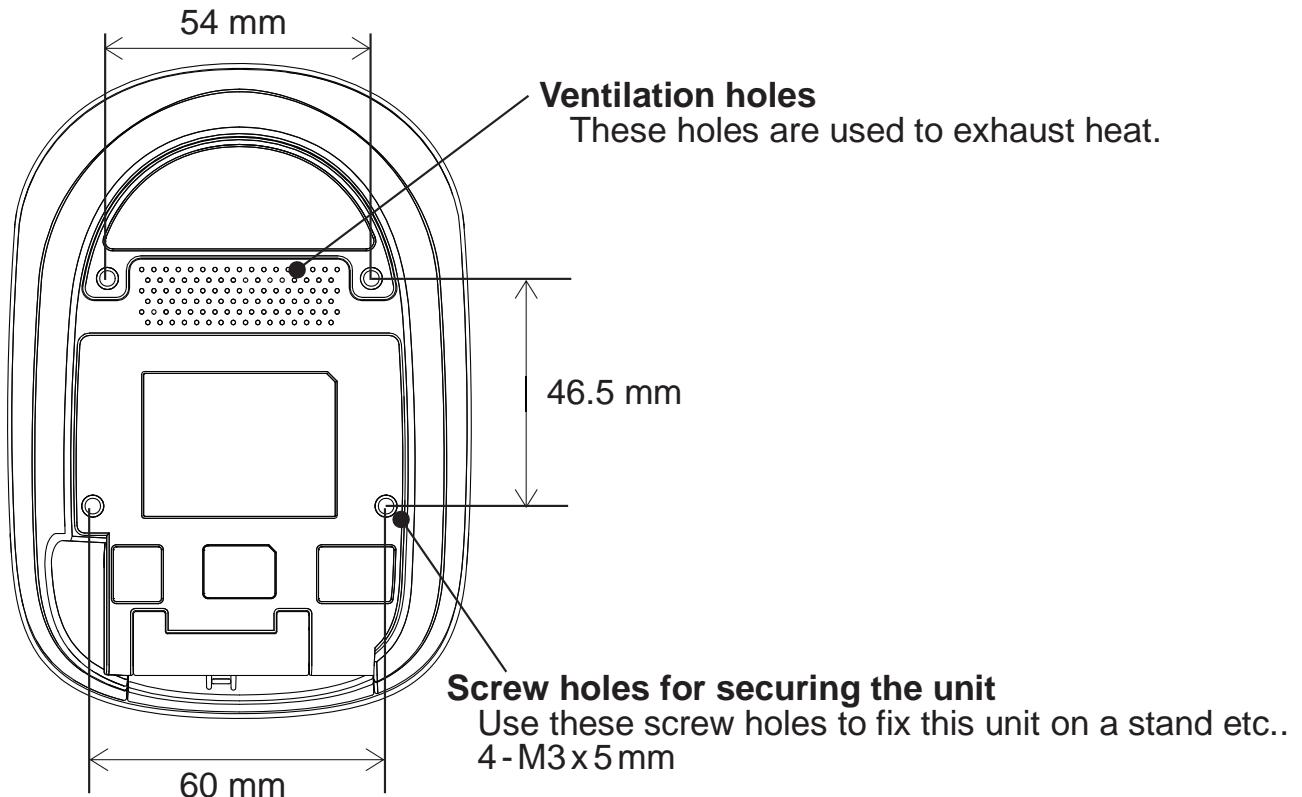
Front view:



Monaural speaker

Sound is played back.

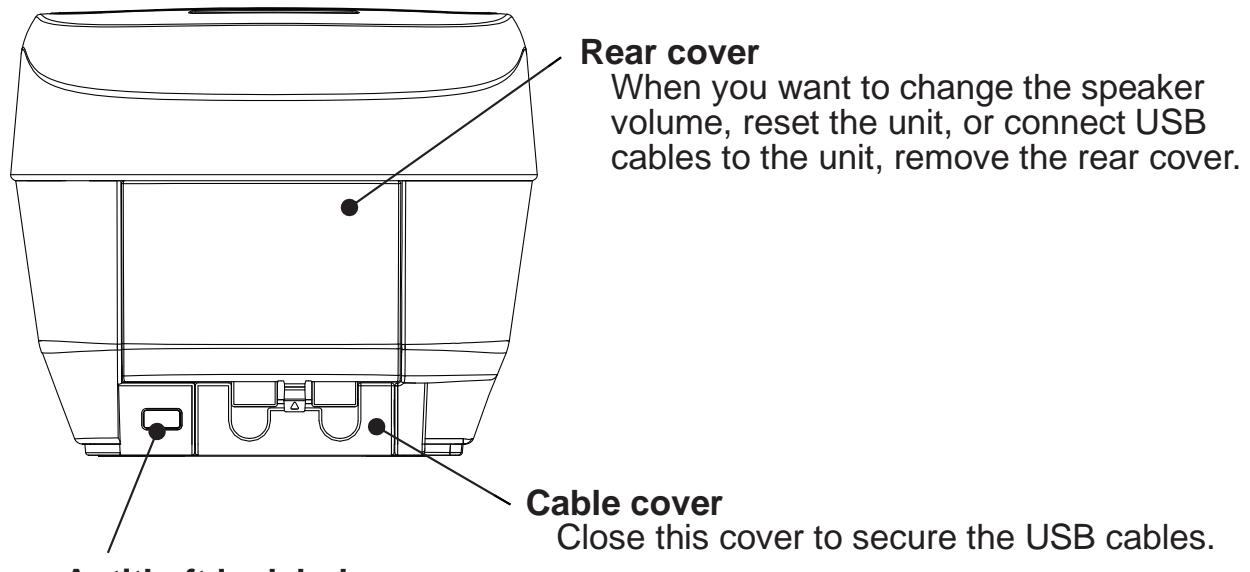
Bottom view:



IMPORTANT

- Do not block the ventilation holes. If block the hole, internal temperature increase and it cause smoke or malfunction.

Rear view:



Rear panel:

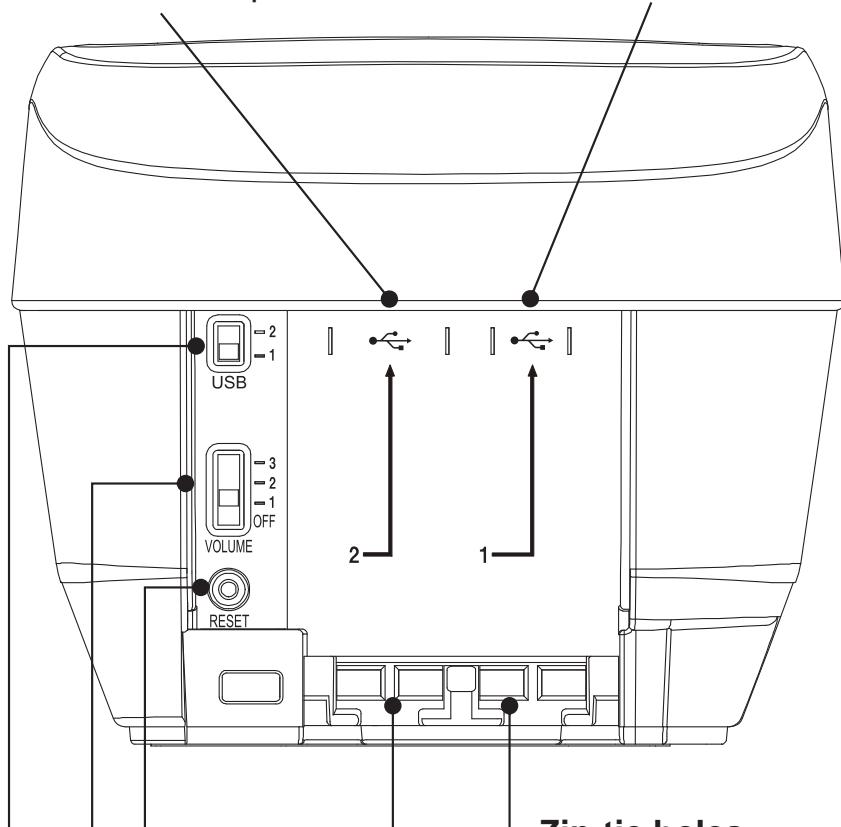
You can access the rear panel by removing the rear cover.

USB port 2 (Type-A connector)

Use this port to connect a USB-to-Wi-Fi adapter.

USB port 1 (Type-C connector)

Use this port to connect the Host device.



Zip-tie holes

These holes can be used to secure cables.

Reset button

If you press and hold this button for three or more seconds, the unit is reset and reboot from power on state.

Volume switch

Use this switch to adjust the volume of the internal speaker. You can set this switch to OFF, 1 (min), 2 (mid), or 3 (max).

Mode switch

Use this switch to select the USB port to be used.
1: USB port 1 is **enabled** and USB port 2 is **disabled**.
2: USB port 1 is **disabled** and USB port 2 is **enabled**.

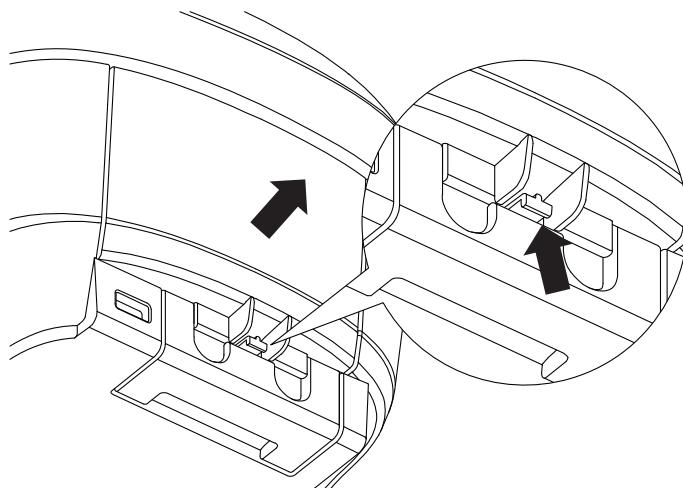
2. Using the unit

2.1 Connection Method

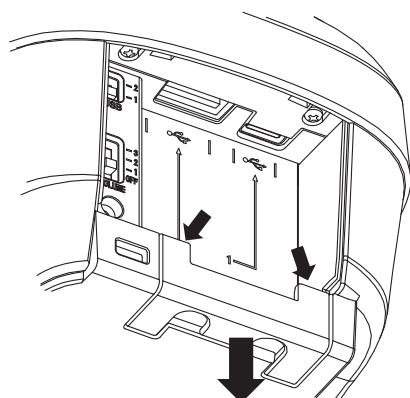
Remove the rear cover and cable cover on the rear of the unit, and then connect USB cables or USB network adapter (USB-to-Wi-Fi).

• Remove covers

- (1) Remove the rear cover.



- (2) Remove the cable cover.

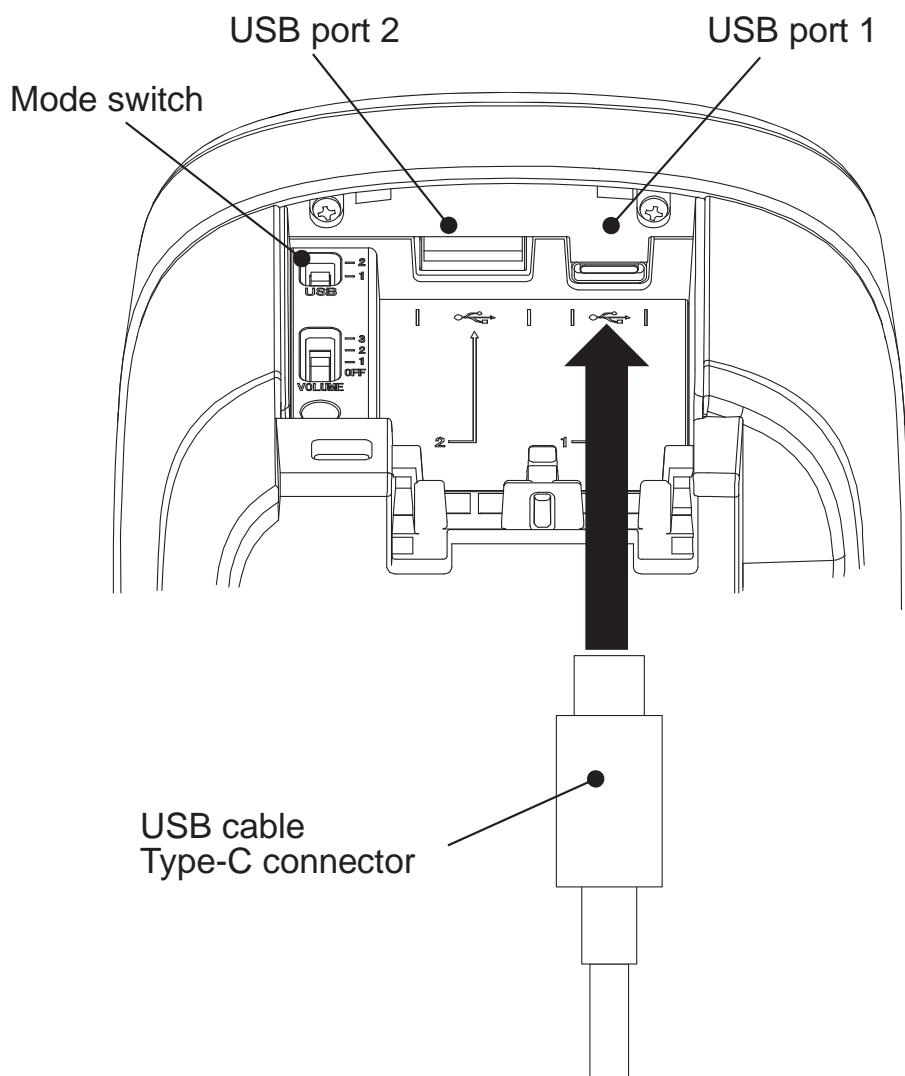


While pulling the points indicated by the two upper arrows toward you, slowly push the cover down to remove it.

IMPORTANT

- When removing the cable cover, move it carefully so that it does not fly off.

- **Connect a cable**



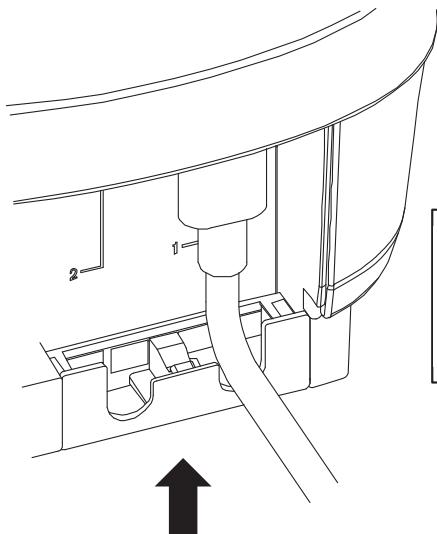
- To connect this product to the Host device via a USB connection, set Mode switch to [1] and connect a USB cable to USB port 1 (right port).
- If you use a USB-to-Wi-Fi adapter, set Mode switch to [2] and connect the adapter to USB port 2.
- USB port 1 supports USB Power Delivery (9V/3A).

IMPORTANT

- Connection using USB cable is recommended to connect host device rather than connect using USB network adapter.
- If this product does not operate normally, disconnect USB connection, and then reconnect it.
- This product is USB 2.0 device. There is some case this product can not work properly if this product connects to USB 3.0, 3.1 or 3.2 port of host device.

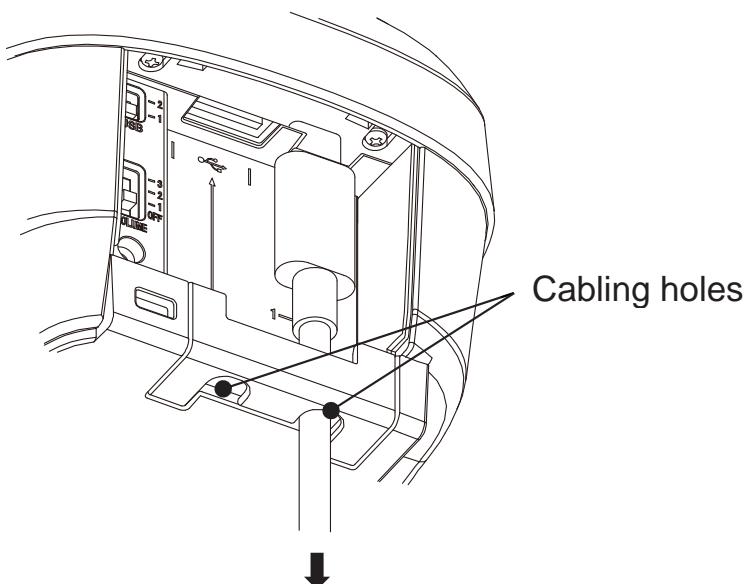
• Attach covers

(1) Attach the cable cover.



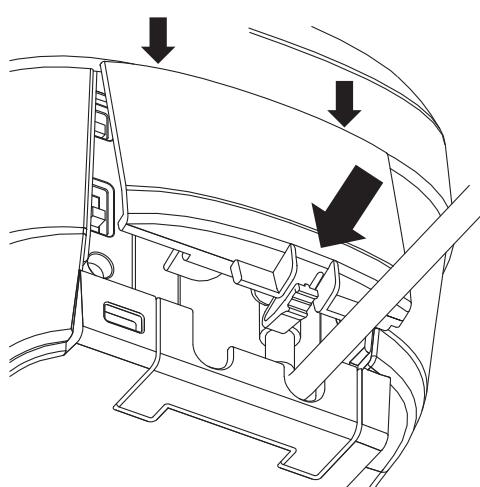
The cable cover can be attached in two ways. If you attach the cable cover so that cabling holes of it face the bottom, a connected cable can go out straight down.

Attach the cable cover from the bottom up.



A connected cable can go out of the unit straight down.

(2) Attach the rear cover.



Insert the upper claws into the unit, and then push the bottom of the cover until the lower claws click.

2.2 Handling the unit

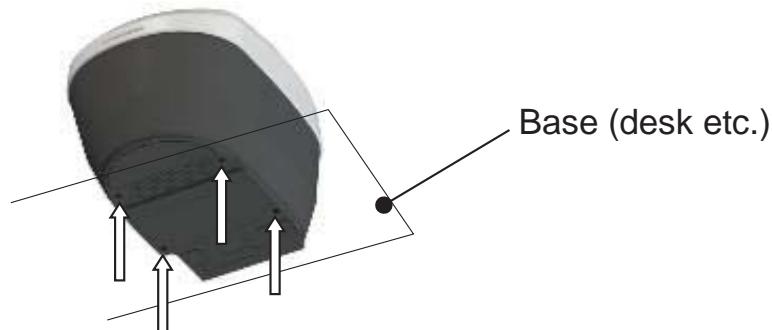
Place the unit in a stable location where the unit will not drop or roll.

If the unit needs to be secured, use four screws to secure the bottom of the unit.

To prevent failures in vein capturing or authentication, note the following:

- Do not place anything around the unit that prevents the user from applying their fingers.
- Do not place the unit in a location where it is exposed to direct sunlight, spotlights, or other strong lights.

Securing the bottom with screws



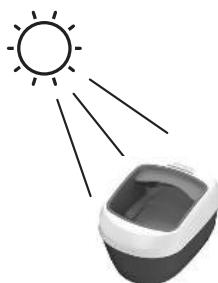
Use four screws to secure the bottom.

Authentication might fail in the following situations:



•Obstructions around the unit

If there are obstructions around the unit, it might be difficult for users to apply their fingers. Do not place anything around the unit.



•Direct sunlight

Authentication might fail in locations where the unit is exposed to direct sunlight. Do not place the unit in such locations.



•Strong illumination such as spotlights

Authentication might fail in locations where the unit is exposed to strong light, such as spotlights. Do not place the unit in such locations.

2.3 Turning the power on

Connect the AC cord to the AC adapter, connect the AC cord to an outlet, and then connect the DC plug of the AC adapter to the DC-IN terminal of the unit.

When power supply via the AC adapter starts, the power to the unit turns on and the unit starts.

When the unit has started, the status LED turns green.

IMPORTANT

- After you connect power via the AC adapter to the unit, it takes about 20 seconds until the unit starts up.
When the unit has started, the status LED turns green.
- If you turn the power off and plan to turn it on again, wait for about 5 to 10 seconds before turning the power on again. If you immediately turn the power on again, the unit might not operate correctly.
- Insert the DC plug straight into the DC-IN terminal completely. Incomplete insertion can cause poor electrical contact that prevents the unit from starting normally.
- Insert the DC plug all the way to prevent malfunction caused by poor contact.

2.4 Turning the power off

The power to the unit turns off when you disconnect the DC plug of the AC adapter from the DC-IN terminal of the unit.

IMPORTANT

- Before you disconnect the plug, make sure that the unit is idle; that is, the unit is not performing any operations such as authentication. Disconnecting the plug while the unit is busy can cause a failure.
- If you turn the power off and plan to turn it on again, wait for about 5 to 10 seconds before turning the power on again. If you immediately turn the power on again, the unit might not operate correctly.

2.5 Resetting the unit

Using reset button, you can reset the unit to the status that existed immediately after the unit was turned on. To do so, hold down the reset button on the rear of the unit for 3 or more seconds by using a narrow-tipped object, such as the point of a ball-point pen. When the unit is reset, it restarts in the same way as when its power is turned on normally.

IMPORTANT

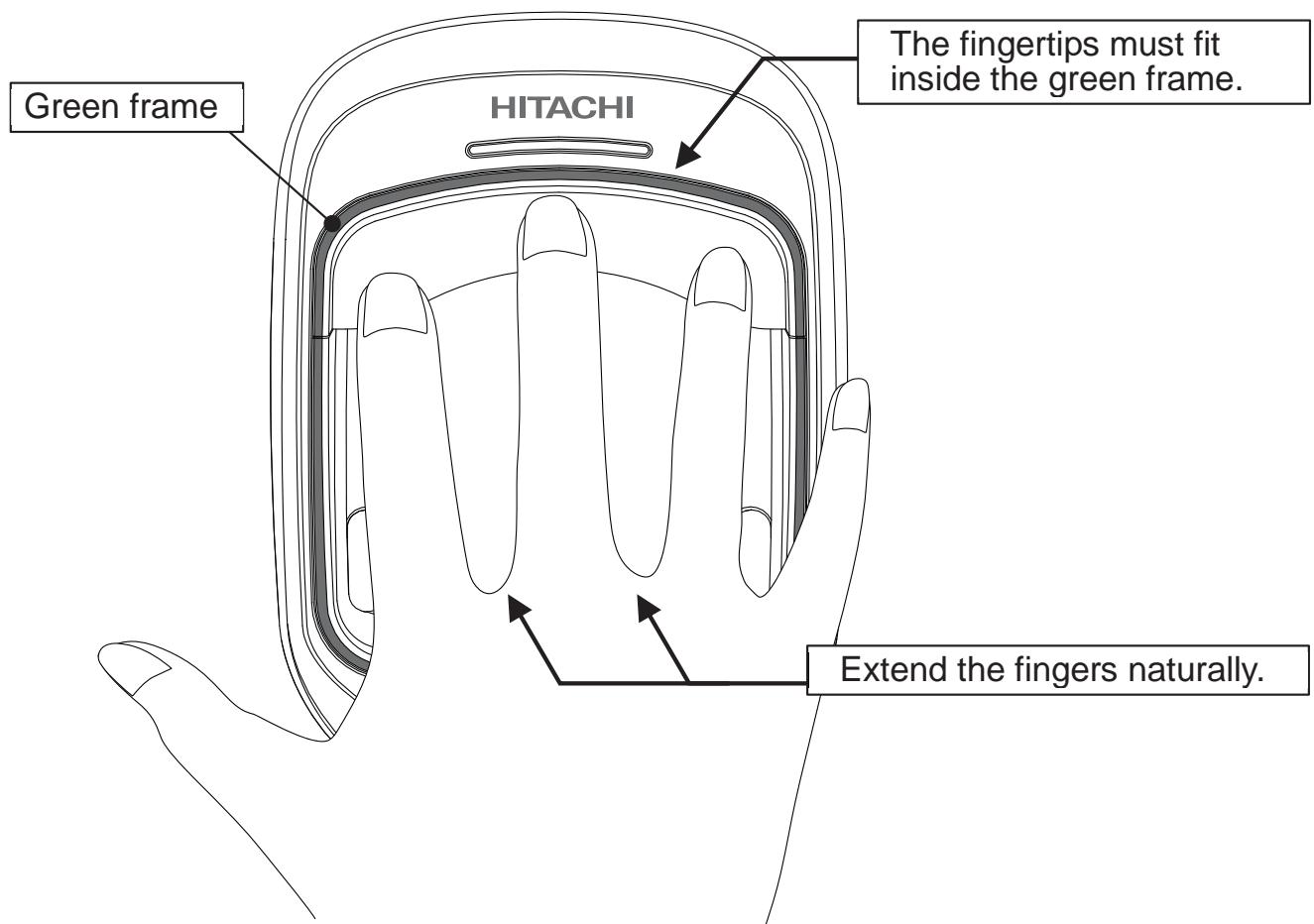
- After you reset the unit, it takes about 20 seconds until the unit starts up.
When the unit has started, the status LED turns green.

3. Finger Vein Authentication

In response to a finger vein authentication request from the software, the unit turns on the capturing LED and starts finger vein capturing.

Extend your fingers naturally, and then place your forefinger, middle finger, and ring finger inside the capturing area within the green frame. The unit then captures the finger vein image and perform user authentication by communicate with the BIS.

• How to apply fingers

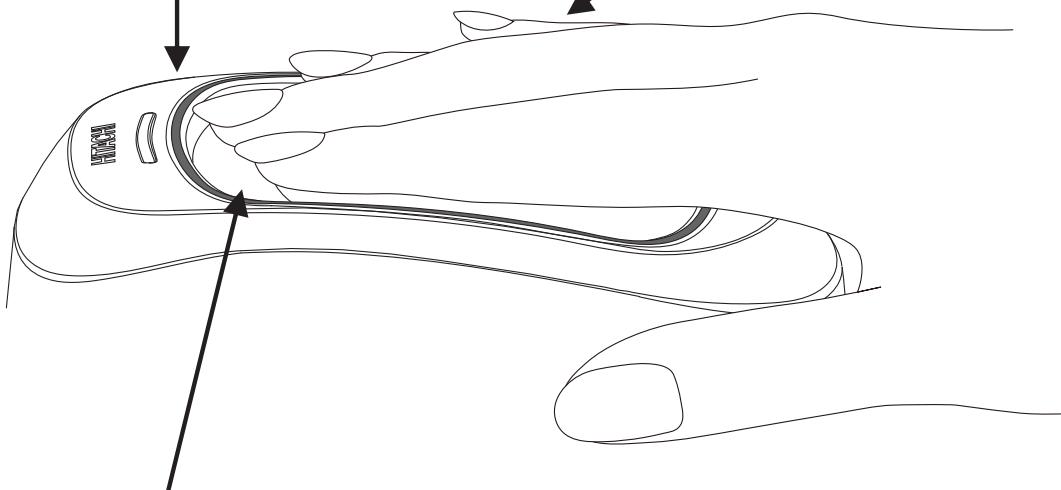


IMPORTANT

- Authentication might fail in the following cases:
 - The fingers are not extended.
 - The fingers are bent.
 - The fingers are backwards.
 - The fingers are covered by something such as large rings or bandages.
 - The finger skin is rough or the fingers are injured.
- You do not need to forcibly apply your fingertips on the finger rest. Attempting to forcibly apply all fingertips in place might cause the fingers to bend, resulting in authentication failure.
If applying all fingertips in place is difficult, apply only the tip of the longest finger.

Be careful to ensure that the fingertip fits inside the green frame.

Straighten the fingers.

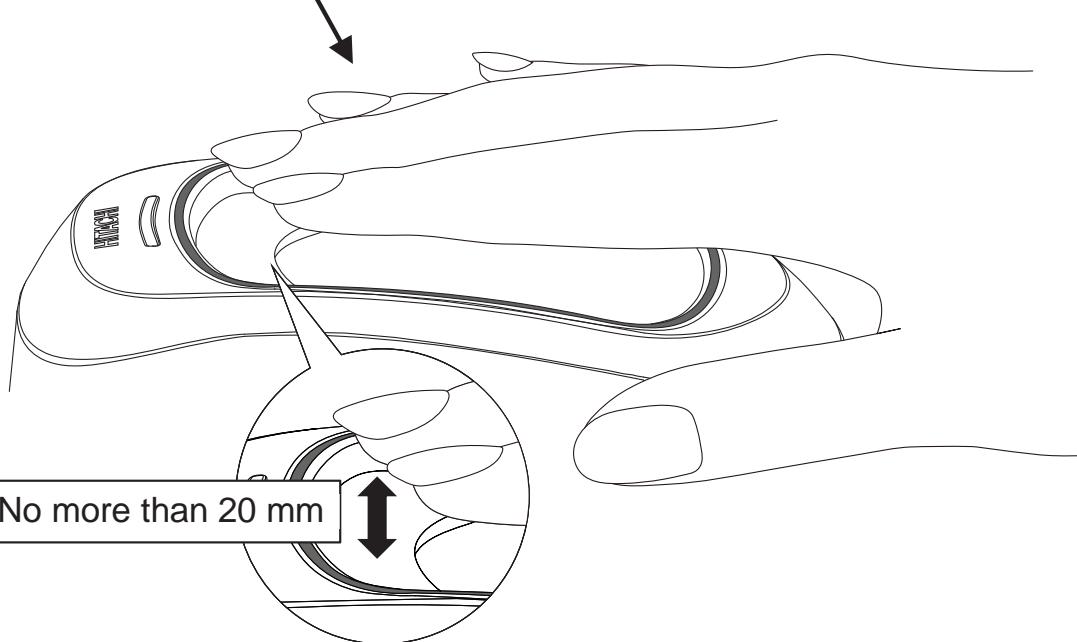


Lightly place the fingertips on the finger rest.
If you are unable to straighten all your fingers, place only the longest finger on the finger rest.

The fingers do not need to contact the finger rest.

When not contacting the finger rest, make sure that the distance between the fingers and the finger rest is no more than 20 mm.

Straighten the fingers and apply them horizontally.



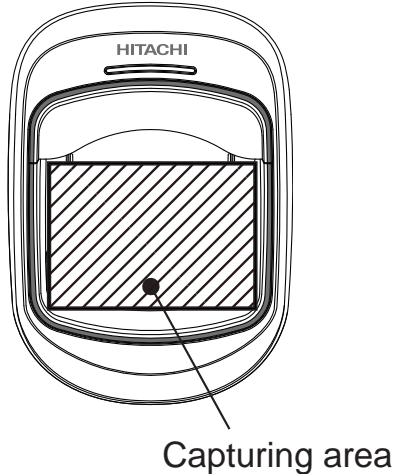
IMPORTANT

- We recommend that you place your fingers so that they directly contact the finger rest when registering finger veins. Authentication is easier when the fingers are kept stable.

4. Reading Barcodes

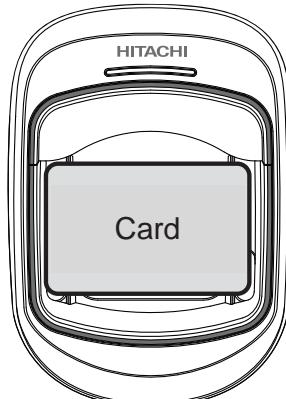
In response to a barcode reading request from the software, the unit turns on the capturing LED and starts reading barcode. A user places a barcode to capturing area then the unit read it.

Barcode capturing area:
Do not overlap the barcode with the finger rest.



Plastic cards or similar cards:

Hold the card over the capturing area, directing the side on which the barcode is printed to the capturing area.



Smartphone:

Display the target barcode on the screen of the smartphone and hold the smartphone over the capturing area, directing the screen toward the capturing area.



Supported barcode formats:

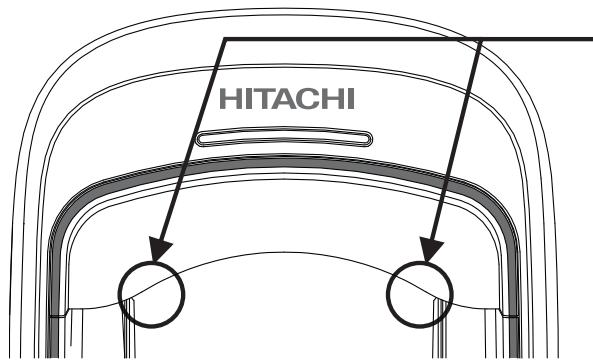
Type	Supported format
One-dimensional barcode	<ul style="list-style-type: none">• EAN-8• EAN-13• UPC-A• UPC-E• CODE39• CODE128• ITF
Two-dimensional barcode	<ul style="list-style-type: none">• QR code• SQRC[#]

[#]: To decode a security QR code (SQRC), you must purchase the SQRC library software and subscribe to the cloud service of DENSO WAVE INCORPORATED. The barcode image captured with this unit as requested by the user application software via the BIS client is decoded by using the SQRC library. For details, see the documentation for the SQRC library.

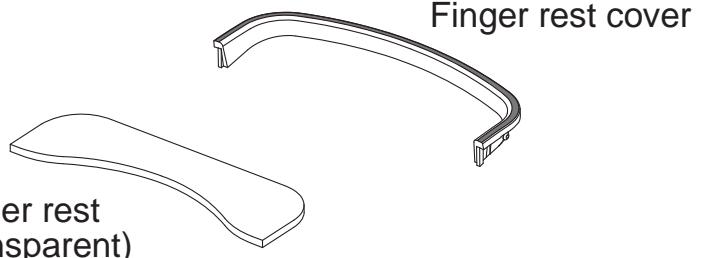
5. Maintenance Procedures

You can detach the finger rest to clean the finger rest and the capturing area of the unit.

To detach the finger rest:



While pulling up on the finger rest at the two circled points, slide the finger rest upward to detach both the finger rest and finger rest cover.



IMPORTANT

- When detaching the finger rest and its cover, move the cover slowly so that it does not fly off.

To clean:

Wipe the inside of the capturing area with a soft cloth.

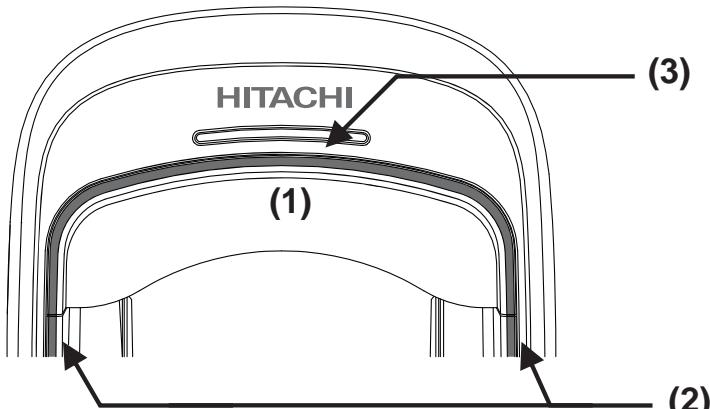
Make sure that dust and other particles do not accumulate on the capturing area.

IMPORTANT

- Periodically clean the interior of the capturing area. Leaving the interior of the capturing area dirty can cause a malfunction.
- Make sure that no liquid accumulates inside the capturing area.
- You can use alcohol to clean the capturing area, finger rest, and the white top case of the unit. Use a soft cloth moistened with alcohol to evenly clean these sections.

To attach the finger rest:

- Put the finger rest in place on the unit.
- Position both ends of the finger rest cover in place.
- To secure the finger rest, push the finger rest cover in until it clicks.



IMPORTANT

- Be careful not to damage or break the finger rest cover.

6. Specifications

Product name	Hitachi Contactless Vein Authentication Unit C-1
Model	PC-KCC300
Authentication data	Stored on the server ^{#1}
Authentication precision ^{#2}	FRR: 0.01% or less FAR: 0.0000016% or less
Interface ^{#3, #4}	USB 2.0 Device x 1 (High Speed) USB 2.0 Host x 1 (High Speed)
Indicator and speaker	Status LED x 1 Monaural speaker x 1
Power	AC adapter: DC 12V 3A USB PD: DC 9V 3A
Lifetime	Unit: 12,000 hours ^{#5} USB port 1: 1,000 insertions and removals USB port 2: 1,000 insertions and removals DC-IN: 2,000 insertions and removals Finger rest: 200 times detaching and attaching
Environmental conditions	<ul style="list-style-type: none"> Operating <ul style="list-style-type: none"> Ambient temperature: 5°C to 35°C Ambient Humidity: 20% to 80% Rh (no condensation) Storage <ul style="list-style-type: none"> Ambient temperature: -10°C to 60°C Ambient Humidity: 20% to 80% Rh (no condensation)
External dimensions	Approx. 96 (W) × 135 (D) × 83 (H) mm
Weight	Approx. 265 g

#1: The maximum number of data items that can be registered depends on the Hitachi Biometric Identity Suite (BIS) with which this unit is used.

#2: These are the results of measurement in 1:1 authentication.

These values were obtained by using a measurement method based on the ISO/IEC 19795-1:2021 international standard regarding the evaluation of precision in biometrics.

FRR: False Reject Rate

FAR: False Accept Rate

#3: Connecting this product to a USB port on the Host Device is recommended.

If you connect this product to a USB hub, make sure that the USB hub is self-powered. If this product does not operate normally, remove it from the USB port, and then connect it to the USB port again.

This product might be unable to operate with some devices if it is connected to a USB 3.0, 3.1, or 3.2 port.

#4: We do not guarantee the operation of all USB devices.

#5: Under conditions where this product is used for 8 hours per day and 25 days per month, the life span is 5 years.

7. Troubleshooting

This chapter describes how to handle problems with the unit.

If a problem occurs, see this chapter and the relevant software documentation.

If you think the problem is obviously due to hardware, contact your distributor.

■ I connected a USB cable to the authentication unit, but the status LED does not turn green.

- The unit has not been recognized.
→ Check whether the host device is correctly set up by referring to the manual for the Hitachi Contactless Vein Authentication Unit C-1 Middleware.
- The USB port of the host device does not work correctly.
→ Restart the host device unit.
- A hardware failure might have occurred.
→ Contact your distributor.

IMPORTANT

- For details on controlling how the status LED lights or flashes, see the specifications of the user application software.
- The user application software uses BIS client and Hitachi Contactless Vein Authentication Unit C-1 Middleware to control the status LED. Note that the software might be set to turn the status LED off even if the host device has successfully recognized this unit.

■ No sound is generated when authentication starts or ends.

- Check whether the volume switch is set to OFF.
→ Check the status of the volume switch on the rear of the unit.
- A hardware failure might have occurred.
→ Contact your distributor.

IMPORTANT

- For details about sound playback, see the specifications of the user application software.
- The user application software uses the BIS client and Hitachi Contactless Vein Authentication Unit C-1 Middleware to control sound playback. If the software does not play back sound, no sound is played from the internal speaker of the unit when authentication.

■ Authentication does not start.

If authentication does not start, the unit might not have been connected to the host device correctly.

- This unit has not been recognized by the host device.

→ After turning the authentication unit off, disconnect the USB cable and the USB-to-Wi-Fi adapter, connect them again, and then turn the authentication unit ON again.
→ Check whether the settings have been specified correctly for the user application software, BIS, BIS client, middleware, and this unit. If any settings are incorrect, correct them, and then connect the unit to the host device again.

■ Authentication fails.

For this product, a single authentication takes a maximum of 10 seconds.

Authentication fails if it fails within 10 seconds. If authentication does not end within 10 seconds, possible causes are as follows:

- Fingers were moving during authentication.
 - During authentication, place the fingers in the authentication area, and do not move the fingers until authentication is complete.
- The fingers are injured or the surface of the fingers are rough or dirty.
 - Authentication might not have finished because an appropriate image is not obtained when the fingers are injured or smeared with dirt, or the surface of the fingers is rough.
 - Make sure that the hand used for authentication is free of injury or skin roughness. Alternatively, clean the hand, and then retry authentication.
- The fingers are not applied correctly.
 - Correctly position your fingers inside the authentication area in the same way as you did during registration.
 - Authentication might fail if the fingers are not positioned inside the authentication area, not extended, or not straight.
- The state of the fingers has changed from the state when registration was performed.
 - For growing children, the state of the fingers might change, making successful authentication difficult. In such cases, perform registration again.
- The ambient environment is too bright.
 - If the fingers or unit is exposed to direct sunlight or spotlights, change the location in which the unit is placed or use a screen or similar object to block the strong light.
- Communication with the BIS or host device is sometimes interrupted.
 - If the communication between this unit and the host device or between the host device and the BIS is sometimes interrupted, check and correct the communication environment and settings.

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