PalmSecure

U3PS-LB13-01ENZ3(1)

FUJITSU Biometric Authentication

PalmSecure™ SDK V02

Sensor Instruction Manual

for PalmSecure™ Sensor V2

FUJITSU

◆ Revision History

Revision	Issued Date	Revised Page	Modification Details
Rev. 1	July 2020	Entire document	Newly created
Rev. 1.1	July 2021	Page 37	• Modified descriptions concerning the Authentication accuracy in “Appendix A Main Specifications of the Sensor”.

◆ For Your Safety

This document contains important information regarding the safe use of the Sensor. Before using the Sensor, please read this document carefully. In particular, you should read and understand "Important Notes for Your Safety", described in this document, before using the Sensor. Please keep this document in a safe place so that you can refer to it when needed.

Standard for the FCC conformity

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. However, 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 required 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 to an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/television technician for help.

This devices 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.

This Class B digital apparatus meets all requirements of the Canadian Interference-Causing Equipment Regulations.

FCC WARNING

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

Returning used electrical and electronic devices in EU countries

Separate collection:
Users of electrical and electronic devices are obligated to collect used devices separately. Electrical (electronic) used devices may not be disposed of together with unsorted household refuse. The separate collection is a condition for reuse, recycling and utilisation of used electrical (electronic) devices, which ensures the protection of resources.

Return and collection systems
Electrical (electronic) used devices from private households can be returned free of charge. To return your used device, please use the country-specific return and collection systems available to you.

Reuse, recycling and utilization
By actively using the offered return and collection systems, you make your contribution to the reuse, recycling and utilisation of electrical (electronic) devices.

Effects on the environment and human health
Electrical (electronic) used devices contain parts which must be handled selectively according to the EU directive. Separate collection and selective treatment are the basis for environment-friendly disposal and the protection of human health.

Meaning of the symbol "Crossed out rubbish bin on wheels"
Electrical (electronic) devices which are marked with following symbols may not be disposed of with household refuse in accordance with the EU directive.

Importer / Distributor in EU:
Fujitsu Technology Solutions GmbH
Mies-van-der Rohe-Strasse 8 D-80807 Munich, Germany

This is the material for only users in China.
This is the mark based on the Chinese law of “Administration on the Control of Pollution Caused by Electronic Information Products”. Please inquire us through our SDK Support Website when users in other countries other than China need this information.

PalmSecure SDK 的污染物质状况

本标志是根据2006年2月28日公布的［电子信息产品污染控制管理办法］以及SJ/T11364-2006［电子信息产品污染控制标识要求］的相关规定所制定的电子信息产品污染控制标志，适用于在中国境内销售的电子信息产品。其数字表示该产品的环保使用期限，单位为年。只要遵守关于该产品的安全及使用上的注意事项，在此期限(从生产日期起算)内，该产品中含有的有毒、有害物质不会发生外泄或突变，用户使用该产品不会对环境造成严重污染或对其人身及财产造成严重损害。

部件名称	有害有毒物质及元素					
	铅(Pb)	汞(Hg)	镉(Cd)	六价铬(Cr(VI))	多溴联苯(PBB)	多溴二苯醚(PBDE)
传感器	×	○	○	×	○	○
传感器外框	○	○	○	○	○	○
手的干们支架	○	○	○	○	○	○
USB连接器	○	○	○	○	○	○
USB线缆	○	○	○	○	○	○
其它付属品	○	○	○	○	○	○

○： 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SJ/T11363-2006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SJ/T11363-2006规定的限量要求.

◆ Introduction

Thank you for purchasing PalmSecure™ SDK V02 (hereinafter called “this product”).

This document describes how to handle the Sensor.

July 2021: Rev. 1.1

Caution for This Manual

You are required to use this product within the specifications described in this document.

Regarding to High Safety Required Usage

This Product is designed, developed and manufactured as contemplated for general use, including without limitation, general office use, personal use, household use, and ordinary industrial use, but is not designed, developed and manufactured as contemplated for use accompanying fatal risks or dangers that, unless extremely high safety is secured, could lead directly to death, personal injury, severe physical damage or other loss (hereinafter “High Safety Required Use”), including without limitation, nuclear reaction control in nuclear facility, aircraft flight control, air traffic control, mass transport control, medical life support system, missile launch control in weapon system. You shall not use this Product without securing the sufficient safety required for the High Safety Required Use. If you wish to use this Product for High Safety Required Use, please consult with the sales representatives in charge before such use.

Cautions for Exporting This Product

When exporting or providing this product and this document to a foreign country, check relevant laws such as “Foreign Exchange and Foreign Trade Control Law”, and regulations such as U.S. export control law, and follow the necessary procedures.

Warnings

- Reprinting or reproducing this document in part or in whole without permission is forbidden.
- Items described in this document are subject to change without prior notice.

PalmSecure is a trademark of Fujitsu Ltd.

Other company names and product names described in this document are trademarks or registered trademarks of each company.

◆ Composition of This Document

This document consists of the following four chapters and the appendix.

Chapter Title	Description
Chapter 1 Introduction to the Sensor	Provides an overview of the Sensor.
Chapter 2 How to Handle the Sensor	Describes how to use the Sensor.
Chapter 3 Considerations When Capturing the Palm Vein	Describes the issues to be considered when you capture the palm vein using the Sensor.
Chapter 4 Troubleshooting	Describes how to troubleshoot when the Sensor does not work properly.
Appendix	
Appendix A: Main Specifications of the Sensor	Attaches the main specifications of the Sensor.

◆ Abbreviations and Common Terms

Abbreviations and common terms used in this document are as follows:

Abbreviation/ Common Term	Description
This product	Abbreviation for “PalmSecure™ SDK V02”.
Sensor	Abbreviation for “PalmSecure Sensor V2”.
SDK V02 Support Website	Abbreviation for “PalmSecure™ SDK V02 Support Website”.
“Hardware Drawings”	Abbreviation for “Hardware Drawings for PalmSecure Sensor V2”.

◆ Notations

The following symbols are used in this document.

- **About Warnings and Cautions**

Symbol	Description
⚠Warning	Warning advises the reader that failure to take or avoid a specific action could result in danger to human body.
⚠Caution	Caution advises the reader that failure to take or avoid a specific action could result in physical injury or damage.

- **About Signs**

Symbol	Description
 General Prohibition	This sign indicates that, in general, an action should not be performed.
 Disassembly Prohibited	This sign indicates that you should not disassemble the items.

- **About Other Symbols**

Symbol	Description
!Caution	Describes things that you have to look out for. You must read it.
★Tip	Provides reference information. Read it as necessary.
>See>	Indicates an item to be referred.
Operation	Describes operation procedures.

◆ Important Notes for Your Safety

To use the Sensor safely, there are some key points that you should remember. Before you use the Sensor, please read this documents carefully and ensure that you handle the Sensor in the appropriate way.

⚠Warning

Failure to conform to the instructions below could cause an accident, such as electric shock and fire, which result in danger to the human body. Please read these instructions very carefully and ensure that you handle the Sensor properly.

 General Prohibition	• **Do not install the Sensor in a dangerous place that could cause electric shock and fire, etc.** For information on the installation environment of the Sensor, refer to "2.1 About the Installation Environment of the Sensor".
	• **Do not drop or expose the Sensor to strong shock** This could result in electric shock or fire.
	• **Do not use the Sensor near water or beverages** This could result in electric shock or fire.
	• **Do not put a piece of metal, such as a clip, inside the Sensor** This could result in electric shock or fire.
 Disassembly Prohibited	• **Do not disassemble or alter the Sensor** This could result in electric shock or fire.

⚠Caution

Failure to conform to the instructions below could cause an accident involving physical injury or damage to the equipment. Please read these instructions very carefully and ensure that you handle the Sensor properly.

 General Prohibition	• **Do not perform the actions that are not described in this document** Fujitsu Frontech Ltd is NOT responsible for any malfunction of the Sensor resulting from actions that are not mentioned in this document.
	• **Do not install the Sensor where it can be exposed to direct sunlight, etc.** This could result in the Sensor not operating properly. For information on the lighting environment when you install the Sensor, refer to "2.2 About the Lighting Environment when Installing the Sensor".
	• **Do not place something heavy on the Sensor** This could cause damage to the Sensor.
	• **Do not place something on the surface of Sensor unit** This could scratch the surface of Sensor unit, resulting in a malfunction of the Sensor.
	• **Do not wipe the surface of Sensor unit with a coarse cloth, etc.** This could scratch the surface of Sensor unit, resulting in a malfunction of the Sensor.
	• **Do not overpower the Palm guide** When the Palm guide is transformed, this could result in a malfunction of the Sensor.
	• **Do not pull the USB Interface cable** This could break the USB Interface cable.
	• **Do not move the Sensor with the USB Interface cable attached** You may drop the Sensor. When you move the Sensor, please ensure that you hold the Sensor unit firmly.
	• **Do not perform repairs yourself** Please contact your account manager when the Sensor does not work properly.

◆ Table of Contents

Chapter1 Introduction to the Sensor

1.1 Overview

The Sensor is a piece of equipment that uses near-infrared light to capture palm vein without contacting the palm.

The Sensor includes the following four parts:

- Sensor unit
- Holder
- USB Interface cable
- Palm guide

★Tip **Mouse type Sensor**
A mouse type Sensor can also be used in this product.

>See> For information on the mouse type Sensor, refer to the “Mouse Type Sensor Instruction Manual”.

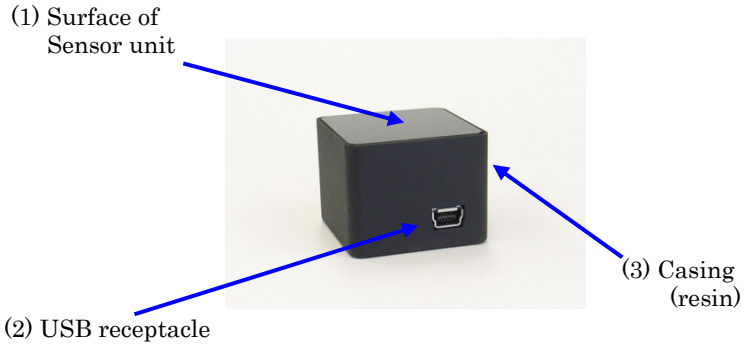
★Tip **U Guide**
A U guide for PalmSecure Sensor V2 can also be used in this product.

1.2 Sensor Unit

The Sensor unit is a piece of equipment used to capture the palm vein.

The following identifies the names of each part of the Sensor unit.

<PalmSecure Sensor V2>



Part Name		Description
(1)	Surface of Sensor unit	This is the part that captures the palm vein.
(2)	USB receptacle	This is the part to which the Series “mini-B” plug (with 5 pins) of the USB Interface cable is connected. Also, the position of the connector is 5.0 mm above the base.
(3)	Casing material	The casing of the Sensor is made of resin.

The Sensor unit is placed in the Holder at the time of purchase.

>See> For information on the Holder, refer to “1.3 Holder”.

1.3 Holder

The Holder is a cover for the Sensor unit.

The following shows the photographic image of the Holder.

The Holder consists of the following 3 parts.

(1) Upper cover

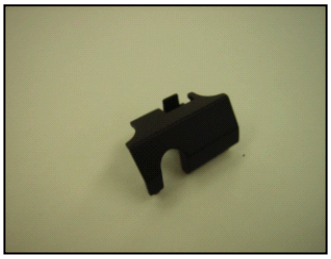
(2) Lower cover

(3) Connector cover

<Upper cover>

<Lower cover>

<Connector cover>



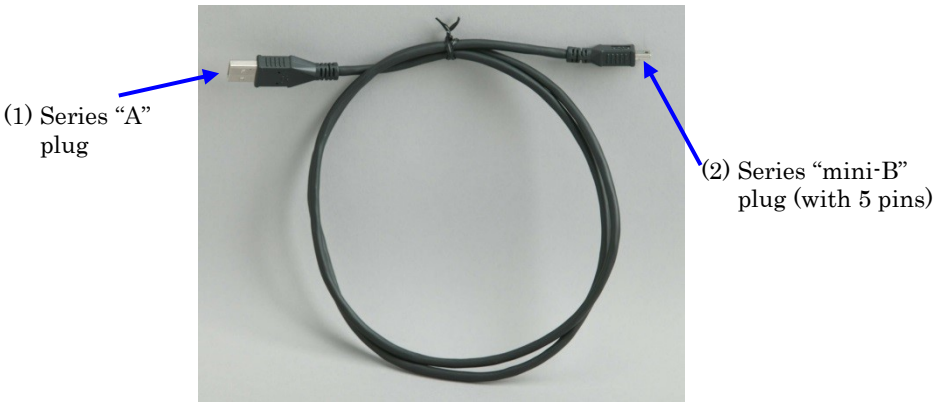
Part Name		Description
(1)	Upper cover	The cover over the upper side of the Sensor unit.
(2)	Lower cover	The cover under the Sensor unit.
(3)	Connector cover	The cover over the USB receptacle.

1.4 USB Interface Cable

The USB Interface cable connects the Sensor unit and the target hardware.

The length of the USB Interface cable which is included in this product is 1 meter.

The following identifies the names of each part of the USB Interface cable.

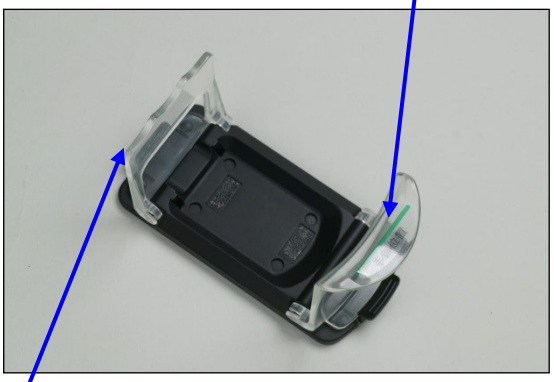


Part Name		Description
(1)	Series “A” plug	This is the part to be inserted into the USB port of the target hardware.
(2)	Series “mini-B” plug (with 5 pins)	This is the part to be inserted into the USB receptacle of the Sensor unit.

1.5 Palm Guide

The Palm guide indicates how to place the hand when the palm vein is being captured. It is designed to optimize the distance between the Sensor and the palm. The following identifies the names of each part of the Palm guide.

<When folded>



<When opened>

Part Name		Description
(1)	Wrist guide	This indicates where to place the wrist.
(2)	Finger guide	This indicates where to place the finger.

The Palm guide is used as opened. It can also be folded when moving or storing.

>See> For information on how to open and fold the Palm guide, refer to "2.5 How to Open and Fold the Palm Guide".

Chapter2 How to Handle the Sensor

2.1 About the Installation Environment of the Sensor

The following table defines the installation environment of the Sensor.

Item	Specification	Note
Temperature	0 to 60℃	In case running for 12 hours or less a day, it is possible to use in the environment of 60℃ at all times. In case running for 24 hours a day, keep the average of 50℃ or less. In case running from 12 hours to 24 hours, refer to the list below.
Humidity	10 to 90%RH	Non-condensing.

!Caution **Do not install the Sensor in a dangerous place that could cause electric shock and fire, etc.**

Please do not install the Sensor in any of the places described below: This could result in electric shock or fire, etc.

- Unstable places (places where the Sensor could fall)
- Hot, cold, and humid places
- Near heating/air conditioning equipment
- Dusty places
- Places where a ferromagnetic field or noise is induced
- Places where static is created (such as desks made of plastic)
- Near volatile inflammable materials or inflammable goods such as drapes
- Places where volatile gas and/or flammable gas is created

★Tip **About approximate temperature based on running time of the Sensor a day.**

The following explains approximate temperature based on running time of the Sensor.

Running hour a day	Temperature
12 hours or less	60℃ at all times (possible to use)
13 hours	average 57℃ or less
14 hours	average 56℃ or less
15 hours	average 55℃ or less
16 hours	average 54℃ or less
17 hours	average 53℃ or less
18 hours	average 53℃ or less
19 hours	average 52℃ or less
20 hours	average 51℃ or less
21 hours	average 50℃ or less
22 hours	average 50℃ or less
23 hours	average 50℃ or less
24 hours	average 50℃ or less

2.2 About the Lighting Environment when Installing the Sensor

The Sensor is a piece of equipment that uses near-infrared light to capture palm vein without contacting the palm. The authentication accuracy of equipment using near-infrared light varies greatly, depending on the amount of near-infrared light from natural light (sunlight), incandescent lamps, and halogen lamps in the environment.

The following table details the lighting environment under which the Sensor should be set up.

<Authentication>

Item	Specification	Note
Natural light	Below 3,000 lux	Under natural light, the visible illumination meter (See Note below) should be faced to the irradiation direction.
Fluorescent lamps, LED lamps	Below 3,000 lux	
Incandescent lamps	Below 700 lux	
Halogen lamps		

<Enrollment>

Item	Specification	Note
Natural light	Below 2,000 lux	Under natural light, the visible illumination meter (See Note below) should be faced to the irradiation direction.
Fluorescent lamps, LED lamps	Below 2,000 lux	
Incandescent lamps	Below 500 lux	
Halogen lamps		

Note) The visible illumination meter is used to measure visible brightness and the brightness of a place. Typically, the brightness in a general office is shown as 500 to 1,500 lux.

!Caution **Do not install the Sensor where it can be exposed to direct sunlight, etc.**
Please do not install the Sensor in any of the places described below: This could result in the Sensor not operating properly.
・Places where the Sensor can be exposed to direct sunlight
・Places where sunlight may come near the Sensor
When you use the Sensor in any of the places mentioned above, please install drapes or blinds on the windows near the Sensor to avoid direct sunlight. Also, measures should be taken with consideration to the changes in sunlight by the time of day (sunrise or sunset) and by seasons.

!Caution Notes on the blind angle and the distance from the blind

When using the Sensor in places where a blind is installed, check the blind angle and the distance from the blind as illustrated in figure 1. Authentication accuracy may improve.

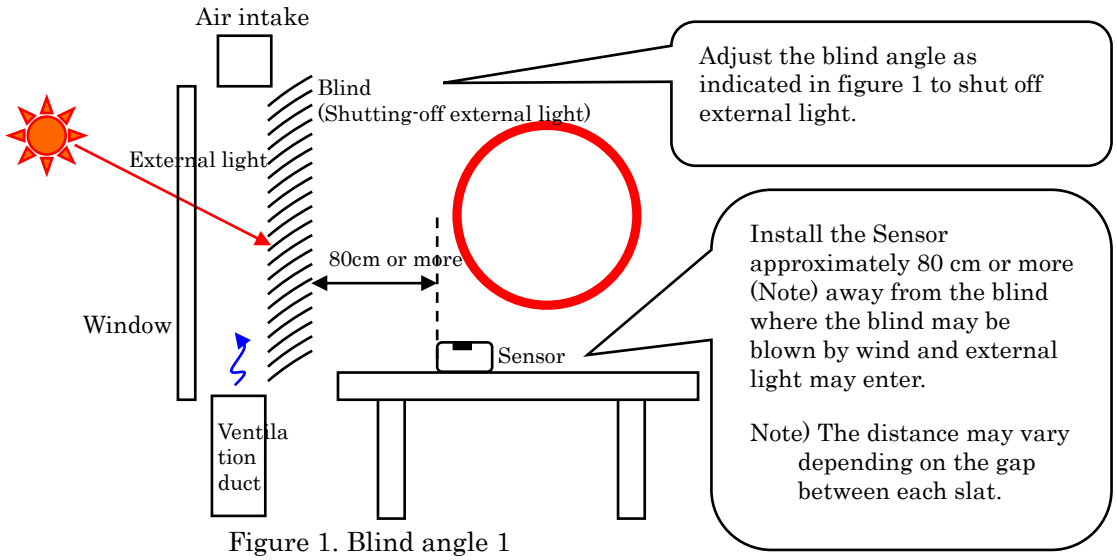


Figure 1. Blind angle 1

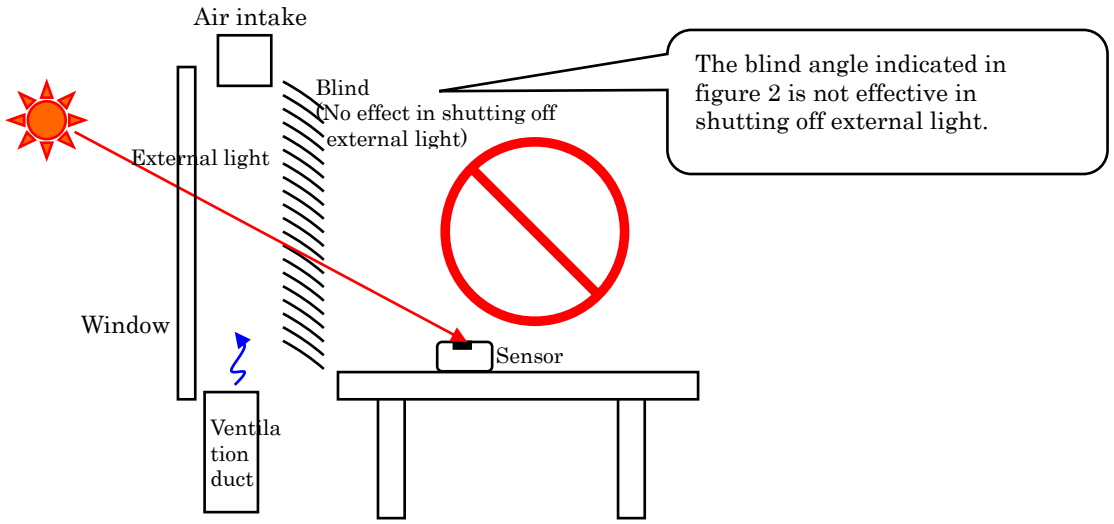


Figure 2. Blind angle 2

!Caution Using the Sensor under incandescent lamps or halogen lamps

Incandescent lamps and halogen lamps have as much as double to four times the luminance as the figures measured by the visible illumination meter. When you use the Sensor under incandescent or halogen lamps, please adjust the angle of the lights so that the Sensor is not exposed to direct light. If the Sensor still does not operate properly, please change the light to fluorescent light.

!Caution Using the Sensor near equipment emitting infrared light

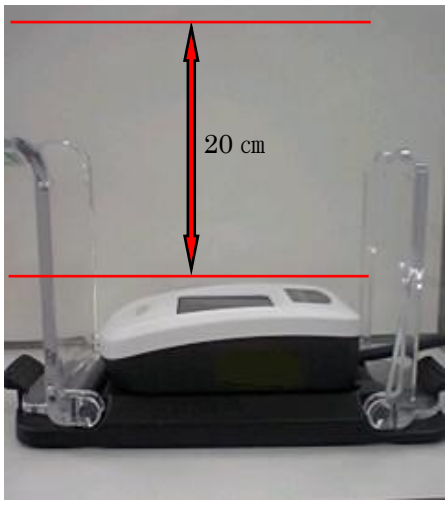
The Sensor may not operate properly when it is used near equipment emitting infrared radiation, such as remote controllers. More than 50 cm of distance from such equipment is recommended when the Sensor is used.

2.3 Clearance Around the Sensor

The following clearance is required around the Sensor.

- **Clearance from the Sensor**

  The following illustrates the required clearance above and to the side of the Sensor.



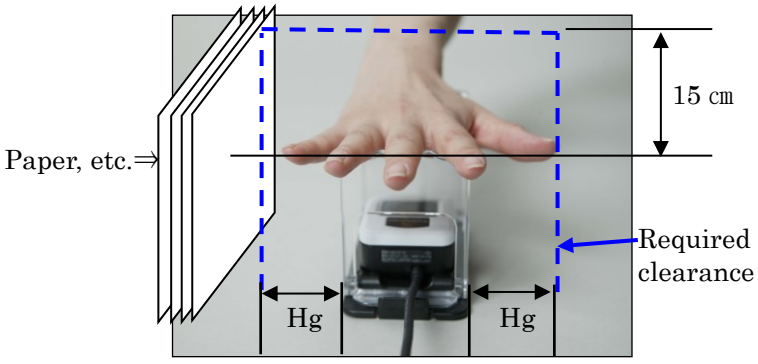
<Clearance above the Sensor>

<Clearance to the side of the Sensor>

>See> For information on Hs (clearance from the side of the Sensor), refer to the next page.

- **Clearance from the Palm guide**

  The following illustrates the required clearance above and to the side of the Palm guide if you use the Palm guide.



>See> For information on Hg (clearance from the side of the Palm guide), refer to the next page.

The required clearance from the side of the Sensor or Palm guide varies depending on the Guide mode.

>See> For information on Guide mode, refer to the “System Development Guide” and “Authentication Library Reference Guide”.

The following illustrates the required clearance from the side of the Sensor and Palm guide.

Guide mode	Hs (Distance from the side of the Sensor)	Hg (Distance from the side of the Palm guide)
With guide mode	8 ㎝	6 ㎝
Without guide mode	10 ㎝	8 ㎝

Authentication results will be affected if there is any object which causes diffuse reflection such as a paper or wall placed within the above clearance space.

!Caution **Objects with a glossy surface such as a mirror or metal**
The above clearance is defined for objects which cause diffuse reflection such as a paper and wall.
Authentication results may be affected by objects with a glossy surface such as a mirror or metal regardless of the distance. Therefore, do not install the Sensor where objects with a glossy surface such as a mirror or metal are located.

2.4 How to Assemble the Sensor Unit, Holder and USB Interface Cable

The following describes how to assemble the Sensor unit, Holder and USB Interface cable.

Operation

Step1 **If the Sensor unit is not already in the Holder, place the Sensor unit in the Holder as follows.**

The following operations are not required if the Sensor unit is already in the Holder. Remove the connector cover and skip to Step 2.

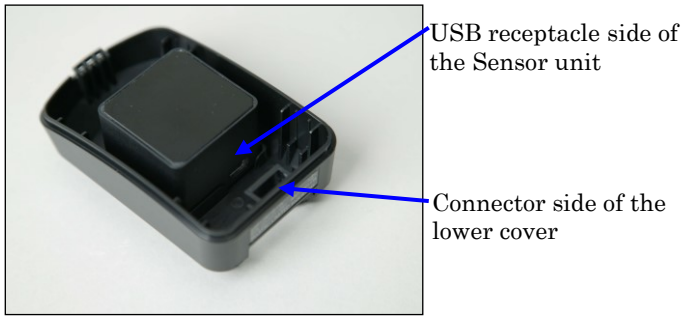
>See> For information on how to remove the connector cover, refer to "Tip When removing the connector cover" in Step 3.

(1) Disassemble the Holder into the following parts.

- Upper cover
- Lower cover
- Connector cover

>See> For information on how to disassemble the Holder, refer to "Tip When removing the connector cover" in Step 3 and "Tip When removing the upper cover" in Step 1 (4).

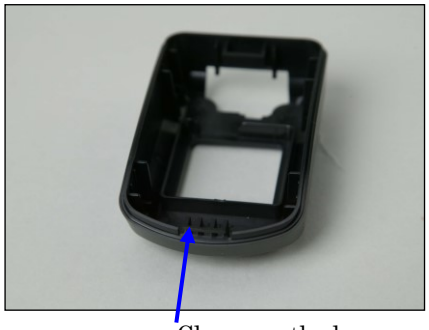
(2) Place the Sensor unit into the lower cover.



!Caution **When placing the Sensor unit in the Holder**

Place the Sensor unit in a way that the USB receptacle side of the Sensor unit is facing the connector cover side of the lower cover.

(3) Fasten the upper cover by inserting the Clamp of the upper cover into the Clamp of the lower cover.

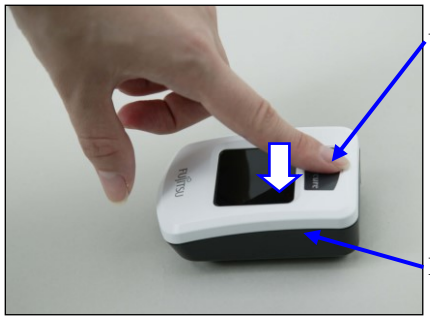


Clamp on the lower cover

<Inserting the Clamp>

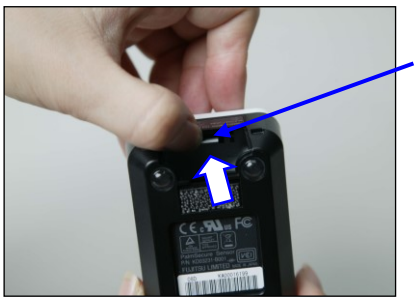
* The Sensor unit is removed to show the Clamps in this photograph.

(4) Secure the upper cover by pushing it with your finger till it clicks.

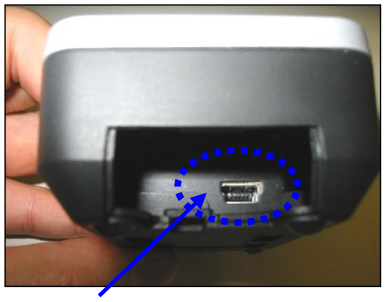


★Tip **When removing the upper cover**

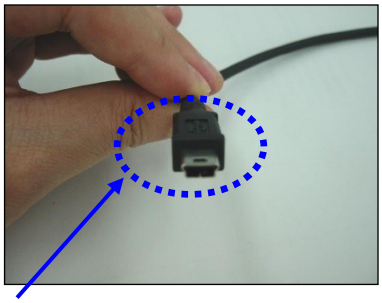
Move the fixing Clamp of the upper cover in the direction of an arrow.



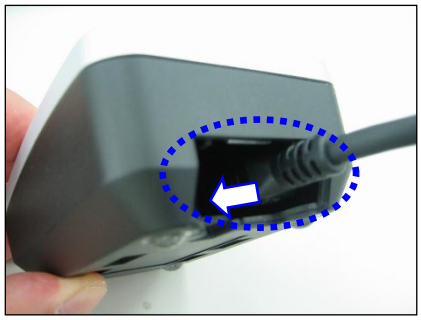
Step2 **Insert the Series "mini-B" plug (with 5 pins) of the USB Interface cable, the USB logo side up, into the USB receptacle on the Sensor unit.**



USB receptacle
on the Sensor unit

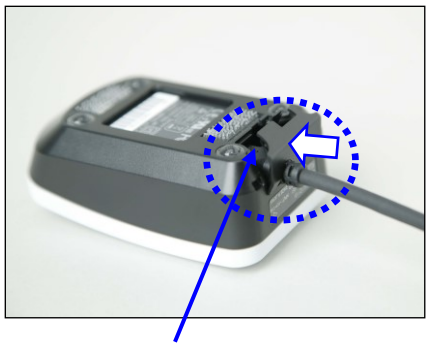


Series "mini-B" plug (with 5 pins)
of the USB Interface cable



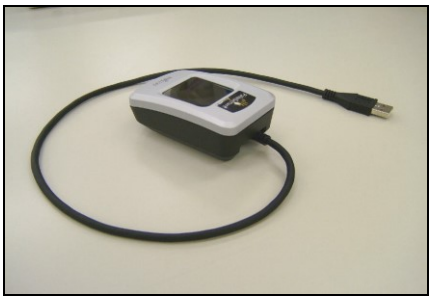
<USB Interface cable connected to the Sensor>

Step3 **Fasten the connector cover by pushing it till clicks.**



Connector cover

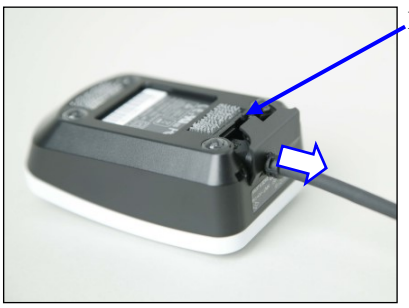
!Caution **When fastening the connector cover**
Take care not to catch the USB Interface cable with the connector cover.



<Assembled Sensor unit, Holder and USB Interface cable>

★Tip **When removing the connector cover**

Move the fixing Clamp of the connector cover in the direction of an arrow.



2.5 How to Open and Fold the Palm Guide

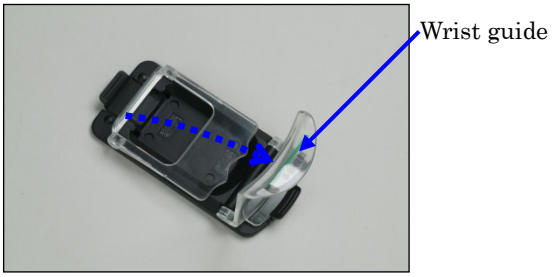
The Palm guide is used as opened. It can also be folded when moving or storing.

The following describes how to open and fold the Palm guide.

◆ How to Open the Palm Guide

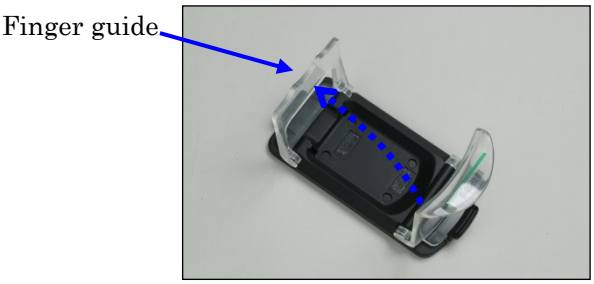
Operation

Step1 **Hold down the lower black section of the Palm guide and open the Wrist guide till it clicks.**



!Caution **When opening the Wrist guide**
Do not open using your finger nails. You may injure yourself.

Step2 **Hold down the lower black section of the Palm guide and open the Finger guide till it clicks in the same manner.**

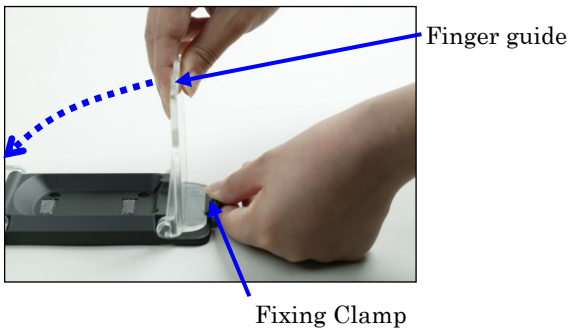


!Caution **When opening the Finger guide**
Do not open using your finger nails. You may injure yourself.

◆ How to Fold the Palm Guide

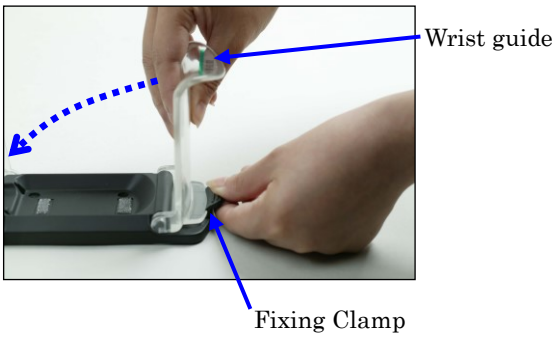
Operation

Step1 **Open the fixing Clamp with your thumb pad and fold the Finger guide.**



!Caution **When folding the Finger guide**
Do not fold using your finger nails. You may injure yourself.

Step2 **Open the fixing Clamp with your thumb pad and fold the Wrist guide in the same manner.**



!Caution **When folding the Wrist guide**
Do not fold using your finger nails. You may injure yourself.

2.6 How to Connect the Sensor to the Target Hardware

The following describes how to connect the Sensor to the target hardware.

>See> For information on how to connect the mouse type Sensor to the target hardware, refer to the “Mouse Type Sensor Instruction Manual”.

!Caution **Before connecting the Sensor**
The Sensor driver should be installed on the target hardware before connecting the Sensor.

>See> For information on how to install the Sensor driver, refer to “Sensor Driver Installation Guide”.

★Tip **Power source of the Sensor**
Power for the Sensor is provided by the connected target hardware.

Operation

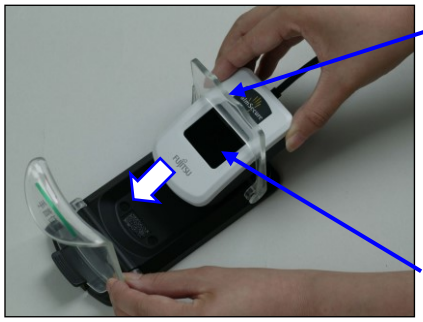
Step1 **Connect the USB Interface cable to the Sensor unit.**
If using the Holder, place the Sensor unit in the Holder before connecting the USB Interface cable.

>See> For information how to connect the USB Interface cable after placing the Sensor unit in the Holder, refer to “2.4 How to Assemble the Sensor Unit, Holder and USB Interface Cable”.

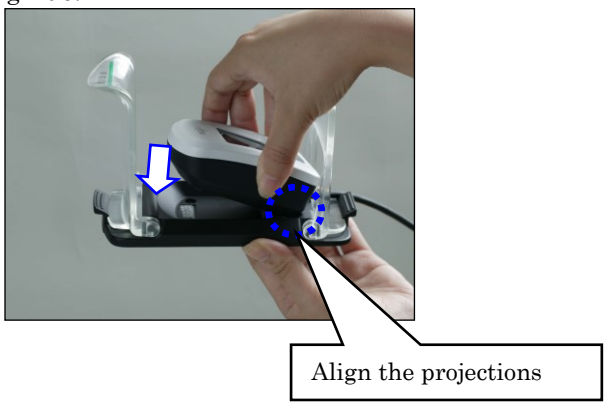
Step2 **If using the Palm guide, attach the Palm guide to the Sensor as follows.**
The following operations are not required if not using the Palm guide.
Skip to Step 3.

(1) Open the Palm guide.
>See> Refer to "2.5 How to Open and Fold the Palm Guide".

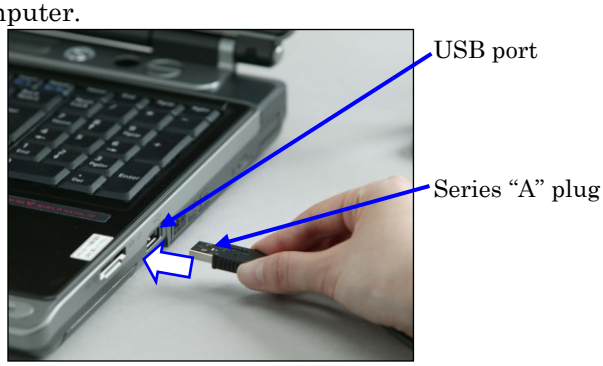
(2) Insert the Sensor from the opening on the Finger guide side of the Palm guide.



(3) Align the projections on the Finger guide side of the Palm guide, and on the bottom of the Sensor and push down the Sensor to fasten on the Palm guide.



Step3 **Insert the Series "A" plug of the USB Interface cable into the USB port of the target hardware.**
The following photograph is an example where the target hardware is a personal computer.



2.7 About Daily Check-ups and Cleaning

2.7.1 About Daily Check-ups

Perform a daily check on the Sensor regarding the following items:

- Establish that there is a firm connection between the Sensor and the target hardware.

  >See> For information on how to connect the Sensor to the target hardware, refer to "2.6 How to Connect the Sensor to the Target Hardware".

- Ensure that the USB Interface cable is not under the equipment and is not being pulled.

2.7.2 About Cleaning the Surface of Sensor Unit

Dust or debris on the surface of Sensor unit may weaken the authentication accuracy of the Sensor.

Perform daily cleaning of the surface of Sensor unit as follows:

- Dust the surface of Sensor unit.
- When the surface of Sensor unit is dirty, wipe gently with a dry, soft cloth.

!Caution **Cleaning the surface of Sensor unit**

Observe the following when cleaning the surface of Sensor unit.

- Do not wipe the surface of Sensor unit with a coarse cloth, etc. The Sensor may not operate correctly if the surface is scratched.
- Do not use water. It may cause a fault if water penetrates into the Sensor unit.
- Do not use any organic solvents such as thinner, benzine, or antiseptic solution. It may cause a fault.
- Do not use any cleaning sprays (which contain flammable substances).

Chapter3 Considerations When Capturing the Palm Vein

3.1 Before Capturing the Palm Vein

3.1.1 About the Influence of the Sensor on the Human Body

The Sensor is a piece of equipment that uses near-infrared light to capture palm vein without contacting the palm.
The near-infrared light level is below 10mW/cm^2, which is the threshold limit value set by ACGIH (See Note below). Although this level of near-infrared light is not visible to the human eye, it does not affect the human body.

Note) ACGIH: American Conference of Governmental Industrial Hygienists

3.1.2 Considerations to Enroll the Palm Vein Data

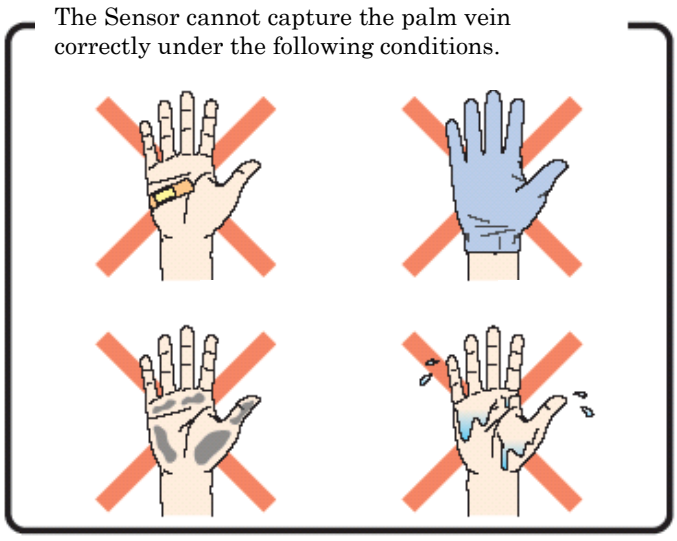
The authentication accuracy is affected by the quality of the enrolled vein data. Poor quality of enrolled palm vein data can be the cause of frequent false rejection during the authentication process. Therefore, when enrolling the vein data by capturing the palm vein, please use extra care when placing the hand.

>See> For information on how to place the hand, refer to “3.2 How to Place the Hand”.

!Caution **When the palm vein cannot be captured properly**

When the condition of the palm has been affected in any of the following ways, the Sensor may not be able to capture the palm vein accurately. This results in deterioration of the quality of the vein data to be enrolled, and may prevent the vein data from being enrolled at all.

- A bandage or cotton gauze on the palm
- The wearing of gloves or a bracelet
- A dirty or scarred palm
- A wet palm



3.1.3 Considerations When Providing Authentication

A false rejection may result when the palm vein captured when providing authentication is different from the status of the vein data that has been enrolled. Therefore, when providing authentication by capturing the palm vein, please be careful to place the hand in the same position as when the vein data was enrolled.

!Caution **In case of false rejection**

The following cases could result in false rejection:

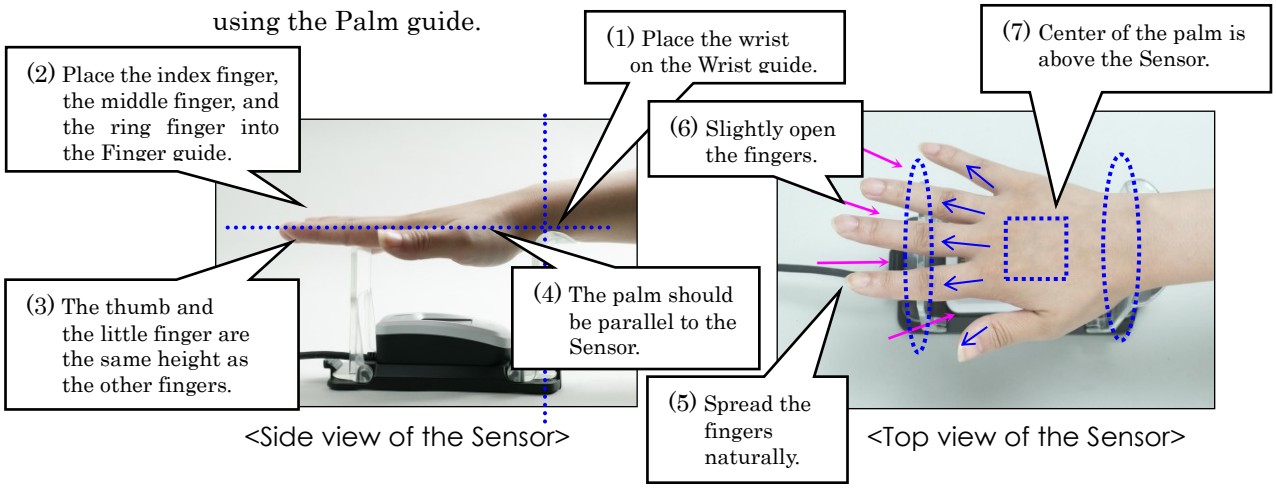
- The condition of the palm has changed since the enrollment of the vein data.
- Intentionally changing the position of the hand when compared to enrollment of the vein data.

It is recommended to re-enroll the vein data if the false rejection persists.

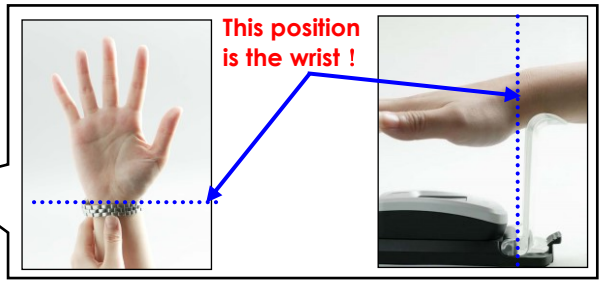
3.2 How to Place the Hand

3.2.1 How to Place the Hand on the Palm Guide

The following shows the correct way to place the hand when capturing palm vein using the Palm guide.

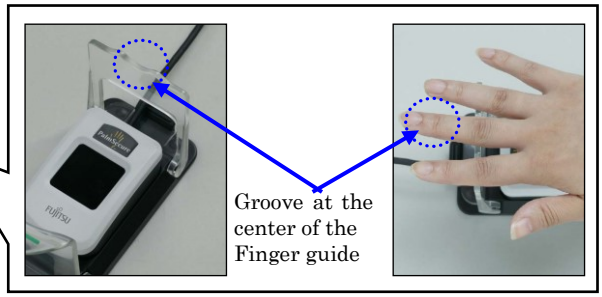


(1) Place the wrist on the Wrist guide.
The wrist is defined as the location of the wristband when you wear a watch pushed up against the palm. Place this location on the Wrist guide.



(2) Place the index finger, the middle finger, and the annular finger (the ring finger) on the Finger guide.
Fit the middle finger in the groove at the center of the Finger guide.

(3) Coordinate the thumb and the little finger to the same height as the index finger, the middle finger and the annular (ring) finger.



(4) Ensure that the palm is parallel with the Sensor.

(5) Spread the fingers naturally.

(6) Slightly open all fingers, including the thumb.

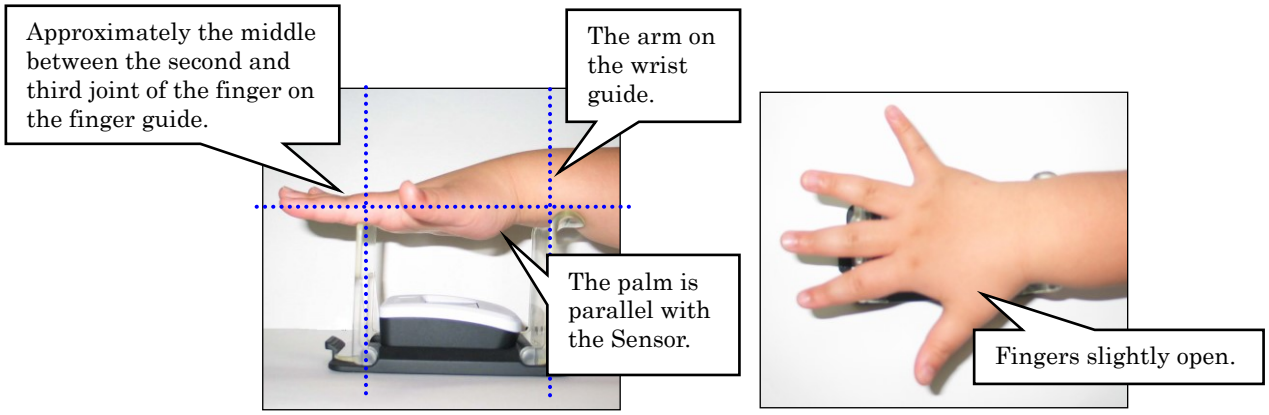
(7) Place the hand so that the center of the palm is above the Sensor.

!Caution **Do not move the hand when capturing the palm vein**

Capturing the palm vein does not work well when the hand is moving.

★Tip **When the hand is too small for the fingertips to reach to the Finger guide**

Place at approximately the middle between the second and third joint of fingers on the finger guide, and place the arm on the wrist guide. Ensure that the palm is parallel with the Sensor, and fingers slightly opened.



<View from the side> <View from above>

Palm vein may not be captured correctly for persons with small hands if the wrist is placed on the wrist guide while the fingertips are not reaching the finger guide; because in such a case, the gaps between fingers are included within the capturing range.
The Palm guide is suitable for 7 years and older in general. It is recommended to make a Palm guide for children of 5 to 6 years designed for their palm size. The Palm guide for children is not provided by Fujitsu Frontech Ltd.

★Tip **About pdf file illustrating the correct hand placement**

The pdf file to assist correct hand placement is available from the SDK V02 Support Website.
It is recommended that you print this pdf file beforehand and place the hand on the printed paper to check the correct manner before capturing the palm vein.

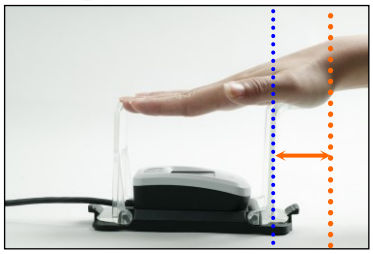
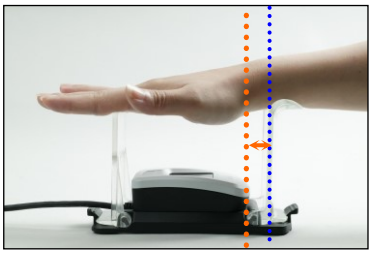
>See> For information on pdf file illustrating the correct hand placement, refer to “System Development Guide”.

!Caution **If the shirt cuffs come out in the captured image when capturing the palm vein**

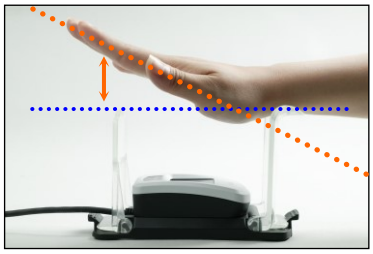
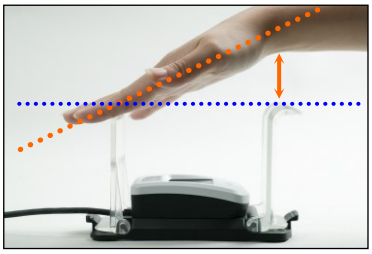
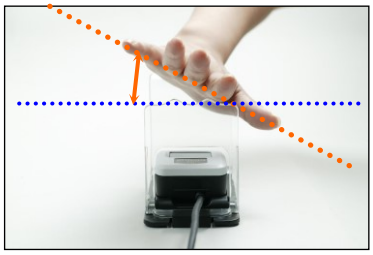
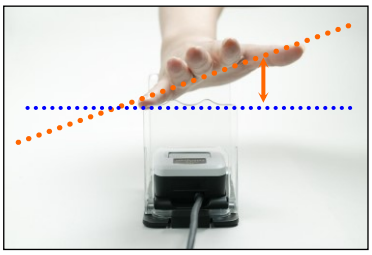
Please note that if the shirt cuffs come out in the captured image when capturing the palm vein user may not authenticate successfully.

!Caution **Incorrect way to place the hand**

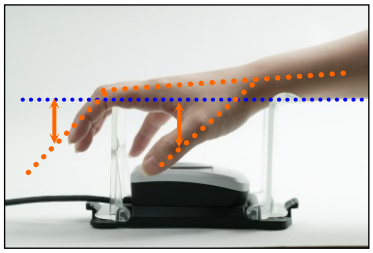
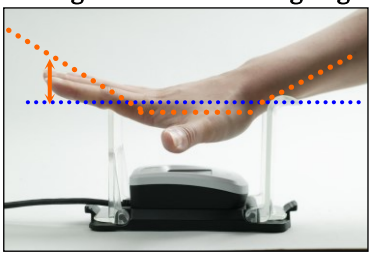
- The position of the wrist is incorrect

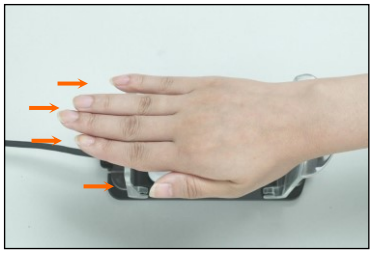
- The palm is not parallel with the Sensor

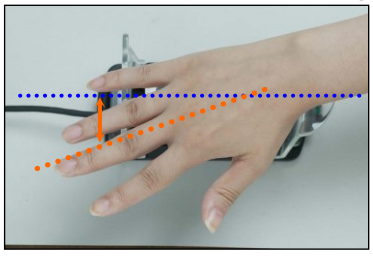
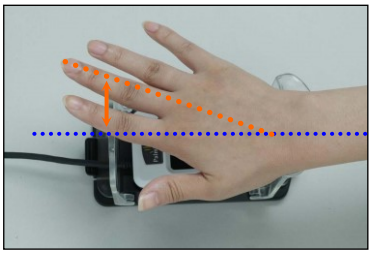
- Fingers are not stretched or bowed
- The palm bows below both the Wrist guide and the Finger guide

- Fingers are not spread (particularly the thumb)



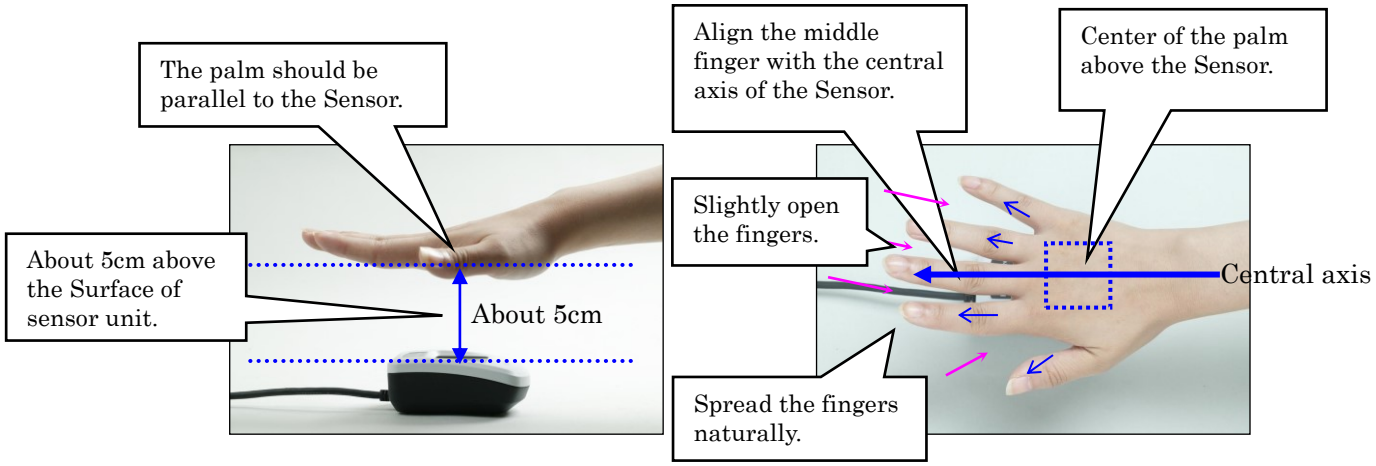
- The hand is place at an angle

3.2.2 How to Place the Hand Without the Palm Guide

The following shows how to place the hand correctly without using the Palm guide.

★Tip **When the Palm guide is not used**
Place the hand about 5cm above the Sensor as you do when using the Palm guide.
It is recommended that you confirm the position of the hand using the Palm guide, remove the Palm guide, and practice the capture of the palm vein several times.



<Side view of the Sensor> <Top view of the Sensor>

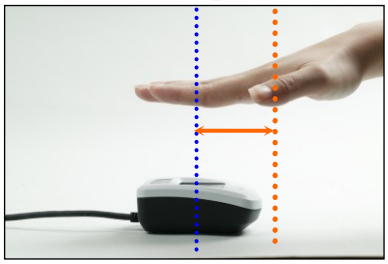
★Tip **About pdf file illustrating the correct hand placement**
The pdf file to assist correct hand placement is available from the SDK V02 Support Website.
It is recommended that you print this pdf file beforehand and place the hand on the printed paper to check the correct manner before capturing the palm vein.

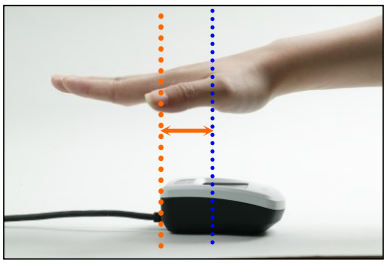
>See> For information on pdf file illustrating the correct hand placement, refer to “System Development Guide”.

!Caution **If the shirt cuffs come out in the captured image when capturing the palm vein**
Please note that if the shirt cuffs come out in the captured image when capturing the palm vein user may not authenticate successfully.

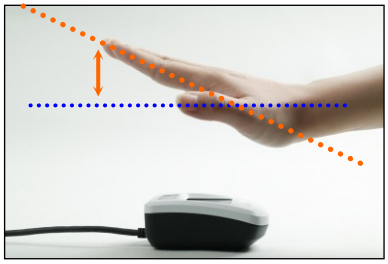
!Caution Incorrect way to place the hand

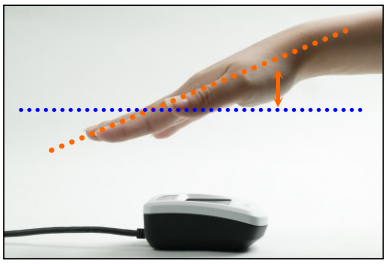
- Position of the palm is incorrect

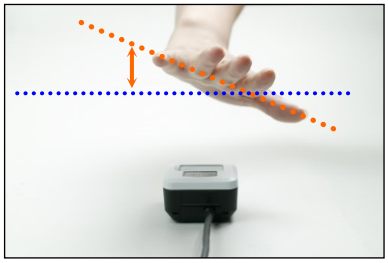


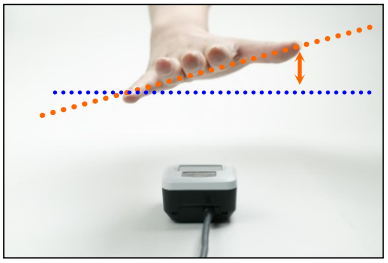


- The palm is not parallel with the Sensor

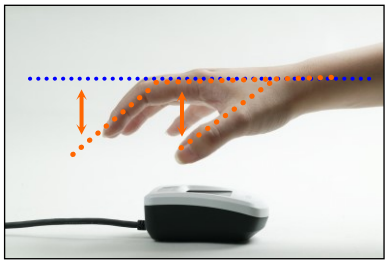




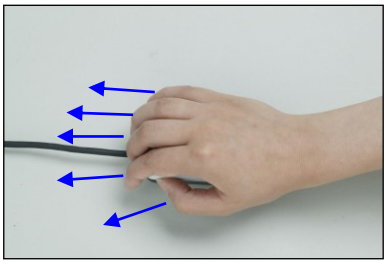




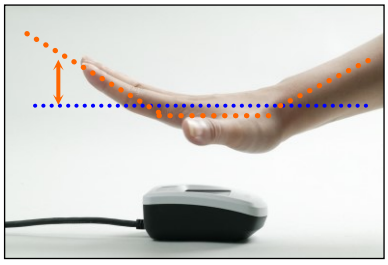
- Fingers are not stretched or bowed



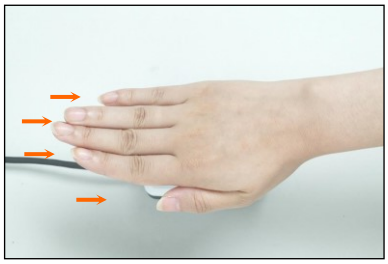
- Fingers are bent as if holding the Sensor



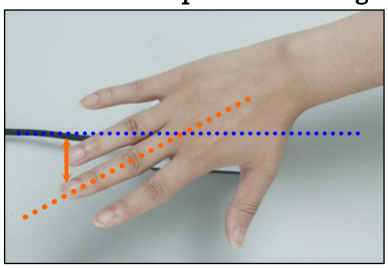
- Fingers are warped

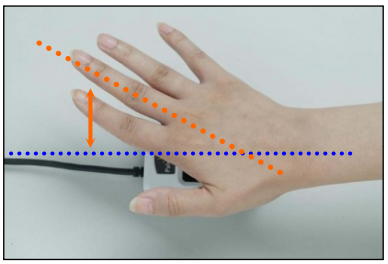


・Fingers are not spread (particularly the thumb)



・The hand is place at an angle





Chapter4 Troubleshooting

When you find that the Sensor does not operate properly, please refer to the appropriate action in the table below.

>See> For information on troubleshooting the mouse type Sensor, refer to the "Mouse Type Sensor Instruction Manual".

If you still have a problem after performing the actions described below, please contact your account manager.

Trouble	Possible Reason	Action
Cannot enroll the vein data False rejection when providing authentication	The lighting environment is not appropriate.	Please check the lighting environment. >See> For information on the lighting environment, refer to "2.2 About the Lighting Environment when Installing the Sensor".
	The surface of Sensor unit is covered with dust or debris.	Please clean the surface of Sensor unit. >See> For information on how to clean the surface of Sensor unit, refer to "2.7.2 About Cleaning the Surface of Sensor Unit".
	The surface of Sensor unit is scratched.	Please exchange the Sensor.
	Placement of the hand is incorrect.	Please check the placement of the hand. >See> For information on how to place the hand, refer to "3.2 How to Place the Hand".
	Authentication accuracy is lower on cold mornings, etc.	Depending on the user's constitution (small blood vessels, low blood pressure, etc.), the authentication accuracy may be lower in some situations such as on cold mornings. Please warm up the hand, and try the authentication again. If the false rejection persists, re-enroll the vein data.
The Sensor does not operate at all	USB Interface cable is unplugged.	Please check the connection of the USB Interface cable. >See> For information on how to connect the USB Interface cable, refer to "2.6 How to Connect the Sensor to the Target Hardware".
Smoke Smell	The Sensor is causing a critical condition.	Turn off the target hardware immediately. Check if there are any problems on the target hardware, and replace the Sensor.

Appendix

Appendix A: Main Specifications of the Sensor

The following table defines the main specifications of the Sensor.

>See> For information on specifications of the mouse type Sensor, refer to the "Mouse Type Sensor Instruction Manual".

Item		Specifications PalmSecure Sensor V2	Note
Reading system		Reading by near-infrared light	
Scope of capture		Entire Palm	
Capturing distance		●Enrollment :40 to 60mm ●Authentication With guide mode :40 to 60mm Without guide mode :35 to 70mm	
Dimensions		Width 35 X Depth 35 X Height 27mm	Sensor unit only For details, refer to the "Hardware Drawings".
Connector position		5.0mm above the base	
Casing material		Resin	
Weight		Below 35 g	Sensor unit only
Voltage of Power supply		4.4 to 5.4V	
Current consumption		500mA (Max)	
	In power saving mode	45mA (Max)	For details of the power saving function, refer to the "System Development Guide".
Power consumption		2.5W (Max)	
Power source		Provided by the USB Interface cable	
Host interface		USB2.0 (only Hi speed)	
Interface connector		Series "mini-B" plug (with 5 pins)	
Interface cable		A cable with a length of 1 m is included with this product. Maximum operable length of cable: 4 m (Please use a connector with qualified USB)	<Recommended connector at the Sensor side> ACON brand : MNC12--5K5210 or equivalent
Installation environment	Installation angle	Full direction	
	Temperature	0 to 60 degrees Celsius	For details, refer to "2.1 About the Installation Environment of the Sensor".
	Humidity	10 to 90%RH	Non-condensing
	Lighting environment	●Authentication Natural light (sunlight) : Below 3,000 lux Fluorescent lamps, LED lamps : Below 3,000 lux Incandescent lamps, Halogen lamps : Below 700 lux ●Enrollment Natural light (sunlight) : Below 2,000 lux Fluorescent lamps, LED lamps : Below 2,000 lux Incandescent lamps, Halogen lamps : Below 500 lux	・Avoid direct sunlight. ・Avoid direct light on the surface of Sensor unit from incandescent or halogen lamps.
Anti-static (ESD)		8kV (Indirect, Direct, Contact)	

Item		Specifications PalmSecure Sensor V2	Note
Drip-proof		Drip-proof structure for the surface of Sensor unit only. However, enrollments of vein data or authentication are not recommended in the condition that the surface of the Sensor has a drip.	Corresponding to IP41, in the degree of protection of IEC60529 IP
Material of the surface of Sensor unit		Glass	
Encryption method		AES (Length of cryptography key more than 128 bit)	
Authentication rate		FRR : 1.00% (No retry) FAR : Below 0.000001%	When verifying (1 to 1 authentication) with R-format type.
Authentication time		For the approximate authentication duration, refer to the "Authentication Library Reference Guide".	
Reliability	MTBF	1,000,000 hours	
	Life of unit	5 years	
Applicable standard	Electromagnetic wave standard	VCCI ClassB, FCC ClassB, EN ClassB	
	Safety standard	UL60950-1, EN60950-1	
	Environmental regulation	Conforms to RoHS and WEEE	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