

FUJITSU Biometric Authentication
PalmSecure™ SDK V02

Sensor Driver

Installation Guide



◆ Revision History

Revision	Issued Date	Revised Page	Modification Details
Rev. 1	Jul 2020	Entire document	Newly created
Rev. 1.1	Jul 2021	Page 4 to 8	<ul style="list-style-type: none"> Modified the following descriptions in “1.2 Hardware and Software Requirements”. <ul style="list-style-type: none"> - Modified descriptions concerning OS. - Added requirements for Arm.
		Page 12	<ul style="list-style-type: none"> Added information concerning silent installation in “2.1 Installing the Sensor Driver for Extended Function (Windows Version)”.
		Page 13	<ul style="list-style-type: none"> Added information concerning silent uninstallation in “2.2 Uninstalling the Sensor Driver for Extended Function (Windows Version)”.
		Page 20	<ul style="list-style-type: none"> Modified the CentOS version in “3.1 Building the Sensor Driver for Extended Function (Linux Version)”.
Rev. 1.2	Mar 2022	Page 4 to 5	<ul style="list-style-type: none"> Added Windows11 to the OS requirements for Windows version in “1.2 Hardware and Software Requirements”.
Rev. 1.3	Nov 2022	Page 4 to 8	<ul style="list-style-type: none"> Modified the following descriptions in “1.2 Hardware and Software Requirements”. <ul style="list-style-type: none"> - Descriptions concerning OS. - Memory for Linux(x64) - Supported CPU for Linux(arm64).
		Page 20	<ul style="list-style-type: none"> Modified the OS for setting example in “3.1 Building the Sensor Driver for Extended Function (Linux Version)”.
Rev. 1.4	Jan 2023	Entire document	<ul style="list-style-type: none"> Deleted “for extended function” from the name of the Sensor driver.
		Page 3	<ul style="list-style-type: none"> Modified descriptions in “1.1 Overview of the Sensor Driver” due to addition of the driver package type of Sensor.
		Page 5 to 6	<ul style="list-style-type: none"> Modified the following descriptions in “1.2.1 Sensor Driver (Windows Version)” in “1.2.1 Hardware and Software Requirements”. <ul style="list-style-type: none"> - Descriptions concerning Windows OS. - Driver package type is added to Sensor driver. - Unnecessary caution for the Sensor driver is deleted.
		Page 16 to 20	<ul style="list-style-type: none"> Added “2.2 Installing Driver Package Type of the Sensor ”.
		Page 21	<ul style="list-style-type: none"> Deleted description for the case when the old type of PalmSecure sensor is connected from “2.3 Considerations and Notes”.

◆ Introduction

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

This document describes how to install the Sensor driver for users who have the following knowledge:

- Basic knowledge of Windows or Linux operations
- Basic knowledge of the Arm processor

Screens shown in this document may be a little different from the screens actually displayed depending on your environment.

June 2023 : Rev. 1.5

Caution for This Manual

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◆ Composition of This Document

This document consists of the following three chapters.

Section/Chapter Title	Description
Chapter 1 Preliminary Steps before Installing the Sensor Driver	Describes things that you should know before installing the Sensor driver.
Chapter 2 Installing the Sensor Driver (Windows Version)	Describes how to install the Sensor driver for Windows.
Chapter 3 Installing the Sensor Driver (Linux Version)	Describes how to install the Sensor driver for Linux.





◆ 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	Common term for “PalmSecure Sensor V2” and “PalmSecure-F Pro”.
SDK	Abbreviation for “PalmSecure™ SDK”.
Windows 10	Abbreviation for “Microsoft® Windows® 10”.
Windows 11	Abbreviation for “Microsoft® Windows® 11”.
Windows	Common term for “Windows 10”, and “Windows 11”.
Authentication library	Common term for the “Authentication library V34” and later.
“Authentication Library Reference Guide”	Common term for any “Authentication Library Reference Guide” for the “Authentication library V34” and later.

◆ Notations

The following symbols are used in this document.

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.
[] button	Indicates a button displayed on the screen.

Also, the “PalmSecure-F Pro” is called “PalmSecure-F Pro sensor” in this document.

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Chapter1 Preliminary Steps before Installing the Sensor Driver

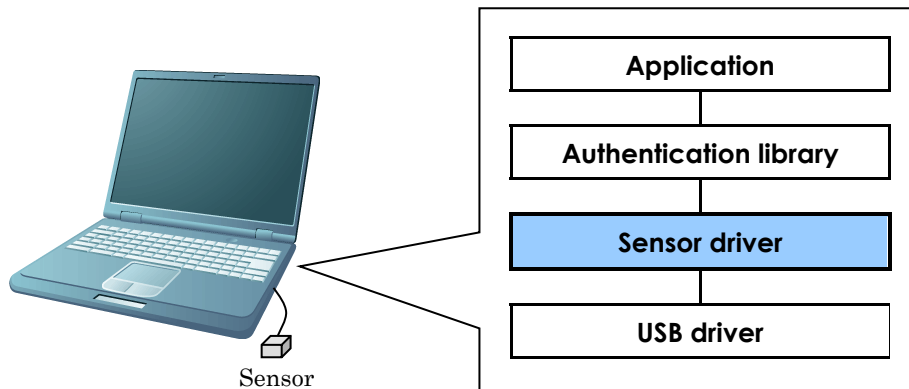
1.1 Overview of the Sensor Driver

**1.2 Hardware and Software
Requirements**

1.1 Overview of the Sensor Driver

The Sensor driver enables the Sensor's operations.

The figure shown below indicates the position of the Sensor driver.



★Tip **USB driver**

The USB driver is included in the OS as part of the operating system.

There are two types of Sensor drivers as follows.

- Sensor driver for Windows
- Sensor driver for Linux

>See> For information on the feature of each type of sensor driver, refer to the "System Development Guide".

★Tip **About conventional Sensor driver for Windows**

The support for the conventional Sensor driver for Windows (V11 and V20) that was provided since PalmSecure SDK V01 launch is discontinued.

Also, note that in this document, naming of the "Sensor driver for extended functions" has been changed to "Sensor driver".

1.1.1 Sensor Driver (Windows Version)

The following Sensor drivers are available for Windows.

- **Installer type**

This Sensor driver is provided in the installer format (MSI package).

The following are the installer type of the Sensor.

- Windows(x64) Sensor Driver V31
- Windows(x86) Sensor Driver V31

Note that this driver does not support the Windows 11 Smart App Control. If the Smart App Control support is required, use the Driver package type of Sensor driver V32.

The following table shows the installer name of the Installer type of Sensor driver.

Installer Type of the Sensor Driver	Installer Name
Windows(x64) Sensor driver V31	PSSD_64.msi
Windows(x32) Sensor driver V31	PSSD_32.msi

- **Driver package type**

This Sensor driver is provided in the driver package.

The following is the driver package type of the Sensor.

- Windows(x64) Sensor driver V32

The following table shows the driver package name of the driver package type of Sensor driver.

Driver Package Type of the Senser Driver	Package Name
Windows(x64) Sensor Driver V32	SensorDRVpkg_WIN64_32XX.zip (Note)

The following shows the contents of the driver package.

1st Hierarchy	2nd Hierarchy	Stored File	Description
SensorDRVpkg_WIN64_32XX (Note)	-	F3BC5UMZ.inf	INF file
		f3bc5umz.cat	Signature file
		Setup.bat	Bat file for driver install
	amd64	F3BC5UMZ.DLL	64bit driver module

Note) XX is the L (level) of the Sensor driver version information.

Example: "3201" means V32L01.



★Tip Event log of the Sensor driver V32

Sensor driver V32 outputs information which indicates sensor connection/disconnection, power state and internal error with source name "PalmSecure Sensor" to the event log (Windows Logs > Application). If the event log is not running, no log is output.

1.1.2 Sensor Driver (Linux Version)

The following Sensor drivers are available for Linux.

- **Linux OS Standard driver (recommended)**

You can use the Linux OS Standard driver as the Sensor driver by configuring udev. Basically, use this driver.

Note that the Authentication library must be V34Lxx-B32 or later.

- **Source program type**

This Sensor driver is provided as source code.

The following lists the files provided as the Source program type Linux Sensor driver.

File name
Makefile
fjveincam.c
fjveincam.h

!Caution About the Source program type Linux Sensor driver for Linux

Operations of this Sensor driver are not guaranteed in customers' environments. It is customers' responsibility to verify the operations.

Also, do not use this Sensor driver in the environment where udev is installed.

!Caution About Installing the Sensor driver for Linux

If both the Linux OS Standard driver and the Source program type Linux Sensor driver are installed, they will not work correctly.

In that case, uninstall the Source program type Linux Sensor driver.

1.2 Hardware and Software Requirements

The following describes hardware and software requirements for installing the Sensor driver.

1.2.1 Sensor Driver (Windows Version)

Hardware and Software Requirements		Description
Hardware Requirement	CPU	Intel® Core™2 Duo 2.40GHz or more (Note 1) (must also comply with the recommended value for the given OS) CPUs with SSE4.2/AES-NI are recommended.
	Memory (Note 2)	64-bit version : 4 GB or more 32-bit version : 2 GB or more (must also comply with the recommended value for the given OS)
	USB port	USB 2.0, USB 3.0 (Note3)
	HDD space (Note 4)	9 MB or more
	Sensor	<ul style="list-style-type: none"> • PalmSecure Sensor V2 • PalmSecure-F Pro sensor
Software Requirement	OS (Note 5)	<ul style="list-style-type: none"> • Windows 10 Version 21H2 (x86 and x64) • Windows 11 Version 22H2 (x64)
	Sensor driver (Note 6)	<Installer type> <ul style="list-style-type: none"> • Windows(x64) Sensor driver V31L47 • Windows(x86) Sensor driver V31L37 <Driver package type> <ul style="list-style-type: none"> • Windows(x64) Sensor driver V32L01

Note 1) When using a CPU that is not described in this requirement, please verify the operations yourself.

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

Note 2) The Sensor driver requires 4.5 MB or more memory.

4.5 MB is required for each Sensor (2 Sensors require 9 MB) when connecting multiple Sensors.

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

Note 3) When using high-power function, be sure to connect the Sensor to a USB 3.0 port.

>See> For information on the high-power function, refer to the “System Development Guide”.

Note 4) Minimum required space for the Sensor driver.

9 MB is required for each Sensor (2 Sensors require 18 MB) when connecting multiple Sensors.

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

Note 5) Operations of the Sensor driver are confirmed in the following environments.

Windows 10 : Pro

Windows 11 : Pro

Operations have not been tested in virtual environments.

Also, the Windows(x64) Sensor driver V31L47 does not support the Smart App Control for Windows 11.

Note 6) The downloaded file of Sensor driver is compressed. Extract them using an extract tool.

1.2.2 Sensor Driver (Linux Version)

◆ Linux(x64)

Hardware and Software Requirements		Description
Hardware Requirement	CPU	Intel® Core™2 Duo 2.40GHz or more (Note 1) (must also comply with the recommended value for the given OS) CPUs with SSE4.2/AES-NI are recommended.
	Memory (Note 2)	4 GB or more (must also comply with the recommended value for the given OS)
	USB port	USB 2.0, USB 3.0 (Note 3)
	HDD space (Note 4)	3 MB or more
	Sensor	<ul style="list-style-type: none"> • PalmSecure Sensor V2 • PalmSecure-F Pro sensor
Software Requirement	OS (Note 5)	<ul style="list-style-type: none"> • Linux (x64) (kernel: 3.10.0 or later, and glibc: 2.17 or later) (CentOS 7.9-2009, Rocky 8.7, and Rocky 9.1)
	Sensor driver	<ul style="list-style-type: none"> • Linux OS Standard driver (Note 6) • Source program type Linux Sensor driver V31L04 or later Contact the sales representatives for the availability of the Source program type.

Note 1) When using a CPU that is not described in this requirement, please verify the operations yourself. (Not working if SSE3/SSSE3 instructions are not implemented on the CPU.)

Note 2) The Sensor driver requires 3 MB or more memory.

3 MB is required for each Sensor (2 Sensors require 6 MB) when connecting multiple Sensors.

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

Note 3) When using high-power function, be sure to connect the Sensor to a USB 3.0 port.

>See> For information on the high-power function, refer to the “System Development Guide”.

Note 4) Minimum required space for the Sensor driver.

3 MB is required for each Sensor (2 Sensors require 6 MB) when connecting multiple Sensors.

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

Note 5) Operations of the Sensor driver are confirmed in the following environments.

Linux : CentOS 7.9-2009 [kernel: 3.10.0-1160.el7.x86_64, glibc: 2.17]

Rocky 8.7 [kernel: 4.18.0-425.3.1.el8.x86_64, glibc: 2.28]

Rocky 9.1 [kernel: 5.14.0-162.6.1.el9.x86_64, glibc: 2.34]

Operations have not been tested in virtual environments.

Note 6) Before using the Linux OS Standard driver, you must configure udev.

>See> For the configuration to use the Linux OS Standard driver, refer to the “3.1.1 Configuring Linux OS Standard Driver”.

◆ Linux(**arm64**) and Linux(**armhf**)

Hardware and Software Requirements		Description
Hardware Requirement	CPU architecture (Note 1)	<64-bit version> Armv8-A <32-bit version> Armv7-A
	Required CPU option	NEON, VFP (CRYPTO is recommended for 64-bit version)
	Supported CPU	<64-bit version (Armv8-A)> • Cortex-A72: Broadcom BCM2711 <32-bit version (Armv7-A)> • Cortex-A15: RZ/G1M (Renesas)
	Memory	<64-bit version> 1 GB or more <32-bit version> 512 MB or more (must also comply with the recommended value for the given OS)
	USB	USB 2.0, USB 3.0 (Note 1)
	Sensor	• PalmSecure-F Pro sensor (Mouse type sensor is not supported)
Software Requirement	OS (Note 2)	Linux (kernel: 3.10.0 or later, glibc: 2.17 or later, Little Endian)
	Sensor driver	• Linux OS Standard driver (Note 3) • Source program type Linux Sensor driver V31L04 or later Contact the sales representatives for the availability of the Source program type.

Note 1) When using high-power function, be sure to connect the Sensor to a USB 3.0 port.

>See> For information on the high-power function, refer to the “System Development Guide”.

Note 2) Operations have not been tested in virtual environments.

Note 3) Before using the Linux OS Standard driver, you must configure udev.

>See> For the configuration to use the Linux OS Standard driver, refer to the “3.1.1 Configuring Linux OS Standard Driver”.

Chapter2 Installing the Sensor Driver (Windows Version)

- 2.1 Installing Installer Type of the Sensor Driver**
- 2.2 Installing Driver Package Type of the Sensor Driver**
- 2.3 Considerations and Notes**

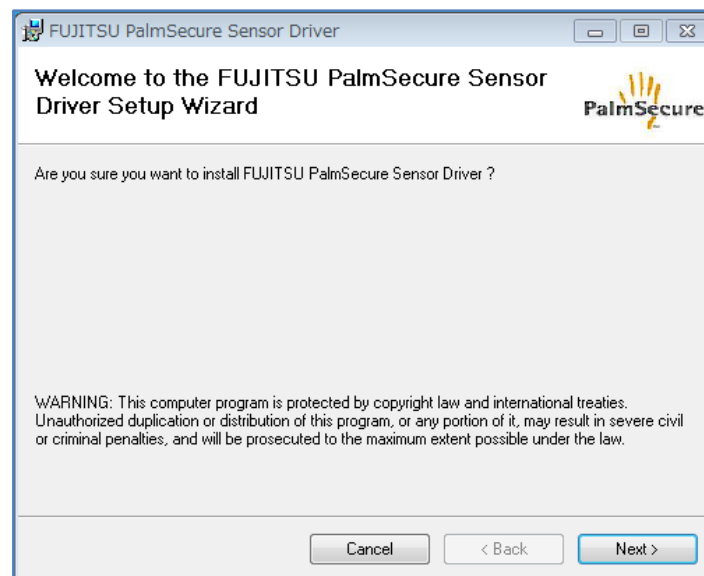
2.1 Installing Installer Type of the Sensor Driver

2.1.1 Installing the Sensor Driver V31

This section describes how to install the installer type of Sensor driver for Windows.

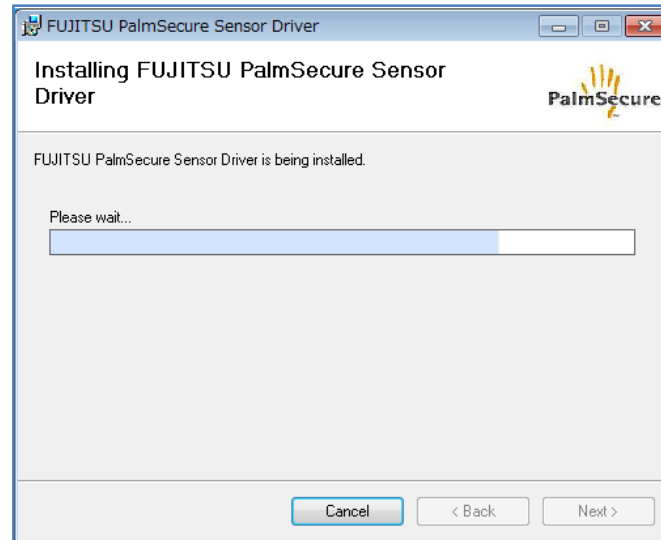
Operation

- Step1** Ensure that the Sensor is not connected to the target hardware.
- Step2** Log in as Administrator.
- Step3** Extract the downloaded Sensor driver and copy the installer of the Sensor driver "PSSD_32.msi" or "PSSD_64.msi" from the folder created by the extraction to any folder on the target hardware.
- Step4** Double-click "PSSD_32.msi" or "PSSD_64.msi" on the target hardware. The installer launches and displays the Welcome screen.



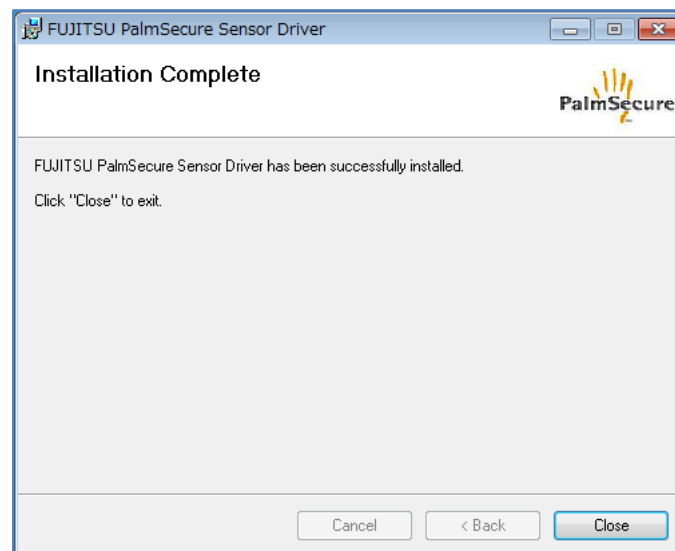
Step5 Click the [Next] button.

Installation of the Sensor driver starts and the screen shows that the installation is in progress.

**★Tip****A [User Account Control] dialog box is displayed**

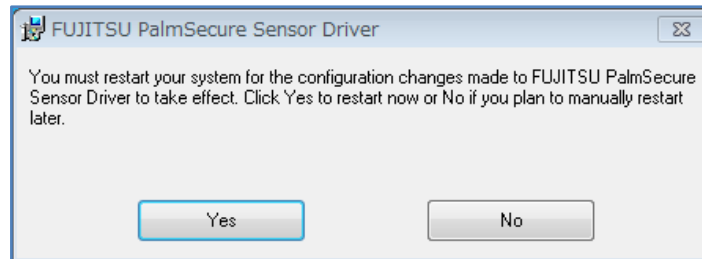
Click [Allow] or [Yes] to continue the process if the User Account Control dialog box is displayed.

When the installation is complete, the Installation Complete screen is displayed.



Step6 Click the [Close] button.

The Installation Complete screen disappears and the restart confirmation dialog box appears.



Step7 Click the [Yes] button to restart the target hardware.

Step8 Connect the Sensor to the target hardware.

The Sensor is automatically detected.

Step9 If there are multiple USB ports where the Sensor may be connected, the Sensor must be detected on each USB port. Disconnect the Sensor from the target hardware and repeat step 8 again.

Step10 Check that the Startup Type of the "Windows Driver Foundation - User-mode Driver Framework" service is "Automatic" to avoid the delay in detecting Sensor by the target hardware at authentication.

>See> For information on how to check the Startup Type of the "Windows Driver Foundation - User-mode Driver Framework" service, refer to "2.3.1 Detecting Sensor is Slow at Authentication".

!Caution When "Windows Driver Foundation - User-mode Driver Framework" service does not exist

The "Windows Driver Foundation - User-mode Driver Framework" service may not exist depending on the version of Windows 10 or Windows 11. In this case, the Step 10 is not necessary.

★Tip When performing silent installation

Silent installation can be performed by using msixec command with administrator credentials.

The following shows an example of the options for silent installation.

msixec /i PSSD_xx.msi /qn /norestart (Note)

Note) You must restart the OS later in this example.

For information on msixec command, refer to the website of Microsoft Co. Operations of silent installation are not confirmed. Please verify the operations yourself thoroughly before using silent installation.

2.1.2 Uninstalling the Sensor Driver V31

This section describes how to uninstall the installer type of Sensor driver for Windows.

Operation

- Step1** **Ensure that the Sensor is not connected to the target hardware.**
- Step2** **Log in as Administrator.**
- Step3** **Select [Programs and Features] or [Uninstall a program] from Control Panel.**
Follow the instructions on the screen to delete “FUJITSU PalmSecure Sensor Driver”.

★Tip **A [User Account Control] dialog box is displayed**
Click [Allow] or [Yes] to continue the process if the User Account Control dialog box is displayed.

- Step4** **Restart the target hardware.**

★Tip **When performing silent uninstallation**
Silent uninstallation can be performed by using msixec command with administrator credentials.
The following shows an example of the options for silent uninstallation.
 msixec /x PSSD_xx.msi /qn /norestart (Note)
 Note) You must restart the OS later in this example.
For information on msixec command, refer to the website of Microsoft Co.
Operations of silent uninstallation are not confirmed. Please verify the operations yourself thoroughly before using silent uninstallation.

2.2 Installing Driver Package Type of the Sensor Driver

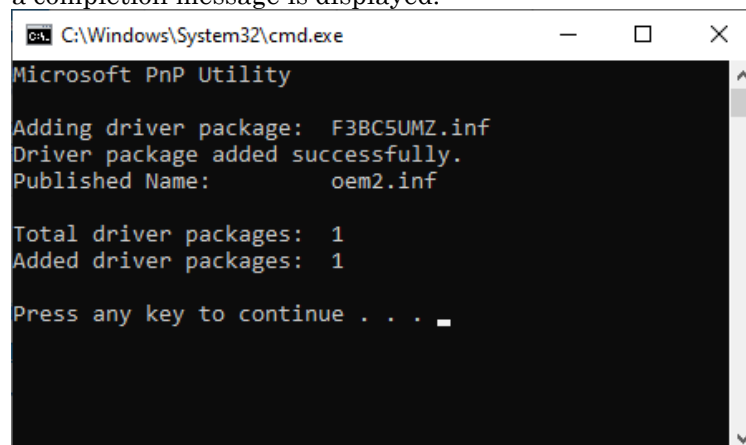
This section describes how to install the installer type of Sensor driver for Windows.

2.2.1 Installing the Sensor Driver V32

Operation

- Step1** If an old version of Sensor Driver is installed, uninstall it.
>See> For information on how to uninstall old version of Sensor driver, refer to “2.1.2 Uninstalling the Sensor Driver V31”.
- Step2** Ensure that the Sensor is not connected to the target hardware.
- Step3** Log in as Administrator.
- Step4** Extract the downloaded Sensor driver and copy the folder of the Sensor driver from the folder created by the extraction to any folder on the target hardware.
- Step5** Install the Driver software as follows
(1) Right-click the Setup.bat in the “SensorDRVpkg_WIN 64_32XX” (XX:Level of the Sensor driver) folder and select “Run as administrator”.

When the driver software installation is complete,
a completion message is displayed.



```
C:\Windows\System32\cmd.exe
Microsoft PnP Utility

Adding driver package: F3BC5UMZ.inf
Driver package added successfully.
Published Name: oem2.inf

Total driver packages: 1
Added driver packages: 1

Press any key to continue . . .
```

- (2) Confirm that the “Driver package added successfully.” is displayed,
Note that the “Published name” varies depending on the installed environment.

★Tip

When the driver is already installed

When the driver is already installed, “Driver package added successfully. (Already exists in the system)” is displayed.

(3) Press the [Enter] key.

Step6 Restart the target hardware.

Step7 Connect the Sensor to the target hardware.

The Sensor is automatically detected.

Step8 If there are multiple USB ports where the Sensor may be connected, the Sensor must be detected on each USB port. Disconnect the Sensor from the target hardware and repeat step 7 again.

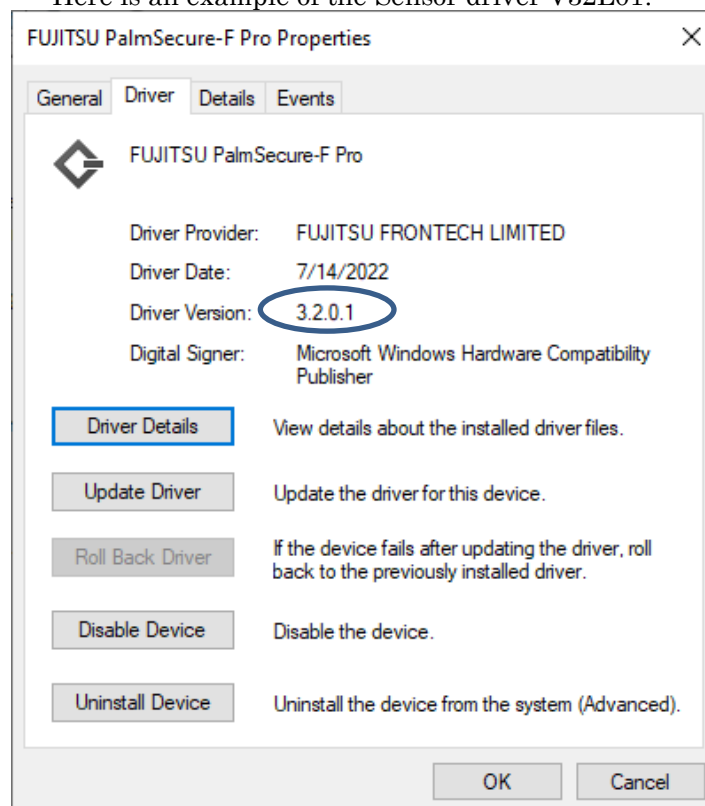
Step9 Confirm that the Sensor driver is successfully installed as follows.

- (1) Start Device Manager.
- (2) Right-click the device name under “PalmSecure ” and select “Properties” from the menu that appears.
- (3) From the properties screen that appears, select the “Driver” tab.
- (4) Confirm that the version matches the version information of the installed sensor driver.

To correspond to the version information, translate it as follows,

- The first two digits correspond to V (Version)
- The last 2 digits correspond to L (Level).

Here is an example of the Sensor driver V32L01.



★Tip **"Device not started (WUDFRd)" is displayed in the "Event" tab of the properties screen of the Device Manager.**

On Windows 11 Version 22H2, even if this driver is installed successfully, "Device not started (WUDFRd)" may be displayed on the "Event" tab of the properties screen in Device Manager. This event outputs the error log with the source name "Kernel-PnP" to the event log (Application and Service Logs > Microsoft > Windows > Kernel-PnP). If the installation is confirmed correctly in Step 9, the operation of this driver is not affected.

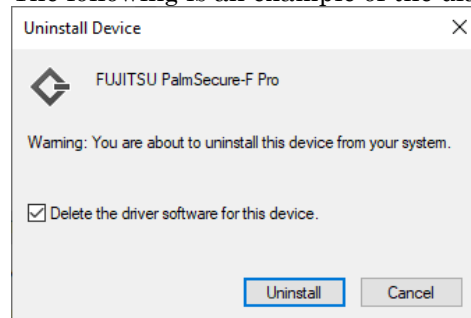
2.2.2 Uninstalling the Sensor Driver V32

Operation

- Step1** Ensure that the Sensor is not connected to the target hardware.
- Step2** Log in as Administrator.
- Step3** Start Device Manager
- Step4** From the “View” menu, select “Show hidden devices”
- Step5** Right-click the device name under “PalmSecure ” and select “Uninstall devices” from the displayed menu.

★Tip **More than one device name is displayed**
 If there are more than one USB port that has recognized the Sensor, more than one device name is displayed. Select any one to continue.

“Uninstall Device” dialog box is displayed.
 The following is an example of the dialog box.



- Step6** Select the “Delete the driver software for this device” option, and Click the [Uninstall] button.

★Tip **The “Delete the driver software for this device” option is not displayed**
 Driver software has already been removed. Click the [Uninstall] button to delete the remaining device information, and continue.

- Step7** If more than one device name is displayed in Step5, repeat Step5 and Step6 in order to uninstall each device.

★Tip **To uninstall by using the PnPUtil command**

Uninstallation can be performed by using PnPUtil command with administrator credentials.

The following shows the steps.

- (1) Search the “Published name”(Note) for the Sensor driver on the target hardware that the uninstall is to be performed.

Note) The “Published name” varied depending on the installed environment.

`pnputil /enum-drivers`

The following is an example of the result.

```
Published Name: oem2.inf
Original Name: f3bc5umz.inf
Provider Name: FUJITSU FRONTECH LIMITED
Class Name: PalmSecure
Class GUID: {c6cf0a04-cc5d-4d64-89ad-9dd862ed4c6a}
Driver Version: 07/14/2022 3.2.0.1
Signer Name: Microsoft Windows Hardware Compatibility Publisher
```

- (2) Uninstall the Sensor driver.

The following shows an example of the options.

`pnputil /delete-driver oemXX.inf(Note) /uninstall /force`

Note) Replace *XX* with a number in the “public name ” you searched for in (1). Pay attention to the display contents of each item such as "Original name" and "Driver version" when searching for in (1) so you do not to specify a different number by mistake.

For information on PnpUtil command, refer to the website of Microsoft Co.

Operations of uninstallation using PnPUtil command are not confirmed.
Please verify the operations yourself thoroughly before using it.

2.3 Considerations and Notes

This section explains the issues to be considered when using the Sensor driver for Windows.

2.3.1 Detecting Sensor is Slow at Authentication

The target hardware may take some time to detect Sensor at authentication if the Startup Type of the “Windows Driver Foundation - User-mode Driver Framework” service is “Manual”. In such cases, the detection of the Sensor may be made faster by setting the Startup Type to “Automatic”.

Set the Startup Type to “Automatic” by following the steps below.

Note that when you install another device driver, the Startup Type may change to “Manual” even after you set it to “Automatic”. This behavior is by design of OS. In this case, set the Startup Type to “Automatic” again.

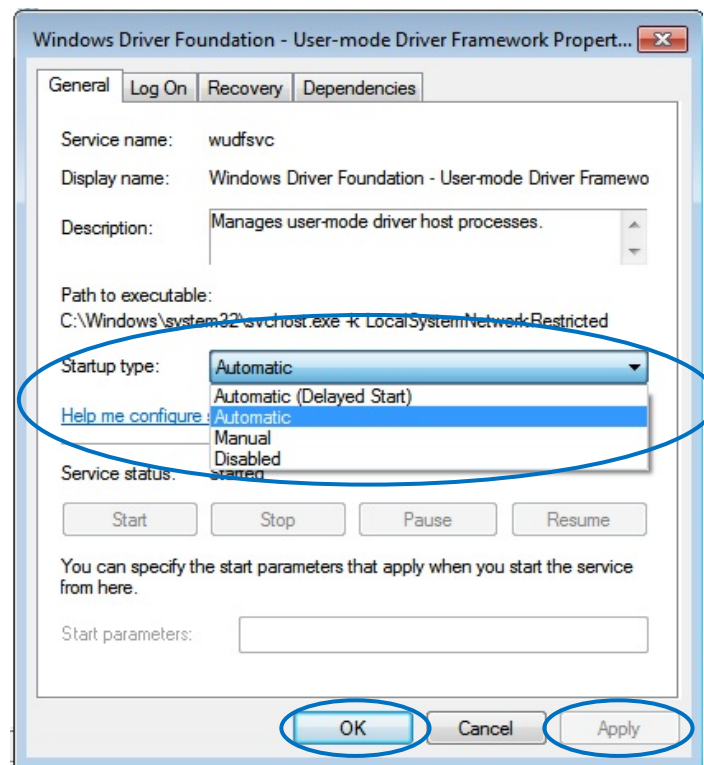
!Caution When “Windows Driver Foundation - User-mode Driver Framework” service does not exist

The “Windows Driver Foundation - User-mode Driver Framework” service may not exist depending on the version of Windows 10 or Windows 11. In this case, this operation is not necessary.

Operation

- Step1** Select [Command Prompt (Admin)].
- Step2** Enter “services.msc” to open the Services Console.
- Step3** Double-click “Windows Driver Foundation - User-mode Driver Framework” in the Services Console.

Step5 Select “Automatic” for “Startup Type” in the displayed screen, click the [Apply] button, and then click the [OK] button.



Step6 Restart the target hardware.

Chapter3 Installing the Sensor Driver (Linux Version)

3.1 Using Linux OS Standard Driver

**3.2 Installing Source Program Type
Sensor Driver**

3.1 Using Linux OS Standard Driver

3.1.1 Configuring Linux OS Standard Driver

The following describes how to install the Linux OS Standard driver as the Sensor driver by configuring udev.

Operation

Step1 If the Source program type Linux Sensor driver is installed, uninstall it.

>See> For information on how to uninstall the Source program type Linux Sensor driver, refer to “3.2.3 Uninstalling the Source Program Type Sensor Driver”.

Step2 Create a file as follows.

[Example]

File name: palmsecure.rules

Contents: Write the udev rules for your sensor referring to the following example.

Sensor type	Setting example
PalmSecure Sensor V2	SUBSYSTEM=="usb",ATTRS{idVendor}=="04c5",ATTRS{idProduct}=="1084",MODE="0666",SYMLINK+="usb/fjpalmscurecam%k"
PalmSecure-F Pro	SUBSYSTEM=="usb",ATTRS{idVendor}=="04c5",ATTRS{idProduct}=="1526",MODE="0666",SYMLINK+="usb/fjpalmscurecam%k"

Step3 Copy the file created in Step2 into the “/etc/udev/rules.d” folder.

★Tip If the “/etc/udev/rules.d” folder does not exist.
The udev may not installed to your device.
Please install the udev.

Step4 Restart the target hardware, and connect the Sensor.

3.1.2 Unconfiguring Linux OS Standard Driver

The following describes how to uninstall the Linux OS Standard driver that is installed as the Sensor driver by unconfiguring udev.

Operation

- Step1** **Disconnect the Sensor from the target hardware.**
- Step2** **Delete the file created when using the Linux OS standard driver as the sensor driver from the “/etc/udev/rules.d” folder.**
- Step3** **Restart the target hardware.**

3.2 Installing Source Program Type Sensor Driver

3.2.1 Building the Source Program Type Sensor Driver

This Sensor driver is provided as source code.

Modify and build the source code for this Sensor driver before installing on the target hardware.

The following steps describe how to modify and build the source code for this Sensor driver.

Operation

- Step1** Install the kernel-devel package of the target kernel version.
This step is not required if you have already installed it.
- Step2** Set the full path to the folder that stores Makefile for the kernel to the KERNDIR environment variable.
Example) Rocky 9.1 with the kernel version "5.14.0-162.6.1.el9.x86_64".

`export KERNDIR=/usr/src/kernels/5.14.0-162.6.1.el9.x86_64`
- Step3** Modify the source code "fjveincam.c", "fjveincam.h", and "Makefile", as necessary.
- Step4** Build the source code.
Command) make
The module "fjveincam.ko" of the Sensor driver is created.

★Tip Checking if the Sensor driver module "fjveincam.ko" is created

Use the modinfo fjveincam.ko command to check.

filename:	/home/palmsecure/driver/fjveincam.ko
version:	VxxLxx (VL of the Sensor driver)
license:	GPL v2
description:	FUJITSU PalmSecure Sensor driver
author:	Fujitsu Frontech Ltd.
srcversion:	603A35C43A66287AF392713
alias:	usb:v04C5p125Ad*dc*dsc*dp*ic*isc*ip*in*
alias:	usb:v04C5p1084d*dc*dsc*dp*ic*isc*ip*in*
depends:	
vermagic:	(Kernel version) SMP mod_unload modversions

3.2.2 Installing the Source Program Type Sensor Driver

This section describes how to install the Sensor driver.

Operation

- Step1** Ensure that udev is not installed.
If udev is installed, use the Linux OS Standard driver.
- Step2** Ensure that the Sensor is not connected to the target hardware.
- Step3** Log in as a user with root privileges.
- Step4** Use the “mkdir” command to create the “extra” folder under the “/lib/modules/(kernel version)/” folder on the target hardware.
Command) `mkdir /lib/modules/(kernel version)/extra`
- Step5** Copy the Sensor driver module you created in “3.2.1 Building the Source Program Type Sensor Driver” into the folder you created in Step 4.

The following shows the file to be copied and the destination folder.

File to be copied	Copy destination folder
fjveincam.ko	/lib/modules/(kernel version)/extra

- Step6** Use the “mkdir” command to create a folder.
Command) `mkdir -p /dev/usb`
- Step7** Use the “mknod” command to create a special file for sensor access “fjveincam0”.
<When connecting one Sensor>
Command) `mknod -m 666 /dev/usb/fjveincam0 c 180 160`
<When connecting more than one Sensor> (e.g. 2 Sensors)
Command) `mknod -m 666 /dev/usb/fjveincam0 c 180 160`
`mknod -m 666 /dev/usb/fjveincam1 c 180 161`
- >See>** For information on multiple Sensor connections, refer to the “System Development Guide” and “Authentication Library Reference Guide”.
- Step8** Use the “depmod” command to update dependencies between kernel modules.
Command) `/sbin/depmod -a &> /dev/null`

Step9 Use the “modprobe” command to load the Sensor driver module “fjveincam”.

Command) /sbin/modprobe fjveincam

Step10 Add the following lines to the start-up script (ex. /etc/rc.d/rc.local) as necessary.

<When connecting one Sensor>

mkdir -p /dev/usb

mknod -m 666 /dev/usb/fjveincam0 c 180 160

<When connecting more than one Sensor> (e.g. 2 Sensors)

mkdir -p /dev/usb

mknod -m 666 /dev/usb/fjveincam0 c 180 160

mknod -m 666 /dev/usb/fjveincam1 c 180 161

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

Step11 Connect the Sensor to the target hardware.

>See> For information on how to connect the sensor, refer to the “Sensor Instruction Manual” or “Mouse Type Sensor Instruction Manual”.

The Sensor is automatically detected.

3.2.3 Uninstalling the Source Program Type Sensor Driver

This section describes how to uninstall the Sensor driver.

Operation

- Step1** Disconnect the Sensor from the target hardware.
- Step2** Log in as a user with root privileges.
- Step3** Use the “rm” command to delete a special file for sensor access “fjveincam0”.
- <When connecting one Sensor>
 Command) `rm /dev/usb/fjveincam0`
- <When connecting more than one Sensor> (e.g. 2 Sensors)
 Command) `rm /dev/usb/fjveincam0`
 `rm /dev/usb/fjveincam1`
- >See>** For information on multiple Sensor connections, refer to the “System Development Guide” and “Authentication Library Reference Guide”.
- Step4** Delete the following lines from the start-up script (ex. /etc/rc.d/rc.local) as necessary.
- <When connecting one Sensor>
`mkdir -p /dev/usb`
 `mknod -m 666 /dev/usb/fjveincam0 c 180 160`
- <When connecting more than one Sensor> (e.g. 2 Sensors)
`mkdir -p /dev/usb`
 `mknod -m 666 /dev/usb/fjveincam0 c 180 160`
 `mknod -m 666 /dev/usb/fjveincam1 c 180 161`
- >See>** For information on multiple Sensor connections, refer to the “System Development Guide” and “Authentication Library Reference Guide”.
- Step5** Use the “modprobe” command to delete the Sensor driver module “fjveincam”.
- Command) `modprobe -r fjveincam`
- Step6** Delete the following file copied under the “/lib/modules/(kernel version)/extra/” folder.
- Command) `rm -rf /lib/modules/(kernel version)/extra/fjveincam.ko`
- Step7** Use the “depmod” command to update dependencies between kernel modules.
- Command) `/sbin/depmod -a &> /dev/null`

