

fi Series

Image Scanner Driver for Linux[®]

User's Guide

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Introduction

Thank you for using the Image Scanner Driver for Linux[®].
This manual describes the overview and operations of this product.
The contents of this manual are subject to change as this product is updated.

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Manufacturer

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Use in High-Safety Applications

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Abbreviations Used in This Manual

The following abbreviations are used in this manual.

Name	Indication
Linux [®]	Linux
Image Scanner Driver for Linux [®]	Linux driver

Name	Indication
Intel®	Intel
Windows®	Windows

Screen Examples in This Manual

The screenshots used in this manual are the ones used in Ubuntu 18.04 LTS.

The actual screens and operations may differ depending on the version.

If the actual screen differs from the screen examples in this manual, operate by following the actual displayed screen.

Notice

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Issue date: February 2019

Issued by: PFU Limited

Linux Driver Specifications

The Linux driver specifications are described below.

Linux Driver Overview

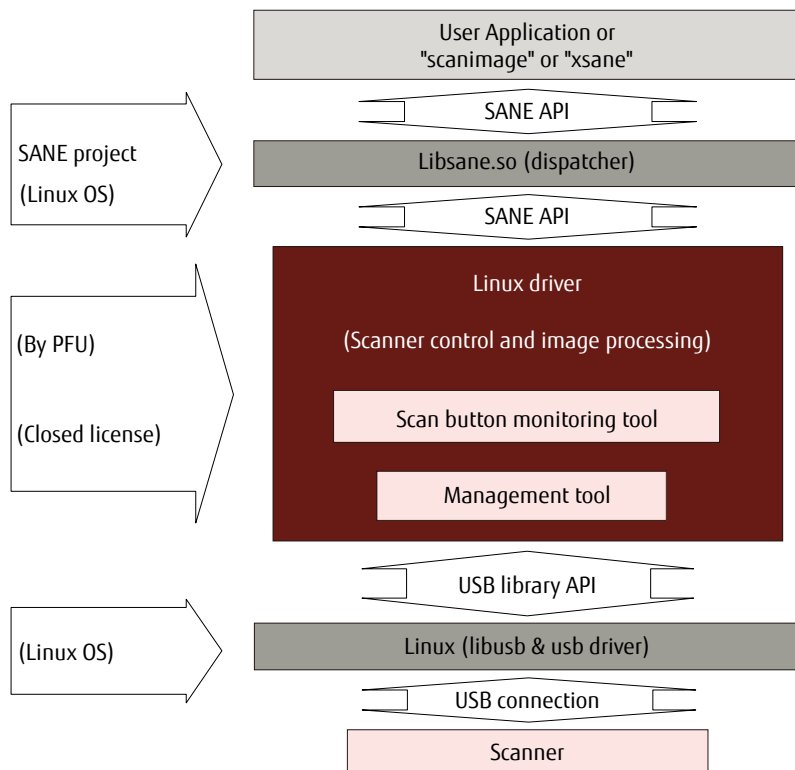
The Linux driver is a library program for controlling fi Series scanners in Linux systems.

It provides an application interface based on SANE API. For this reason, if you install the Linux driver in typical Linux systems, you can call the driver from the following applications that support SANE API:

- User Application
- Applications Provided by Ubuntu (such as "scanimage" or "xsane")

The Linux driver also provides the functions for the following tools:

- Scan button monitoring tool
Used to start scanning when the scan button is pressed.
If the scan button monitoring tool is not running, scanning does not start when the scan button is pressed.
For details, refer to [Scan Button Monitoring Tool \(page 38\)](#).
- Management tool
Used to manage consumables and configure the settings such as the period of time before the scanner is automatically turned off, the offset value, and the magnification level.
For details, refer to [Management Tool \(page 40\)](#).



Note:In Linux systems, the term "driver" refers to a module that is installed in the Linux kernel and operates in privilege mode for the CPU. Previously, scanner drivers had been installed in the Linux kernel for operation. Currently, a scanner driver is installed as a library based on SANE API outside the kernel and operates by dynamically linking from applications. Although the scanner driver is actually a library, PFU and other scanner manufacturers call it a "driver".

Supported Scanners

The supported scanners are shown below.

- fi-7030
- fi-7140
- fi-7240
- fi-7160
- fi-7260
- fi-7180
- fi-7280
- fi-7460
- fi-7480
- fi-7700S

The supported imprinter is shown below.

- fi-718PR

Provided Product Units

This product is provided in two packages (installers). The supported scanners, and the distribution name and CPU architecture that correspond to each package are shown below.

Distribution name and CPU architecture	Package (installer) file name	Package format
Ubuntu 32-bit	pfufs-ubuntu18.04_2.3.2_i386.deb	deb
Ubuntu 64-bit	pfufs-ubuntu18.04_2.3.2_amd64.deb	deb

The file names have the meanings shown below.

Ubuntu18.04: The Linux distribution name that is supported by this package. The main version that is supported is added.

2.3.2: Driver version number

i386/amd64: Supported CPU architecture

deb: Package format

System Requirements

The system requirements are shown below.

- **Operating system**

Ubuntu Desktop

- Ubuntu 14.04 LTS (32-bit/64-bit)
- Ubuntu 16.04 LTS (32-bit/64-bit)
- Ubuntu 18.04 LTS (32-bit/64-bit)

- **Hardware**

The hardware requirements are shown below.

CPU Architecture	Intel x86 architecture (32-bit/64-bit)
Disk Space Required	2 MB
CPU	Intel Core™ i5 2400S 2.5GHz
Memory	4.0 GB

- **Operation verification tools**

The image scanning applications "scanimage" and "xsane" can be used as operation verification tools with many versions of Linux. PFU has not verified other applications that support SANE API.

Application Name	Application Description
scanimage	Command line based image scanning application. Command line options can be used to specify detailed settings for scanning. Because this application is included in the distributions for Ubuntu, it can be used after Ubuntu is installed.
xsane	Image scanning application for a GUI environment. Detailed settings can be specified when scanning in a GUI screen. Because this application is not included in the distributions for Ubuntu 14, Ubuntu 16, and Ubuntu 18, it cannot be used immediately after Ubuntu is installed. To use "xsane", the package must be downloaded from the Ubuntu distributor. To download and install the package, follow the procedure below. <ol style="list-style-type: none"> 1 Connect a computer to the Internet. 2 Open the terminal software. 3 Execute the "sudo" command, enter the password for the superuser (root user) to become a root user. <pre>sudo su -</pre>

Application Name	Application Description
	<p data-bbox="595 271 1433 344">4 Use the command below to connect to the Ubuntu server and check the latest package information, and then download it.</p> <div data-bbox="635 367 1449 461" style="border: 1px solid black; padding: 5px;"><pre data-bbox="639 376 847 450">apt-get update apt-get install xsane</pre></div> <p data-bbox="533 483 1449 595">In an environment where a proxy server is used to connect to the Internet, Ubuntu that is installed in the computer needs to be configured. Configure Ubuntu based on the specific proxy server environment.</p>

Installation and Uninstallation Procedures

Procedures are shown below for installation and uninstallation of the Linux driver.

Obtaining the Linux driver

The Linux driver can be downloaded from the following website.

<http://imagescanner.fujitsu.com/global/dl/>

For details, contact the distributor/dealer where you purchased this product.

Preparation

- Copy the package that was downloaded from the website to the installation target computer.
- Turn off the scanner, and disconnect the USB cable connected to the computer.

Installation Procedure

An example of the procedure to install the Linux driver (Ubuntu 64-bit) is shown below.

Install the Linux driver in the following procedure:

- 1 After starting Ubuntu and logging in, open the terminal software.**
- 2 Execute the "sudo" command, enter the password for the superuser (root user) to become a root user.**

```
sudo su -
```

- 3 Execute the command below, and check that the type of Ubuntu system is the 64-bit version.**

```
uname -m
```

HINT

To find out the type of system, use the "uname" command. The type of system is shown as a result of the command that was executed.

Display Result	Type of System
i386 or i686	32-bit
x86_64	64-bit

- 4 Use the "cd" command to move to the folder where the "pfufs-ubuntu18.04_2.3.2_amd64.deb" package is located.**
- 5 Execute the command below to install the package.**

```
dpkg -i pfufs-ubuntu18.04_2.3.2_amd64.deb
```

- 6 Execute the command below, and check that the package was installed correctly.**

```
dpkg -l pfufs
```

If the package name "pfufs" appears, the installation of the Linux driver was successful.

- 7 Connect the scanner, and turn on the power.**
- 8 Start an operation verification tool such as "scanimage" or "xsane", and check the scanning operation.**

Uninstallation Procedure

Uninstall the Linux driver in the following procedure:

- 1 Turn off the scanner.**
- 2 Open the terminal software.**
- 3 Execute the "sudo" command, enter the password for the superuser (root user) to become a root user.**

```
sudo su -
```

- 4 Execute the command below to uninstall the package.**

```
dpkg -r pfufs
```

- 5 Execute the command below to delete the package information.**

```
dpkg --purge pfufs
```

- 6 Execute the command below, and check that the package was uninstalled correctly.**

```
dpkg -l pfufs
```

If the "pfufs" package information is not displayed, the Linux driver is uninstalled successfully.

HINT

Uninstalling the Linux driver does not delete any images that were scanned before the uninstallation.

Linux Driver Overview

This product provides the SANE API as a library for using the functions of this product from applications that support the SANE API (such as user application, "scanimage", and "xsane").

To use this product to scan a document with a scanner, use one of the methods below.

- Using a SANE API function interface

This method is used to control the scanner directly with a C-language application.

For details about a SANE API function interface, refer to [Using a SANE API function interface \(page 16\)](#).

- Using an image scanning application (such as "scanimage" or "xsane") that is built using the SANE API

This method is used to configure the scan settings from the OS standard CUI or a GUI application in order to scan a document.

For details about an application that is built using the SANE API, refer to [Using an Image Scanning Application That Is Built Using the SANE API \(page 17\)](#).

A function overview of this driver and a comparison on the specifications with drivers for other operating systems are shown in the table below.

No.	Function	Linux Driver		PaperStream IP Driver
1	Supported operating system	Ubuntu 14	○	Windows
		Ubuntu 15	–	
		Ubuntu 16	○	
		Ubuntu 17	–	
		Ubuntu 18	○	
2	Supported architecture	Intel x86/x86_64		Intel x86/x86_64
3	32-bit CPU support	○		○
4	64-bit CPU support	○		○
5	Download from a public site	○		○
6	Installer format	deb		Unique
7	Installer size	2 MB		100 MB
8	License	Unique		Unique
9	Image scanning application	Not included		Included
10	Profile	–		○
11	Paper source (Front/Rear/Duplex/Flatbed)	○		○
12	Resolution	50 to 600 dpi		50 to 1200 dpi
13	Image type (Color/grayscale/binary black & white)	○		○
14	Paper size (Custom)	○		○

No.	Function	Linux Driver	PaperStream IP Driver
15	Paper size (Standard sizes)	A3, A4, A5, A6, B4, B5, B6, Double-Letter, Letter, Legal, Executive, Folio, Postcard, Business card (*1)	○ (Various)
16	Cropping	○	○
17	Rotation (90°, 180°, 270°)	–	○
18	Rotation (Automatic)	–	○
19	Multifeed detection	○	○
20	Brightness	○	○
	Contrast	○	○
	Shadow	○	○
	Highlight	○	○
	Gamma	○	○
21	Binarization method	SDTC	○
		Static threshold	○
		Error diffusion	○
22	Dropout color	None/R/G/B/W	None/R/G/B/W/Custom
23	Sharpness	○	○
24	Inverted image	–	○
25	Automatic color/black & white detection	–	○
26	Blank page detection	○	○
27	Blank page detection (sensitivity)	○	○
28	sRGB correction	–	○
29	Hole punch removal	–	○
30	Multi image output	–	○
31	Separation	–	○
32	Edge repair	–	○
33	Page edge filler	–	○
34	Digital endorser	–	○

No.	Function	Linux Driver	PaperStream IP Driver
35	JPEG compression (Output from the scanner)	○ (*2)	○
36	Asynchronous (pre-read)	○	○
37	Setting the waiting time before the scanner enters power saving mode	○ (management tool)	○
38	Setting the time period before the scanner is automatically turned off when it is left unused	○ (management tool)	○
39	Scanning with the Scan button	○	○
40	Imprinter	○	○
41	Obtaining the scanner status	○	○
42	Obtaining the scanner error information	○	○

○: Supported

–: Not supported

*1: Only fi-7460, fi-7480, and fi-7700S support the following paper sizes:

- A3
- B4
- Double-letter
- Executive

fi-7460, fi-7480, and fi-7700S do not support the "Business card" paper size.

*2: JPEG output is possible in order to improve the data transfer speed between the scanner and the driver. The data is transferred to an application as standard SANE API (uncompressed) data.

Using a SANE API function interface

The SANE API supports the following SANE API functions:

sane_init()

Initializes a scanner library

sane_exit()

Exits the scanner library

sane_get_device()

Obtains a scanner device

sane_open()

Opens a scanner device

sane_close()

Closes a scanner device

sane_get_option_description()

Obtains option parameters

sane_control_option()

Sets option parameter values

sane_get_parameters()

Obtains option parameter values

sane_start()

Starts a scan

sane_read()

Reads data from a scanner

sane_cancel()

Cancels a scanner operation

sane_set_io_mode()

Sets I/O mode

sane_get_select_fd()

Obtains a file descriptor

sane_strstatus()

Obtains a scanner status

For details about how to call the SANE API functions and how they work, refer to the site below.

<http://www.sane-project.org/html/>

Using an Image Scanning Application That Is Built Using the SANE API

"scanimage" is an application which runs with the SANE API.

You can specify scan parameters or perform a scan with the imprinter by specifying an option for the "scanimage" command.

The following two types of options are available for the "scanimage" command. Specify a combination of the two types.

- **Options for specifying scanning operations and the output format (for all models)**

These are the options for specifying scanning operations and the output format, which are common for all models.

An example of the options for specifying scanning operations and the output format, which are common for all models, is shown below.

```
scanimage
--format=tiff          : Output file format
--batch=/tmp/out-image-sample%d.tiff : Output file name
-n                    : Checks the specified options (a scan is not performed).
--batch-count=3       : Scans 3 pages (images).
--batch-increment=2   : Increments %d in the output file name by two.
--help                : Displays Help messages.
```

- **Options related to scan parameters and the imprinter (specific for each model)**

These are the options related to scan parameters and the imprinter.

Available options vary depending on the model that is used.

An example of options related to scan parameters and the imprinter is shown below.

```
scanimage
--source Adf-front    : Scans the front side of a document in the ADF.
--resolution 300      : Resolution 300
--imprinter back-side : Uses the imprinter function.
--string "%05ud"      : Prints a five-digit number with the imprinter.
--autofeed=no         : Does not use the cache in the scanner.
```

Options for Specifying Scanning Operations and the Output Format (for All Models)

The "scanimage" command can be used to display a list of options that can be specified.

An example of the results of the command executed with "scanimage --help" specified is shown below.

When a scanner that is connected to a computer can be used, executing this command displays a list of options that can be specified for the model in use and then displays a list of options that can be specified for all models.

```
Usage: scanimage [OPTION]...
```

Start image acquisition on a scanner device and write image data to standard output.

Parameters are separated by a blank from single-character options (e.g.

-d epson) and by a "=" from multi-character options (e.g. --device-name=epson).

-d, --device-name=DEVICE use a given scanner device (e.g. hp:/dev/scanner)

--format=pnm|tiff|png|jpeg file format of output file

-i, --icc-profile=PROFILE include this ICC profile into TIFF file

-L, --list-devices show available scanner devices

-f, --formatted-device-list=FORMAT similar to -L, but the FORMAT of the output

can be specified: %d (device name), %v (vendor),

%m (model), %t (type), %i (index number), and

%n (newline)

-b, --batch[=FORMAT] working in batch mode, FORMAT is `out%d.pnm' `out%d.tif'

```

    `out%d.png' or `out%d.jpg' by default depending on --format
--batch-start=#    page number to start naming files with
--batch-count=#    how many pages to scan in batch mode
--batch-increment=#  increase page number in filename by #
--batch-double     increment page number by two, same as
                  --batch-increment=2
--batch-print      print image filenames to stdout
--batch-prompt     ask for pressing a key before scanning a page
--accept-md5-only  only accept authorization requests using md5
-p, --progress     print progress messages
-n, --dont-scan    only set options, don't actually scan
-T, --test         test backend thoroughly
-A, --all-options  list all available backend options
-h, --help         display this help message and exit
-v, --verbose      give even more status messages
-B, --buffer-size=#  change input buffer size (in kB, default 32)
-V, --version      print version information

```

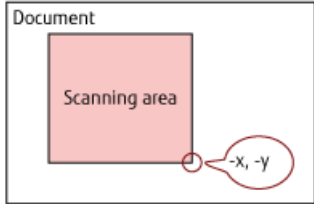
Options Related to Scan Parameters and the Imprinter (Specific for Each Model)

A list of options related to scan parameters and the imprinter (specific for each model) that can be specified when using the "scanimage" command is shown below.

When using this product with "xsane", the setting items corresponding to the options below can be specified on the "xsane" setting screen.

Function	Option (Syntax)	Settable values of argument (Bold: Default setting)	Notes
Paper source	--source	Flatbed	Flatbed: Flatbed
		Adf-front	Adf-front: Front side
		Adf-back	Adf-back: Back side
		Adf-duplex	Adf-duplex: Both sides
			"Flatbed" is valid only for scanners equipped with a flatbed.
Image type	--mode	Lineart	Black & White
		Gray	Grayscale
		Color	Color
Resolution	--resolution	50 to 600 (300)	<ul style="list-style-type: none"> Specify the number of pixels per inch. Settable in units of 1 dpi.
Paper width	--page-width	<ul style="list-style-type: none"> fi-7460/fi-7480/fi-7700S 26 to 304.8 (210.0) 	<ul style="list-style-type: none"> This setting is enabled only when "Custom" is specified for "--paper-size" (units: mm). (*1)

Function	Option (Syntax)	Settable values of argument (Bold: Default setting)	Notes
		<ul style="list-style-type: none"> fi-7030/fi-7140/fi-7240/fi-7160/fi-7260/fi-7180/fi-7280 26 to 216 (210.0) 	<ul style="list-style-type: none"> This setting cannot be specified when "Flatbed" is specified for "--source".
Paper length	--page-height	26 to 5588 (297.0) <ul style="list-style-type: none"> 50 to 200 dpi 26 to 5588 201 to 300 dpi 26 to 5461 301 to 400 dpi 26 to 4064 401 to 600 dpi 26 to 2700 	<ul style="list-style-type: none"> This setting is enabled only when "Custom" is specified for "--paper-size" (units: mm). (*1) This setting cannot be specified when "Flatbed" is specified for "--source".
Scanning area (Top-left x)	-l	0 to --page-width (0)	<ul style="list-style-type: none"> For the ADF, this setting is enabled only when "Custom" is specified for "--paper-size" (units: mm). (*1) When "yes" is specified for "page-auto" or "Overscan" is specified for "--cropping", this setting is ignored. When "Flatbed" is specified for "--source", the maximum size is as follows: <ul style="list-style-type: none"> For fi-7240/fi-7260/fi-7280 -x: 216, -y: 297 For fi-7700S -x: 304.8, -y: 457.2 -x and -y may be interpreted differently depending on the scanning tool. <ul style="list-style-type: none"> scanimage interprets -x and -y as the size (width and height) of a scanning area. xsane interprets -x and -y as the bottom right of a scanning area.
Scanning area (Top-left y)	-t	0 to --page-height (0)	
Scanning area (Bottom-right x)	-x	26 to --page-width (210.0)	
Scanning area (Bottom-right y)	-y	26 to --page-height (297.0)	

Function	Option (Syntax)	Settable values of argument (Bold: Default setting)	Notes	
				
Paper type	--paper-size	Custom	<ul style="list-style-type: none"> • When "Custom" is selected, scanning is performed within the range of the setting values for "--page-height" and "--page-width". Also, when "yes" is specified for "--page-auto", this setting is ignored. • This setting cannot be specified when "Flatbed" is specified for "--source". 	
		A3		
		A4		
		A5		
		A6		
		B4		
		B5		
		B6		A3 (297 × 420 mm) (*2)
		Double-Letter		A4 (210 × 297 mm)
		Letter		A5 (148 × 210 mm)
		Legal		A6 (105 × 148 mm)
		Folio		B4 (257 × 364 mm) (*2)
		Executive		B5 (182 × 257 mm)
		Postcard		B6 (128 × 182 mm)
Business card	Double-Letter (279.4 × 431.8 mm) (*2)			
			Letter (216 × 279.4 mm)	
			Legal (216 × 355.6 mm)	
			Folio (216.0 × 330.0 mm)	
			Executive (184.15 × 266.7 mm) (*2)	
			Postcard (100 × 148 mm)	
			Business card (90 × 55 mm) (*3)	
Cropping	--page-auto	=(yes no)	<ul style="list-style-type: none"> • When "yes" is specified for "--page-auto", the following settings are ignored: <ul style="list-style-type: none"> - --page-height - --page-width - --paper-size - Top-left x - Top-left y 	

Function	Option (Syntax)	Settable values of argument (Bold: Default setting)	Notes
			<ul style="list-style-type: none"> - Bottom-right x - Bottom-right y ● "--cropping" and "-page-auto" cannot be specified together. ● The maximum paper sizes that can be scanned vary depending on the resolution. (*4) However, the actual paper sizes that can be scanned depends on the computer environment.
Cropping priority	--page-auto-priority	Speed	<ul style="list-style-type: none"> ● This setting cannot be specified when fi-7030 or fi-7700S is used. ● This setting can be specified when "yes" is specified for "--page-auto". However, this setting cannot be specified when "Flatbed" is specified for "--source" or when "White" is specified for "--bgcolor". <p>Speed: Prioritizes the cropping speed. Accuracy: Prioritizes the cropping accuracy.</p>
		Accuracy:	
Cropping method (Overscan)	--cropping	Old_specification	<ul style="list-style-type: none"> ● "--cropping" and "-page-auto" cannot be specified together. ● When "Overscan" is specified for "--cropping", an image that is a little larger than the size specified for "--paper-size" is output. When "Custom" is specified for "--paper-size", the values specified for "page-height" and "page-width" are enabled. When a specific size is specified for "--paper-size", the values specified for "page-height" and "page-width" are ignored. ● This setting cannot be specified when "Flatbed" is specified for "--source".
		Overscan	

Function	Option (Syntax)	Settable values of argument (Bold: Default setting)	Notes
			<ul style="list-style-type: none"> For fi-7700S, "--cropping" and "--bgcolor" cannot be specified together. For the models other than fi-7030 and fi-7700S, "Overscan" cannot be specified for "--cropping" when "White" is specified for "--bgcolor".
Background color that is used when the ADF is used for scanning	--bgcolor	Black	<ul style="list-style-type: none"> This setting cannot be specified when fi-7030 is used. This setting cannot be specified when "Flatbed" is specified for "--source". For fi-7700S, this setting cannot be specified when "yes" is specified for "--page-auto". For fi-7700S, "--cropping" and "--bgcolor" cannot be specified together. For the models other than fi-7700S, "White" cannot be specified for "--bgcolor" when "Overscan" is specified for "--cropping". It is recommended that you specify "White" for "--bgcolor" when scanning dark color documents.
		White	
Binarization method	--bw-mode	SDTC	This setting is enabled when "Lineart" is specified for "--mode". SDTC: Automatic Threshold: Static threshold Error-diffusion: Error diffusion
		Threshold	
		Error-diffusion	
Binarization method (Static Threshold)	--threshold	0 to 255 (128)	This setting is enabled when "Threshold" is specified for "--bw-mode".
Brightness	--brightness	-127 to 127 (0)	The higher the specified value is, the brighter the image becomes.
Contrast	--contrast	-127 to 127 (0)	The higher the specified value is, the clearer the contrast in the image becomes.

Function	Option (Syntax)	Settable values of argument (Bold: Default setting)	Notes
Shadow	--shadow	[0 - 254] (0)	<ul style="list-style-type: none"> When "Lineart" is specified for "--mode", the default values are as follows: Shadow: 0, Highlight: 255, Gamma: 1.0 When "Color" or "Gray" is specified for "--mode", the default values are as follows: Shadow: 10, Highlight: 230, Gamma: 1.6 For "Shadow", specify a value lower than the value specified for "Highlight". When the default values are specified for "Shadow", "Highlight", and "Gamma" in xsane, these values will be changed if the setting for "--mode" is changed. However, when values other than the default values are specified, these values will not be changed even if the setting for "--mode" is changed.
Highlight	--highlight	[1 - 255] (255)	
Gamma	--gamma	[0.1 - 10] (1.0)	
Multifeed detection	--multifeed-detection	Do-not-detect	This setting is disabled when "Flatbed" is specified for "--source". Do-not-detect: Do not detect a multifeed Stop: Detect a multifeed
		Stop	
Detecting multifeeds by the overlapping of documents	--mf-overlapping	=(yes no)	This setting is enabled when "Stop" is specified for "--multifeed-detection".
Detecting multifeeds by the length of the document	--mf-length	=(yes no)	This setting is enabled when "Stop" is specified for "--multifeed-detection".
Specifying whether or not to enable pre-pick	--prepick	=(yes no)	<ul style="list-style-type: none"> This setting cannot be specified when fi-7030 is used. This setting is disabled when "Flatbed" is specified for "--source".

Function	Option (Syntax)	Settable values of argument (Bold: Default setting)	Notes
Dropout color	--dropoutcolor	White	This setting is enabled when "Gray" or "Lineart" is specified for "--mode".
		Red	
		Green	
		Blue	
		None	
Sharpness	--cleanup-sharpness	None	<ul style="list-style-type: none"> • The sharpness is not adjusted and images are not enhanced. • This setting is enabled when "Color" or "Lineart" is specified for "--mode".
		Smoothing	This setting is enabled when "Lineart" is specified for "--mode".
		Emphasis-level-1	This setting is enabled only when "Color" or "Lineart" is specified for "--mode".
		Emphasis-level-2	
		Emphasis-level-3	
		Descreen-level-1	This setting is enabled when "Color" is specified for "--mode".
		Descreen-level-2	
		Descreen-level-3	
		Descreen-level-4	
Blank page skip	--blank-page-skip	[=(yes no)]	<ul style="list-style-type: none"> • If "yes" is specified, the data for blank pages is deleted. • This setting is disabled when "Flatbed" is specified for "--source".
Blank page skip (sensitivity)	--blank-page-skip-sensitivity	1 to 5 (3)	This setting is enabled when "yes" is specified for "--blank-page-skip". The determination sensitivity is specified. 1: More likely to detect blank pages 3: Normal detection setting 5: Less likely to detect blank pages
Binarization method (SDTC level)	--bw-sdtk-variance	Low	This setting is enabled when "SDTC" is specified for "--bw-mode". It specifies the SDTC level.
		Mid	
		High	
JPEG transfer	--jpeg	[=(yes no)]	<ul style="list-style-type: none"> • This setting is enabled when "Gray" or "Color" is specified for "--mode".

Function	Option (Syntax)	Settable values of argument (Bold: Default setting)	Notes
			<ul style="list-style-type: none"> • A scanner transfers a compressed JPEG image to a computer when "yes" is specified for "--jpeg". An application always receives an uncompressed image from the driver regardless of this setting.
JPEG type	--jpeg-type	444	This setting is enabled when "yes" is specified for "--jpeg".
		422	
		411	
JPEG compression rate	--jpeg-quality	1 to 7 (4)	<ul style="list-style-type: none"> • This setting is enabled when "yes" is specified for "--jpeg". • The lower the specified value is, the higher the compression rate becomes and the larger the noise becomes for the image.
Preceding scan	--autofeed	=(yes no)	If ADF is used, a preceding scan is performed by using the cache memory in the scanner. Because all sheets that are loaded in the ADF paper chute (feeder) are fed, if an application stops the scanning process along the way, the scanned images that remain in the cache memory are discarded.
Obtaining the scanner status	--get-sc-status	- (no arguments)	<ul style="list-style-type: none"> • Obtains 4-byte numbers that indicate the scanner status. For details, refer to Values of the Scanner Information to Be Displayed (page 56). • The information related to the scanner status is collected from a scanner every time the "scanimage" command is executed. • Executing this option repeatedly at short 1 second or less intervals puts a heavy load on the system. • This option is disabled even if it is specified. You can refer to the

Function	Option (Syntax)	Settable values of argument (Bold: Default setting)	Notes
			scanner status by executing "scanimage --help". (Example) --get-sc-status <string> [0x80000000]
Obtaining the scanner error information	--get-sc-error	- (no arguments)	<ul style="list-style-type: none"> Obtains the information of an error that occurred with the last scan as a 4-byte number. For details, refer to Values of the Scanner Information to Be Displayed (page 56). The scanner error information is collected when a scan is performed with a scanner. When performing a scan continuously, you can only refer to the last error information. Executing this option repeatedly at short 1 second or less intervals puts a heavy load on the system. The error information regarding the period from the time a scanner is turned on to the time the first scan is performed cannot be obtained. This option is disabled even if it is specified. You can refer to the error information by executing "scanimage --help". (Example) --get-sc-error <string> [0x03800320]
Imprinter (*5)	--imprinter	Off	Does not print with the Imprinter. The options related to the imprinter cannot be specified if this option is specified.
		Back-side (*6)	Prints a character string on the back side of a document after a document is scanned.
	--string	For details, refer to Characters That Can Be	Prints a string of up to 43 characters.

Function	Option (Syntax)	Settable values of argument (Bold: Default setting)	Notes
		Printed With the Imprinter (page 31) .	
	--offset	[0 - 863.6] (0)	Specify a value for positioning the offset from the top edge of a document to print character strings on (unit: mm). Note that 5 mm is added to the value that you specify for the position to start a print at. Even if the printed string does not fit in the document, it does not cause an error.
	--initial-counter-value	[0 - 99999999] (1)	When a counter value is added to a string, specify an initial value for the counter. (*7)
	--counter-step	[-2 - 2] (1)	When a counter value is added to a string, specify a value by which the counter value is incremented or decremented every time a scan is performed.
	--font-type	Horizontal-normal	Specify a size and direction for a string that is printed with the imprinter. Horizontal-normal: Horizontal - Normal Horizontal-bold: Horizontal - Bold Horizontal-narrow: Horizontal - Narrow Vertical-normal: Vertical - Normal Vertical-bold: Vertical - Bold
Horizontal-bold			
Horizontal-narrow			
Vertical-normal			
Vertical-bold			
	-font-direction	Top-to-bottom	Specify a printing direction. Top-to-bottom: A string is printed from top to bottom. Bottom-to-top: A string is printed from bottom to top.
Bottom-to-top			

***1:**In the SANE API, the length and width are calculated in multiples of 1/65536. Therefore, an image smaller than the specified size may be output. In this case, specify a size that is a little larger. For example, add 0.1 (mm) to the current size.

***2:**This paper size is supported with the following scanner models:

- fi-7460
- fi-7480
- fi-7700S

***3:**This paper size is supported with the following scanner models:

- fi-7030
- fi-7140
- fi-7240
- fi-7160
- fi-7260
- fi-7180
- fi-7280

***4:**The maximum paper sizes of documents that can be scanned according to the resolution are as follows:

- fi-7030/fi-7140/fi-7240/fi-7160/fi-7260/fi-7180/fi-7280
 - 50 to 200 dpi
216 × 5588 mm
 - 201 to 300 dpi
216 × 5461 mm
 - 301 to 400 dpi
216 × 4064 mm
 - 401 to 600 dpi
216 × 2700 mm
- fi-7460/fi-7480
 - 50 to 200 dpi
304.8 × 5588 mm
 - 201 to 300 dpi
304.8 × 5461 mm
 - 301 to 400 dpi
304.8 × 4064 mm
 - 401 to 600 dpi
304.8 × 2700 mm

***5:**The options related to the imprinter can be specified when the imprinter is installed. When the imprinter is not installed, specifying an option related to the imprinter displays the error message "sane_start: Invalid argument".

***6:**When "Back-side" is specified for "--Imprinter", specify a character string for printing (--string).

***7:**Specify an initial value for the counter of the imprinter every time you call the "scanimage" command. A counter value is not carried over even if the "scanimage" command is called repeatedly. If a value is omitted, the default value "1" is specified.



CAUTION

In some applications, if the specified value for a parameter is out of the specified range, the value may be replaced with the maximum value or the minimum value in the range.

HINT

- You can check the list of these options and values that can be set for the options when Linux driver is installed and the scanner that you want to use is turned on and connected to the computer.
Execute the following command to display a list of options and a list of values that can be specified.

```
scanimage --help
```

- For an option that requires the argument "yes" or "no", if you do not specify either of the arguments, the option is executed with the "yes" argument specified.
- The values specified for the "scanimage" command are reset every time the command is executed. The values are not carried over even if the "scanimage" command is executed repeatedly. If a value is omitted, the default value is used.

Characters That Can Be Printed With the Imprinter

Characters that can be printed with the imprinter ("--string" option) are shown below.

Character string

Specify a character string for printing. Up to 43 characters can be printed.

The following characters can be printed by entering them directly.

- Alphabets
A to Z, a to z
- Numbers
0, 1 to 9
- Symbols
! "# \$ % & ' () * + , - . / : ; < = > ? @ [\] ^ _ ` { | } ~

HINT

- Specify "%%" to print "%" as a character.
- Specify "~" to print "~" as a character.

- Space

For details, refer to [Character Strings That Can Be Entered With the Endorser and Output Examples](#) (page 31).

A character string consists of the following elements:

- Character
- Counter
- Date, month, and year
- Time (hours, minutes)

HINT

When a character string to be printed does not fit in the print area in the document, only the characters that fit in the print area, starting from the first character, are printed. This does not cause an error.

Character Strings That Can Be Entered With the Endorser and Output Examples

Character strings that can be entered with the endorser and output examples are as follows:

Type	Character string to be entered	Example of a character string to be output	Notes
Character	Scan	Scan	Entered characters are output without any change

Type	Character string to be entered	Example of a character string to be output	Notes
Counter (*1)	%05ud	00001	%0Nud: N-digit number for the counter (N= 3 to 8)
Counter (when multiple strings are entered)	%05ud%03ud	00001	When multiple strings are entered, the first string is prioritized
Year (last two digits for the year (western calendar))	%YY	19	(Example for the year 2019)
Year (four digits for the year (western calendar))	%YYYY	2019	(Example for the year 2019)
Month	%M	2	(Example for February)
Month (two digits for the month)	%MM	02	(Example for February)
Month (abbreviation in English)	%MMM	FEB	(Example for February)
Date	%D	7	(Example for the seventh)
Date (two digits for the date)	%DD	07	(Example for the seventh)
Hour	%H	7	(Example for 7 o'clock)
Hours (two digits for the hours)	%HH	07	(Example for 7 o'clock)
Minute	%N	7	(Example for 7 minutes)
Minutes (two digits for the minutes)	%NN	07	(Example for 7 minutes)
Julian date	%J	2456181.517430	
Example of a combination	Scan-%YYYY/%MM/%DD %HH:%NN_%05ud	Scan-2019/07/27 12:15_00001	

***1:**

When a character string to be printed does not match the output range because of an increase or decrease in the counter value, the value is adjusted in order for the character string to match the output range. For example, when a counter value is three digits long, the counter value is adjusted to 0 if it exceeds 999. The counter value is adjusted to 999 if it is less than 0.

The character string format and the output range for a counter value to be printed are as follows:

Character string	Range
%03ud	[0, 999]
%04ud	[0, 9999]
%05ud	[0, 99999]
%06ud	[0, 999999]
%07ud	[0, 9999999]
%08ud	[0, 99999999]

How to Fix Errors That Occur While Performing a Scan

This section describes how to fix errors that occur while performing a scan. The display messages for various types of errors that occur when scanning by "scanimage" are also included for reference.

Return code in SANE API	Message displayed in "scanimage" (Reference)	Cause, Result of the Cause, and the Corrective Action
SANE_STATUS_IO_ERROR	Error during device I/O	<p>Cause</p> <p>The USB cable was disconnected during a scanning process.</p> <p>Result of the Cause</p> <p>The scanner stops the scanning process and the image scanning application returns an error.</p> <p>Corrective Action</p> <p>Reconnect the USB cable to the computer. Turn the scanner off, and then turn it on again.</p>
SANE_STATUS_IO_ERROR	Error during device I/O	<p>Cause</p> <p>The power cable was disconnected during a scanning process.</p> <p>Result of the Cause</p> <p>The scanner stops the scanning process and the image scanning application returns an error.</p> <p>Corrective Action</p> <p>Connect the power cable properly. To disconnect and connect the power cable, an interval of 5 or more seconds is required. After reconnecting the power cable, turn the scanner on.</p> <p>Exit the application and start it again.</p>
SANE_STATUS_IO_ERROR	Error during device I/O	<p>Cause</p> <p>Scanning is performed without unlocking the transport lock.</p> <p>Result of the Cause</p> <p>The scanner stops the scanning process and the image scanning application returns an error.</p>

Return code in SANE API	Message displayed in "scanimage" (Reference)	Cause, Result of the Cause, and the Corrective Action
		<p>Corrective Action</p> <p>Turn off the scanner, unlock the transport lock, and try scanning again.</p>
SANE_STATUS_NO_DOCS	Document feeder out of documents	<p>Cause</p> <p>There are no documents left in the ADF paper chute (feeder) during a scanning process.</p> <p>Result of the Cause</p> <p>The scanner stops the scanning process and the image scanning application returns an error.</p> <p>Corrective Action</p> <p>If more documents need to be scanned, load the documents in the ADF paper chute (feeder), and try scanning again.</p>
SANE_STATUS_JAMMED	Document feeder jammed	<p>Cause</p> <p>A document jam occurred during a scanning process.</p> <p>Result of the Cause</p> <p>The scanner stops the scanning process and the image scanning application returns an error.</p> <p>Corrective Action</p> <p>Open the ADF cover, remove the jammed document, and then try scanning again. If document jams occur frequently, clean the inside of the scanner.</p>
SANE_STATUS_COVER_OPEN	Scanner cover is open	<p>Cause</p> <p>The ADF cover is open during a scanning process.</p> <p>Result of the Cause</p> <p>The scanner stops the scanning process and the image scanning application returns an error.</p> <p>Corrective Action</p> <p>Close the ADF cover, reload the documents, and then try scanning again.</p>
SANE_STATUS_CANCELLED	Operation was cancelled	<p>Cause</p> <p>Scanning is canceled during a scanning process.</p>

Return code in SANE API	Message displayed in "scanimage" (Reference)	Cause, Result of the Cause, and the Corrective Action
		<p>Result of the Cause</p> <p>The scanner stops the scanning process and the image scanning application returns an error.</p> <p>Corrective Action</p> <p>A document may be remaining in the scanner. Open the ADF cover and remove the document.</p>
SANE_STATUS_UNSUPPORTED	<p>unrecognized option</p> <p>Example:</p> <pre>#scanimage --page-size=A4 >pfu.pnm #unrecognized option '--page-size=A4'</pre>	<p>Cause</p> <p>An incorrect option was specified.</p> <p>Result of the Cause</p> <p>The scanner does not start scanning and the image scanning application returns an error.</p> <p>Corrective Action</p> <p>Specify the correct option, and then try scanning again.</p>
SANE_STATUS_GOOD	<p>rounded value of XX from XX to XX</p> <p>Example:</p> <pre>#scanimage --contrast 128 >pfu.pnm # rounded value of contrast from 128 to 127</pre>	<p>Cause</p> <ul style="list-style-type: none"> • A document has been scanned successfully. • A value outside the allowable range was specified, but the document has been scanned successfully. <p>Result of the Cause</p> <p>If a value outside the allowable range was specified, the scanner scans a document after the value is changed to a value within the allowable range. A message appears indicating that the value was changed.</p> <p>Corrective Action</p> <p>Not needed.</p>
SANE_STATUS_NO_MEM	Out of memory	<p>Cause</p> <p>Memory ran out during a scanning process.</p> <p>Result of the Cause</p> <p>The scanner stops the scanning process and the image scanning application returns an error.</p> <p>Corrective Action</p> <p>Change the settings such as the resolution and the paper size to reduce the image size and scan again. In addition,</p>

Return code in SANE API	Message displayed in "scanimage" (Reference)	Cause, Result of the Cause, and the Corrective Action
		<p>some parameters tend to consume memory. Disable the cropping parameter and the blank page skip parameter and try again.</p> <p>If the problem persists, add memory.</p>
SANE_STATUS_CANCELLED	Operation was cancelled	<p>Cause</p> <p>The STOP button was pressed to cancel scanning.</p> <p>Result of the Cause</p> <p>The scanner stops the scanning process and the image scanning application returns an error.</p> <p>Corrective Action</p> <p>A document may be remaining in the scanner. Open the ADF cover and remove the document.</p>

Scan Button Monitoring Tool

This tool monitors the [Scan] button of the scanner and performs a scan by executing the "scanimage" command when it detects that the [Scan] button was pressed.

The usage is described below.

- **How to start or stop the monitoring tool**

The monitoring tool is not started in the state immediately after installation.

Perform the operation below as the superuser (root user) to enable starting and stopping.

Starting the monitoring tool

```
/etc/init.d/pfufsscanbutton start
```

Stopping the monitoring tool

```
/etc/init.d/pfufsscanbutton stop
```

The monitoring tool must be registered to be started automatically when the system is started.

The system is managed by "update-rc.d".

- **Output location of image data**

When scanning is performed by pressing the [Scan] button, a folder with a name indicating the current time is created under the folder below, and the image is stored there.

```
/opt/pfufs/image
```

The attributes of the scanned image are shown below. Also, the image is output in the PNM format by default.

```
Owner: root
```

```
Permissions: 644
```

- **Changing the scan parameters**

When the [Scan] button is pressed, the scan process is performed based on the configuration file below.

```
/opt/pfufs/etc/pfufsscanbutton.conf
```

To change the scan parameters, change the values in the configuration file as the superuser (root user) in any text editor. Due to the "scanimage" specifications, images can be output in a limited number of formats. To convert an image to another format, use an application or tool for converting images to other formats.

Configuration file example: A configuration file with the settings below is saved upon installation.

```
scanimage --batch --format=png --source "Adf-front" --mode Lineart --resolution 300 --autofeed=yes
```

HINT

The contents of the configuration file cannot be written as a shell script. The configuration file can be used only as an option for the "scanimage" command.

By default, images are saved in the "/opt/pfufs/image" directory. However, you can change the save destination by using the "batch" option as follows.

```
scanimage --batch=/tmp/Image-%d.pnm --format=png --source "Adf-front" --mode Lineart --resolution 300 --autofeed=yes
```

- **Notes**

- When the scanner is in use (for example, when a scanning application is using the scanner), the monitoring tool cannot start scanning even if the [Scan] button is pressed.
On the other hand, when a scan is being performed by the monitoring tool due to the [Scan] button being pressed, other applications cannot start scanning.
The function to stop/resume scanning with the Scan button is not supported.
- The monitoring tool can monitor only one scanner. When multiple scanners are connected to the computer, the monitoring tool does not run correctly.
- If you need to save an error message that is generated during a scan, add the output file path and name (for example, "/tmp/err.log") to the configuration file (pfufsscanbutton.conf) as follows:

```
scanimage --batch --format=png --source "Adf-front" --mode Lineart --resolution 300 --autofeed=yes >/tmp/err.log
```

Management Tool

The management tool allows you to maintain the scanner and configure the settings such as the waiting time before the scanner enters power saving mode, the period of time before the scanner is automatically turned off when it is left unused, the magnification level, and the offset value.

Details on how to use this management tool and its functions are described below.

How to Use the Management Tool

Specify an option and an argument for the "pfufconsumables" command and then execute the command. Root privileges are required depending on the option you specify.

```
# pfufconsumables <option> <setting value for an argument>
```

Example:The command for setting the scanner to be automatically turned off

```
# pfufconsumables --power-off inactive
```

Functions, Options, and Setting Values for Arguments

No.	Function	Option	Setting value for an argument	Notes
1	Listing the scanners that are connected	-L or --list-devices	None	The following information is displayed for each scanner that is connected: <ul style="list-style-type: none"> • Scanner name • USB bus number • Port number
2	Specifying a scanner	-d or --device-name	Scanner name:USB bus number:port number Example: fi-7030:001:003	If you do not specify this option, the scanner that is detected first is specified. For the USB bus number and the port number, specify the values that are listed when the command is executed with option "-L" or "--list-devices" specified.
3	Displaying the Help information	-h or -help	None	The Help information for the management tool is displayed.
4	Displaying the version of the management tool	-V or -version	None	The version of the management tool is displayed.

No.	Function	Option	Setting value for an argument	Notes
5	Displaying the scanner information	--info	None	The following information about the scanner is displayed: <ul style="list-style-type: none"> • Scanner name • Firmware version • Serial number • Consumable counters • Waiting time before the scanner enters power saving mode/time period before the scanner is automatically turned off when it is left unused • Magnification level and offset value
6	Clearing the number of sheets scanned after cleaning (*1)	--after-cleaning-clear	None	The number of sheets scanned after cleaning is cleared.
7	Clearing the counter number for the brake roller (*1)	--brake-roller-clear	None	The counter number for the brake roller is cleared.
8	Clearing the counter number for the pick roller (*1)	--pick-roller-clear	None	The counter number for the pick roller is cleared.
9	Setting the waiting time before the scanner enters power saving mode (*1)	--sleeptimer	5 to 235 (Specify the time in minutes in multiples of 5)	Specify a value for the waiting time before the scanner enters power saving mode in minutes. If the specified time that is not in multiples of 5, it is rounded down to the time in multiples of 5.
10	Setting the time period before the scanner is automatically turned off when it is left unused (*1)	--power-off	inactive	Specify an option to keep the scanner on even when it is left unused or specify one of the following time periods before the scanner is automatically turned off. <ul style="list-style-type: none"> • 1-hour • 2-hours
			1-hour	
			2-hours	
			4-hours	
			8-hours	

No.	Function	Option	Setting value for an argument	Notes
				<ul style="list-style-type: none"> • 4-hours • 8-hours
11	Setting the offset value	--adf-front-offset-main	fi-7700S: -4 to 6 (*0.5 mm) (Step: 1)	Specify the ADF front offset value for main scanning (widthways).
		--adf-front-offset-sub	Models other than fi-7700S: -4 to 4 (*0.5 mm) (Step: 1)	Specify the ADF front offset value for sub scanning (lengthways).
		--adf-front-offset-end-of-page	-4 to 4 (*0.5 mm) (Step: 1)	Specify the ADF front offset value for the bottom edge of the document.
		--adf-back-offset-main		Specify the ADF rear offset value for main scanning (widthways).
		--adf-back-offset-sub		Specify the ADF rear offset value for sub scanning (lengthways).
		--adf-back-offset-end-of-page	Specify the ADF rear offset value for the bottom edge of the document.	
		--flatbed-offset-main	fi-7700S: -4 to 6 (*0.5 mm) (Step: 1)	Specify the flatbed offset value for main scanning (widthways).
		--flatbed-offset-sub	Models other than fi-7700S: -4 to 4 (*0.5 mm) (Step: 1)	Specify the flatbed offset value for sub scanning (lengthways).
12	Setting the magnification level (*1)	--adf-magnification-adjustment	-3.1 to 3.1% (Step: 0.1)	Specify the ADF magnification level for sub scanning (lengthways).
		--flatbed-magnification-adjustment		Specify the flatbed magnification level for sub scanning (lengthways).

*1:Only a user with root privileges can set this option.

- If you specify two or more options from No.1, No.3, No.4, and No.5 at the same time, only the first option is applied.

For example, when the following command is executed, only the version of the management tool is displayed.

```
pfufsconsumables -V --info
```

- If you specify an option from No.1, No.3, No.4, and No.5 and an option from No.6 through No.12 at the same time, the option from No.6 through No.12 is not applied.
For example, when the following command is executed, the version of the management tool is displayed, but the waiting time before the scanner enters power saving mode is not applied.

```
pfufconsumables --sleeptimer 60 -V
```

- Option No.6 and subsequent options can be specified only when the management tool is executed by the superuser (root user). These options cannot be specified by a general user. In addition, option No.6 is not displayed when "--help" is specified.
- To output the displayed results of the scanner information into a text file by using the management tool, execute the following command:

Example:"result_of_info.txt" in the following command is an arbitrary text file name.

```
pfufconsumables --info > result_of_info.txt
```

ATTENTION

Make sure that you start the management tool to check the status of the scanner before operating the operator panel or performing a scan with the scanner.

Models and Supported Functions

The models that support each function (option) are shown below.

Function (Option)	Scanner Model				
	fi-7700S	fi-7460 fi-7480	fi-7240 fi-7260 fi-7280	fi-7140 fi-7160 fi-7180	fi-7030
Listing the scanners that are connected -L or --list-devices	○	○	○	○	○
Specifying a scanner -d or --device-name	○	○	○	○	○
Displaying the Help information -h or -help	○	○	○	○	○
Displaying the version of the management tool -V or -version	○	○	○	○	○
Displaying the scanner information --info	○	○	○	○	○
Clearing the number of sheets scanned after cleaning (*1) --after-cleaning-clear	○	○	○	○	○
Clearing the counter number for the brake roller (*1)	○	○	○	○	○

Function (Option)	Scanner Model				
	fi-7700S	fi-7460 fi-7480	fi-7240 fi-7260 fi-7280	fi-7140 fi-7160 fi-7180	fi-7030
--brake-roller-clear					
Clearing the counter number for the pick roller (*1) --pick-roller-clear	○	○	○	○	○
Clearing the value for the remaining ink (*1) --remaining-ink-clear	-	-	-	○	-
Setting the waiting time before the scanner enters power saving mode (*1) --sleeptimer	○	○	○	○	○
Setting the time period before the scanner is automatically turned off when it is left unused (*1) --power-off	○	○	○	○	○
Setting the ADF front offset value for main scanning (widthways) (*1) --adf-front-offset-main	○	○	○	○	○
Setting the ADF front offset value for sub scanning (lengthways) (*1) --adf-front-offset-sub	○	○	○	○	○
Setting the ADF front offset value for the bottom edge of the document (*1) --adf-front-offset-end-of-page	-	-	-	-	○
Setting the ADF rear offset value for main scanning (widthways) (*1) --adf-back-offset-main	-	○	○	○	○
Setting the ADF rear offset value for sub scanning (lengthways) (*1) --adf-back-offset-sub	-	○	○	○	○
Setting the ADF rear offset value for the bottom edge of the document (*1) --adf-back-offset-end-of-page	-	-	-	-	○
Setting the flatbed offset value for main scanning (widthways) (*1) --flatbed-offset-main	○	-	○	-	-
Setting the flatbed offset value for sub scanning (lengthways) (*1) --flatbed-offset-sub	○	-	○	-	-

Function (Option)	Scanner Model				
	fi-7700S	fi-7460 fi-7480	fi-7240 fi-7260 fi-7280	fi-7140 fi-7160 fi-7180	fi-7030
Setting the ADF magnification level for sub scanning (lengthways) (*1) --adf-magnification-adjustment	○	○	○	○	○
Setting the flatbed magnification level for sub scanning (lengthways) (*1) --flatbed-magnification-adjustment	○	-	○	-	-

○: Supported

-: Not supported

*1: Only a user with root privileges can set this option.

Return Values

This section describes the return values of the management tool.

Return value	Description
0x00	Applying the specified settings or clearing the counter was successfully completed.
Value other than 0x00	An error has occurred. Applying the specified settings or clearing the counter failed.

Obtaining the Scanner Information

The commands to obtain the scanner information allow you to obtain the following information.

- Scanner status information ("pfufsgetscstatus" command)

The following command is used to obtain a 4-byte number that indicates the scanner status collected from the scanner every time the "scanimage" command is executed.

The information that can be obtained is identical to the information displayed in the "--get-sc-status" section when "scanimage --help" is executed.

- Scanner error information ("pfufsgetscerror" command)

This command is used to obtain the scanner error information that was generated for the most recent scan.

The information that can be obtained is identical to the information displayed in the "--get-sc-error" section when "scanimage --help" is executed.

Each command is described below.

For details about the scanner information that is obtained, refer to [Values of the Scanner Information to Be Displayed \(page 56\)](#).

Command to Obtain the Scanner Status

The following command is used to obtain a 4-byte number that indicates the scanner status collected from the scanner every time the "scanimage" command is executed.

"pfufsgetscstatus" command

Format

```
pfufsgetscstatus
```

Argument

None

Output format

0XXXXXXXX

Example

0xB0000000

Return code

0: The command is completed successfully

Value other than 0: An error occurred while executing the command.

Error message

Error messages output by the SANE API, such as "no SANE device ..." and "Device busy", are displayed.

ATTENTION

Executing this command repeatedly at short 1 second or less intervals puts a heavy load on the system.

Command to Obtain the Scanner Error Information

The following command is used to obtain the scanner error information that was generated during the last scan.

"pfufgetscerror" command

Format

```
pfufgetscerror
```

Argument

None

Output format

0XXXXXXXX

Example

JAM

0x038010031

Return code

0: The command is completed successfully

Value other than 0: An error occurred while executing the command.

Error message

Error messages output by the SANE API, such as "no SANE device ..." and "Device busy", are displayed.

ATTENTION

- Executing this command repeatedly at short 1 second or less intervals puts a heavy load on the system.
- The error information regarding the period from the time a scanner is turned on to the time the first scan is performed cannot be obtained.
- When performing a scan continuously, you can only refer to the latest error information.

Basic Knowledge for Using Linux Drivers

Linux

Many different types of Linux distributions are available around the world. A Linux distribution includes a Linux kernel module that is released for free, libraries, command components, and applications. In addition, a Linux distribution is on the DVD provided or other distributable media.

Well-known distributions are Debian, Ubuntu, Redhat, CentOS, and OpenSUSE.

Each distribution has a different aspect, such as bundled applications, a GUI system, a support system, or a bug fix frequency.

- Debian
For general use.
 - Ubuntu
Debian based distribution that is optimized for desktop computers.
 - Redhat (Red Hat Enterprise Linux)
For server systems. Commercial based distribution that is supported by Red Hat for a fee.
 - CentOS
A clone of Red Hat Enterprise Linux. Trademarks are removed from this distribution so that users can use this for free.
 - OpenSUSE
For general use.
Commercial based distribution (such as SUSE Linux Enterprise) that is supported by SUSE is also available.
- PFU conducted the development for the driver and support based on the Ubuntu distribution because of its market share and high versatility.

Ubuntu

Ubuntu 18.04 LTS includes scanner drivers (based on SANE 1.0.27) for various scanner manufacturers. It includes scanner drivers for the fi Series as well. However, these drivers are not supported by PFU Limited.

ATTENTION

Ubuntu 14.04 LTS also includes scanner drivers, but because these drivers are older (based on SANE 1.0.24), they do not work when the scanner is connected to a computer via a USB 3.0 controller.

The following describes how to obtain Ubuntu 18.04 LTS and how to install it.

● Obtaining an OS image

An OS Image (ISO format) can be obtained from the site below. This site is mirrored by organizations in various countries. Because the network environment varies in each country, be sure to select the most suitable site.

- Download site
 - Original site
<http://releases.ubuntu.com/18.04/>

- Example of a mirror site (Japan Advanced Institute of Science and Technology)
<http://ftp.jaist.ac.jp/pub/Linux/ubuntu-releases/18.04/>

- ISO image to be downloaded
(for 64-bit systems) `ubuntu-18.04-desktop-amd64.iso`

HINT

- A screen asking for a donation may appear when attempting to download an OS image by following the URL from the original website for Ubuntu.
- If you do not know the nearest mirror site to you, search for the above ISO image file name, and find which site is the nearest to you from the displayed site URLs.

- **How to install Ubuntu18.04 LTS**

There are three methods for installing Ubuntu18.04 LTS.

- **How to install Ubuntu18.04 LTS in the virtualization software such as Virtual Box and VMware installed on Windows**

You can keep your Windows computer environment as it is and use Ubuntu18.04 LTS.

First, install virtualization software. For the installation method, refer to the install instructions of each software.

After you prepare the virtualization environment, proceed with the installation steps by referring to the following website:

<http://www.ubuntu.com/download/desktop/install-ubuntu-desktop>

- **How to write the ISO image to a writable disc such as a DVD and then start Linux from the DVD.**

You can keep your Windows computer environment as it is and use Ubuntu18.04 LTS.

Linux runs in the memory without being installed to the computer hard disk.

Refer to the following website for the installation procedure:

<http://www.ubuntu.com/download/desktop/try-ubuntu-before-you-install>

- **How to install Ubuntu18.04 LTS on your computer from the DVD**

Refer to the following website for the installation procedure:

<http://www.ubuntu.com/download/desktop/install-ubuntu-desktop>

Scanners on Linux Platform

SANE API

The SANE API is an API for scanners, which is used on Linux OS.

The SANE API can be used to operate a scanner using one of the two methods below.

- Method of using the image scanning application included in Linux OS
Scanning applications (such as "scanimage", "xsane", and "simple-scan") that support the SANE API can usually be used in Linux OS. The scanner can be used from these applications.
For example, by calling the "scanimage" command from the user application, a scanned image can be output as a file. In this case, you can develop your application without any regard to the SANE API.
- Method of creating an application using the
This driver has functions that call an interface based on the SANE API (14 functions including "sane_open()", "sane_start()", and "sane_read()"). These functions can be used to build a unique application in C language.
The points to take into consideration when using the SANE API are shown below.
- In contrast to the scanner driver for Windows, no GUI setting screen is provided, and the functions are generally limited. Therefore, the scanner driver based on the SANE API is extremely small in size. For this reason, distribution is easy, and it is ideal as an element for creating a system with limited disk resources such as thin clients.
- The driver based on the SANE API cannot create files. Uncompressed images are sent to an application via memory transfer. For this reason, if you need files in a format such as a PDF format, you need to create the files with an application on the calling side. Generally, the Linux OS includes file format conversion tools, and so after scanning, the application calls these tools to create the target file format.

SANE API Function Interface

The Linux driver supports SANE API functions. By calling the functions from an application, the scanner can be controlled.

For details about functions which are provided by the Linux driver, refer to [Using a SANE API function interface \(page 16\)](#).

For details about SANE API, refer to the site below. SANE API is in a public domain, and it can be used by anyone.
<http://www.sane-project.org/html/>

Image Scanning Applications

The image scanning applications that can be used in Ubuntu are as follows:

Tool Name	Description
scanimage	Image scanning application for command line based operations. Command line options can be used to specify detailed settings for scanning.
xsane	Image scanning application for a GUI environment. Detailed settings can be specified when scanning in a GUI screen.

Tool Name	Description
simple-scan	Image scanning application for a GUI environment. This has a simple structure, and it is easy to use, but as a result, detailed options cannot be specified.

The above-mentioned applications are all Linux freeware.

PFU uses the above-mentioned "scanimage" and "xsane" to evaluate the Linux drivers, but does not guarantee or support the operations for "scanimage" and "xsane". Nor does PFU provide any support for the above-mentioned freeware applications.

This chapter is intended to explain how to use the Linux drivers. Because it is highly likely that the customer is using these applications, these applications are introduced here.

"scanimage" Usage Examples

This explanation assumes that the computer and scanner are connected by a USB cable and power is being supplied to them.

- 1 **Open the terminal software.**
- 2 **Load documents in the ADF paper chute (feeder).**
- 3 **Execute the "scanimage" command. Executing this command performs a scanning operation and creates a specified file.**

```
scanimage --format=tiff --batch=sample-image.tiff
```

Although the command is shown in multiple lines in the following examples, you must enter the command in a single line when actually entering it.

Example:When scanning with the settings: 300 dpi for the resolution, gray for the image type, red for the dropout, and tiff for the output file format

```
scanimage --mode Gray --resolution 300 --batch=ImageFile-%d.tiff --format=tiff --dropoutcolor Red
```

Example:When scanning with the settings: 100 dpi for the resolution, color for the image type, 30 for the contrast, and tiff for the output file format

```
scanimage --mode Color --resolution 100 --batch=ImageFile-%d.tiff --format=tiff --contrast 30
```

Example:When using fi-7160 to scan with the settings: 100 dpi for the resolution, color for the image type, 1.7 for the gamma value, overscan enabled, the imprinter used, and tiff for the output file format

```
scanimage --mode Color --resolution 100 --batch=ImageFile-%d.tiff --format=tiff --gamma 1.7 --cropping Over  
rscan --imprinter=Back-side --string "%05ud" --initial-counter-value 1 --font-type Horizontal-bold
```

Example:When using fi-7160 to scan with as many specified parameters as possible

```
scanimage --mode color --resolution 300 --source Adf-front --page-auto=yes --page-auto-priority Speed --brigh  
ttness 0 --contrast 0 --auto-feed=yes --multifeed-detection Stop --mf-overlapping=yes --mf-length=yes --bgc  
olor Black --cleanup-sharpness None --prepick=yes --blank-page-skip=yes --blank-page-skip-sensitivity 3 > o  
utput-image.pnm
```

In addition to the options supported by the driver, the options for batch processing and other operations by the "scanimage" command itself can also be specified with options. The options are as follows:

Example: Ubuntu18

```

root:/home/pfu# scanimage --help
Usage: scanimage [OPTION]...

Start image acquisition on a scanner device and write image data to
standard output.

Parameters are separated by a blank from single-character options (e.g.
-d epson) and by a "=" from multi-character options (e.g. --device-name=epson).
-d, --device-name=DEVICE use a given scanner device (e.g. hp:/dev/scanner)
--format=pnm|tiff|png|jpeg file format of output file
-i, --icc-profile=PROFILE include this ICC profile into TIFF file
-L, --list-devices show available scanner devices
-f, --formatted-device-list=FORMAT similar to -L, but the FORMAT of the output
    can be specified: %d (device name), %v (vendor),
    %m (model), %t (type), %i (index number), and
    %n (newline)
-b, --batch[=FORMAT] working in batch mode, FORMAT is `out%d.pnm' `out%d.tif'
    `out%d.png' or `out%d.jpg' by default depending on --format
--batch-start=# page number to start naming files with
--batch-count=# how many pages to scan in batch mode
--batch-increment=# increase page number in filename by #
--batch-double increment page number by two, same as
    --batch-increment=2
--batch-print print image filenames to stdout
--batch-prompt ask for pressing a key before scanning a page
--accept-md5-only only accept authorization requests using md5
-p, --progress print progress messages
-n, --dont-scan only set options, don't actually scan
-T, --test test backend thoroughly
-A, --all-options list all available backend options
-h, --help display this help message and exit
-v, --verbose give even more status messages
-B, --buffer-size=# change input buffer size (in kB, default 32)
-V, --version print version information

```

HINT

The "scanimage" command is open source. Any unclear points about an operation can be checked using the source code.

The scanimage for each Linux OS can be obtained from the respective distributor. The latest version can be obtained from the site below.

<http://www.sane-project.org/>

"pfufscgetscerror" Usage Example

An example of the procedure to perform a scan, while checking the scanner error information, is as follows:

1 Perform a scan by using the "scanimage" command.

For details, refer to ["scanimage" Usage Examples \(page 51\)](#).

2 Determine whether the return code indicates an error or not.

If the return code is "0", which indicates successful completion, or "7", which indicates no document, proceed to another operation.

3 If the return code indicates an error, check the scanner error information with the "pfufscgetscerror" command and take appropriate measures for the cause.

Example:When checking the scanner error information according to the return code from the "scanimage" command and take appropriate measures accordingly.

```
while :
do
scanimage --batch-count=1 --batch=Imagefile.pnm
RTN_CODE=$?
if [ $RTN_CODE -eq 0 ]; then
    echo "Scan Success"
else
    if [ $RTN_CODE -eq 7 ]; then
        echo "no document"
    else
        SC_ERROR=`pfufscgetscerror `
        echo "ERROR :"$SC_ERROR
    fi
fi

echo "Next ?"
read a
done
```

"xsane" Usage Example

The procedure for scanning by "xsane" is shown below.

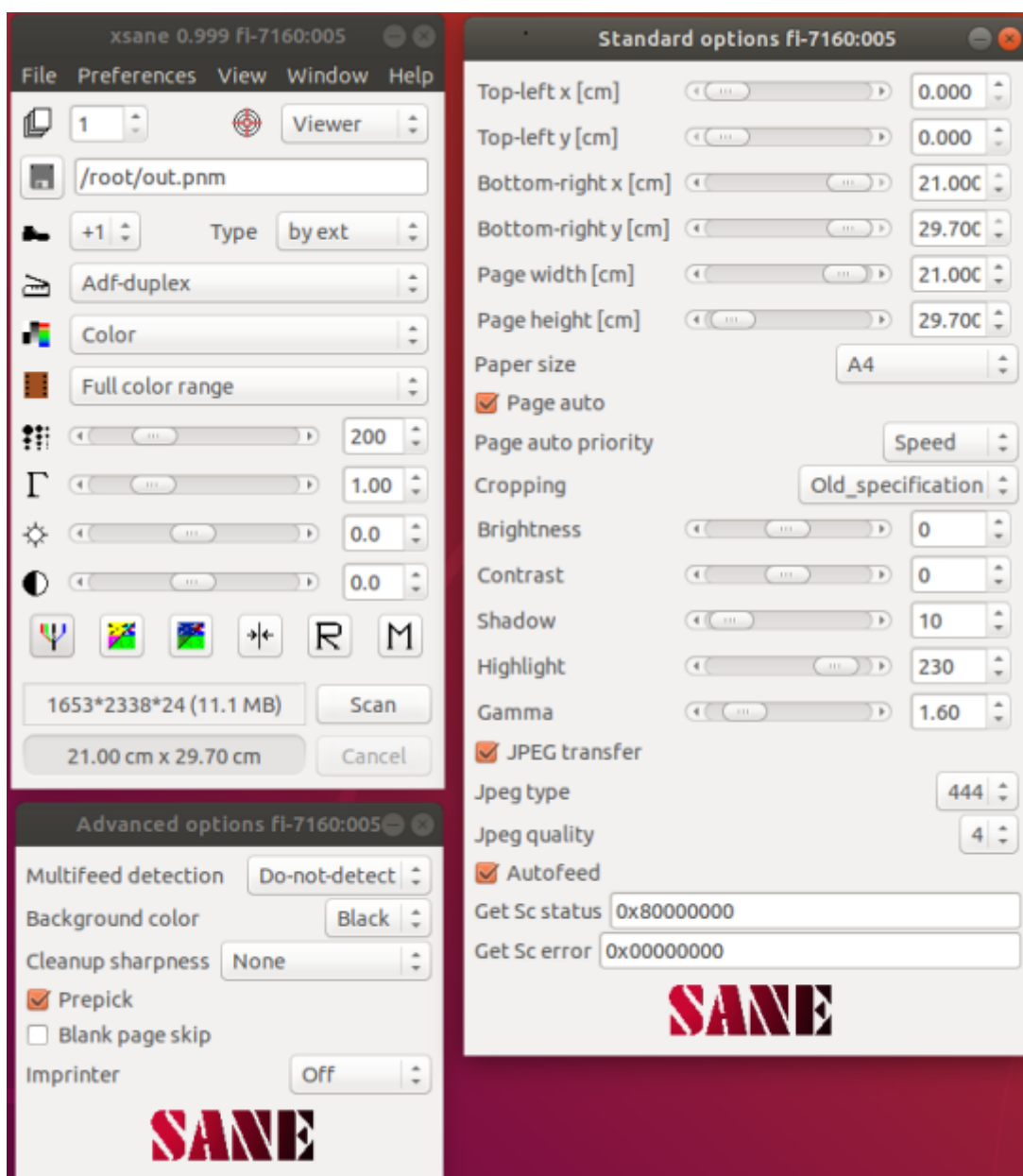
This explanation assumes that the computer and scanner are connected by a USB cable and power is being supplied to them.

1 Open the terminal software.

- 2 Execute the "xsane" command. When this is executed, a tool with a GUI setting screen is started.

```
xsane
```

- 3 In the GUI setting screen, check or change the resolution, scan mode, paper size, and other settings.
- 4 Load documents in the ADF paper chute (feeder).
- 5 Click the [Scan] button on the GUI setting screen to start a scanning process.
- 6 Once the scanning process is complete, an operation is performed based on the output method that was set beforehand.



Because "xsane" is not included in the distributions for Ubuntu 14, Ubuntu 16, and Ubuntu 18, it cannot be used immediately after Ubuntu is installed. To use "xsane", the package must be downloaded from the Ubuntu distributor.

For the details about how to install "xsane", refer to [Operation verification tools \(page 10\)](#).

Image Conversion of an Output Image

SANE API does not have an interface for outputting a file. As a result, the driver does not have a function to output an image as a file. A scanning application or similar program is required to create a file. Typical Linux operating systems include tools for image conversion. Some examples are the "convert" command and "mogrify" command provided in ImageMagick (integration software which can create, edit, merge, and convert images). These commands can be used to convert the TIFF file created by "scanimage" to the target format.

Example:Image conversion of a single TIFF file to a JPEG format

```
convert TIFFfilename.tiff JPEGfilename.jpeg
```

Example:Image conversion of all JPEG files in the current directory to a PNG format

```
for pic in *.jpg
do
convert ${pic} `basename ${pic} .jpg` .png
done
```

Example:Image conversion of all TIFF files in the current directory to a JPEG format

```
mogrify -format jpeg *.tiff
```

HINT

- ImageMagick supports more than 100 types of image file formats including GIF, JPEG, JPEG 2000, PNG, PDF, Photo CD, TIFF, and DPX. For details about the usage, refer to the site below.
<http://www.imagemagick.org/>
- ImageMagick may not be installed for certain Linux OS installation methods. If this happens, perform an additional installation using the method for the respective Linux OS.
For Ubuntu, ImageMagick can be installed from the Ubuntu Software Center.

Values of the Scanner Information to Be Displayed

This chapter describes the values to be displayed for each scanner, regarding the scanner information that is obtained by executing the "scanimage --help" command or the following commands:

- "pfufsgetscstatus" command
This command is used to obtain the scanner status.
- "pfufsgetscerror" command
This command is used to obtain the scanner error information.

fi-7030

The values of the scanner information to be displayed for fi-7030 are shown below.

- **Values of the scanner status to be obtained**

A value in a hexadecimal number consisting of bits is displayed for each event. In practice, a combination of multiple events (multiple numbers consisting of bits) is displayed.

Values other than the values shown below may be displayed.

Value of the Scanner Status to Be Obtained	Meaning
0x80000000	The ADF paper chute does not have any documents (It has a document when the most significant bit is "0").
0x20000000	The ADF cover is open.
0x00000001	A multifeed was detected.

- **Values of the scanner error information to be obtained**

The values of the scanner error information to be displayed are shown below. Values other than the values shown below may be displayed.

If the same value is displayed repeatedly even after the scanner is restarted, contact the distributor/dealer where you purchased this product.

Value of the Scanner Error Information to Be Obtained	Meaning	Error Code in the SANE API	Corrective Action
0x00000000	None	SANE_STATUS_GOOD	Not needed.
0x03800240	The ADF is open.	SANE_STATUS_COVER_OPEN	Close the ADF, and then try scanning again.
0x03800320	The ADF paper chute does not have any documents.	SANE_STATUS_NO_DOCS	Load some documents in the ADF paper chute (feeder).
0x03802078	The cancel button on the scanner was pressed.	SANE_STATUS_CANCELLED	Remove the documents, and then try scanning again.
0x03800131, 0x03800150	A paper jam occurred.	SANE_STATUS_JAMMED	Readjust the documents, and then try scanning again.
0x03800755	A multifeed (Overlap) was detected.		Remove the documents which are stopped in a multifeed state, check the

Value of the Scanner Error Information to Be Obtained	Meaning	Error Code in the SANE API	Corrective Action
0x03800756	A multifeed (Length) was detected.		scanned images, and then load the documents again.

fi-7140/fi-7240/fi-7160/fi-7260/fi-7180/fi-7280

The values of the scanner information to be displayed for fi-7140, fi-7240, fi-7160, fi-7260, fi-7180, or fi-7280 are shown below.

- **Values of the scanner status to be obtained**

A value in a hexadecimal number consisting of bits is displayed for each event. In practice, a combination of multiple events (multiple numbers consisting of bits) is displayed.

Values other than the values shown below may be displayed.

Value of the Scanner Status to Be Obtained	Meaning
0x80000000	The ADF paper chute does not have any documents (It has a document when the most significant bit is "0").
0x40000000	A paper jam occurred. Or, a document remains in the ADF paper chute because a scan stopped for some reason, such as when the cancel button on the scanner is pressed.
0x20000000	The ADF cover is open.
0x10000000	The imprinter cover is open. Or, a document remains in the ADF because an error occurred, stopping the scan.
0x00000001	A multifeed was detected.

- **Values of the scanner error information to be obtained**

The values of the scanner error information to be displayed are shown below. Values other than the values shown below may be displayed.

If the same value is displayed repeatedly even after the scanner is restarted, contact the distributor/dealer where you purchased this product.

Value of the Scanner Error Information to Be Obtained	Meaning	Error Code in the SANE API	Corrective Action
0x00000000	None	SANE_STATUS_GOOD	Not needed.
0x03800240	The ADF is open.	SANE_STATUS_COVER_OPEN	Close the ADF, and then try scanning again.
0x0380024A	The imprinter cover is open. Or, an error was detected in the imprinter.		Close the imprinter cover, and then try scanning again. Or, make sure that the imprinter is installed correctly again.

Value of the Scanner Error Information to Be Obtained	Meaning	Error Code in the SANE API	Corrective Action
0x03800320	The ADF paper chute does not have any documents.	SANE_STATUS_NO_DOCS	Load some documents in the ADF paper chute (feeder).
0x03802078	The cancel button on the scanner was pressed.	SANE_STATUS_CANCELLED	Remove the documents, and then try scanning again.
0x03800131, 0x03800150	A paper jam occurred.	SANE_STATUS_JAMMED	Readjust the documents, and then try scanning again.
0x03800755	A multifeed (Overlap) was detected.		Remove the documents which are stopped in a multifeed state, check the scanned images, and then load the documents again.
0x03800756	A multifeed (Length) was detected.		
0x0380015A	The print cartridge cover is open.		Close the print cartridge cover, and then try scanning again.
0x038010B4	The print cartridge is not installed correctly.	SANE_STATUS_IO_ERROR	Make sure that the print cartridge is installed correctly, and then try scanning again. Or, check the amount of ink remaining for the imprinter.
0x048010B3	The imprinter is not ready.		Make sure that the imprinter is installed correctly.
0x048010B5	The print cartridge is not ready.		Make sure that the print cartridge is installed correctly, and then try scanning again.
0x03800801, 0x03800804	The sensor(s) are dirty.		Open the ADF and clean the sensor(s).
0x04800587	A transport lock error or a flatbed motor error occurred.		Make sure that the transport lock is unlocked. If the problem still persists even after the

Value of the Scanner Error Information to Be Obtained	Meaning	Error Code in the SANE API	Corrective Action
			transport lock is unlocked, contact the distributor/ dealer where you purchased this product.
0x04800510	A transport lock error occurred.		Make sure that the transport lock is unlocked.

fi-7460/fi-7480

The values of the scanner information to be displayed for fi-7460 or fi-7480 are shown below.

- **Values of the scanner status to be obtained**

A value in a hexadecimal number consisting of bits is displayed for each event. In practice, a combination of multiple events (multiple numbers consisting of bits) is displayed.

Values other than the values shown below may be displayed.

Value of the Scanner Status to Be Obtained	Meaning
0x80000000	The ADF paper chute does not have any documents (It has a document when the most significant bit is "0").
0x40000000	A paper jam occurred. Or, a document remains in the ADF paper chute because a scan stopped for some reason, such as when the cancel button on the scanner is pressed.
0x20000000	The ADF cover is open.
0x00000001	A multifeed was detected.

- **Values of the scanner error information to be obtained**

The values of the scanner error information to be displayed are shown below. Values other than the values shown below may be displayed.

If the same value is displayed repeatedly even after the scanner is restarted, contact the distributor/dealer where you purchased this product.

Value of the Scanner Error Information to Be Obtained	Meaning	Error Code in the SANE API	Corrective Action
0x00000000	None	SANE_STATUS_GOOD	Not needed.
0x03800240	The ADF is open.	SANE_STATUS_COVER_OPEN	Close the ADF, and then try scanning again.
0x03800320	The ADF paper chute does not have any documents.	SANE_STATUS_NO_DOCS	Load some documents in the ADF paper chute (feeder).
0x03802078	The cancel button on the scanner was pressed.	SANE_STATUS_CANCELLED	Remove the documents, and then try scanning again.
0x03800131, 0x03800150	A paper jam occurred.	SANE_STATUS_JAMMED	Readjust the documents, and then try scanning again.

Value of the Scanner Error Information to Be Obtained	Meaning	Error Code in the SANE API	Corrective Action
0x03800755	A multifeed (Overlap) was detected.		Remove the documents which are stopped in a multifeed state, check the scanned images, and then load the documents again.
0x03800756	A multifeed (Length) was detected.		
0x03800801, 0x03800804	The sensor(s) are dirty.	SANE_STATUS_IO_ERROR	Open the ADF and clean the sensor(s).
0x0380085F	Switching the feed mode switch was detected.		The feed mode switch may have been switched. Make sure that the feed mode switch is set correctly, reload the documents, and try scanning again.

fi-7700S

The values of the scanner information to be displayed for fi-7700S are shown below.

- **Values of the scanner status to be obtained**

A value in a hexadecimal number consisting of bits is displayed for each event. In practice, a combination of multiple events (multiple numbers consisting of bits) is displayed.

Values other than the values shown below may be displayed.

Value of the Scanner Status to Be Obtained	Meaning
0x80000000	The ADF paper chute does not have any documents (It has a document when the most significant bit is "0").
0x20000000	The ADF cover is open.
0x08000000	The document cover is open.
0x00020000	The feed mode switch is set to "Manual Single Mode".
0x00000001	A multifeed was detected.

- **Values of the scanner error information to be obtained**

The values of the scanner error information to be displayed are shown below. Values other than the values shown below may be displayed.

If the same value is displayed repeatedly even after the scanner is restarted, contact the distributor/dealer where you purchased this product.

Value of the Scanner Error Information to Be Obtained	Meaning	Error Code in the SANE API	Corrective Action
0x00000000	None	SANE_STATUS_GOOD	Not needed.
0x03800240	The ADF is open.	SANE_STATUS_COVER_OPEN	Close the ADF, and then try scanning again.
0x03800320	The ADF paper chute does not have any documents.	SANE_STATUS_NO_DOCS	Load some documents in the ADF paper chute (feeder).
0x03802078	The cancel button on the scanner was pressed.	SANE_STATUS_CANCELLED	Remove the documents, and then try scanning again.
0x03800131, 0x03800136, 0x03800150	A paper jam occurred.	SANE_STATUS_JAMMED	Readjust the documents, and then try scanning again.

Value of the Scanner Error Information to Be Obtained	Meaning	Error Code in the SANE API	Corrective Action
0x03800755	A multifeed (Overlap) was detected.		Remove the documents which are stopped in a multifeed state, check the scanned images, and then load the documents again.
0x03800756	A multifeed (Length) was detected.		
0x03800801, 0x03800804	The sensor(s) are dirty.	SANE_STATUS_IO_ERROR	Open the ADF and clean the sensor(s).
0x04800587	A transport lock error or a flatbed motor error occurred.		Make sure that the transport lock is unlocked. If the problem still persists even after the transport lock is unlocked, contact the distributor/ dealer where you purchased this product.
0x04800510	A transport lock error occurred.		Make sure that the transport lock is unlocked.
0x0380085F	Switching the feed mode switch was detected.		The feed mode switch may have been switched. Make sure that the feed mode switch is set correctly, reload the documents, and try scanning again.