

**Image Processing Software  
Option  
Version 2.5**

**USER'S GUIDE**

Information in this document is subject to change without notice

©PFU LIMITED 2002-2013.

# Contents

1. Introduction.....	1
1.1 The contents of package.....	4
1.2 Required Conditions.....	5
2. Installation .....	7
2.1 Launch Installer.....	7
2.2 Select Installation Language.....	8
2.3 Start Installation.....	8
2.4 License Agreement .....	10
2.5 Input Serial Number and Key code .....	10
2.6 Select the installation path .....	11
2.7 Select Program Folder .....	11
2.8 Complete Installation.....	12
2.9 How to Uninstall .....	13
3. How to use “Image Processing Software Option” .....	14
3.1. With TWAIN Driver .....	14
3.1.1 Select TWAIN Data Source .....	14
3.1.2 Scanning and Image Processing.....	15
3.2. With ISIS Driver.....	21
3.2.1 Select ISIS Data Source .....	21
3.2.2 Scanning and Image Processing.....	21
4. IMAGE PROCESSING .....	26
4.1 Fixed Threshold .....	28
a) Threshold .....	28
4.2 OCR DTC .....	29
a) Pre Filter .....	29
b) Gradation .....	29
c) Threshold Table.....	30
d) Noise Removal .....	30
e) Smoothing.....	30
4.3 Form DTC .....	31
a) Sensitivity.....	31
b) Threshold.....	31
4.4 Dither.....	32
a) Dither Pattern.....	32

b) Outline Detection Threshold .....	32
c) Brightness .....	32
d) Contrast .....	32
4.5 Minimize Average Error .....	33
a) Outline Detection Threshold .....	33
b) Brightness .....	33
c) Contrast .....	33
4.6 Random Dither .....	34
a) Base Dither / Gradation .....	34
b) Outline Detection Threshold .....	34
c) Brightness .....	34
d) Contrast .....	34
5. Filter .....	35
a) Average 3x3 .....	35
b) Average 3x5 .....	35
c) Emphasis 3x3 .....	35
6. Generate B&W and Color Images Simultaneously .....	36
a) Order .....	36
b) Dropout color .....	36
7. Individual front/back Image Mode .....	37
a) Order .....	37
b) Dropout color .....	37
About Support Service .....	38
INDEX .....	39

[APPENDIX - A](#). Image Processing Example (← If this is clicked, the pdf file will open directly.)

Refer to “SIPC2.PDF” in [SIPC] - [Enu] folder of CD-ROM.

# 1. Introduction

Thank you for purchasing the Image Processing Software Option.

“Image Processing Software Option” is a software option for image scanner fi series to perform advanced processing by using with “TWAIN Driver” and “ISIS Driver” scanner driver.

Also, “Image Processing Software Option” provides “Generate B&W and Color Images Simultaneously” function that allows simultaneous generation of both color and black & white images in a single scanning operation, and “Independent Color Mode” that allows generating different color types of image for each side of the document respectively in duplex scanning. (It is available only with TWAIN)

“Image Processing Software Option” provides high speed image processing for document filing operation. Conventionally, such high speed image processing has been provided by hardware like image scanners or scanner adapter boards, for typical documents size in the document filing market is 8.5x11 inches or A4 that is much larger than photographs in data size, and requiring high speed to process tens to hundreds of pages at once.

However, Intel<sup>®</sup> MMX<sup>®</sup> (Multi Media Extension) technology brought high performance to Personal Computers and enabled high speed image processing. “Image Processing Software Option” fully utilized MMX<sup>®</sup> (Multi Media Extension) technology and achieved high speed image processing comparable to that by hardware.

Most of image processing application is designed for image effect for amusement, but document filing requires binarization technology for recognizing hand drawings or characters on color paper. For the documents including photographs and text, photographs should be gradated moderately and text should be cleared. Furthermore, high speed is required for processing batches of documents.

“Image Processing Software Option” provides specialized image processing to meet such requirements as above.

This guide describes the installation method and procedures for appropriate use.

Please read this guide before using this software.

## Trademarks

Microsoft and Windows are registered trademarks of Microsoft Corporation in the United States and/ or other countries.

Intel, MMX and Pentium are registered trademark of US Intel Corporation.

Adobe, the Adobe logo, and Acrobat are either registered trademarks or trademarks of Adobe Systems Incorporated.

ISIS and QuickScan are trademarks or registered trademarks of EMC Corporation in the United States.

Other company names and product names are the registered trademarks or trademarks of the respective companies.

## How Trademarks Are Indicated In This Manual

The following abbreviated terms used in this guide are described.

Windows 2000

Windows<sup>®</sup> 2000 Professional

Windows XP

Windows<sup>®</sup> XP Home Edition

Windows<sup>®</sup> XP Professional

Windows<sup>®</sup> XP Professional x64 Edition

Windows Server 2003

Windows Server<sup>®</sup> 2003, Standard Edition

Windows Server<sup>®</sup> 2003, Standard x64 Edition

Windows Server<sup>®</sup> 2003 R2, Standard Edition

Windows Server<sup>®</sup> 2003 R2, Standard x64 Edition

Windows Server 2008

Windows Server<sup>®</sup> 2008 Standard (32/64-bit)

Windows Server<sup>®</sup> 2008 R2 Standard

Windows Vista

Windows Vista<sup>®</sup> Home Basic (32/64-bit)

Windows Vista<sup>®</sup> Home Premium (32/64-bit)

Windows Vista<sup>®</sup> Business (32/64-bit)

Windows Vista<sup>®</sup> Enterprise (32/64-bit)

Windows Vista<sup>®</sup> Ultimate (32/64-bit)

#### Windows 7

Windows® 7 Home Premium (32/64-bit)

Windows® 7 Professional (32/64-bit)

Windows® 7 Enterprise (32/64-bit)

Windows® 7 Ultimate (32/64-bit)

#### Windows 8

Windows® 8 Home Premium (32/64-bit)

Windows® 8 Pro (32/64-bit)

Windows® 8 Enterprise (32/64-bit)

#### Windows 8.1

Windows® 8.1 Home Premium (32/64-bit)

Windows® 8.1 Pro (32/64-bit)

Windows® 8.1 Enterprise (32/64-bit)

#### Windows Server 2012

Windows® Server 2012 Standard

Windows® Server 2012 R2 Standard

Where there is no distinction between the different versions of the above operating systems, the general term “Windows” is used.

### **Use in High-safety Applications**

This product has been designed and manufactured on the assumption that it will be used in office, personal, domestic, regular industrial, and general-purpose applications. It has not been designed and manufactured for use in applications (simply called "high-safety applications" from here on) that directly involve danger to life and health when a high degree of safety is required, for example, in the control of nuclear reactions at nuclear power facilities, automatic flight control of aircraft, air traffic control, operation control in mass-transport systems, medical equipment for sustaining life, and missile firing control in weapons systems, and when provisionally the safety in question is not ensured. The user should use this product with adopting measures for ensuring safety in such high-safety applications. PFU LIMITED assumes no liability whatsoever for damages arising from use of this product by the user in high-safety applications, and for any claims or compensation for damages by the user or a third party.

## 1.1 The contents of package

The followings are included in this package.

- **“Image Processing Software Option” CD-ROM** 1
- **Image Processing Software Option Quick Installation Guide** 1

The following applications and electronic manuals are included in the Image Processing Software Option CD-ROM.

### <Applications>

- **Image Processing Software Option (Main application)**  
Software option for image processing

### <Electronic manuals>

- **Image Processing Software Option User’s Guide (This guide)**
- **Image Processing Example (Appendix-A)**  
It illustrates an example of image processing by the "Image Processing Software Option".  
It is linked to [Index]-[appendix-A] of "Image Processing Software Option User’s Guide”.

## 1.2 Required Conditions

“Image Processing Software Option” requires following environment.

- A PC equipped with an Intel® Pentium® II (or Celeron®) Processor or later, or compatible one and that supports correct operations of either of the following Operating Systems.

Windows 2000

Windows® 2000 Professional

Windows XP

Windows® XP Home Edition

Windows® XP Professional

Windows® XP Professional x64 Edition

Windows Server 2003

Windows Server® 2003, Standard Edition

Windows Server® 2003, Standard x64 Edition

Windows Server® 2003 R2, Standard Edition

Windows Server® 2003 R2, Standard x64 Edition

Windows Server 2008

Windows Server® 2008 Standard (32/64-bit)

Windows Server® 2008 R2 Standard

Windows Vista

Windows Vista® Home Basic (32/64-bit)

Windows Vista® Home Premium (32/64-bit)

Windows Vista® Business (32/64-bit)

Windows Vista® Enterprise (32/64-bit)

Windows Vista® Ultimate (32/64-bit)

Windows 7

Windows® 7 Home Premium (32/64-bit)

Windows® 7 Professional (32/64-bit)

Windows® 7 Enterprise (32/64-bit)

Windows® 7 Ultimate (32/64-bit)

Windows 8

Windows® 8 Home Premium (32/64-bit)

Windows® 8 Pro (32/64-bit)

Windows® 8 Enterprise (32/64-bit)

Windows 8.1

Windows® 8.1 Home Premium (32/64-bit)

Windows® 8.1 Pro (32/64-bit)

Windows® 8.1 Enterprise (32/64-bit)

Windows Server 2012

Windows® Server 2012 Standard

Windows® Server 2012 R2 Standard

- “Image Processing Software Option” requires either of the following device driver depending on which operating system is being used.

<Driver complies with TWAIN standard>

TWAIN Driver Version 9.16.120 or later

(\*You can check the version of TWAIN Driver installed your PC, when you start TWAIN Driver and click the [About...] button.)

<Driver complies with ISIS standard>

ISIS Driver

- \* Visit the following web site for the newest information of the scanner that “Image Processing Software Option” supports.

<http://www.fujitsu.com/global/services/computing/peripheral/scanners/fi/option/prosoft/>

## 2. Installation

Please follow below procedure to install “Image Processing Software Option”.

### Note.

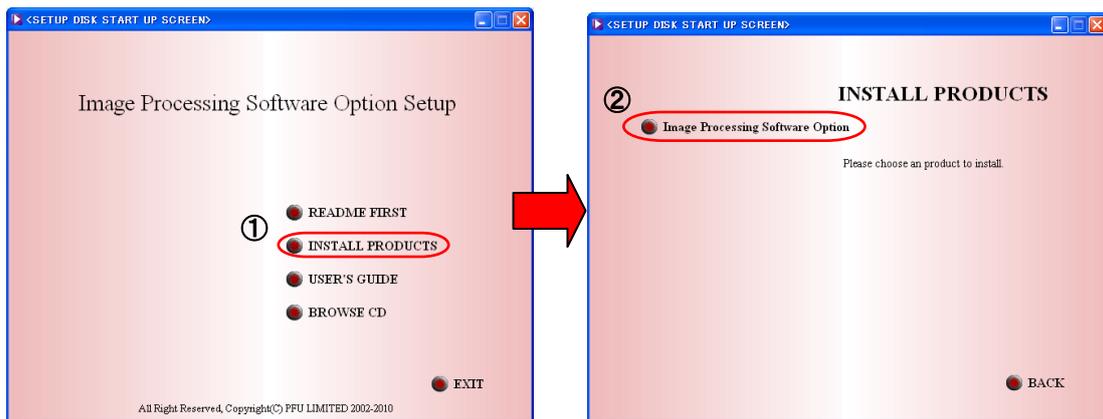
- For using TWAIN Driver, install proper version of **Version 9.16.120 or later**. You can confirm the TWAIN Driver version by clicking on [About...] button Driver UI.
- For using the ISIS Driver, it is necessary to install the ISIS Driver for the scanner models that support “Image Processing Software Option”. Please confirm if the ISIS Driver is installed in your PC.
- Administrator access is required.

### 2.1 Launch Installer

Insert “Image Processing Software Option” CD-ROM into CD-drive.

The following dialog is displayed.

Select [INSTALL PRODUCTS] → [Image Processing Software Option].

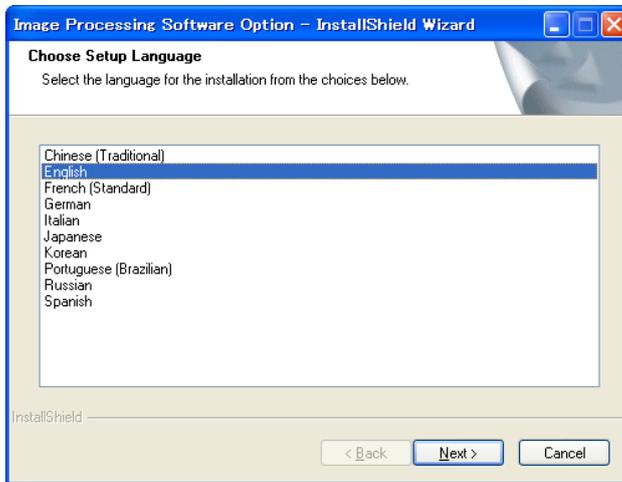


### Note:

This Dialog is not displayed automatically when CD-drive "Auto play" is disabled.  
In this case, please run “**Install.exe**” in the Image Processing Software Option CD-ROM.

## 2.2 Select Installation Language

Select “English” and click [Next >] button.

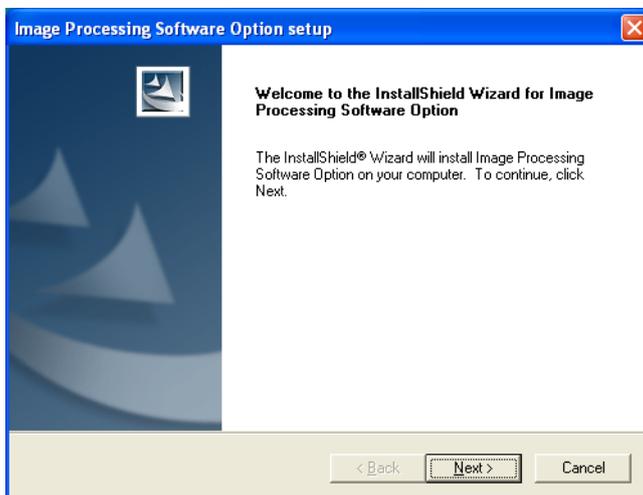


### Note:

When Japanese is selected, the Japanese manual is installed, and when other language is selected, English manual is installed.

## 2.3 Start Installation

When below installation dialog box shown, click [Next >] button.



Following error will come up if TWAIN Driver or ISIS Driver is not installed or if you have the incorrect version installed.

- When neither of TWAIN Driver or ISIS Driver is installed



- When the version of the driver is old



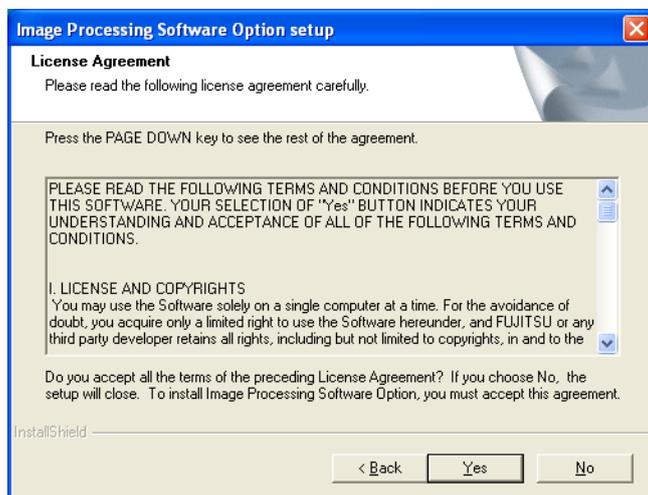
- "Image Processing Software Option" may not work properly if the required PC's hardware is not detected by software. Please refer to section 1.2 for PC/hardware requirement.

In this case, the following dialog appears. Please click [OK] button to cancel the installation.



## 2.4 License Agreement

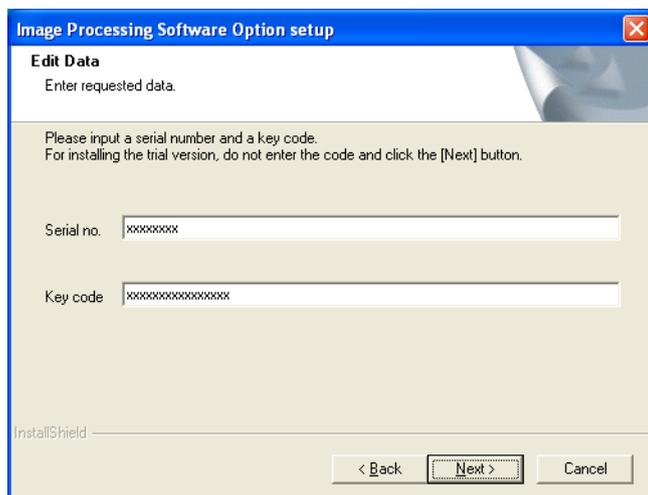
Please read the License Agreement carefully. Click on [Yes] button only if you are agreed to the terms and condition of the license agreement.



## 2.5 Input Serial Number and Key code

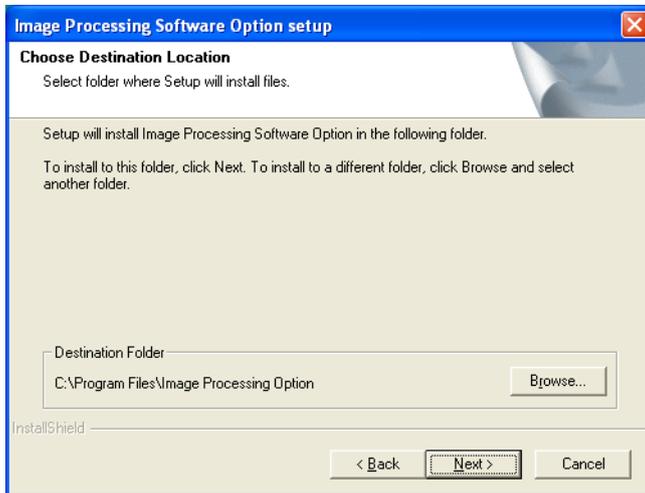
Input the serial number and key code that are written on the CD case, and click [Next >] button.

(\* If clicking [Next >] button without inputting anything, the trial version is installed.)



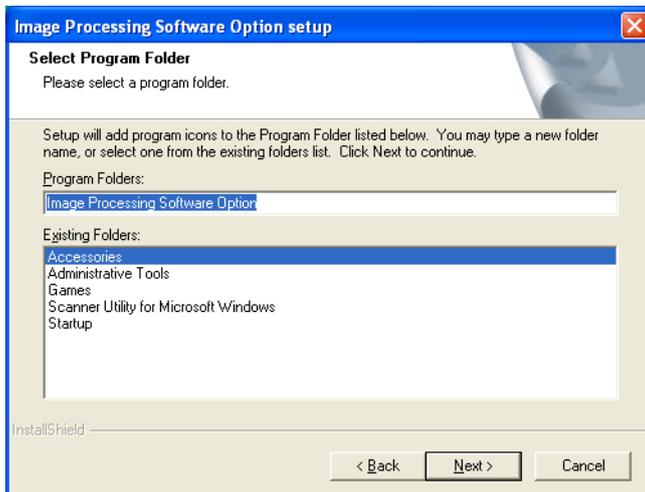
## 2.6 Select the installation path

To change the installation path, select [Browse...] button and specify the destination folder.  
Select [Next >] button to continue installation.



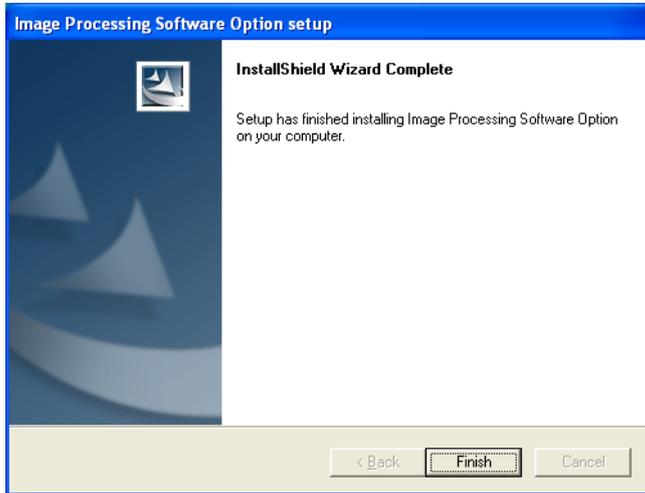
## 2.7 Select Program Folder

Select [Next >] button to continue installation.  
To customize the description of software's folder type in the name in [Program Folders:] window.



## 2.8 Complete Installation

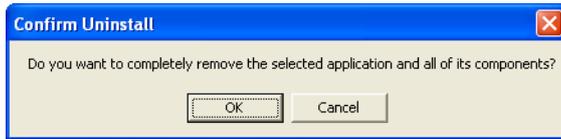
When all the files and folders are stored into local hard disk, click [Finish] button to finish the installation.



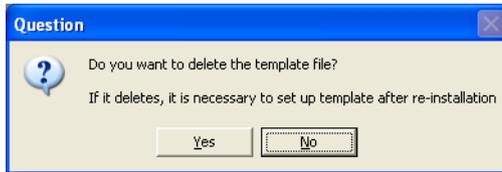
## 2.9 How to Uninstall

Please follow below step by step instruction to remove "Image Processing Software Option":

1. Launch [Add/Remove Programs] by select [Control]-[Add/Remove Programs] form the [Start] menu
2. Find and select "Image Processing Software Option" from the list, then click on [Change/Remove] button.
3. Click the [OK] button when below window shown.



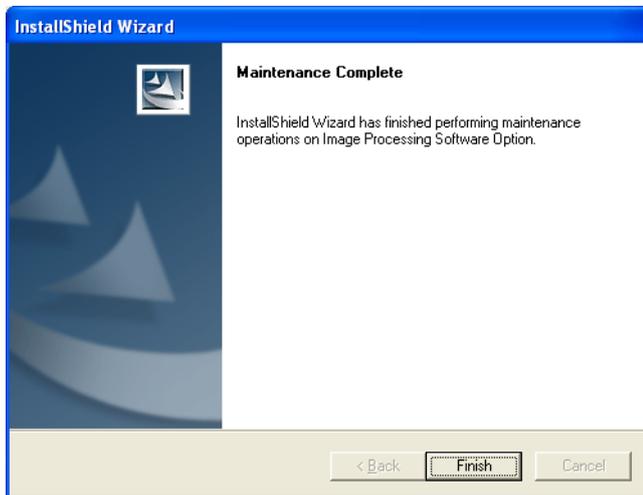
4. Click on [Yes] button if you would like to delete the template file, otherwise click on [No] button.



**Note:**

By selecting [Yes] all data will be lost and the template has to be recreated for future use.

5. Click [Finish] button to complete the software removal task.



### 3. How to use “Image Processing Software Option”

“Image Processing Software Option” provides processing function with the scanner driver (TWAIN Driver or ISIS Driver). Specify a TWAIN Data Source from TWAIN supported applications, or an ISIS Data Source from ISIS supported applications, to enable advanced processing for the data of scanned documents.

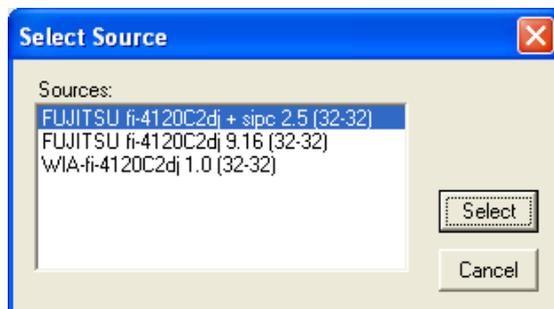
#### 3.1. With TWAIN Driver

##### 3.1.1 Select TWAIN Data Source

Selecting the proper source from imaging application is required to activate “Image Processing Software Option”. Follow below procedure to select the source when using ScandAll21 application:

Open “Select Source” Dialog Box. This Dialog Box is displayed by selecting Menu Item [Select].

When “Image Processing Software Option” has been installed correctly, the “Image Processing Software Option” will be listed in [Select Source] menu. As shown in below figure there is two selections to choose from. Standard “Twain Data Source” is listed on the top and “Image Processing Software Option” is shown as “Twain Data Source + SIPC”. To activate “Image Processing Software Option” select “Twain Data Source + SIPC.”



### 3.1.2 Scanning and Image Processing

Below figure is explaining the button functionality of “Image Processing Software Option” scanning dial box. Select [Acquire/Scan...] to view this figure

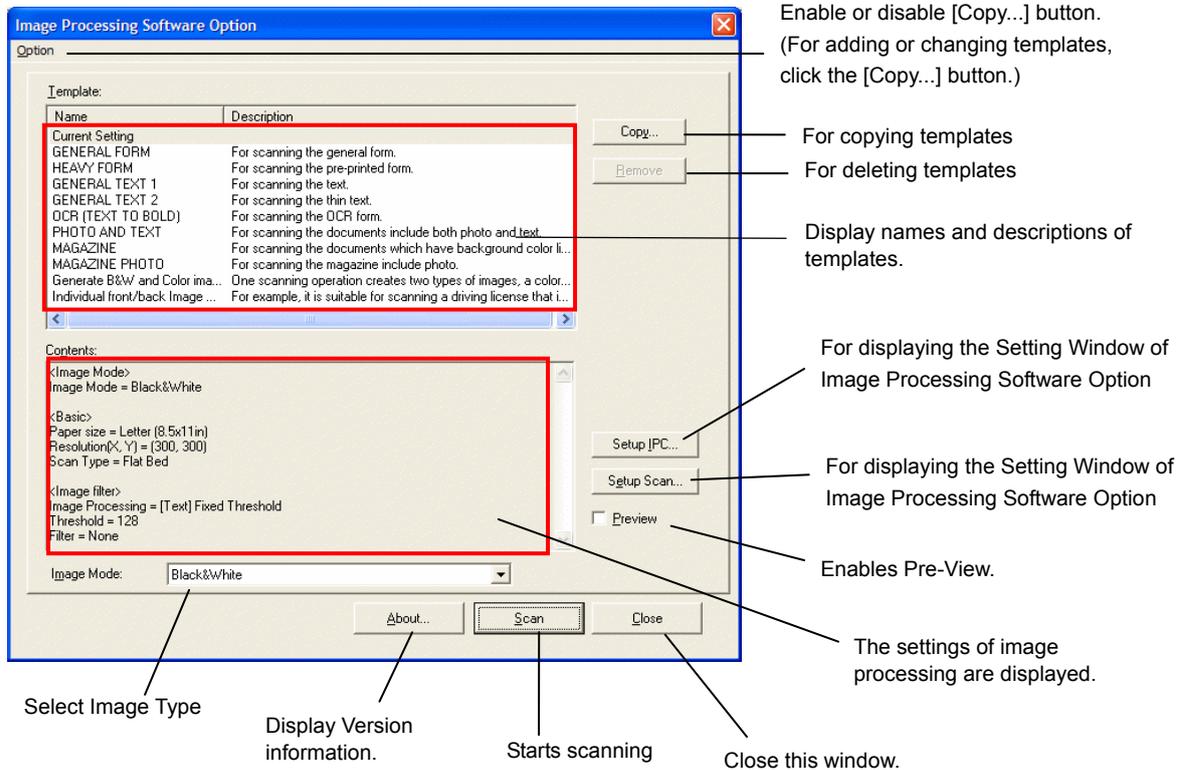


Figure: Main Dialog

#### <General Scanning Procedure>

1. Copy a template by clicking the [Copy...] button.  
⇒ A new template is created based on the template selected from the list.
  2. Click the [Setup IPC...] button or the [Setup Scan...] button to configure settings.  
⇒ The changed template is saved as a new one.
  3. Select a template suitable for scanning from the Template list.
  4. Start scanning with [Scan] button.
- \*) Once you registered a template, you can start scanning easily by repeating step (3) and (4) in above instruction.

## - Option

Enables or disables editing templates.

**Basic:** Disables editing templates.  
Used for protecting created templates from miss-operations such as deleting or changing.

**Advance:** Enables editing templates.  
Select this option when adding, deleting or changing templates.

## - Template:

Shows a list of currently registered templates. The templates include scanning settings and image processing settings. Maximum of 99 template/presets can be registered.

“Image Processing Software Option” includes below ten sample template/presets to choose from:

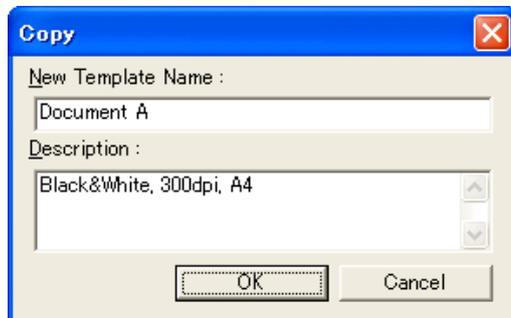
GENERAL FORM	: For scanning the general form
HEAVY FORM	: For scanning the pre-printed form
GENERAL TEXT 1	: For scanning the text
GENERAL TEXT 2	: For scanning the thin text
OCR (TEXT TO BOLD)	: For scanning the OCR form
PHOTO AND TEXT	: For scanning the documents include both photo and text
MAGAZINE	: For scanning the documents which have background color like a magazine
MAGAZINE PHOTO	: For scanning the magazines include photo
GENERATE B&W AND COLOR IMAGE SIMULTANEOUSLY	: One scanning operation creates two types of images, a color image for saving and a black&white image for OCR capturing.
INDIVIDUAL FRONT/BACK IMAGE MODE	: For example, it is suitable for scanning a driving license that includes a color picture on the front side and text information only on the back side.

If you need to create a new template, click [Copy...] button.

### - [Copy...] button

Makes a copy of the selected template and register it as a new one.

On the window below, enter [New Template Name:], [Description:] then click the [OK] button.



[New Template Name:]

Input a template name. (Mandatory)

The inputted name is displayed on the Template list of the main dialog as [Name].

(Up to 100 characters can be entered.)

[Description:]

Input description of the template.

It is displayed on the Template list of the main dialog as [Description].

(Up to 500 characters can be entered.)

### - [Remove] button

Deletes the selected template.

### - [Image Mode] list box

Selects the image mode to be generated.

#### - **Black & White:**

Generates black & white image data that is suitable for OCR.

#### - **24 bit Color:**

Performs scanning with 24bit (16777216) colors. It is suitable for scanning color photographs.

With the image processing software option, the generated image is output without image-processing.

Also [Image Processing...] button and [Preview] function are disabled.

#### - **Generate B&W and Color Image Simultaneously:**

Generates both of color image data and black & white image data simultaneously per scanning.

#### - **Individual front/back Image Mode:**

Processes one side of document into color image data and the other side into black & white image data individually.

**- [Setup IPC...] button**

Displays the [Image Processing] dialog. Set up “Image processing”, “Generate B&W and Color images simultaneously”, or “Individual front/back Image Mode” in the each tab shown.

(For details on the settings of Image Processing, refer to “4. Image Processing”, “5. Filter”, “6. Generate B&W and Color images simultaneously” and “7. Individual front/back Image Mode”)

**- [Setup Scan...] button**

Displays the [TWAIN Driver] dialog. Configure settings of scanning on the dialog.

(“24 bit color” and “Grayscale” are available as [Image Mode] because Image Processing Software Option performs binarization processing for grayscale images.)

**- [About...] button**

By clicking [About...], the version information window is displayed.



(\*This figure shows an example. The actual version may be different.)

**- [Close] button**

Click on [Close] button to close the Main Dialog.

**- [Scan] button**

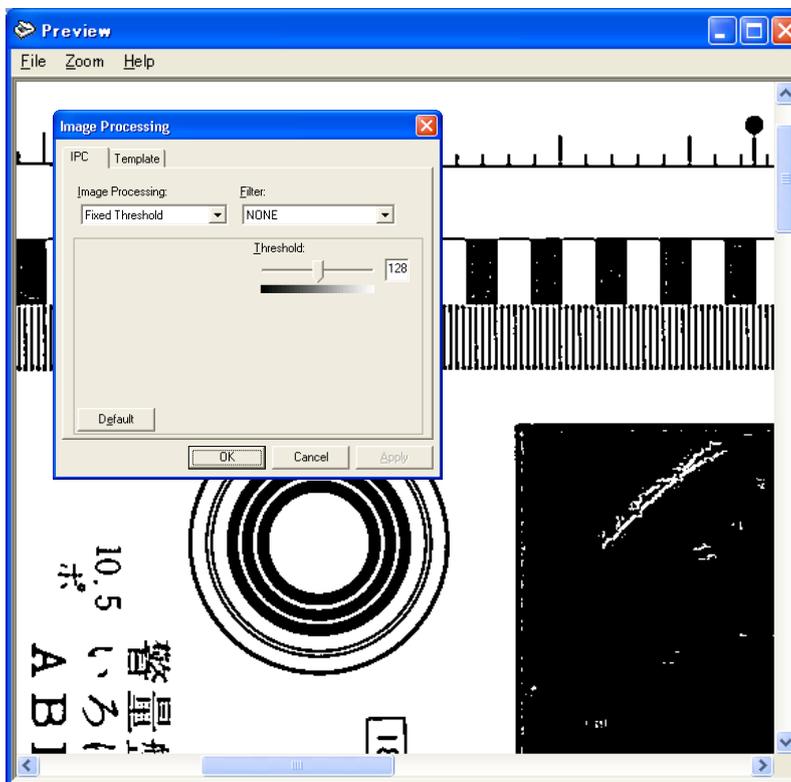
Starts scanning, image processing, and image data transfer to TWAIN application based on the settings of the selected template.

## - Preview

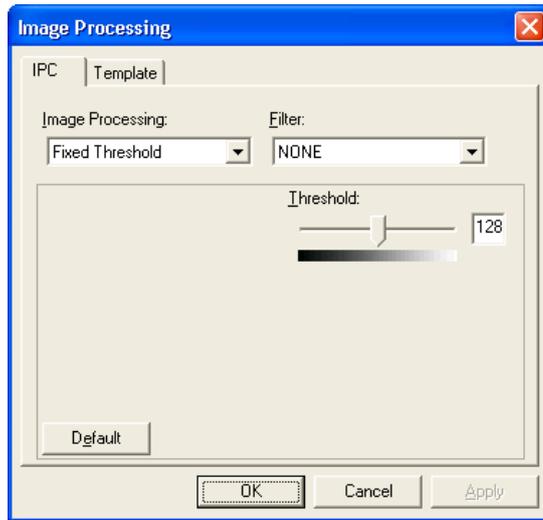
Processed image can be viewed by selecting [Preview] check box. Processed image is previewed before transferring image to application.

When this function is enabled, it is possible to retry of image processing. Upon every [Image Processing] window update, image processing is applied to the images.

When using the ADF (Automatic Document Feeder) for batch scanning, the first document (front side) is displayed on the [Preview] window, and scanning will be temporarily interrupted. (At this time, two or more documents may be scanned depending on the scanner. Although the images except for the first document are not displayed, all the scanned image data is kept until it is transferred to applications.)



Scanned image using [Preview] can be resized by using [Zoom] from the menu bar.



#### - [IPC] tab

Used for configuration settings of image processing. Upon every change, the changed image processing is applied to the previewed image.

(For details, refer to “4. Image Processing”, “5 Filter”.)

When the result of image processing is satisfactory, click [OK] button. The image data is transferred to applications.

When using the ADF (Automatic Document Feeder) for continuous scanning, the interrupted scan will be resumed upon clicking this button. (In this case, the same image processing setting is applied to all the other scans.)

Click the [Cancel] button, when you would like to abort scanning.

#### - [Template] tab

The changed settings are applied to the template when “Update Template” check box is marked.

(\*This tab is not displayed when “Basic” is selected from the [Option] menu on the main dialog.)

#### **Note:**

The scanned image data is not transferred to applications by the preview function of “TWAIN Driver”. However, the image data displayed in the [Preview] window can be transferred to applications by clicking the [OK] button in “Image Processing Software Option”.

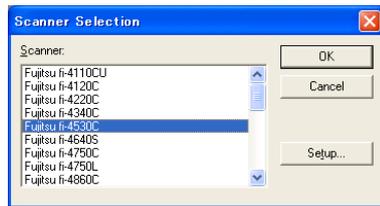
## 3.2. With ISIS Driver

### 3.2.1 Select ISIS Data Source

For using “Image Processing Software Option” with ISIS Driver, select the scanner for first.

When using ScandAll PRO, select [Scan] - [Select Scanner...] on the menu bar. Then select the connected scanner and click the [OK] button.

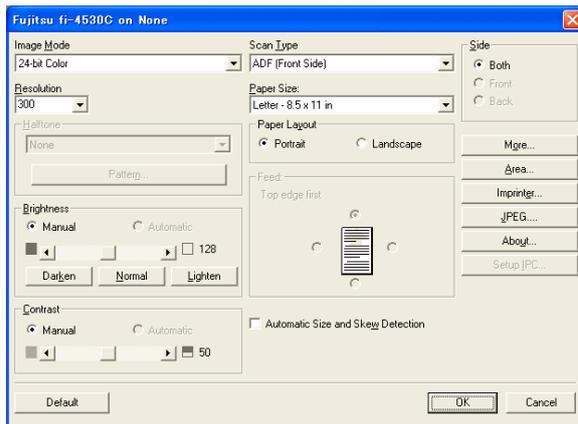
When using QuickScan™, select [Scan] - [Select Scanner...] on the menu bar. Then select the connected scanner and click the [OK] button.



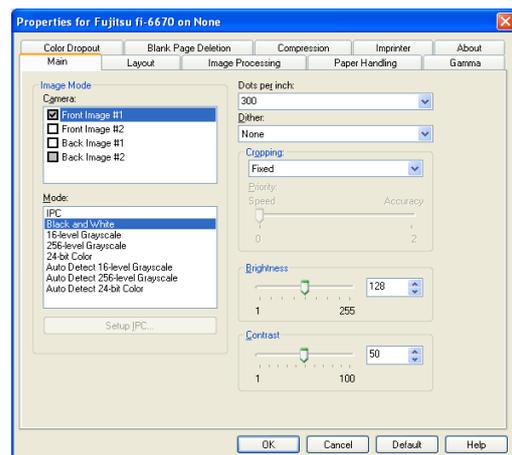
### 3.2.2 Scanning and Image Processing

Image Processing Software Option is embedded as a function of the ISIS Driver. So it is possible to configure the settings of Image Processing Software Option on the Setting Window of ISIS Driver like as the other settings of the ISIS Driver.

\* ISIS Driver does not support Generate B&W and Color images simultaneously or Individual front/back Image Mode.



Setting Window of ISIS Driver  
(V1-series Main window)



Setting Window of ISIS Driver  
(V2-series Main window)

Configure the settings following the procedure below.

1. Open the Setting Window from your application.

The method for this operation varies depending on your application. For details, refer to the Help file or Operator's manual of the application.

To open the setting window with ScandAll PRO;

① Select [Scan] - [Settings...] or

② Select [Scan] - [Batch Scan Settings...], and click [Add] or [Edit] button, then finally click [Detail Scanner Settings...] under the [Scan] tab.

To open the setting window with QuickScan™;

① Select [Scan] - [Preview Settings...] or

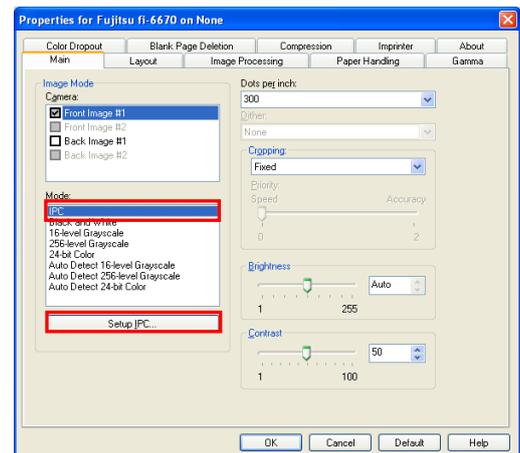
② Select [Scan] - [New Batch...], and click [Add Profile...] or [Edit Profile...] button, then finally click [Scanner Settings] under the [Scan] tab.

2. Select [Image Processing] or [IPC] from [Image Mode].

⇒[Setup IPC...] button is enabled.



Setting Window of ISIS Driver (V1-series Main window)



Setting Window of ISIS Driver (V2-series Main window)

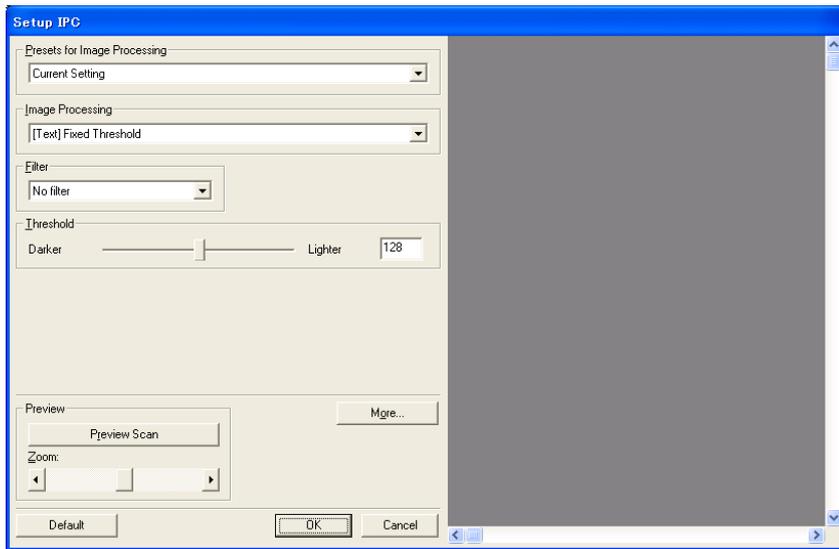
\* Change the settings besides the Image Mode, as needed.

3. Click [Setup IPC...] button.

⇒[IPC Setup] window is activated.

4. Configure the settings of Image Processing on the window below. Then click the [OK] button.

⇒The main dialog appears again.



5. When all the necessary configurations are finished, click the [OK] button to close the “Setting Window for ISIS Driver”.

6. Start scanning with the application.

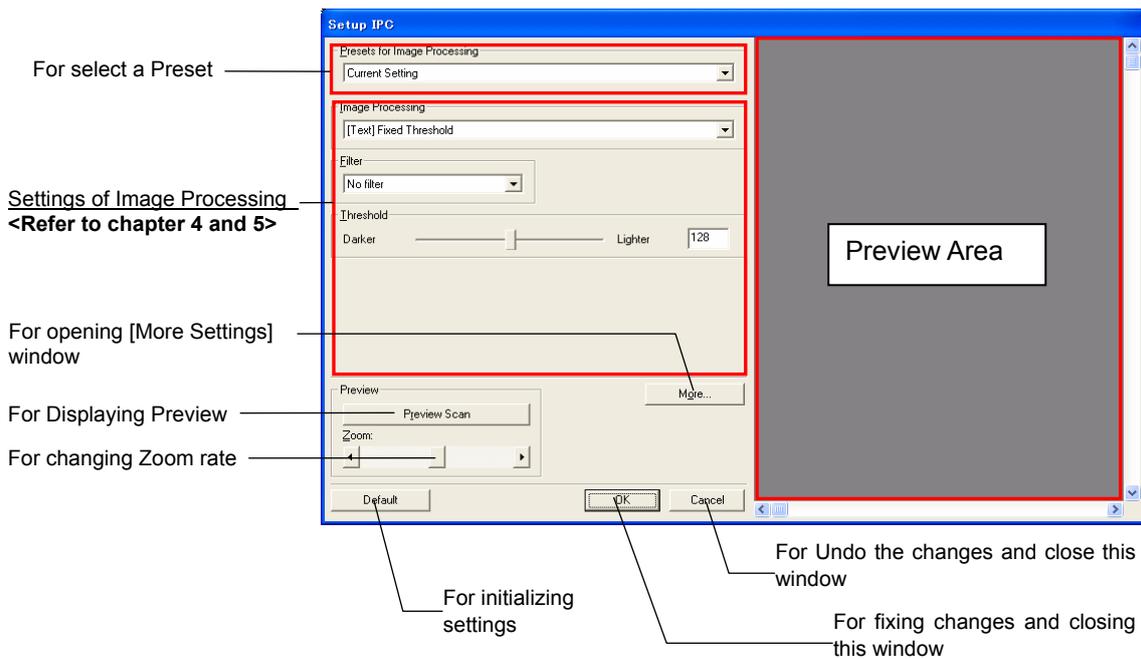
The method for this operation varies depending on your application. For details, refer to the Help file or Operator’s manual of the application.

To start scanning with ScandAll PRO,

- ① Select [Scan] - [Settings...] or
- ② Select [Scan] - [Batch Scan], and click the profile you want to execute.

To start scanning with QuickScan™,

- ① Select [Scan] - [Preview Scan] or
- ② Select [Scan] - [New Batch...], and click the [Scan] button.



Setup IPC Window (Setting window of Image Processing)

- **Presets for Image Processing**

Select one from the list of presets for applying to Image Processing.

Provided patterns of presets are:

General FORM	: For scanning the general form
HEAVY FORM	: For scanning the pre-printed form
GENERAL Text 1	: For scanning the text
GENERAL Text 2	: For scanning the thin text
OCR (Text to Bold)	: For scanning the OCR form
Photo and Text	: For scanning the documents include both photo and text
Magazine	: For scanning the documents which have background color like a magazine
Magazine Photo	: For scanning the magazines include photo

The selected preset is applied to the settings of Image Processing.

- **Image Processing**

Select the type of binarization processing.

Setting item below changes according to the selected Image Processing.

(Refer to “4. Image Processing” for details.)

- **Filter**

Select the type of filter.

The selected filter is applied to the image before the image processing.

(Refer to “5. Filter” for details.)

- **[More] button**

Displays the [More Settings] window of the “ISIS Driver”.

- **[Default] button**

Resets all the setting items to the initial (default) value.

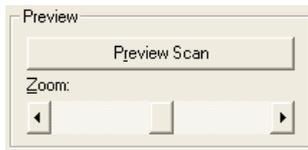
- **[OK] button**

Fixes the changed settings and closes the [Setup IPC] window.

- **[Cancel] button**

Cancels the changes and closes the [Setup IPC] window.

- **Preview**



- [Preview Scan] button  
Scans a document with the current settings and displays the processing result on the Preview Area.
- Zoom  
Changes the zoom rate of Preview Area by using the slider control.

**Note:**

The scanned image data is not transferred to applications by the preview function of the "ISIS Driver". Scan the documents with your application again.

## 4. IMAGE PROCESSING

**Main MENU**  
Select an Image Processing type for binarization.

**Filter**  
Select a Filter before Image Processing.  
<Refer to Section 5 for details>

**Setting Item**  
Displays setting items related to the Image Processing selected in the Main MENU.  
<Refer to Section 4.1-4.6 for details>

Returns the settings to the default value.

Enables the new setting, and closes this dialog.

Returns the settings to the previous value, and closes this dialog.

### Example of TWAIN Driver

**Main MENU**  
Select an Image Processing for binarization.

**Filter**  
Select a Filter for Image Processing.

**Setting Item:**  
Displays setting items related to the Image Processing selected in the Main MENU.  
<Refer to Section 4.1-4.6>

### Example of ISIS Driver

Available Image Processing are:

**<For Text>**

- 4.1 Fixed Threshold : [Text] Fixed Threshold
- 4.2 OCR DTC : [Text] Dynamic Threshold for OCR
- 4.3 Form DTC : [Text] Dynamic Threshold for FORM

**<For Photo>**

- 4.4 Dither : [Photo] Halftone by Dither
- 4.5 Minimize Average Error : [Photo] Halftone by Minimize Average Error
- 4.6 Random Dither : [Photo] Halftone by Random Dither

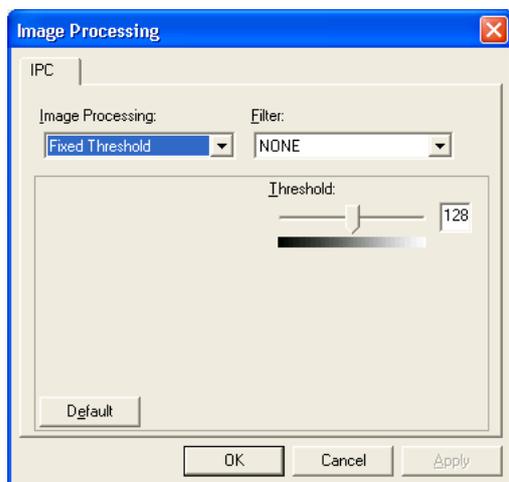
## 4.1 Fixed Threshold

→Image Processing Example

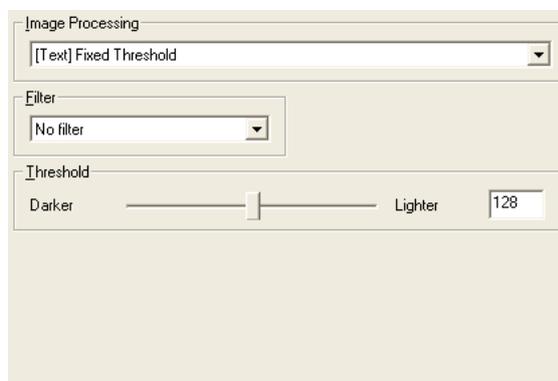
Fixed Threshold is one of the methods for binarization called “Simplified Threshold” or “Fixed Threshold” and it is used for binarization of images with a specified threshold value.

Changing the threshold makes the entire scanned image lighter or darker. For example, if you set the value by the slider control to its maximum (to the right end) black colors of the document will be captured as white.

You can also use emphasizing or smoothing effects by combining this function with filters.



TWAIN



ISIS

### a) Threshold

This value is used as the threshold for binarization.

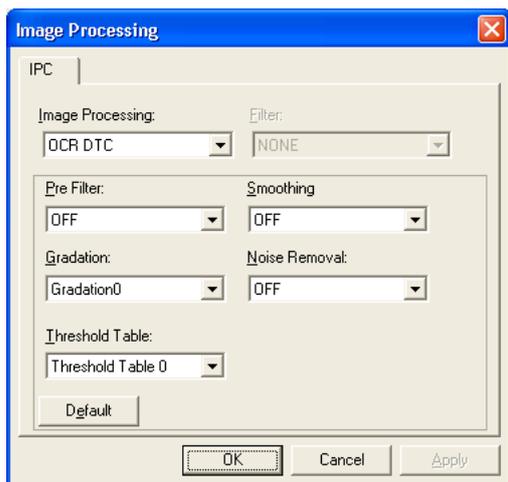
Decreasing the value makes images darker and increasing the value gives lighter. Images.

Specify the threshold value within the range from 1(Dark) to 255(Bright).

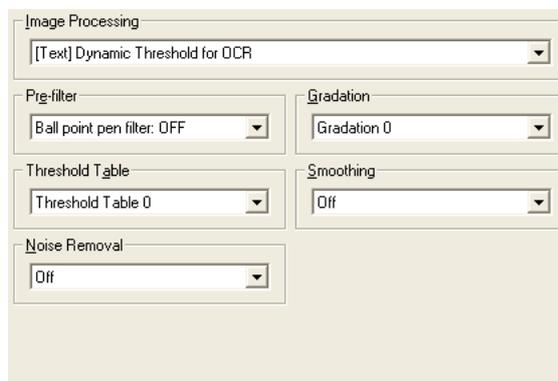
## 4.2 OCR DTC

→Image Processing Example

OCR DTC is emulation of DTC (Dynamic Threshold Circuit) which has been used in Japanese OCR (Optical Character Recognition) System. OCR DTC reduces background noises to improve the accuracy of character recognition.



TWAIN



ISIS

### a) Pre Filter

Used for enabling or disabling the Ball point pen filter.

Lines written with ballpoint pens actually have two lines per stroke. This is not significant to human eyes, but OCR may recognize such a line as two separate lines and this may lead to deterioration of the character recognition rate. The Ball point pen filter averages these two lines into one solid line.

### b) Gradation

This function uses Gradation patters (below) for correcting grayscale or scanned images before binarizing.

- Gradation 0 : NORMAL USE
- Gradation 1 : DARKEN
- Gradation 2 : LIGHTEN
- Gradation 3 : LINEAR

### **c) Threshold Table**

This table is used for computing a threshold for binarizing based on.

Threshold Table 0 : [DARKEST OCR]

Threshold Table 1 : [DARKER OCR]

Threshold Table 2 : [DARK OCR]

Threshold Table 3 : [LIGHT OCR]

Threshold Table 4 : [LIGHTER OCR]

Threshold Table 5 : [LIGHTEST OCR]

Threshold Table 6 : [DARK IMAGE]

Threshold Table 7 : [LIGHT IMAGE]

### **d) Noise Removal**

This function removes isolated dots due to binarization processing.

Available sizes of isolate dots are: 2x2, 3x3, 4x4, 5x5, or OFF.

### **e) Smoothing**

This function corrects convex and concave of contour.

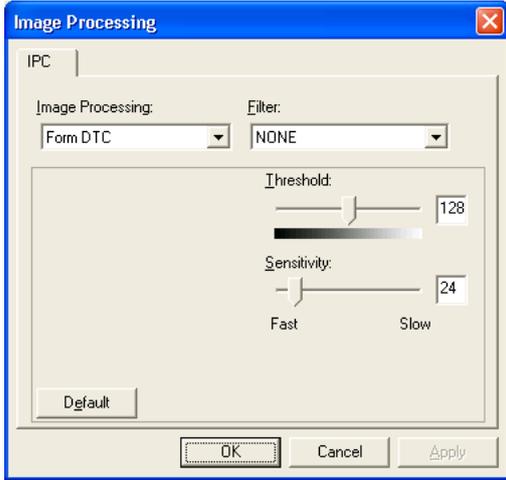
Available smoothing tables are: OCR, Image, or OFF.

### 4.3 Form DTC

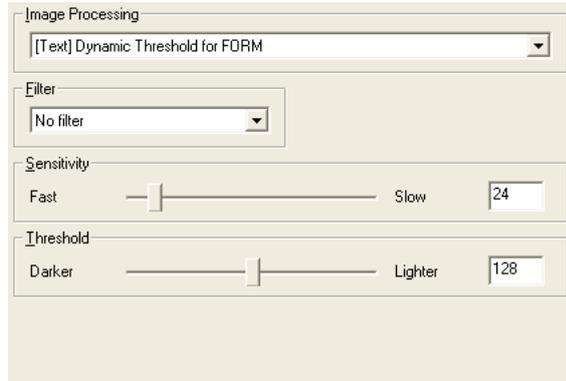
→Image Processing Example

Form DTC separates texts from dirty or colored background. Text legibility is important for the Document Filing application. Form DTC algorithm calculates the threshold level between local area max-min values for maximizing the contrast.

It is also possible to use filters (Average3x3, or Average3x5) with Form DTC to reduce noises.



TWAIN



ISIS

#### a) Sensitivity

This parameter specifies the difference range between maximum and minimum local area values. If the difference is lower than the Sensitivity value, the local area is regarded as a plain area and the images are binarized with the fixed threshold.

The fixed threshold is applied to binarization more frequently when the Sensitivity is low, meanwhile higher Sensitivity increases the possibility of applying the DTC to the image binarization.

Specify the sensitivity with in the range of 0(Fast) to 255(Slow).

#### b) Threshold

This parameter specifies the fixed threshold that is applied by the Sensitivity parameter.

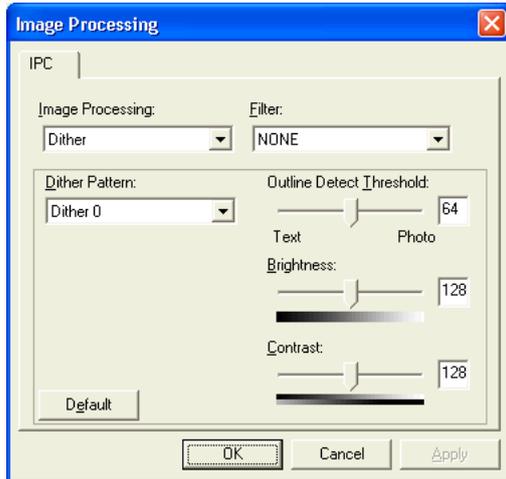
Lower value makes images darker, and higher value makes the images lighter.

Specify the threshold within the range of 1(Dark) to 255(Bright).

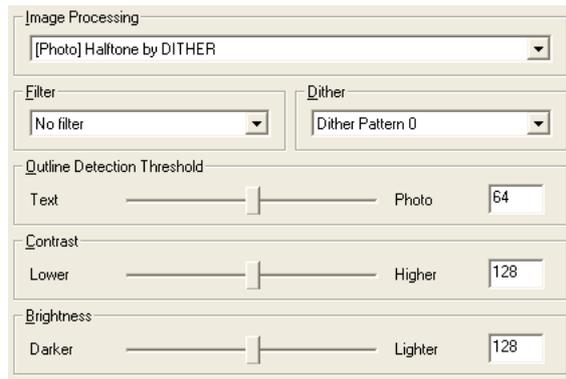
## 4.4 Dither

→Image Processing Example

Dither is basic pseudo-half-tone technique. Pseudo-Halftone is a method to express continuous tone gradation in black and white dots. Dither method binarizes images by using various level thresholds arranged in matrix.



TWAIN



ISIS

### a) Dither Pattern

This menu is used for selecting a pattern for dithering.

- Dither 0 : PHOTO pattern
- Dither 1 : PHOTO/TEXT pattern
- Dither 2 : PHOTO pattern for Laser Printer
- Dither 3 : PHOTO/TEXT pattern for Laser Printer

### b) Outline Detection Threshold

This parameter specifies the threshold of contour region.

Lower value makes the outline sensitive, higher value makes the outline insensitive.

Specify the threshold within the range from 0(for Text) to 127(for Photo).

### c) Brightness

This parameter controls brightness. Lower is value makes the images darker, higher value makes the images lighter.

Specify the brightness within the range from 1(Dark) to 255(Bright).

### d) Contrast

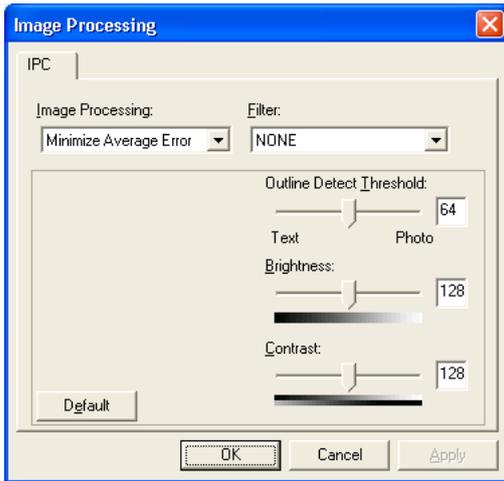
This value controls contrast. Lower value makes the contrast soft, higher value makes the contrast sharp. Specify the contrast within the range from 1(Low) to 255(High).

## 4.5 Minimize Average Error

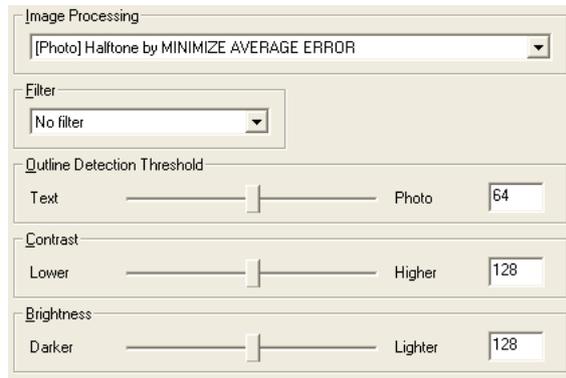
→Image Processing Example

Minimize Average Error is pseudo-half-tone technique, that binarizes images with corrected threshold by binarizing the error. It improves tone reproduction.

By adjusting contrast higher, tone continuity is lost but texts become clear.



TWAIN



ISIS

### a) Outline Detection Threshold

This parameter specifies the threshold of contour region.

Lower value makes the outline sensitive, higher value makes the outline insensitive.

Specify the threshold within the range from 0(for Text) to 127(for Photo).

### b) Brightness

This parameter controls brightness. Lower value makes the images darker, higher value makes the images lighter.

Specify the brightness within the range from 1(Dark) to 255(Bright).

### c) Contrast

This parameter controls contrast. Lower value makes the contrast soft, higher value makes the contrast sharp.

Specify the contrast within the range from 1(Low) to 255(High).

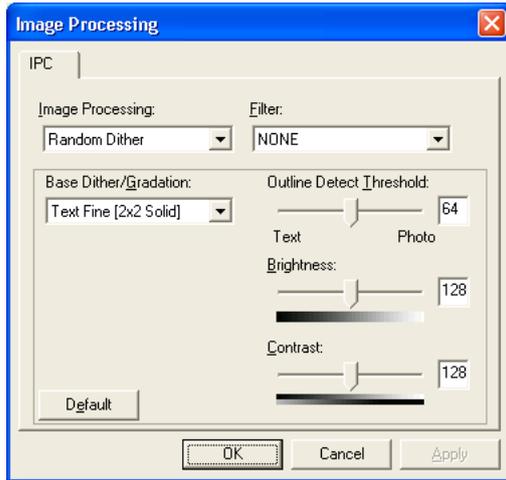
## 4.6 Random Dither

→Image Processing Example

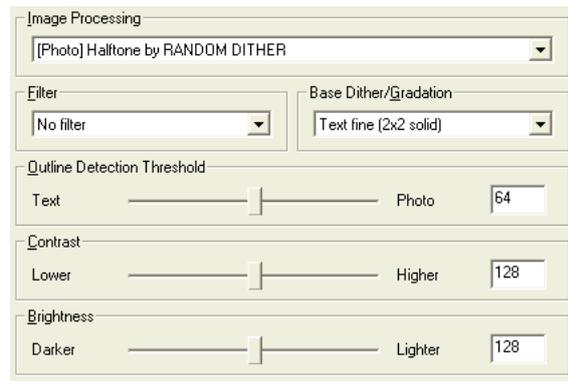
This dither pattern binarizes images by changing dither matrix by random number.

Dither matrix can be minimized to 2x2 as threshold level is changed each pixel, it does not distort text.

This dither pattern is suitable for text document including photograph such as magazines.



TWAIN



ISIS

### a) Base Dither / Gradation

This option specifies base dither pattern which random numbers are added.

- Text Fine : 2x2 dither matrix with dark tone
- Photo Fine : 8x8 dither matrix with light tone

### b) Outline Detection Threshold

This parameter specifies the threshold of contour region.

Lower value makes the outline sensitive, higher value makes the outline insensitive.

Specify the threshold within the range from 0(for Text) to 127(for Photo).

### c) Brightness

This parameter controls brightness. Lower value makes the images darker, higher value makes the images lighter.

Specify the brightness within the range from 1(Dark) to 255(Bright).

### d) Contrast

This parameter controls contrast. Lower value makes the contrast soft, higher value makes the contrast sharp.

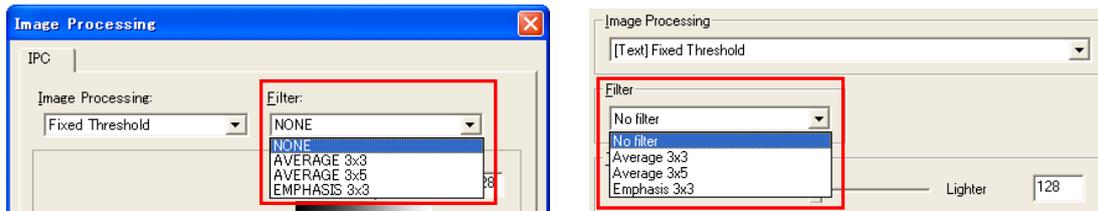
Specify the contrast within the range from 1(Low) to 255(High).

## 5. Filter

→Image Processing Example

This option is used for selecting pre-filtering before image processing.

OCR DTC cannot use Filter, Ball Point Pen Filter is available.



### a) Average 3x3

Average 3x3 replaces center pixel by weighted averaging of surrounding 3x3 pixels.

The average effect reduces noise.

### b) Average 3x5

Average 3x5 replaces center pixel by weighted averaging of surrounding 3x5 pixels.

The average effect reduces noise. "3x5" is more effect than "3x3".

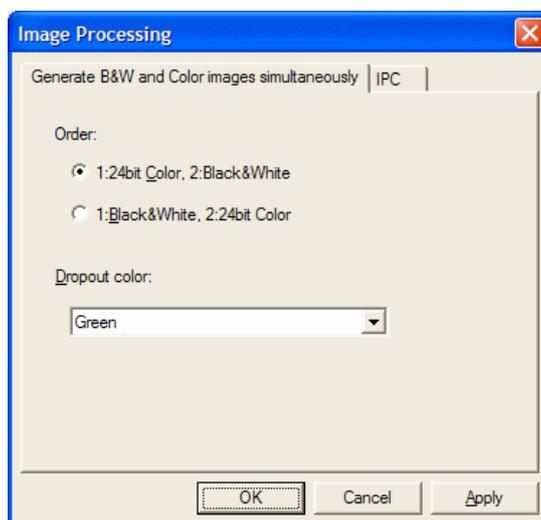
### c) Emphasis 3x3

Emphasis 3x3 adds 3x3 Laplacian (differential) to center pixel.

The effect emphasizes edge sharpenings.

## 6. Generate B&W and Color Images Simultaneously

Generate B&W and Color Images Simultaneously is a function that generates both color and black & white images simultaneously in one scanning operation. (It is available only with TWAIN)



Generate B&W and Color Images Simultaneously allows you to make full use of the scanned information by utilizing the color image for saving and the black and white image for OCR processing. Also it improves your working efficiency drastically because the single operation of scanning can generate both of color and black & white images that conventionally require two operations separately.

### [Generate B&W and Color Images Simultaneously] tab

#### **a) Order**

1:24bit Color, 2:Black&White

Generates a color image firstly and a black & white image secondly.

1:Black&White, 2:24bit Color

Generates a black & white image firstly and a color image secondly.

#### **b) Dropout color**

Selects any of Green, Red, Blue, White and None.

### [IPC] tab

Refer to “4. IMAGE PROCESSING” and “5. Filter”.

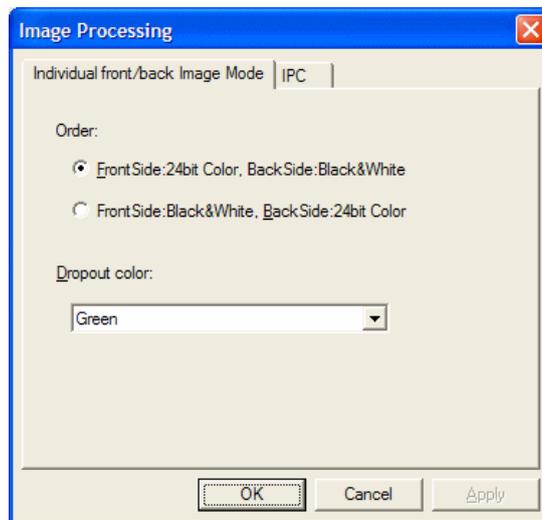
#### **Note.**

When scanning in “Generate B&W and Color images simultaneously” or “Individual front/back Image Mode”, you are recommended to use the software (ScandAll PRO) bundled with the scanner. If you scan a document in “Generate B&W and Color images simultaneously” or “Individual front/back Image Mode”, the function may not operate properly or the image may not be displayed.

## 7. Individual front/back Image Mode

Individual front/back Image Mode is a function that generates each of images for front side and back sides of the document in different data formats of color and a black & white respectively. (it is available only with TWAIN).

When scanning a document that contains color contents in the front side and the black & white contents in the back side, only a single operation allows the both sides of image saved in optimized data format respectively.



### [Individual front/back Image Mode] tab

#### **a) Order**

Front Side: 24bit Color, Back Side: Black&White

Generates a color image for the front side of the document, and a black & white image for the back.

Front Side: Black&White, Back Side: 24bit Color

Generates a black & white image for the front side of the document, and a color image for the back.

#### **b) Dropout color**

Selects any of Green, Red, Blue, White and None.

### [IPC] tab

Refer to “4. IMAGE PROCESSING” and “5. Filter”.

#### **Note.**

When scanning in “Generate B&W and Color images simultaneously” or “Individual front/back Image Mode”, you are recommended to use the software (ScandAll PRO) bundled with the scanner.

If you scan a document in “Generate B&W and Color images simultaneously” or “Individual front/back Image Mode”, the function may not operate properly or the image may not be displayed.

## About Support Service

If you have any inquiries about this product, please contact the nearest FUJITSU office listed in “FUJITSU Offices list” included in this package

Since it is practically impossible for Fujitsu staff to be aware of every detail of your daily scanning operation, please understand that our staff may sometimes be unable to answer your question immediately. To help us in our effort to provide you with the best support possible, we ask you to kindly prepare the following information (as many as possible):

- The product name and version number of this product
- The version of Operating Software (whether OS has been updated)
- The manufacturer, product name, and model number of your computer
- The manufacturer, product name, and model number of the scanner you use
- Driver’s revision and description of inquire
- The procedures to reproduce the problem, or what steps were taken to fix the issue. Whether any application, driver or device was installed prior the problem occurs, etc.

# INDEX

---

## *A*

About.....	18
Average 3x3.....	35
Average 3x5.....	35

---

## *B*

Ball point pen filter.....	29
<b>Base Dither / Gradation</b> .....	34
Brightness .....	32, 33, 34

---

## *C*

Close.....	18
Contrast.....	32, 33, 34
Copy .....	17

---

## *D*

Default button .....	24
Dither.....	32
Dither Pattern.....	32

---

## *E*

Emphasis 3x3.....	35
-------------------	----

---

## *F*

Filter .....	24, 35
Form DTC .....	31

---

## *G*

Generate B&W and Color Images Simultaneously.	36
<b>Gradation</b> .....	29

---

## *I*

Image Processing .....	24
Individual front/back Image Mode.....	37
Installation .....	7
IPC tab .....	20
<b>ISIS Data Source</b> .....	21

---

## *M*

Minimize Average Error .....	33
More button.....	24

---

## *N*

<b>Noise Removal</b> .....	30
----------------------------	----

---

## *O*

OCR DTC.....	29
Option .....	16
Outline Detection Threshold .....	32, 33, 34

---

## *P*

<b>Pre Filter</b> .....	29
Presets .....	24
Preview.....	19, 25

---

***R***

Random Dither.....	34
Remove .....	17
<b>Required Conditions</b> .....	5

---

***S***

Scan.....	18
<b>Sensitivity</b> .....	31
Setup IPC .....	18
Setup Scan.....	18
<b>Smoothing</b> .....	30

---

***T***

Template .....	16
Template tab.....	20
Threshold.....	28, 31
<b>Threshold Table</b> .....	30
<b>TWAIN Data Source</b> .....	14

---

***U***

<b>uninstall</b> .....	13
------------------------	----

---

Image Processing Software Option  
User's Guide

First Edition September 2002

2nd Edition June 2003

3rd Edition December 2004

4th Edition February 2005

5th Edition February 2006

6th Edition February 2007

7th Edition May 2008

8th Edition March 2010

9th Edition June 2010

10th Edition March 2011

11th Edition October 2012

12th Edition December 2013

© PFU LIMITED 2002-2013.

- 
- The contents of this document may change for improvements without prior notice.
  - PFU LIMITED takes no responsibilities for infringements of third parties' patents or other rights that may stem from the use of the data in this document.
  - Unauthorized reproduction of this document is prohibited.