



3-Heights™

Image to PDF Converter Shell

Image to Image Converter Shell

User's Manual

Version 1.91

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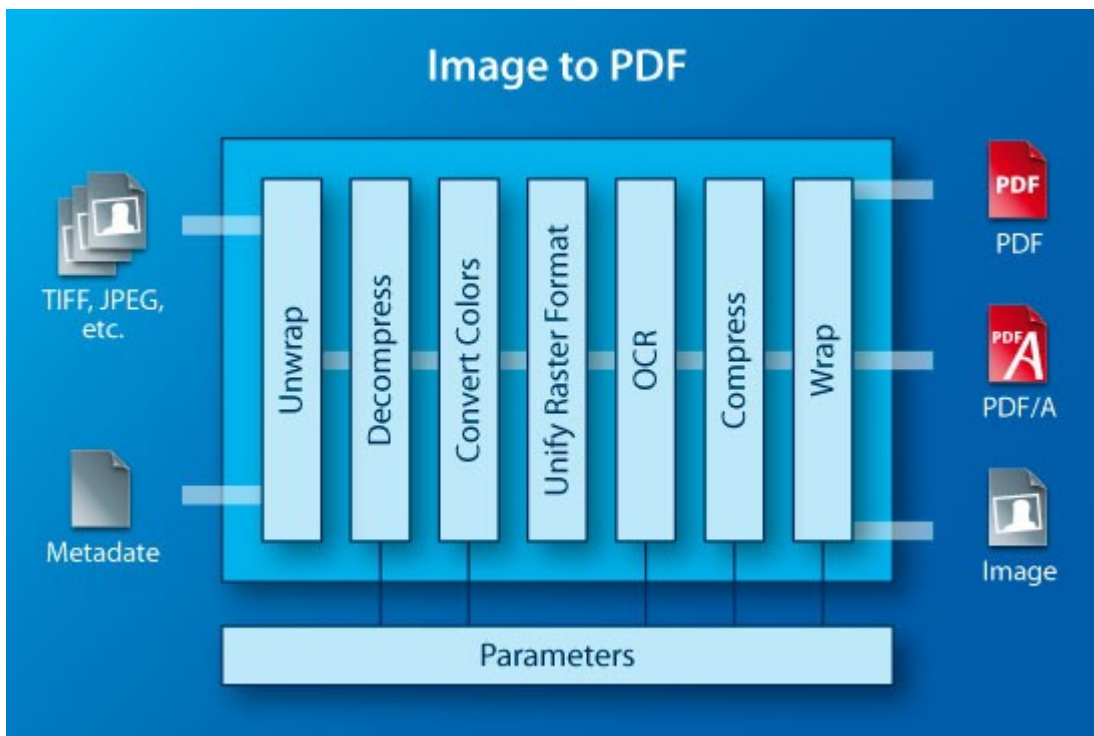
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1 Introduction

1.1 Description

The 3-Heights™ Image to PDF Converter converts raster image formats to PDF and PDF/A. PDF/A has been acknowledged world-wide as the ISO standard for long-term archiving since 2005. The Image to PDF Converter is used to convert images into a standardized format, for instance for electronic archiving or electronic data exchange.

It is also possible to include metadata from external sources. The Converter is characterized by a robust design, high throughput and accurate image reproduction. The optional OCR add-in makes output files searchable in full text mode.



1.2 Functions

The 3-Heights™ Image to PDF Converter converts raster image formats such as JPEG, TIFF or PNG to PDF or PDF/A. It can merge pages from various image files to form a single PDF and can also split multi-page image files into single page PDF files. Further options include defining page size and resolution, image scaling and the inclusion of (external) metadata. Optical character recognition (OCR) is also available as an option.

Features

Image to PDF:

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- Convert single page or multi-page raster images to PDF
- Definable output format (PDF/A-1a, PDF/A-1b, PDF 1.4 , etc.)
- Automatic or selectable image compression, depending on the image type
- Automatic or selectable PDF page size
- Selectable page area
- Selectable image quality for lossy compression
- Set image position
- Set scaling
- Set standard resolution (DPI / X and Y coordinates)
- Set encryption and access rights
- Selectable and embeddable ICC color profile
- Define alternative texts (tagging) and image language
- Set document attributes
- Input and output document from file or memory
- Set cropbox for the generated PDF file
- Optional JPEG image recompression
- Set image orientation
- List available OCR engines
- Set OCR engine
- Set OCR engine language(s)
- Set options specific to OCR engine (performance optimization)
- Embedding metadata
- Support for image masks

Image to Image:

- Split single page or multi-page raster images into individual, single page images
- Merge multiple images to form one multi-page image
- Convert to an image format of the same color depth
- Modify TIFF image compression
- Set quality index for lossy image compression
- Create lossy and lossless JPEG2000 and JBIG2 images
- Read input and output document from file or memory

Formats

Input Formats:

- BMP (1, 2, 4, 8, 24 bit)

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- GIF (2 to 8 bit)
- JBIG2 (lossy compression, lossless compression)
- JPEG, JPEG2000 and JPEG-LS (Grayscale, RGB)
- CMYK
- PBM and PNG (1 to 8, 24 bit)
- TIFF
 - Bitonal : uncompressed, CCITT G3, CCITT G3-2D, CCITT G4, LZW, ZIP, Packbits
 - Grayscale, RGB and CMYK: uncompressed, LZW, JPEG, JPEG (old), ZIP, Packbits

Output formats - Image to PDF Converter:

- PDF 1.x (e.g. PDF 1.4, PDF 1.5, etc.)
- PDF/A-1a
- PDF/A-1b
- PDF/A-2a
- PDF/A-2b
- PDF/A-2u

Output formats - Image to Image Converter:

- All input formats plus EPS

Compliance

- Standards: ISO 19005-1 (PDF/A-1), ISO 32000 (PDF 1.7), TIFF V6
- Quality assurance: Isartor test suite

1.3 Operating Systems

- Windows 2000, XP, 2003, Vista, 2008, Windows 7 - 32 and 64 bit
- FreeBSD 4.7 for Intel
- HP-UX 11.0 – 32 bit and 32/64 bit Itanium
- IBM AIX (4.3: 32 Bit, 5.1: 64 bit)
- Linux (SuSE and Red Hat on Intel)
- Mac OS X
- Sun Solaris (2.7 and higher)

2 Installation

2.1 Windows

The retail version of the 3-Heights™ Image to PDF Converter Shell comes as a ZIP archive containing various files including runtime binary executable code, documentation and license terms.

1. Download the ZIP archive of the product from your download account at www.pdf-tools.com.
2. Open the ZIP archive.
3. Check the appropriate option to preserve file paths (folder names) and unzip the archive to a local folder (e.g. *C:\program files\pdf-tools*).
4. The unzip process now creates the following subdirectories:
 - *Bin*: Contains the runtime executable binary code
 - *Doc*: Contains documentation files
5. (Optional) To allow for start the Image to PDF Converter from a shell without providing the fully qualified path, the directory where *img2pdf.exe* resides needs to be included in the "Path" environment variable.

How to Set the "Path" Environment Variable

To set the "Path" environment variable on Windows 2000, go to **Start -> Settings -> Control Panel -> System -> Advanced -> Environment Variables**

Windows XP, go to **Start -> Control Panel** (classic view) -> **System -> Advanced -> Environment Variables**.

Select "Path" and **Edit**, then add the directory where *img2pdf.exe* is located to the "Path". If the environment variable "Path" does not exist, create it.

2.2 Unix

32 bit Version

Unpack the archive in an installation directory, e.g. /usr/local

Include the bin directory in the PATH environment variable. The commands for the various platforms are:

Linux, Solaris, HP-UX, AIX: export PATH=\$PATH:/usr/local/bin:.

OS/X: setenv PATH \$PATH:/usr/local/bin:.

64 bit Version

The 64 bit versions are dynamically linked and require a shared library. The performance of the 64 bit and the 32 bit version is equal, it is suggested to use the 32 bit version, unless the application requires otherwise. The shared libraries can be downloaded from the web site at <http://www.pdf-tools.com>

The shared library needs to be copied to the lib subdirectory, which needs to be included in the appropriate environment variable that is used by the operating specific loader (ld).

The shell commands are (depending on the command shell):

Linux, Solaris, HP-UX: export LD_LIBRARY_PATH=/usr/local/lib

AIX: export LIBPATH=/usr/local/lib

OS/X: setenv DYLD_LIBRARY_PATH /usr/local/lib

3 Getting Started and User's Guide

The simplest command requires an input image file parameter and an output PDF file as parameters:

```
img2pdf input.tif output.pdf
```

It converts an image type file to a PDF document. If the image is multi-page TIFF image, then each page in the image will be converted to a page in the PDF output document.

To convert and concatenate several image files into one PDF document, add the input files as additional parameters before the output file:

```
img2pdf input1.tif input2.jpg input3.gif output.pdf
```

3.1 Specify the Name and Folder of the Output File

The output folder can simply be added in front of the output file name. On Windows this could look like this:

```
C:\> img2pdf input.tif myfolder\output.pdf
```

or

```
C:\> img2pdf input.tif C:\myfolder\output.pdf
```

3.2 The Use of Wildcards (*.)

Img2Pdf supports wildcards. If a directory for example contains the following image files:

```
A01.jpg
```

```
A02.jpg
```

```
A03.jpg
```

```
B01.jpg
```

Then the following command processes all JPEG files starting with the letter "A".

```
img2pdf A*.jpg output.pdf
```

Note that the file extension must always be a supported image format. When using wildcards, it is helpful to set the verbose mode option. The command then looks like this:

```
img2pdf -v *.jpg output.pdf
```

And the generated output message looks like this:

```
Converting file A01.jpg (1)
```

```
Converting file A02.jpg (2)
```

```
...
```

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Done.

Wildcards return a list of existing documents. If you would like to convert all images in a directory to individual PDF documents, it is required to use a variable to name the output files. Here is an example using the FOR command of the CMD shell, it converts all *.tif images to PDFs with the same name and the extension pdf, in the same folder:

```
for %i in (*.tif) do img2pdf -v %i %~ni.pdf
```

Of course, one can adjust the paths, or use a different output name:

```
for %i in (C:\img\*.tif) do img2pdf %i C:\PDF\new_%~ni.pdf
```

Note that variables used in a batch file require two leading % instead of one.

3.3 Converting Images to Images

To convert an image file to an image file with another format, you just need to enter the image to image executable, the file name and the desired output image file name, with the correct extension:

```
img2img input.tif output.jpg
```

Note that the image to image converter cannot change the color depth.

3.4 List the Usage

The usage and a list of available options can be retrieved by typing img2pdf without parameters.

4 Reference Manual - Image to PDF Conversions

4.1 Compression Types

A list of all supported compression types is provided in the table: Compression Types.

Table: Compression Types	
Value	Compression
0	raw
1	JPEG
2	Flate (ZIP)
3	LZW
4	CCITT Fax Group3
5	CCITT Fax Group3 2D
6	CCITT Fax Group 4
7	JBIG2 (Supported in PDF 1.4 or later)
8	JPEG2000 (Supported in PDF 1.5 or later, not supported in PDF/A)

4.2 General Switches

-a Adjust the Page Size to the Size of the Image

Adjust the pages of the PDF document to the size of the image.

-aa Set Alternate Text

In order to create a PDF/A-1a compliant document, an image must have an alternate text. The option `-aa` sets this alternate text. This option is only relevant in combination with PDF/A-1a. The default text is "Imported image".

Example: Set the compliance to PDF/A-1a and set the alternative text for the image to "some text".

```
img2pdf -c1 pdfa-1a -aa "some text" input.tif output.pdf
```

-al Set Language for Alternate Text

Set the language for the alternate text that is set using the option `-aa`. The default language is US-EN. Other languages can be set using the corresponding abbreviations, e.g. DE (German), FR (French), etc.

Example: Set the compliance to PDF/A-1a, set the alternative text to "Berschreibung"

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and the language to German.

```
img2pdf -cl pdfa-1a -aa "Beschreibung" -al DE input.tif output.pdf
```

-bc Set Crop Box

Set the crop box. It takes four parameters: x-position, y-position, width and height. All values are in PDF points (A4 = 595 x 842 points).

The crop box is a rectangle, defining the visible region of the page. When the page is displayed or printed, its contents are to be clipped (cropped) to this rectangle and then imposed on the output medium in some implementation-defined manner.

Example: *The following command creates an image with a crop box that is positioned 50 points from the left border, 100 points from the bottom, is 150 points wide and 200 points high.*

```
img2pdf -bc 50 100 150 200 input.tif output.pdf
```

If no crop box is set, the crop box is equal to the media box.

-c Center Images

Center the images on the pages horizontally and vertically. This option disables options -f and -a.

-cl Set Compliance Level

Set the PDF compliance level. Supported compliance modes are:

- pdf1.xRegular PDF Versions such as 1.2, 1.3, 1.5, 1.6, etc
- pdfa-1b PDF/A 1b Format

The default is pdf1.4.

Example: *To create a document compliant with PDF/A-1b, use a setting like this:*

```
Img2pdf -cl pdfa-1b -oi "colorsRGB Color Space Profile.icm" input.tif output.pdf
```

Note: In order to create PDF/A compatible documents, it is required to provide a color profile. The color profile will then be embedded in the PDF/A document. (See switch -oi)

Selecting a PDF/A compliance level will automatically generate the XML metadata and other requirements to meet the PDF/A specification.

-d Set the Resolution

Set the default resolution in dots per inch (dpi) if not provided from the image. The default is 96. If the resolution is given by the image then this option doesn't have any effect. Basically the switch -d changes the amount of dots per inch by changing the size of the image in the PDF document. The size of the raster image in pixel is not changed.

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Example: Set the resolution to 150 dpi.

```
img2pdf -d 150 input.tif output.pdf
```

-f Fit the Image Size to the Page Size

Scale the image to fit on the page dimensions. This disables `-a`.

-fb Bi-tonal Image Compression

Set the bi-tonal image compression. Default is "CCITT4".

Example: Set the compression for bi-tonal images to CCITT Group 3.

```
img2pdf -fb 4 input.tif output.pdf
```

-fc Color / Grey Scale Image Compression

Set the color / grey image compression. Default is "JPEG".

Example: Set the compression for color images to JPEG2000.

```
img2pdf -fc 8 input.jpg output.pdf
```

-fi Indexed Image Compression

Set the indexed image compression. Default is "Flate".

Example: Set the compression for indexed images to LZW.

```
img2pdf -fi 3 input.tif output.pdf
```

-fr Recompress JPEG Streams

Re-compress JPEG streams. This is useful for JPEG streams that can't be read by certain (older) PDF viewing applications.

-i Set the Document Information

Set document properties, such as Document Title, Author, Subject, Keywords.

Example: Set the title and the author entries of the document properties.

```
img2pdf -i Title="My Title" -i Author="My Name" input.tif output.pdf
```

-o Set Owner Password

Set an owner password (password will be required to modify the PDF document security settings, such as permission flags or passwords).

Example: Set the owner password to "owner".

```
img2pdf -o owner input.tif output.pdf
```

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-oi Set the Color Profile

Color profiles are usually provided with the OS. On Windows for example they can be found at C:\WINNT\system32\spool\drivers\color.

Alternatively profiles can be found here:

- www.pdf-tools.com/public/downloads/resources/colorprofiles.zip
- www.color.org/srgbprofiles.html
- www.adobe.com/support/downloads/iccprofiles/icc_eula_win_dist.html

Please note that most color profiles are copyrighted, therefore you should read the license agreements on the above links before using the color profiles.

Example: Set the color profile to a specific profile that exists on the system.

```
img2pdf -oi "C:\WINNT\system32\spool\drivers\color\sRGB Color Space Profile.icm" input.tif output.pdf
```

-or Set Image Orientation

Set the orientation of the image. Available orientations are:

Table: Orientation		
Value		Description
0	(Default)	inherent
1		top-left
2		top-right
3		bottom-right
4		bottom-left
5		left-top
6		right-top
7		right-bottom
8		left-bottom

-ow Optimize for the Web

Add so called linearization tags to the document. A linearized document has a slightly larger file size than a non-linearized file, and provides the following features (among others):

- When a document is opened through a PDF viewing application plug-in for an Internet browser, the first page can be viewed without downloading the entire PDF file.
- When another page is requested by the user, that page is displayed as quickly as possible and incrementally as data arrives, without downloading the entire PDF file.

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-p Set the Permission Flags

Set the permission flags. It is only usable in combination with encrypted documents. By default no permissions are granted. The permissions that can be granted are listed in the table: Permission Flags.

Table: Permission Flags	
Value	Description
4	low resolution printing
8	modify the document
16	copy objects
32	add or modify annotations
256	form filling
512	support disabilities
1024	assembling
2048	high quality printing

Example: The following command sets the owner password to "owner" and the permission flags to allow printing in low resolution (value = 4) and allow form filling (value = 256).

```
img2pdf -o owner -p 260 input.tif output.pdf
```

Note that "high quality printing" (2048) requires the "low resolution printing" (4) flag to be set as well:

```
img2pdf -o owner -p 2052 input.tif output.pdf
```

For further information about the permission flags, see PDF Reference Manual section 3.5.2.

-pg Page Range

Set the page range to be converted.

Example: Convert pages 1 and two of a multi-page TIFF image.

```
img2pdf -pg 1 2 input.tif output.pdf
```

-q Quality of Lossy Compressed Images

Some image compression algorithms, such as Jpeg, Jpeg2000, Jbig2 support lossy compression. The quality index can be controlled using the option `-q`. The lowest quality index is 1, the highest is 100. The default value is 75. If the quality is set to 100, Jpeg2000 and Jbig2 images are compressed lossless.

Example: Set the image quality to 100 use JPEG2000 with lossless compression for color images:

```
img2pdf -fc 8 -q 100 input.pdf output.pdf
```

-rl Reporting Level

The reporting level describes which type of error messages should be written to stderr. This option can for example be used to see what replacement fonts are selected for non-embedded fonts. The available values are listed in the table: Reporting Level.

Table: Reporting Level	
Value	Description
1	do not report
2 (Default)	report errors
3	report errors, warnings
4	report errors, warnings, information

Example: The following command reports all errors and warnings:

```
img2pdf -rl 2 input.tif output.pdf
```

Example: The following command writes all error messages to the log file error.log.

```
img2pdf -rl 2 input.tif output.pdf 2>error.log
```

-sb Set the Border Size

Define the width of a white border around the image in pages of the PDF document. The units are points (1 point = 1/72 inch). The default is 0 points. The border is not increasing the dimensions of the page set by the option "-sp".

Example: Set the width of the border to 20 points.

```
img2pdf -sb 20 input.tif output.pdf
```

-sp Set the Page Dimensions

Set the dimensions of the pages of the PDF document in points (1 point = 1/72 inch). The default is "A4" (595 x 842 points).

Example: Create "Letter" sized PDF pages.

```
img2pdf -sp 612 792 input.tif output.pdf
```

-u Set User Password

Set a user password (password will be required to open the PDF document).

Example: Set the user password of the PDF document to "user".

```
img2pdf -u user input.tif output.pdf
```

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-v Verbose Mode

Enable the verbose mode, which prints out the steps performed by img2pdf.

@ Use a Control File

Read the parameters from a control file. This is particularly useful for long commands, as usually shells have a limited length of a command. Each option and file name is to be written on a new line in the control file. Use double quotes around strings containing blanks.

Example of a control file *control.txt*:

```
-q 80
-i "Title=My Title"
"C:\Some Path\input.tif"
output.pdf
```

Example of a command using a control file:

```
img2pdf @control.txt
```

4.3 OCR Related Switches

-le List Available OCR Engines

This switch lists all available OCR engines. The name retrieved this way is to be used as argument of the switch **-ocr**.

```
img2pdf -le
List of available OCR engines:
- abbyy
End of list.
```

-ocl Set OCR Language

In order to optimize the performance of the OCR engine, it can be given hints what languages are used. The default language of the Abbyy FineReader 8.1 OCR Engine is English. This switch can only be used if the switch **-ocr** is set.

Example: Set the OCR languages to English and German.

```
img2pdf -ocr abbyy -ocl "English, German" input.tif output.pdf
```

See also documentation for the *3-Heights™ OCR Add-On*.

-ocp Set OCR Parameters

Using this switch OCR engine specific parameters (key/value pairs) can be set to optimize the performance.

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Example: Enable the balanced mode to improve the speed and do not detect whether text is bold or not.

```
img2pdf -ocr abbyy -ocp "BalancedMode=TRUE, DetectBold=FALSE" input.tif
output.pdf
```

See also documentation for the *3-Heights™ OCR Add-On*.

-ocr Select an OCR Engine

If a PDF document has to be made fully text searchable even if the text is part of a raster image then the images which are contained in the PDF document must be run through an OCR engine. With this switch the user can select an OCR engine, e.g. "Abbyy", and instruct the tool to embed the recognized text as a hidden layer on top of the image. If the add-in is not found or the engine cannot be initialized (because it is not installed or the license key is not valid) then an error message is issued.

The name of the OCR engine can be retrieved using the switch **-le**. If the switch **-ocr** is not used, no OCR is applied.

Example: Set the OCR engine to the "Abbyy FineReader 8.1 OCR Engine":

```
img2pdf -ocr abbyy input.tif output.pdf
```

See also documentation for the *3-Heights™ OCR Add-On*.

5 Reference Manual - Image to Image Conversions

5.1 Define the Output Format

The output image format is defined by its extension. There is a list of supported extensions and the corresponding file type.

Table: Output Format	
Extension	File Format
<code>.tif, .tiff</code>	Tagged Image File Format
<code>.jpg, .jpe, .jpeg</code>	Joint Photographic Expert Group
<code>.png</code>	Portable Network Graphics
<code>.gif</code>	Graphics Interchange Format
<code>.bmp</code>	Window Bitmap
<code>.jb2</code>	Joint Bi-level Image Experts Group
<code>.jp2</code>	JPEG2000
<code>.jpx</code>	Extended JPEG2000
<code>.pbm, .pgm, .pnm, .ppm</code>	Portable Bitmap File Format
<code>.eps</code>	Encapsulated PostScript (Output only)

5.2 Compression Types: TIFF Only

The following compression types can be set for converting TIFF files.

Table: Compression Types for TIFF	
Value	Compression
0	raw
1	JPEG
2	Flate (ZIP)
3	LZW
4	CCITT Fax Group3
5	CCITT Fax Group3 2D
6	CCITT Fax Group 4

Compression types 7 (Jbig) and 8 (Jpeg2000) are not applicable for TIFF.

5.3 Switches

-cb Bitonal Image Compression - TIFF Only

Set the bi-tonal image compression. Default is "CCITT4".

Example: Apply CCITT Group 3 compression to bi-tonal images.

```
img2img -cb 4 input.tif output.tif
```

-cc Color / Grey Scale Image Compression - TIFF Only

Set the color / grey image compression. Default is "JPEG".

Example: Do not apply compression to color images.

```
img2img -cc 0 input.tif output.tif
```

-ci Indexed Image Compression - TIFF Only

Set the indexed image compression. Default is "Flate".

Example: Apply LZW compression to indexed images.

```
img2img -ci 3 input.tif output.tif
```

-d Set the Resolution

Set the resolution of the output image in dots per inch (dpi). If the value exceeds the resolution of the input image, up-sampling is applied.

Example: Set the resolution to 300 dpi.

```
img2img -d 300 input.tif output.tif
```

-m Merge Input to Multi-Page Output

Merge several input files into one image output file.

Example: Merge all TIFF files in a folder into one TIFF file.

```
img2img -m *.tif output.tif
```

-q Set the Compression Quality

Set the quality index for lossy compression such as Jpeg. Allowed values are 1 (lowest) to 100 (highest). Default is 75.

Example: Set the image quality to 50.

```
img2img -q 50 input.jpg output.jpg
```

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A quality index of 100 means lossless compression is applied if the format supports it (Jbig2, Jpeg2000).

-s Split Multi-Page Input to Single-Page Output

Split a multiple page input file (e.g. a 5 page TIFF file) into single page output files (e.g. 5 separate TIFF files).

-t Transform Colors from CMYK to RGB

Apply a color conversion and convert CMYK to RGB.

6 Return Codes

All return codes other than 0 indicate an error in the processing. Messages with return code 0 are written to stdout, messages with return codes other than 0 are written to stderr. Status and processing messages with no return code can be written to either stdout or stderr, see specific list of messages below. Providing no options returns the usage and return code 0.

6.1 Image to PDF Converter

Table: Return Codes Image to PDF Converter		
<i>ErrorCode</i>	<i>Meaning</i>	<i>Possible messages</i>
0	Success	<ul style="list-style-type: none"> No return string Return usage
1	Input File could not be opened or invalid parameters	<ul style="list-style-type: none"> "Couldn't open control file" "Too many parameters." "Couldn't import image file %s."
2	The PDF Output File could not be written.	<ul style="list-style-type: none"> "Couldn't create output file %s"
3	Option error	<ul style="list-style-type: none"> "Key/value pair %s doesn't contain a '='" "Invalid option %s."
none	Information (stdout)	<ul style="list-style-type: none"> "Done." "Converting file %s(%d)"

Where %s is the corresponding parameter name (file name or option) and %d a page counter.

6.2 Image to Image Converter

Table: Return Codes Image to Image Converter		
<i>ErrorCode</i>	<i>Meaning</i>	<i>Possible messages</i>
0	Success	<ul style="list-style-type: none"> No return string Return usage
1	Input File could not be opened or invalid parameters	<ul style="list-style-type: none"> "Specify at least one input and one output file name." "Format of output file %s isn't supported." "Couldn't create output file %s"

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2	The PDF Output File could not be written.	<ul style="list-style-type: none"> • "Too many parameters." • "Couldn't create output file %s"
3	Option error	<ul style="list-style-type: none"> • "Too many parameters.\n" • "Invalid option %s." • "Cannot split and merge at the same time."
none	Information (stdout)	<ul style="list-style-type: none"> • "Done." • "Converting image %s(%d)"
none	Skipped processing errors (stderr)	<ul style="list-style-type: none"> • "Format of input file %s isn't supported." • "Couldn't read page %d of input file %s." • "Couldn't open input file %s." • "Inappropriate Output file Name." • "Conversion from input to output image format is not supported." • "Output file %s doesn't support multiple pages."

Where %s is the corresponding parameter name (file name or option) and %d a page counter.