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1 Introduction

1.1 Description

The 3-Heights™ Image to PDF Converter Shell 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 Shell 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.

1.2.1 Features

Image to PDF

- Conversion of single page or multi-page raster images to PDF
- Convert JPM to PDF/A-2 with MRC
- Set PDF conformance
- 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 user access permissions
- Selectable and embeddable ICC color profile
- Define alternative texts (tagging) and image language
- Set document attributes
- Optional JPEG image recompression
- Set image orientation (portrait or landscape)
- Optical character recognition (OCR)
- Embedding XMP metadata
- Support for image masks
- Support for mixed raster content (MRC)

**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 lossless JBIG2 images and lossy/lossless JPEG2000
- Set resolution and image dimensions

**PdfOcr**

- Recognition of machine generated texts
- Recognition of typewriter scripts and barcodes (1D)
- Image manipulation
- Image pre-processing

### 1.2.2 Formats

**Input Formats**

- BMP (1, 2, 4, 8, 24 bit)
- GIF (2 to 8 bit)
- JBIG2 (lossless compression)
- JPEG, JPEG2000 and JPEG-LS (Grayscale, RGB)
- JPM
- 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 (PDF 1.0, ..., PDF 1.7)
- PDF 2.0
- PDF/A-1a, PDF/A-1b
- PDF/A-2a, PDF/A-2b, PDF/A-2u
- PDF/A-3a, PDF/A-3b, PDF/A-3u

Output Formats - Image to Image Converter

- All input formats plus EPS

1.2.3 Conformance

- Standards:
  - ISO 32000-1 (PDF 1.7)
  - ISO 32000-2 (PDF 2.0)
  - ISO 19005-1 (PDF/A-1)
  - ISO 19005-2 (PDF/A-2)
  - ISO 19005-3 (PDF/A-3)
  - TIFF V6
- Quality assurance: Isartor test suite

1.3 Operating Systems

The 3-Heights™ Image to PDF Converter Shell is available for the following operating systems:

- Windows Client 7+ | x86 and x64
- Linux:
  - Red Hat, CentOS, Oracle Linux 7+ | x64
  - Fedora 29+ | x64
  - Debian 8+ | x64
  - Other: Linux kernel 2.6+, GCC toolset 4.8+ | x64
- macOS 10.10+ | x64

‘+’ indicates the minimum supported version.
2 Installation

2.1 Windows

The 3-Heights™ Image to PDF Converter Shell comes as a ZIP archive or as an MSI installer.

The installation of the software requires the following steps.

1. You need administrator rights to install this software.
2. Log in to your download account at http://www.pdf-tools.com. Select the product "Image to PDF Converter Shell". If you have no active downloads available or cannot log in, please contact pdfsales@pdf-tools.com for assistance.

You will find different versions of the product available. We suggest to download the version, which is selected by default. A different version can be selected using the combo box.

There is an MSI (*.msi) package and a ZIP (*.zip) archive available. The MSI (Microsoft Installer) package provides an installation routine that installs and uninstalls the product for you. The ZIP archive allows you to select and install everything manually.

There is a 32 and a 64-bit version of the product available. While the 32-bit version runs on both, 32 and 64-bit platforms, the 64-bit version runs on 64-bit platforms only. The MSI installs the 64-bit version, whereas the ZIP archive contains both the 32-bit and the 64-bit version of the product. Therefore, on 32-bit systems, the ZIP archive must be used.

3. If you select an MSI package, start it and follow the steps in the installation routine.
4. If you are using the ZIP archive, do the following. Unzip the archive to a local folder, e.g. C:\Program Files\PDF Tools AG. This creates the following subdirectories:

<table>
<thead>
<tr>
<th>Subdirectory</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>bin</td>
<td>Contains the runtime executable binaries.</td>
</tr>
<tr>
<td>doc</td>
<td>Contains documentation.</td>
</tr>
</tbody>
</table>

5. (Optional) To easily use the 3-Heights™ Image to PDF Converter Shell from a shell, the directory needs to be included in the “Path” environment variable.
6. (Optional) Register your license key using the License Management.
7. Ensure the cache directory exists as described in chapter Special Directories.
8. Make sure your platform meets the requirements regarding fonts described in chapter Fonts.
9. (Optional) Download and install the 3-Heights™ OCR Enterprise Add-On and the OCR Engine as described in the respective manuals:
   - 3-Heights™ OCR Service: OcrService.pdf from the separate product kit.

2.1.1 How to set the Environment Variable “Path”

To set the environment variable “Path” on Windows, 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” variable. If the environment variable “Path” does not exist, create it.
2.2 Linux and macOS

This section describes installation steps required on Linux or macOS.

Here is an overview of the files that come with the 3-Heights™ Image to PDF Converter Shell:

<table>
<thead>
<tr>
<th>Name</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>bin/x64/img2pdf</td>
<td>This is the main executable.</td>
</tr>
<tr>
<td>bin/x64/*.ocr</td>
<td>These are OCR plugin modules.</td>
</tr>
<tr>
<td>doc/<em>.</em></td>
<td>Documentation</td>
</tr>
</tbody>
</table>

2.2.1 Linux

1. Unpack the archive in an installation directory, e.g. /opt/pdf-tools.com/
2. Verify that the GNU shared libraries required by the product are available on your system:

   ldd img2pdf

   In case the above reports any missing libraries you have three options:
   a. Download an archive that is linked to a different version of the GNU shared libraries and verify whether they are available on your system. Use any version whose requirements are met. Note that this option is not available for all platforms.
   b. Use your system's package manager to install the missing libraries. It usually suffices to install the package libstdc++6.
   c. Use GNU shared libraries provided by PDF Tools AG:
      2. Download the GNU shared libraries for your platform.
3. Install the libraries manually according to your system's documentation. This typically involves copying them to your library directory, e.g. /usr/lib or /usr/lib64, and running ldconfig.

4. Verify that the GNU shared libraries required by the product are available on your system now.

3. Create a link to the executable from one of the standard executable directories, e.g:

   ln -s /opt/pdf-tools.com/bin/x64/img2pdf /usr/bin

4. Optionally register your license key using the license manager.

5. Ensure the cache directory exists as described in chapter Special Directories.

6. Make sure your platform meets the requirements regarding fonts described in chapter Fonts.

7. (Optional) Download and install the 3-Heights™ OCR Enterprise Add-On and the OCR Engine as described in the respective manuals:
   - 3-Heights™ OCR Service: OcrService.pdf from the separate product kit.

2.3 Uninstall

If you have used the MSI for the installation, go to Start → 3-Heights™ Image to PDF Converter Shell... → Uninstall ...

If you have used the ZIP file for the installation: In order to uninstall the product, undo all the steps done during installation.

2.4 Color Profiles

In PDF/A the usage of uncalibrated color spaces (DeviceGray, DeviceRGB, and DeviceCMYK) is prohibited because colors that are specified in this way cannot be reproduced reliably on multiple output devices. Therefore, when converting to PDF/A, a color profile has to be embedded.

If no color profiles are available, default profiles for both RGB and CMYK are generated on the fly by the 3-Heights™ Image to PDF Converter Shell.

2.4.1 Default Color Profiles

If no particular color profiles are set default profiles are used. For device RGB colors a color profile named "sRGB Color Space Profile.icm" and for device CMYK a profile named "USWebCoatedSWOP.icc" are searched for in the following directories:

Windows
1. %SystemRoot%\System32\spool\drivers\color
2. directory Icc, which must be a direct sub-directory of where the img2pdf.exe resides.

Linux and macOS
1. $PDF_ICC_PATH if the environment variable is defined
2. the current working directory

2.4.2 Set other Color Profiles

Another color profile may be set using the options -oi or -cs.
2.4.3 Get Other Color Profiles

Most systems have pre-installed color profiles available, for example on Windows at %SystemRoot%\system32\spool\drivers\color\. Color profiles can also be downloaded from the links provided in the directory bin\Icc\ or from the following websites:

- [http://www.color.org/srgbprofiles.html](http://www.color.org/srgbprofiles.html)

2.5 Fonts

Fonts are required, if OCR is preformed and OCR text is added to a PDF document. Hereby it is crucial, that the fonts available in the Font Directories contain all characters required for the OCR text. For example, when recognizing Japanese OCR text, it is recommended to add the fonts “MS Mincho” or “MS Gothic” to the Font Directories.

Note that on Windows when a font is installed it is by default installed only for a particular user. It is important to either install fonts for all users, or make sure the 3-Heights™ Image to PDF Converter Shell is run under that user and the user profile is loaded.

2.5.1 Font Cache

A cache of all fonts in all Font Directories is created. If fonts are added or removed from the font directories, the cache is updated automatically.

In order to achieve optimal performance, make sure that the cache directory is writable for the 3-Heights™ Image to PDF Converter Shell. Otherwise the font cache cannot be updated and the font directories have to be scanned on each program startup.

The font cache is created in the subdirectory <CacheDirectory>/Installed Fonts of the Cache Directory.

2.6 Note about the Evaluation License

With the evaluation license the 3-Heights™ Image to PDF Converter Shell automatically adds a watermark to the output files.

2.7 Special Directories

2.7.1 Directory for temporary files

This directory for temporary files is used for data specific to one instance of a program. The data is not shared between different invocations and deleted after termination of the program.

The directory is determined as follows. The product checks for the existence of environment variables in the following order and uses the first path found:

Windows

1. The path specified by the %TMP% environment variable.
2. The path specified by the %TEMP% environment variable.
3. The path specified by the `%USERPROFILE%` environment variable.
4. The Windows directory.

**Linux and macOS**
1. The path specified by the `$PDFTMPDIR` environment variable.
2. The path specified by the `$TMP` environment variable.
3. The `/tmp` directory.

### 2.7.2 Cache Directory

The cache directory is used for data that is persisted and shared between different invocations of a program. The actual caches are created in subdirectories. The content of this directory can safely be deleted to clean all caches. This directory should be writable by the application, otherwise caches cannot be created or updated and performance will degrade significantly.

**Windows**
- If the user has a profile:
  - `%LOCAL_APPDATA%\PDF Tools AG\Caches`
- If the user has no profile:
  - `<TempDirectory>\PDF Tools AG\Caches`

**Linux and macOS**
- If the user has a home directory:
  - `~/.pdf-tools/Caches`
- If the user has no home directory:
  - `<TempDirectory>/pdf-tools/Caches`

where `<TempDirectory>` refers to the **Directory for temporary files**.

### 2.7.3 Font Directories

The location of the font directories depends on the operating system. Font directories are traversed recursively in the order as specified below.

If two fonts with the same name are found, the latter one takes precedence, i.e. user fonts will always take precedence over system fonts.

**Windows**
1. `%SystemRoot%\Fonts`
2. User fonts listed in the registry key `\HKEY_CURRENT_USER\Software\Microsoft\Windows NT\CurrentVersion\Fonts`. This includes user specific fonts from `C:\Users\<user>\AppData\Local\Microsoft\Windows\Fonts` and app specific fonts from `C:\Program Files\WindowsApps` directory `Fonts`, which must be a direct sub-directory of where `img2pdf.exe` resides.

**macOS**
1. `/System/Library/Fonts`
2. `/Library/Fonts`
**Linux**

1. `/usr/share/fonts`
2. `/usr/local/share/fonts`
3. `~/.fonts`
4. `$PDFFONTDIR` or `/usr/lib/X11/fonts/Type1`
3 License Management

The 3-Heights™ Image to PDF Converter Shell requires a valid license in order to run correctly. If no license key is set or the license is not valid, then the executable will fail and the return code will be set to 10.

More information about license management is available in the license key technote.
4 Getting Started

3-Heights™ Image to PDF Converter Shell provides three separate programs:

**img2pdf** this executable is for converting most raster images files, such as TIFF, JPEG, PNG, BMP, GIF, etc. to a PDF or PDF/A document. The majority of this documentation is dedicated to this executable.

**img2img** this executable is for converting a raster image from one format to another raster image format, e.g. from BMP to PNG.

**jpm2pdf** this executable is for converting a JPM image (JPEG 2000, Part 6) to a PDF/A-2 document with Mixed Raster Content (MRC).

**pdfocr** this executable is used in combination with an optical character recognition (OCR) engine to make PDF documents searchable by performing OCR on embedded images.

All features of the tools are listed in their usage. The usage can be retrieved by typing the name of the executable, such as `img2pdf`, without parameters.

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
```

4.1 Specify the Folder of the Output File

The output folder can simply be added in front of the output file name

```
img2pdf input.pdf myfolder\output.pdf
```

or absolute (Windows):

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

4.2 The Use of Wildcards (*)

The 3-Heights™ Image to PDF Converter Shell supports wildcards. If a directory for example contains the following input JPEG files:

A01.jpg
A02.jpg
A03.jpg
B01.jpg
B02.jpg
Then the following command processes all JPEG files starting with the letter "A".

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

**Note:** The file extension of the input files must always be a supported format. When using wildcards, it is helpful to set the verbose mode option `-v`. The command then looks like this:

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

And the generated output message looks like this:

Wildcards return a list of existing files. If you would like to convert all files in a directory to individual output files, it is required to use a variable to name the output files.

**Example:** Use the for command of the Windows CMD shell, to convert all JPEG files to individual PDF files with the same name and the extension .pdf, in the same directory:

```
for %f in (*.jpg) do img2pdf -v %f %~nf.pdf
```

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

```
for %f in (C:\InputDir\*.jpg) do img2pdf -v %f C:\OutputDir\%~nf.pdf
```

**Note:** Variables used in a batch file (.bat) require two leading `%` instead of one.

### 4.3 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.

### 4.4 JPM to PDF/A

Use the jpg2pdf executable to convert a JPEG 2000 Part 6 to a PDF/A-2 document.

```
jpm2pdf input.jpm output.pdf
```
The tool can create optional content groups which can be used by the reader of the PDF document to switch off and on the various MRC layers.

```
(jpm2pdf -ocg input.jpm output.pdf)
```

### 4.5 PdfOcr

After the PDF OCR Import Shell and the 3-Heights™ OCR Enterprise Add-On are installed, you can list the available OCR Add-Ons to retrieve the name of the OCR engine using the command `pdfocr -le` as shown below:

**Example:**

```
pdfocr -le
List of available OCR engines:
- abbyy10
- abbyy11
- service
End of list.
```

The list includes only the entries of the available OCR Add-ons. The entries in the list indicate which of the Add-Ons `pdfocrpluginService.ocr`, `pdfocrpluginAbbyy10.ocr` and `pdfocrpluginAbbyy11.ocr` are found. The Add-Ons are required to communicate with the actual OCR-engine or service. Being able to list the Add-Ons does not necessarily mean the OCR-engine is installed and ready. How the OCR-engine is installed is described in the documentation PdfOcrEnterprise.pdf.

Once the name (e.g. "abbyy11") is known, it is provided as argument to the switch `-ocr`. The command following example is the basic command to apply OCR to a document, i.e. the input document `input.pdf` is read, OCR is applied, and the resulting, ocr'ed document is saved as `output.pdf`.

**Example:** Set the OCR engine to the “Abbyy FineReader 11 OCR Engine”

```
pdfocr -ocr abbyy11 input.pdf output.pdf
```

Additional OCR engine dependant settings or settings related to encryption are described in the chapter Interface Reference.
5 Interface Reference

5.1 Options for Image to PDF

5.1.1 Use a Control File

Use a Control File  @filename

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:  Control file control.txt

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

Example:  A command using a control file:

img2pdf @control.txt

5.1.2 Adjust the Page Size to the Size of the Image

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

Adjust the pages of the PDF document to the size of the image. This disables -c and -f.

5.1.3 Set Alternate Text

Set Alternate Text  -aa  {alt}

In order to create a document that conforms to PDF/A-2a, an image must have an alternate text. The option -aa sets this alternate text. This option is only relevant in combination with PDF/A-2a. The default text is "Imported image".

Example:  Set the conformance to PDF/A-2a and set the alternative text for the image to "some text".

img2pdf -cl pdfa-2a -aa "some text" input.tif output.pdf
5.1.4 -al Set Language for Alternate Text

```
Set Language for Alternate Text -al <lang>
```

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 conformance to PDF/A-2a, set the alternative text to "Beschreibung" and the language to German.

```
img2pdf -cl pdfa-2a -aa "Beschreibung" -al DE input.tif output.pdf
```

5.1.5 -ao Adjust page orientation

```
Adjust page orientation -ao
```

When set, every page of the PDF is oriented in such a way that the longer side length of the input image conforms with the longer side length of the corresponding page.

**Example:** Fit input TIFF (multipage) to PDF with A5 pages. Adjust orientation of every PDF page to corresponding input TIFF page.

```
img2pdf -ao -f -sp 420 595 input.tif output.pdf
```

5.1.6 -ax Add XMP Metadata

```
Add XMP Metadata -ax <file>
```

Specify a file with XMP metadata, which are added to the output document. The XMP metadata are copied only and not checked for PDF conformance.

5.1.7 -b Set Bits per Pixel

```
Set Bits per Pixel -b <n>
```

Set the color depth. Available: Bi-tonal: 1. When using 1 bit per pixel, it is suggested to set a suitable dithering algorithm (option -h).

**Example:** Convert to bitonal and use LZW compression.

```
img2pdf -b 1 -fb 3 input.jpg output.pdf
```
5.1.8 -bc Set Crop Box

Set Crop Box -bc x y w h

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.

5.1.9 -c Center Images

Center Images -c

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

5.1.10 -cl Set Conformance Level

Set Conformance Level -cl level

Set the PDF conformance level. Supported conformance levels are:

- **pdf1.x** Regular PDF versions 1.0, 1.1, 1.2, 1.3, 1.4, 1.5, 1.6, 1.7
- **pdf2.0** Regular PDF version 2.0
- **pdfa-1b** PDF/A-1b format
- **pdfa-1a** PDF/A 1a format (accessibility)
- **pdfa-2b** PDF/A 2b format
- **pdfa-2u** PDF/A 2u format (Unicode)
- **pdfa-2a** PDF/A 2a format (accessibility)
- **pdfa-3b** PDF/A 3b format
- **pdfa-3u** PDF/A 3u format (Unicode)
- **pdfa-3a** PDF/A 3a format (accessibility)

The default is pdf1.7.

Example: To create a document that conforms to PDF/A-1b, use a setting like this:

```
img2pdf -cl pdfa-2b input.tif output.pdf
```
Note: In order to create PDF/A compatible documents, it may be required to provide a color profile. The color profile will then be embedded in the PDF/A document. (See switches `-cs` and `-oi`)

Selecting a PDF/A conformance level will automatically generate the XML metadata and other requirements to meet the PDF/A specification. If JPEG2000 images are to be converted to PDF/A and the JPEG2000 compression shall be retained, a PDF/A-2 or PDF/A-3 conformance level must be selected.

### 5.1.11 `-cs` Color Space Profile

Set a color profile for embedding in the output PDF. The color profile provided here is used directly for the image’s color space in the output PDF. See also `-oi` for setting the PDF’s output intent.

At maximum three profiles (one RGB profile, one CMYK profile, and one Gray profile) can be set by using at most one `-oi` switch and/or at most three `-cs` switches.

**Example:** Set a color profile for all RGB images in the PDF.

```
img2pdf -cs "C:\Windows\system32\spool\drivers\color\sRGB\Color Space Profile.icm" input.jpg output.pdf
```

### 5.1.12 `-d` Set Resolution in DPI

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 does not 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.

**Example:** Set the resolution to 150 DPI.

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

### 5.1.13 `-f` Fit the Image Size to the Page Size

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

### 5.1.14 `-fb` Bi-tonal Image Compression

```
```
Set the bi-tonal image compression. Default is 6 (CCITT Fax Group 4). See Compression Types for possible codecs.

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

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

### 5.1.15 -fc  Color / Grey Scale Image Compression

Set the color / grey image compression. Default is 1 (JPEG). See Compression Types for possible codecs.

**Example:** Set the compression for color images to JPEG2000.

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

### 5.1.16 -h  Dithering Mode

Set the dithering mode. Allowed values are:

<table>
<thead>
<tr>
<th>Value</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>no dithering</td>
</tr>
<tr>
<td>1</td>
<td>(Default) Floyd-Steinberg</td>
</tr>
<tr>
<td>2</td>
<td>Halftone block</td>
</tr>
<tr>
<td>3</td>
<td>Halftone continuous</td>
</tr>
<tr>
<td>4</td>
<td>G3 Optimized</td>
</tr>
<tr>
<td>5</td>
<td>G4 Optimized</td>
</tr>
<tr>
<td>6</td>
<td>Atkinson dithering is very fast and produces images that can be compressed really well with reasonably good image quality.</td>
</tr>
</tbody>
</table>

Dithering provides a better image quality, especially for 1 bit images, at the cost of a larger file size.

**Example:** Convert image to bi-tonal, use dithering mode halftone continuous and use jbig2 compression

```
img2pdf -h 3 -b 1 -fb 7 input.jpg output.tif
```
5.1.17  **-fi  Indexed Image Compression**

| Indexed Image Compression  | -fi (compr) |

Set the indexed image compression. Default is 2 (Flate). See [Compression Types](#) for possible codecs.

**Example:** Set the compression for indexed images to LZW.

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

5.1.18  **-fr  Recompress JPEG Streams**

| Recompress JPEG Streams  | -fr |

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

5.1.19  **-fu  Unpack Indexed Images**

| Unpack Indexed Images  | -fu |

This switch instructs the converter to unpack images with bits per sample of less than 8 to exactly 8 bits.

5.1.20  **-i  Set Document Information**

| Set Document Information  | -i (key=value) |

Set document properties, such as “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
```

5.1.21  **-le  List OCR Engines**

| List OCR Engines  | -le |

OCR engines are accessed through the corresponding OCR interface DLLs. At present interfacing the following engines are supported:

- **Abbyy FineReader 11 OCR Engine Abbyy11.ocr**
  - This engine is accessed by the OCR interface DLL pdfocrpluginAbbyy11.ocr.

- **Abbyy FineReader 10 OCR Engine Abbyy10.ocr**
  - This engine is accessed by the OCR interface DLL pdfocrpluginAbbyy10.ocr.
3-Heights™ OCR Service  This service is accessed by the OCR interface DLL pdfoocrpluginservice.ocr. The service accesses the Abbyy FineReader 10 or 11 OCR Engine.

The OCR interface DLLs are provided by the 3-Heights™ Image to PDF Converter Shell. The OCR engine is provided as a separate product, such as 3-Heights™ OCR Enterprise Add-On.

Here is an example of listing available OCR engines:

```
img2pdf -le 
List of available OCR engines: 
  - abbyy11 
  - abbyy10 
  - service 
End of list.
```

In order to make use of the OCR engine, the OCR interface DLL and the OCR engine must be installed. The switch -le lists all available OCR interface DLLs. It does not verify the corresponding OCR engine is installed and can be initialized. The OCR engine is actually accessed when using the switch -ocr.

5.1.22 -lk  Set License Key

```
Set License Key -lk <key>
```

Pass a license key to the application at runtime instead of using one that is installed on the system.

```
img2pdf -lk X-XXXXX-XXXXX-XXXXX-XXXXX-XXXXX-XXXXX ...
```

This is required in an OEM scenario only.

5.1.23 -o  Owner Password

```
Owner Password -o <owner>
```

The owner password is required to change the security settings of the document. In order to apply permission flags, an owner password must be set. Permission flags are set with the switch -p.

**Example:** Encrypt a document and set the owner password to `<owner>`.

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

5.1.24 -ocb  Convert Images to Bitonal before OCR Recognition

```
Convert Images to Bitonal before OCR Recognition -ocb
```

Specify whether the images should be converted to bi-tonal (black and white) before OCR recognition. Enabling this feature can improve the memory consumption of the OCR process.
5.1.25  -ocbc  Embed barcodes

Embed barcodes  -ocbc

Embed the recognized barcodes in the XMP metadata.

5.1.26  -ocd  Resolution for OCR Recognition

Resolution for OCR Recognition  -ocd  <n>

Resample images to target resolution before they are sent to the OCR engine. If no value is set, images are re-sampled to 300 DPI for OCR, which is the preferred resolution for most OCR engines.

5.1.27  -oci  Do not deskew image

Do not deskew image  -oci

Do not de-skew original image (with -ocs only). This option specifies whether the image and text are de-skewed according to the recognized skew angle.

- With option -oci:
  Do not change skew of images (i.e. do not change appearance of the page). This setting is recommended for born-digital documents.
- Without option -oci:
  Rotate image, such that lines of text are made horizontal. This might change the appearance of the page. This setting is recommended for scanned documents.

5.1.28  -ocl  Set OCR Language

Set OCR Language  -ocl  <languages>

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 11 OCR Engine is English. This switch can only be used if the switch -ocr is set. This setting depends on the OCR engine.

The following switch set the languages to English and German:

```
img2pdf -ocr abbyy11 -ocl "English, German" input.tif output.pdf
```

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

5.1.29  -ocr  Load OCR Engine

Load OCR Engine  -ocr  <name>

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. Abbyy11, 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 -1e. If the switch -ocr is not used, no OCR is applied.

**Example:** The following switch sets the OCR engine to the OCR Service

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

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

### 5.1.30 -ocri Reembed preprocessed image

This option currently requires the -occs to be set.

The OCR engine de-skews and de-noises the input image before recognizing the characters. This option controls whether the 3-Heights™ Image to PDF Converter Shell should use the preprocessed image or keep the original image.

This option has only an effect, if the preprocessed image is provided by the OCR engine, which depends on the type and settings of the engine.

If this option is set, the resulting image may have a different color space, compression and size.

Since this option currently requires -occs, it is recommended only for simple scanned documents.

### 5.1.31 -ocp Set OCR Parameters

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

The following switch sets a predefined profile (i.e. a configuration setting) which is optimized for creating electronic archives with high accuracy:

```
img2pdf -ocr abbyy11 -ocp "PredefinedProfile = DocumentArchiving_Accuracy"
input.tif output.pdf
```

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

### 5.1.32 -occs Correct skew angle

Correct the skew angle of images.

This option has only an effect, if the required information is provided by the OCR engine, which depends on the type and settings of the engine.

This option might change the appearance of the page and is only recommended for simple scanned documents that consist of a single image.
Using the option for digital-born documents may destroy the page layout.

### 5.1.33 -ocs Do Not Re-embed De-skewed Image

<table>
<thead>
<tr>
<th>Do Not Re-embed De-skewed Image</th>
</tr>
</thead>
</table>

The OCR engine de-skews and de-noises the input image before recognizing the characters. This option controls whether the 3-Heights™ Image to PDF Converter Shell should use the de-skewed image or keep the original image.

- **With option -ocs:**
  - Embed the original image (also see option -oci). This setting is recommended for born-digital documents.
- **Without option -ocs:**
  - Embed the de-skewed and de-noised image from the OCR engine. This might change the appearance of the page. This setting is recommended for scanned documents.

### 5.1.34 -oct Threshold Resolution for OCR

<table>
<thead>
<tr>
<th>Threshold Resolution for OCR</th>
</tr>
</thead>
</table>

Only images with a higher resolution than the threshold are re-sampled before OCR. The default is 400 DPI. If set to -1, no re-sampling is applied.

**Example:** Resample all images with a resolution of more than 300 DPI to 300 DPI:

```bash
img2pdf -ocd 300 -oct 1 input.tif output.pdf
```

**Example:** Resample all images with a resolution of 400 DPI or more to 300 DPI (default):

```bash
img2pdf -ocd 300 -oct 400 input.tif output.pdf
```

**Example:** Do not resample:

```bash
img2pdf -oct -1 input.tif output.pdf
```

**Compatibility Note:** Initially this switch was called -ocD and then renamed to -oct to avoid confusions with the switch -ocd.

### 5.1.35 -ocx Export recognized ocr text to file

<table>
<thead>
<tr>
<th>Export recognized ocr text to file</th>
</tr>
</thead>
</table>

Export the retrieved OCR text to a file. This function can only be used in combination with an OCR engine (see -ocr). When an OCR engine is set, the OCR text is always embedded in the resulting PDF document. If this method is used, it is in addition also extracted to a file.

The output format is a table, where rows are separated by a new line and columns are separated by a tabulator. The table contains the following columns:
<table>
<thead>
<tr>
<th>Output column</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Page</td>
<td>Page number</td>
</tr>
<tr>
<td>Image</td>
<td>PDF object number which contains the image</td>
</tr>
<tr>
<td>FontSize</td>
<td>Font size in points</td>
</tr>
<tr>
<td>FontName</td>
<td>Font name, for any barcode font the name is Barcode. This value is only set if the font name is returned by the OCR engine.</td>
</tr>
</tbody>
</table>
| FontFamily    | 1 Serif  
2 SansSerif  
3 Monospaced  
This value is only set if provided by the OCR engine. |
| FontStyles    | 2 Bold  
4Italic  
8 Underline  
16 Strikeout  
This value is only set if provided by the OCR engine. 
Example: 6 = 2 + 4 = Bold + Italic |
| Baseline      | Baseline of the text |
| Left, Top, Right, Bottom | Bounding box of the text in PDF coordinates |
| String        | Recognized text |

**Example:** Write extracted text to the file text.txt.

```
img2pdf -ocr abbyy11 -ocx text.txt input.tif output.pdf
```

### 5.1.36 -oi Set Output Intent

**Set Output Intent** -oi \(\text{profile}\)

The output intent holds the output color profile. Setting the output intent is generally only recommended for images intended for a particular CMYK output device. In other cases, the option `-cs` should be used.

Color profiles are usually provided with the OS. On Windows for example they can be found at `C:\Windows\System32\spool\drivers\color`.

Alternatively profiles can be found here:
- [www.color.org/srgbprofiles.html](http://www.color.org/srgbprofiles.html)
Note: Most color profiles are copyrighted, therefore you should read the license agreements on the above links before using the color profiles.

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

```bash
img2pdf -oi "C:\Windows\system32\spool\drivers\color\USWebCoatedSWOP.icc" input.tif output.pdf
```

### 5.1.37 -or Set Image Orientation

Set Image Orientation `-or <n>`

Set the orientation of the image. Available orientations are:

<table>
<thead>
<tr>
<th>Value</th>
<th>Description</th>
<th>Transformation</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>inherent</td>
<td>Undefined</td>
</tr>
<tr>
<td>1</td>
<td>top-left</td>
<td>Untransformed</td>
</tr>
<tr>
<td>2</td>
<td>top-right</td>
<td>Horizontal flip</td>
</tr>
<tr>
<td>3</td>
<td>bottom-right</td>
<td>Rotation by 180°</td>
</tr>
<tr>
<td>4</td>
<td>bottom-left</td>
<td>Vertical flip</td>
</tr>
<tr>
<td>5</td>
<td>left-top</td>
<td>Rotation by 90° clockwise followed by horizontal flip</td>
</tr>
<tr>
<td>6</td>
<td>right-top</td>
<td>Rotation by 90° clockwise</td>
</tr>
<tr>
<td>7</td>
<td>right-bottom</td>
<td>Rotation by 90° clockwise followed by vertical flip</td>
</tr>
<tr>
<td>8</td>
<td>left-bottom</td>
<td>Rotation by 90° counter-clockwise</td>
</tr>
</tbody>
</table>

### 5.1.38 -ow Optimize for the Web

Optimize for the Web `-ow`

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.

### 5.1.39 -p Permission Flags

Permission Flags `-p <flags>`
This option sets the permission flags. It is only usable when producing encrypted documents. I.e. at least an owner password must be set with `-o`, and additionally a user password can be set with `-u`. When omitting the option `-p` then all permissions are granted. The permissions that can be granted are listed below.

<table>
<thead>
<tr>
<th>Value</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>allow nothing (no permissions are granted)</td>
</tr>
<tr>
<td>4</td>
<td>allow printing (low resolution)</td>
</tr>
<tr>
<td>8</td>
<td>allow changing the document</td>
</tr>
<tr>
<td>16</td>
<td>allow content copying or extraction</td>
</tr>
<tr>
<td>32</td>
<td>allow annotations</td>
</tr>
<tr>
<td>256</td>
<td>allow filling of form fields</td>
</tr>
<tr>
<td>512</td>
<td>support disabilities</td>
</tr>
<tr>
<td>1024</td>
<td>allow document assembly</td>
</tr>
<tr>
<td>2048</td>
<td>allow high quality printing</td>
</tr>
</tbody>
</table>

Any combination of permissions can be granted by adding up their values.

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

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

**Example:** “High quality printing” 2048 requires the standard printing flag 4 to be set too.

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

For further information about the permission flags, see PDF Reference 1.7 Section 3.5.2.

### 5.1.40 -pg Page Range

If not all pages should be printed, the page range can be defined using the switch `-pg`. Use 1 for the first page, use -1 for the last page.

**Example:** Convert the first page only.

```
img2pdf -pg 1 1 input.tif output.pdf
```
### 5.1.41 -q Set Image Quality

<table>
<thead>
<tr>
<th>Set Image Quality</th>
<th>-q &lt;quality&gt;</th>
</tr>
</thead>
</table>

Some image compression algorithms, such as JPEG or JPEG2000 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 80. If the quality is set to 100, JPEG2000 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.jpg output.pdf
```

### 5.1.42 -rw Report decode errors

<table>
<thead>
<tr>
<th>Report decode errors</th>
<th>-rw</th>
</tr>
</thead>
</table>

Return error code if decode errors occur.

### 5.1.43 -sb Set Border Size

<table>
<thead>
<tr>
<th>Set Border Size</th>
<th>-sb &lt;n&gt;</th>
</tr>
</thead>
</table>

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
```

### 5.1.44 -sp Set Page Dimensions

<table>
<thead>
<tr>
<th>Set Page Dimensions</th>
<th>-sp &lt;w&gt; &lt;h&gt;</th>
</tr>
</thead>
</table>

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). Disables option `-a`.

**Example:** Create “Letter” sized PDF pages.
```
img2pdf -sp 612 792 input.tif output.pdf
```
5.1.45  -u  User Password

**User Password  -u <user>**

Set the user password of the document. If a document which has a user password is opened for any purpose (such as viewing, printing, editing), either the user or the owner password must be provided.

Someone who knows the user password is able to open and read the document. Someone who knows the owner password is able to open, read and modify (e.g. change passwords) the document. A PDF document can have none, either, or both passwords.

**Example:** Encrypt a document with a user and an owner password.

```
img2pdf -u userpassword -o ownerpassword input.tif output.pdf
```

5.1.46  -v  Verbose Mode

**Verbose Mode  -v**

This option turns on the verbose mode.

In the verbose mode, additional information during the processing is written to the shell.

5.2 Options for Image to Image

5.2.1  -cb  Bi-tonal Image Compression

**Bi-tonal Image Compression  -cb <compr>**

Set the bi-tonal image compression. Default is 6 (CCITT Fax Group 4). See Compression Types: TIFF Only for possible codecs.

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

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

5.2.2  -cc  Color / Grey Scale Image Compression

**Color / Grey Scale Image Compression  -cc <compr>**

Set the color / grey image compression. Default is 9 (TIFFJPEG). See Compression Types: TIFF Only for possible codecs.

**Example:** Set the compression for color images to JPEG.

```
img2img -cc 1 input.jpg output.tif
```
5.2.3  -ci  Indexed Image Compression

```
Indexed Image Compression  -ci <compr>
```

Set the indexed image compression. Default is 3 (LZW). See Compression Types: TIFF Only for possible codecs.

**Example:** Set the compression for indexed images to Flate.

```
img2img -ci 2 input.tif output.tif
```

5.2.4  -d  Set Resolution

```
Set Resolution  -d <dpi>
```

Set the resolution of the output image in dots per inch (DPI). The width and the height remain constant. If furthermore option -r is set, true_width and true_height are constant, whereas the width and the height are changed. This latter case results in a resampling of the image. For more information about the behavior see Specification of Resolution and Image Dimensions.

**Example:** Set the resolution of output file to 300 DPI and let true_width and true_height be constant.

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

5.2.5  -dd  Set Default Resolution

```
Set Default Resolution  -dd <dpi>
```

Set the default resolution of the input image in dots per inch (DPI). It is only effective in case where the input image has no resolution stated. Default 96 DPI.

**Example:** Set the default resolution of input file to 72 DPI.

```
img2img -dd 72 input.tif output.bmp
```

5.2.6  -fu  Unpack Indexed Images

This switch instructs the converter to unpack images with bits per sample of less than 8 to exactly 8 bits.

5.2.7  -hp  Set Height

```
Set Height  -hp <height>
```

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Set the height in pixels of the output image. The width is calculated respecting proportions. If the width is set too (see `-wp`), the height is omitted. For more information about the behavior see [Specification of Resolution and Image Dimensions](#).

**Example:** Set height of output file to 1800 pixels.

```bash
img2img -hp 1800 input.tif output.bmp
```

### 5.2.8 -ht Set True Height

**Set True Height**

```
-ht <true_height>
```

Set the true_height in mm of output image. The true_width is calculated respecting proportions. If the true_width is set too (see `-wt`), the true_height is omitted. For more information about the behavior see [Specification of Resolution and Image Dimensions](#).

**Example:** Set true_height of output file to 500 mm and let the resolution be constant.

```bash
img2img -ht 500 -r input.bmp output.jpg
```

### 5.2.9 -lk Set License Key

**Set License Key**

```
-lk <key>
```

Pass a license key to the application at runtime instead of using one that is installed on the system.

```
img2pdf -lk X-XXXXX-XXXXX-XXXXX-XXXXX-XXXXX-XXXXX-XXXXX...
```

This is required in an OEM scenario only.

### 5.2.10 -m Merge Input to Multi-Page Output

**Merge Input to Multi-Page Output**

```
-m
```

Merge several input files into one image output file.

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

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

### 5.2.11 -pg Page Range

**Page Range**

```
-pg <first> <last>
```

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If not all pages should be converted, the page range can be defined using the switch `-pg`. Use 1 for the first page, use `-1` for the last page. This switch is not available when merging (see `-m`).

**Example:** Convert the first page only.

```bash
img2img -pg 1 1 input.tif output.tif
```

**Example:** Convert all but the first page to jpg.

```bash
img2img -pg 2 -1 -s input.tif outpu%d.jpg
```

### 5.2.12 -q Set Image Quality

**Set Image Quality** `-q <quality>`

Set the quality index for lossy compression such as JPEG. Allowed values are 1 (lowest) to 100 (highest). Default is 80.

**Example:** Set the image quality to 50.

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

A quality index of 100 means lossless compression if the format supports it (JPEG2000).

### 5.2.13 -r Allow Resampling

**Allow Resampling** `-r`

Forces resampling in situations where only the resolution (see `-d`) or only the true_width/true_height (see `-wt`, `-ht`) is set. For more information about the behavior see Specification of Resolution and Image Dimensions.

**Example:** Set resolution of output to 72 DPI, let true_width and true_height be constant.

```bash
img2img -r -d 72 input.tif output.tif
```

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

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

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

### 5.2.15 -t Transform Colors from CMYK to RGB

**Transform Colors from CMYK to RGB** `-t`
Apply a color conversion and convert CMYK to RGB.

5.2.16 -wp Set Width

**Set Width** -wp `<width>`

Set the width in pixels of the output image. The height is calculated respecting proportions. If the height is set too (see `-hp`), the height is omitted. For more information about the behavior see Specification of Resolution and Image Dimensions.

Example: Set width of output file to 1500 pixels and resolution to 300 DPI.

```bash
img2img -wp 1500 -d 300 input.tif output.bmp
```

5.2.17 -wt Set True Width

**Set True Width** -wt `<true_width>`

Set the true_width in mm of output image. The true_height is calculated respecting proportions. If the true_height is set too (see `-ht`), the true_height is omitted. For more information about the behavior see Specification of Resolution and Image Dimensions.

Example: Set true_width of output file to 500 mm and width to 1000 pixels.

```bash
img2img -wt 500 -wp 1000 input.bmp output.tif
```

5.3 Options for PdfOcr

5.3.1 -le List OCR Engines

**List OCR Engines** -le

OCR engines are accessed through the corresponding OCR interface DLLs. At present interfacing the following engines are supported:

- **Abbyy FineReader 11 OCR Engine**
  This engine is accessed by the OCR interface DLL `pdfocrpluginAbbyy11.ocr`.

- **Abbyy FineReader 10 OCR Engine**
  This engine is accessed by the OCR interface DLL `pdfocrpluginAbbyy10.ocr`.

- **3-Heights™ OCR Service**
  This service is accessed by the OCR interface DLL `pdfocrpluginService.ocr`. The service accesses the Abbyy FineReader 10 or 11 OCR Engine.

The OCR interface DLLs are provided by the 3-Heights™ Image to PDF Converter Shell. The OCR engine is provided as a separate product, such as 3-Heights™ OCR Enterprise Add-On.
Here is an example of listing available OCR engines:

```bash
img2pdf -le
List of available OCR engines:
- abbyy11
- abbyy10
- service
End of list.
```

In order to make use of the OCR engine, the OCR interface DLL and the OCR engine must be installed. The switch `-le` lists all available OCR interface DLLs. It does not verify the corresponding OCR engine is installed and can be initialized. The OCR engine is actually accessed when using the switch `-ocr`.

### 5.3.2 `-lk` Set License Key

```bash
Set License Key -lk <key>
```

Pass a license key to the application at runtime instead of using one that is installed on the system.

```bash
img2pdf -lk X-XXXXX-XXXXX-XXXXX-XXXXX-XXXXX-XXXXX ...
```

This is required in an OEM scenario only.

### 5.3.3 `-o` Owner Password

```bash
Owner Password -o <owner>
```

The owner password is required to change the security settings of the document. In order to apply permission flags, an owner password must be set. Permission flags are set with the switch `-p`.

**Example:** Encrypt a document and set the owner password to `<owner>`.

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

### 5.3.4 `-oca` Rotate the image to the detected angle

```bash
Rotate the image to the detected angle -oca
```

The OCR engine may detect that an image needs to be rotated in order to have the text in an up-right position. If this is the case and this switch is used then the original image is replaced by the rotated image.

### 5.3.5 `-ocb` Convert Images to Bitonal before OCR Recognition

```bash
Convert Images to Bitonal before OCR Recognition -ocb
```

Specify whether the images should be converted to bi-tonal (black and white) before OCR recognition. Enabling this feature can improve the memory consumption of the OCR process.
5.3.6  -ocbc  Embed barcodes

Embed barcodes -ocbc

Embed the recognized barcodes in the XMP metadata.

5.3.7  -occs  Correct skew angle

Correct skew angle -occs

Correct the skew angle of images.
This option has only an effect, if the required information is provided by the OCR engine, which depends on the type and settings of the engine.
This option might change the appearance of the page and is only recommended for simple scanned documents that consist of a single image.
Using the option for digital-born documents may destroy the page layout.

5.3.8  -ocd  Resolution for OCR Recognition

Resolution for OCR Recognition -ocd <n>

Resample images to target resolution before they are sent to the OCR engine. If no value is set, images are re-sampled to 300 DPI for OCR, which is the preferred resolution for most OCR engines.

5.3.9  -oci  Do not deskew image

Do not deskew image -oci

Do not de-skew original image (with -ocs only). This option specifies whether the image and text are de-skewed according to the recognized skew angle.

- With option -oci:
  Do not change skew of images (i.e. do not change appearance of the page). This setting is recommended for born-digital documents.
- Without option -oci:
  Rotate image, such that lines of text are made horizontal. This might change the appearance of the page. This setting is recommended for scanned documents.

5.3.10 -ocl  Set OCR Language

Set OCR Language -ocl <languages>

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 11 OCR Engine is English. This switch can only be used if the switch -ocr is set. This setting depends on the OCR engine.
The following switch set the languages to English and German:
5.3.11  **-ocm  OCR mode**

Specify behavior of the 3-Heights™ Image to PDF Converter Shell for files with existing OCR text. Available OCR modes are the following:

1. Only perform OCR for images without existing OCR text (default).
2. If OCR engine is active, remove old OCR text and perform OCR for all images. Hence, existing OCR text is not removed if OCR engine is not active.
3. Only perform OCR if input file contains no text.

**Example:** Set OCR mode 2

```
img2pdf -ocr abbyy11 -ocm 2 input.tif output.pdf
```

5.3.12  **-ocp  Set OCR Parameters**

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

The following switch sets a predefined profile (i.e. a configuration setting) which is optimized for creating electronic archives with high accuracy:

```
img2pdf -ocr abbyy11 -ocp "PredefinedProfile = DocumentArchiving_Accuracy"
input.tif output.pdf
```

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

5.3.13  **-ocr  Load 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. Abbyy11, 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: The following switch sets the OCR engine to the OCR Service

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

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

### 5.3.14 -ocri Reembed preprocessed image

<table>
<thead>
<tr>
<th>Reembed preprocessed image -ocri</th>
</tr>
</thead>
</table>

This option currently requires the `-occs` to be set.

The OCR engine de-skews and de-noises the input image before recognizing the characters. This option controls whether the 3-Heights™ Image to PDF Converter Shell should use the preprocessed image or keep the original image.

This option has only an effect, if the preprocessed image is provided by the OCR engine, which depends on the type and settings of the engine.

If this option is set, the resulting image may have a different color space, compression and size.

Since this option currently requires `-occs`, it is recommended only for simple scanned documents.

### 5.3.15 -ocs Do Not Re-embed De-skewed Image

<table>
<thead>
<tr>
<th>Do Not Re-embed De-skewed Image -ocs</th>
</tr>
</thead>
</table>

The OCR engine de-skews and de-noises the input image before recognizing the characters. This option controls whether the 3-Heights™ Image to PDF Converter Shell should use the de-skewed image or keep the original image.

- With option `-ocs`:
  Embed the original image (also see option `-oci`). This setting is recommended for born-digital documents.

- Without option `-ocs`:
  Embed the de-skewed and de-noised image from the OCR engine. This might change the appearance of the page. This setting is recommended for scanned documents.

### 5.3.16 -oct Threshold Resolution for OCR

<table>
<thead>
<tr>
<th>Threshold Resolution for OCR -oct &lt;n&gt;</th>
</tr>
</thead>
</table>

Only images with a higher resolution than the threshold are re-sampled before OCR. The default is 400 DPI. If set to `-1`, no re-sampling is applied.

**Example:** Resample all images with a resolution of more than 300 DPI to 300 DPI:

```
img2pdf -ocd 300 -oct 1 input.tif output.pdf
```

**Example:** Resample all images with a resolution of 400 DPI or more to 300 DPI (default):

```
img2pdf -ocd 300 -oct 400 input.tif output.pdf
```
Example: Do not resample:

```bash
img2pdf -oct -1 input.tif output.pdf
```

Compatibility Note: Initially this switch was called `-oCD` and then renamed to `-oct` to avoid confusions with the switch `-ocd`.

### 5.3.17 -p Permission Flags

This option sets the permission flags. It is only usable when producing encrypted documents. I.e. at least an owner password must be set with `-o`, and additionally a user password can be set with `-u`. When omitting the option `-p` then all permissions are granted. The permissions that can be granted are listed below.

<table>
<thead>
<tr>
<th>Value</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>allow nothing (no permissions are granted)</td>
</tr>
<tr>
<td>4</td>
<td>allow printing (low resolution)</td>
</tr>
<tr>
<td>8</td>
<td>allow changing the document</td>
</tr>
<tr>
<td>16</td>
<td>allow content copying or extraction</td>
</tr>
<tr>
<td>32</td>
<td>allow annotations</td>
</tr>
<tr>
<td>256</td>
<td>allow filling of form fields</td>
</tr>
<tr>
<td>512</td>
<td>support disabilities</td>
</tr>
<tr>
<td>1024</td>
<td>allow document assembly</td>
</tr>
<tr>
<td>2048</td>
<td>allow high quality printing</td>
</tr>
</tbody>
</table>

Any combination of permissions can be granted by adding up their values.

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

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

Example: “High quality printing” 2048 requires the standard printing flag 4 to be set too.

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

For further information about the permission flags, see PDF Reference 1.7 Section 3.5.2.
5.3.18  -pw  Read an Encrypted PDF File

Read an Encrypted PDF File  -pw  <password>

A PDF document that has a user password (the password to open the document) can only be processed when either the user or the owner password is provided. The password can be provided using the option -pw followed by the password.

Example:  The input PDF document is encrypted with a user password. Either the user or the owner password of the input PDF is “mypassword”. The command to process such an encrypted file is:

    img2pdf -pw mypassword input.pdf output.pdf

When a PDF is encrypted with a user password and the password is not provided or is incorrect, the 3-Heights™ Image to PDF Converter Shell cannot read and process the file. Instead it will generate the following error message:

    Password wasn’t correct.

5.3.19  -u  User Password

User Password  -u  <user>

Set the user password of the document. If a document which has a user password is opened for any purpose (such as viewing, printing, editing), either the user or the owner password must be provided.

Someone who knows the user password is able to open and read the document. Someone who knows the owner password is able to open, read and modify (e.g. change passwords) the document. A PDF document can have none, either, or both passwords.

Example:  Encrypt a document with a user and an owner password.

    img2pdf -u userpassword -o ownerpassword input.tif output.pdf

5.3.20  -v  Verbose Mode

Verbose Mode  -v

This option turns on the verbose mode.

In the verbose mode, additional information during the processing is written to the shell.

5.4  Supported Image Extensions

The following extensions are supported:
### Supported Image Extensions Table

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

### 5.5 Compression Types

The following compression types can be set.

<table>
<thead>
<tr>
<th>Value</th>
<th>Compression</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>raw</td>
</tr>
<tr>
<td>1</td>
<td>JPEG</td>
</tr>
<tr>
<td>2</td>
<td>Flate (ZIP)</td>
</tr>
<tr>
<td>3</td>
<td>LZW</td>
</tr>
<tr>
<td>4</td>
<td>CCITT Fax Group 3</td>
</tr>
<tr>
<td>5</td>
<td>CCITT Fax Group 3 2D</td>
</tr>
<tr>
<td>6</td>
<td>CCITT Fax Group 4</td>
</tr>
<tr>
<td>7</td>
<td>JBIG2 (Supported in PDF 1.4 or later)</td>
</tr>
<tr>
<td>8</td>
<td>JPEG2000 (Supported in PDF 1.5 or later, not supported in PDF/A-1)</td>
</tr>
</tbody>
</table>

### 5.6 Compression Types: TIFF Only

The following compression types can be set for converting TIFF files.
<table>
<thead>
<tr>
<th>Value</th>
<th>Compression</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>raw</td>
</tr>
<tr>
<td>1</td>
<td>JPEG</td>
</tr>
<tr>
<td>2</td>
<td>Flate (ZIP)</td>
</tr>
<tr>
<td>3</td>
<td>LZW</td>
</tr>
<tr>
<td>4</td>
<td>CCITT Fax Group3</td>
</tr>
<tr>
<td>5</td>
<td>CCITT Fax Group3 2D</td>
</tr>
<tr>
<td>6</td>
<td>CCITT Fax Group 4</td>
</tr>
<tr>
<td>9</td>
<td>CCITT TIFFJPEG</td>
</tr>
</tbody>
</table>

Compression types 7 (Jbig) and 8 (JPEG2000) are not applicable for TIFF.

### 5.7 Specification of Resolution and Image Dimensions

The three image dimensions (resolution, true_width and width) depend on each other. They have to satisfy the following relation (the same is true for the height and the true_height):

\[
\text{resolution} = \frac{\text{width}}{\text{true_width}}.
\]

If the width (see `-wp`) and the height (see `-hp`) are set at the same time, the height is omitted due to priority of width. Equivalently, true_width has priority to true_height. All transformations are done respecting image proportions.

The option `-r` (allow_resampling) can be used to force in certain situations to perform a resampling. The table below enlists the possible parameter combinations and shows the behavior of the Image to Image Converter Shell.

<table>
<thead>
<tr>
<th>Options</th>
<th>Properties of Output Image</th>
</tr>
</thead>
<tbody>
<tr>
<td>-d</td>
<td>-wp/-hp -wt/ht -r</td>
</tr>
<tr>
<td>not set</td>
<td>not set not set set/not set</td>
</tr>
<tr>
<td>not set</td>
<td>set not set set/not set</td>
</tr>
<tr>
<td>not set</td>
<td>set set not set set/not set</td>
</tr>
<tr>
<td>not set</td>
<td>not set set set</td>
</tr>
<tr>
<td>not set</td>
<td>not set set not set</td>
</tr>
<tr>
<td>set</td>
<td>not set not set set</td>
</tr>
<tr>
<td>set</td>
<td>not set</td>
</tr>
<tr>
<td>-----</td>
<td>--------</td>
</tr>
<tr>
<td>set</td>
<td>set</td>
</tr>
<tr>
<td>set</td>
<td>not set</td>
</tr>
<tr>
<td>set</td>
<td>set</td>
</tr>
</tbody>
</table>
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>
<thead>
<tr>
<th>Error Code</th>
<th>Meaning</th>
<th>Possible Messages</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>Success</td>
<td>No return string</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Return usage</td>
</tr>
<tr>
<td>1</td>
<td>Input File could not be opened or invalid</td>
<td>&quot;Couldn't open control file&quot;</td>
</tr>
<tr>
<td></td>
<td>parameters</td>
<td>&quot;Too many parameters&quot;</td>
</tr>
<tr>
<td></td>
<td></td>
<td>&quot;Couldn't import image file %s.&quot;</td>
</tr>
<tr>
<td>2</td>
<td>The PDF Output File could not be written.</td>
<td>&quot;Couldn't create output file %s&quot;</td>
</tr>
<tr>
<td>3</td>
<td>Option error</td>
<td>&quot;Key/value pair %s doesn't contain a ']='&quot;</td>
</tr>
<tr>
<td></td>
<td></td>
<td>&quot;Invalid option %s.&quot;</td>
</tr>
<tr>
<td>4</td>
<td>OCR error</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Decode errors</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>License error</td>
<td></td>
</tr>
<tr>
<td>none</td>
<td>Information (stdout)</td>
<td>&quot;Done.&quot;</td>
</tr>
<tr>
<td></td>
<td></td>
<td>&quot;Converting file %s(%d)&quot;</td>
</tr>
</tbody>
</table>

In the above table, %s is the corresponding parameter name (file name or option) and %d a page counter.

6.2 Image to Image Converter

<table>
<thead>
<tr>
<th>Error Code</th>
<th>Meaning</th>
<th>Possible Messages</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>Success</td>
<td>No return string</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Return usage</td>
</tr>
</tbody>
</table>
### Table: Return Codes Image to PDF Converter

<table>
<thead>
<tr>
<th>Value</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>Success.</td>
</tr>
<tr>
<td>1</td>
<td>Couldn't open input file.</td>
</tr>
<tr>
<td>2</td>
<td>PDF output file could not be created.</td>
</tr>
<tr>
<td>4</td>
<td>OCR engine error.</td>
</tr>
<tr>
<td>5</td>
<td>OCR parameter error.</td>
</tr>
<tr>
<td>6</td>
<td>OCR error.</td>
</tr>
<tr>
<td>10</td>
<td>License error, e.g. invalid license key.</td>
</tr>
</tbody>
</table>

In the above table, %s is the corresponding parameter name (file name or option) and %d a page counter.

### 6.3 PdfOcr

All return codes other than 0 indicate an error in the processing.

---

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7 Version History

7.1 Changes in Version 6
- Improved search algorithm for installed fonts: User fonts under Windows are now also taken into account.

7.2 Changes in Version 5

7.3 Changes in Version 4.12
- New OCR plugin "abyy12" for the ABBYY FineReader 12 engine.
- Improved reading and recovery of corrupt TIFF images.
- New HTTP proxy setting in the GUI license manager.

Shell img2pdf
- Changed behavior, option set page dimension - sp disables option adjust page - a.

7.4 Changes in Version 4.11
- New support for reading and writing PDF 2.0 documents.
- Improved font subsetting of CFF and OpenType fonts.
- Improved repair of corrupt image streams.

7.5 Changes in Version 4.10

Shell img2pdf
- New option -ao: Adjust page orientation.

Shell img2img
- New option -pg first last: If not all pages should be converted, the page range can be defined explicitly.

7.6 Changes in Version 4.9
- Improved metadata generation for standard PDF properties.
- New option -h: Set the dithering algorithm.
- New option -b: Set the color depth. Available: Bi-tonal: 1. When using 1 bit per pixel, it is suggested to set a suitable dithering algorithm.
7.7 Changes in Version 4.8

Shell img2img

- **New** option `-hp` to set the height of the image in pixel.
- **New** option `-ht` to set the true height of the image in mm.
- **New** option `-wp` to set the width of the image in pixel.
- **New** option `-wt` to set the true width of the image in mm.
- **New** option `-r` to force resampling.
- **New** option `-dd` to set the resolution of input image, if input image has none.
- **Changed** option `-d`, no resampling performed when set only.
- **Deprecated** option `-h`, use now `-hp`.
- **Deprecated** option `-w`, use now `-wp`. 
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