3-Heights™
Image to PDF Converter Service

Version 6.6.0
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1 Introduction

1.1 Description

The 3-Heights™ Image to PDF Converter Service 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 Service 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
- 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

### 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)
- 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 Service

The 3-Heights™ Image to PDF Converter Service is a ready-to-use product that allows to install a Windows NT service process to automatically convert various types of images from watched folders into PDF files. Image to PDF Converter Service combines three programs in one executable.

1. A converting service that can be run on Windows platforms. The service can be started, paused, stopped via the Windows service control panel and reports to the application log of the Windows event log panel.
2. A command line interface to control the Image to PDF Converter Service. By means of this interface the service can be installed, started, stopped and deleted.
3. A converter query program which can be used to retrieve information about available conversion options such as file type, compression, dithering, color depths, etc.

1.4 Operating Systems

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

- Windows Client 7+ | x86 and x64

‘+’ indicates the minimum supported version.
2 Installation

2.1 Overview

The Image to PDF Converter Service is configured by the file `Img2PdfSvr.ini`, which needs to be located in the same directory as the executable `Img2PdfSvr.exe`. Before starting the service, the configuration file needs to be adjusted. How this is done is described in the chapter [Configuration File Img2PdfSvr.ini](#).

Once configured, the service can be created, started, paused, continued, stopped and deleted via the command line. To use the create and delete functions, administrator permissions are required. To start and stop the service, operator permissions are required.

When the service is running, it processes PDF documents that are copied or moved into watched folders. They are then renamed and moved to the folder Jobs. The renaming gives the PDF a 16 character long Time-stamp to create unique job tickets. This ensures there are no conflicts with documents that have the same name.

2.2 Windows

The 3-Heights™ Image to PDF Converter Service comes 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](http://www.pdf-tools.com). Select the product “Image to PDF Converter Service”. 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.
   
   The product comes as an MSI (Microsoft Installer) package that provides an installation routine for installing and uninstalling the 3-Heights™ Image to PDF Converter Service.
   
   The package installs the 64-bit version, which runs on 64-bit platforms only.
3. Start the MSI package and follow the steps in the installation routine.
4. Ensure the cache directory exists as described in chapter [Special Directories](#).
5. Make sure your platform meets the requirements regarding fonts described in chapter [Fonts](#).
6. (Optional) Download and install the 3-Heights™ OCR Enterprise Add-On and the OCR Engine as described in the respective manuals:
   - 3-Heights™ OCR Add-On for ABBYY FineReader Engine v10: [OcrAbbyy10.pdf](#)
   - 3-Heights™ OCR Add-On for ABBYY FineReader Engine v11: [OcrAbbyy11.pdf](#)
   - 3-Heights™ OCR Add-On for ABBYY FineReader Engine v12: [OcrAbbyy12.pdf](#)
   - 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 Service... → Uninstall...

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 Service.

### 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\directory Icc`, which must be a direct sub-directory of where the Img2PdfSvr.exe resides.

### 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\directory Icc\`. 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.

#### 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 Service. 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 Service 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.

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`

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`
3. `\Fonts`, which must be a direct sub-directory of where `Img2PdfSvr.exe` resides.
3 License Management

The 3-Heights™ Image to PDF Converter Service requires a valid license in order to run correctly. If no license key is set or the license is not valid, then an error message will be printed to the service log.

3.1 License Installation and Management

There are two possibilities to pass the license key to the application:

1. The license key is installed using the GUI tool (graphical user interface). This is the easiest way if the licenses are managed manually. It is only available on Windows.
2. The license key is installed using the shell tool. This is the preferred solution for automated license management.

3.1.1 Graphical License Manager Tool

The GUI tool LicenseManager.exe is located in the bin directory of the product kit (Windows only).

### List all installed license keys

The license manager always shows a list of all installed license keys in the left pane of the window. This includes licenses of other PDF Tools products. The user can choose between:

- Licenses available for all users. Administrator rights are needed for modifications.
- Licenses available for the current user only.

### Add and delete license keys

License keys can be added or deleted with the “Add Key” and “Delete” buttons in the toolbar.

- The “Add key” button installs the license key into the currently selected list.

  **Note:** Services run by default under the LOCAL SERVICE user, not under the current user.

- The “Delete” button deletes the currently selected license keys.
Display the properties of a license

If a license is selected in the license list, its properties are displayed in the right pane of the window.

3.1.2 Command Line License Manager Tool

The command line license manager tool licmgr is available in the bin\x86 and bin\x64 directory.

**Note:** The command line tool licmgr is not included in Windows platform kits, as the GUI tool is the recommended tool for managing licenses. A Windows licmgr shelltool is available in the Utilities & Tools section of your My PDF Tools customer account.

A complete description of all commands and options can be obtained by running the program without parameters:

```licmgr```

**List all installed license keys**

```licmgr list```

The currently active license for a specific product is marked with a * on the left side.

**Example:**

```>licmgr list
Local machine:
  Product Name:
    1-XXXXX-XXXXX-XXXXX-XXXXX-XXXXX-XXXXX-XXXXX
    1-YYYYY-YYYYY-YYYYY-YYYYY-YYYYY-YYYYY-YYYYY
    * 1-ZZZZZ-ZZZZZ-ZZZZZ-ZZZZZ-ZZZZZ-ZZZZZ-ZZZZZ
Current user:```

**Add and delete license keys**

Install new license key:

```licmgr store 1-XXXXX-XXXXX-XXXXX-XXXXX-XXXXX-XXXXX-XXXXX-XXXXX```

Delete old license key:

```licmgr delete 1-XXXXX-XXXXX-XXXXX-XXXXX-XXXXX-XXXXX-XXXXX-XXXXX```

Both commands have the optional argument `-s` that defines the scope of the action:

- `g` For all users
- `u` Current user
Display the properties of a license

licmgr info 1-XXXXX-XXXXX-XXXXX-XXXXX-XXXXX-XXXXX-XXXXX

Properties that invalidate the license are marked with an X, properties that require attention are marked with an !. In that case an additional line with a comment is displayed.

Example:

```plaintext
>licmgr info 1-XXXXX-XXXXX-XXXXX-XXXXX-XXXXX-XXXXX-XXXXX
- Key: 1-XXXXX-XXXXX-XXXXX-XXXXX-XXXXX-XXXXX-XXXXX
- Product: Product Name
- Features: Feature1,Feature2
- Intended use: Development
- Watermark: No
- Platform: Windows
- Installation: Yes
! Activation: 2018-05-07
  (The license has not yet been activated.)
- Expiration: Does not expire
- Maintenance: 2019-04-27
```

### 3.2 License Selection and Precedence

#### 3.2.1 Selection

If multiple keys for the same product are installed in the same scope, only one of them can be active at the same time.

Installed keys that are not selected are not considered by the software!

**In the Graphical User Interface** use the check box on the left side of the license key to mark a license as selected.

**With the Command Line Interface** use the select subcommand:

```plaintext
licmgr select 1-XXXXX-XXXXX-XXXXX-XXXXX-XXXXX-XXXXX-XXXXX
```

#### 3.2.2 Precedence

License keys are considered in the following order:

1. License selected for the current user
2. License selected for the current user (*legacy key format*)
3. License selected for all users
4. License selected for all users ([legacy key format](#))

The first matching license is used, regardless whether it is valid or not.

### 3.3 Key Update

If a license property like the maintenance expiration date changes, the key can be update directly in the license manager.

**In the Graphical User Interface** select the license and press the button "Update Key" in the toolbar:

![License Manager Interface](image)

**With the Command Line Interface** use the update subcommand:

```
licmgr update 1-XXXXX-XXXXX-XXXXX-XXXXX-XXXXX-XXXXX-XXXXX
```

### 3.4 License activation

New licenses keys have to be activated (except for OEM licenses).

**Note:** Licenses that need activation have to be installed in the license manager and must not be passed to the component at runtime.

The license activation is tied to a specific computer. If the license is installed at user scope, the activation is also tied to that specific user. The same license key can be activated multiple times, if the license quantity is larger than 1.

Every license key includes a date, after which the license has to be activated, which is typically 10 days after the issuing date of the key. Prior to this date, the key can be used without activation and without any restrictions.

#### 3.4.1 Activation

The License can be activated directly within the license manager. Every activation increases the activation count of the license by 1.

It is recommended to add a comment to the activation request which helps keeping track of all activations for a specific license key. In case of problems it also helps us providing support.

The comment is stored in the activation database as long as the license key remains activated. Upon deactivation it is deleted from the database immediately.

All activations and the corresponding comments can be examined using the **Load online properties** function of the license manager. The information is accessible to anyone with access to the license key.

**In the Graphical User Interface** select the license and press the button "Activate license" in the toolbar:
It is recommended to add a comment to the activation request by using the subsequent dialog box.

**With the Command Line Interface** use the activate subcommand:

```
licmgr activate 1-XXXXX-XXXXX-XXXXX-XXXXX-XXXXX-XXXXX-XXXXX
```

Note that the key has to be installed first.

It is recommended to add a comment to the activation request by using the `-c` or `-cd` option:

```
licmgr activate -cd 1-XXXXX-XXXXX-XXXXX-XXXXX-XXXXX-XXXXX-XXXXX
licmgr activate -c "custom comment" 1-XXXXX-XXXXX-XXXXX-XXXXX-XXXXX-XXXXX-XXXXX
```

### 3.4.2 Reactivation

The activation is tied to specific properties of the computer like the MAC address or host name. If one of these properties changes, the activation becomes invalid and the license has to be reactivated. A reactivation does not increase the activation count on the license.

The process for reactivation is the same as for the activation.

**In the Graphical User Interface** the button “Activate license” changes to “Reactivate license”:

With the Command Line Interface the subcommand activate is used again:

```
licmgr activate 1-XXXXX-XXXXX-XXXXX-XXXXX-XXXXX-XXXXX-XXXXX
```

### 3.4.3 Deactivation

To move a license to a different computer, it has to be deactivated first. Deactivation decreases the activation count of the license by 1.

The process for deactivation is similar to the activation process.

**In the Graphical User Interface** select the license and press the button “Deactivate license” in the toolbar:

With the Command Line Interface use the deactivate subcommand:
3.5 Proxy Setting

A proxy URL can be configured for computers that cannot access the internet without a web proxy.

**Note:** The proxy must allow connections via HTTP CONNECT to the server www.pdf-tools.com:443.

**In the Graphical User Interface** press the button “Settings” in the toolbar:

![Settings button in the toolbar](image)

and enter the proxy URL in the respective field:

![Settings window with proxy URL](image)

3.6 Offline Usage

The following actions in the license manager need access to the internet:

- License Activation
- License Reactivation
- License Deactivation
- Key Update

On systems without internet access, a three step process can be used instead, using a form on the PDF Tools website.

3.6.1 First Step: Create a Request File

**In the Graphical User Interface** select the license and use the dropdown menu on the right side of the button in the toolbar:

![Dropdown menu in the toolbar](image)

**With the Command Line Interface** use the `-fs` option to specify the destination path of the request file:
License Deactivation: When saving the deactivation request file, the license is **deactivated immediately** and cannot be used any further. It can however only be activated again after completing the deactivation on the website.

### 3.6.2 Second Step: Use Form on Website


Upon success, the response will be downloaded automatically if necessary.

### 3.6.3 Third Step: Apply the Response File

**In the Graphical User Interface** select the license and use the dropdown menu on right side of the button in the toolbar:

**With the Command Line Interface** use the `-fl` option to specify the source path of the response file:

```
licmgr activate -fs activation_request.bin 1-XXXXX-XXXXX-XXXXX-XXXXX-XXXXX-XXXXX-XXXXX
```

### 3.7 License Key Versions

As of 2018 all new keys will have the format `1-XXXXX-XXXXX-XXXXX-XXXXX-XXXXX-XXXXX-XXXXX`. Legacy keys with the old format `0-XXXXX-XXXXX-XXXXX-XXXXX-XXXXX-XXXXX-XXXXX` are still accepted for a limited time period.

For compatibility reasons, old and new version keys can be installed side by side and one key of each version can be selected at the same time. In that case, the software always uses the new version.
3.8 License Key Storage

Depending on the platform the license management system uses different stores for the license keys.

3.8.1 Windows

The license keys are stored in the registry:
- \"HKLM\Software\PDF Tools AG\" (for all users)
- \"HKCU\Software\PDF Tools AG\" (for the current user)

3.9 Troubleshooting

3.9.1 License key cannot be installed

The license key cannot be installed in the license manager application. The error message is: "Invalid license format."

Possible causes:
- The license manager application is an older version that only supports the legacy key format.

Solution
Use a current version of the license manager application or use a license key in the legacy key format if available.

3.9.2 License is not visible in license manager

The license key was successfully installed previously but is not visible in the license manager anymore. The software is still working correctly.

Possible causes:
- The license manager application is an older version that only supports the legacy key format.

Solution
Use a current version of the license manager application.

3.9.3 License is not found at runtime

The license is not found at runtime by the software. The error message is: "No license key was set."

Possible causes:
- The license key is actually missing (not installed).
- The license key is installed but not selected in the license manager.
The application is an older version that only supports the legacy key format, while the license key has the new license format.
The software was not restarted after registering the license.

Solution
Install and select a valid license key that is compatible with the installed version of the software or use a newer version of the software. The new license key format is supported starting with version 4.10.26.1 For compatibility reasons, one license key of each format can be selected at the same time.

3.9.4 Eval watermark is displayed where it should not

The software prints an evaluation watermark onto the output document, even if the installed license is a productive one.

Possible causes:
- There is an evaluation license key selected for the current user, that takes precedence over the key for all users.

Note: The software might be run under a different user than the license manager application.

- An evaluation license key that is passed at runtime takes precedence over those selected in the license manager.
- There is an evaluation license key selected with a newer license format that takes precedence over the key in the older format.
- The software was not restarted after changing the license key from an evaluation key to a productive one.

Solution
Disable or remove all evaluation license in all scopes, check that no evaluation key is passed at runtime and restart the software.

3.9.5 Activation is not recognized

The license is installed and activated in the license manager, but the software does not recognize it as activated.
The error message is: "The license has not been activated."

Possible causes:
- There is an unregistered license key selected for the current user, that takes precedence over the key for all users. This leads to an error even if the same license is registered for all users.

Note: The software might be run under a different user than the license manager application.

- A license key that is passed at runtime takes precedence over those selected in the license manager. This leads to an error even if the same license is registered in the license manager.
The software was not restarted after activating the license.

Solution
Disable, remove or activate all unregistered licenses in all scopes, check that no key is passed at runtime and restart the software.

### 3.9.6 Activation is invalidated too often

The license activation is invalidated regularly, for no obvious reason.

Possible causes:
- One of the properties used to calculate the system fingerprint is changing frequently.

Solution
Update to a newer version of the PDF Tools product, deactivate the license key using the new license manager and activate it again. After that, an improved fingerprinting algorithm is used. Deactivation and activation have to be executed separately, a reactivation of the license in one step does not change the fingerprinting algorithm and thus does not solve the problem.

Note: After this procedure, older products might not recognize the activation as valid anymore. Reactivating the license using an old license manager will revert the activation to the old fingerprinting algorithm.

### 3.9.7 Connection to the licensing service fails

The license activation/deactivation/update fails because the license manager cannot reach the licensing server. The error message depends on the platform and the exact error condition.

Possible causes:
- The computer is not connected to the internet.
- The connection is blocked by a corporate firewall.

Solution
Make sure that the computer is connected to the internet and that the host `www.pdf-tools.com` is reachable on port 443 (HTTPS).
If this is not possible, try Offline Usage instead.

### 3.9.8 Offline usage fails due to a request/response mismatch

The offline license activation/deactivation/update fails because the response file does not match the request file.
The error message is: "Mismatch between request and response."

Possible causes:
- The response file is applied to a different machine than the request file was created.
- The response file as applied to a different user than the request file was created.
- The response file was applied to a specific user while the request was created for all users, or vice versa.
- The response file is applied to the wrong license key.
- Another request file has been created between creating the request file and applying the response file.
- The license key was updated between creating the request file and applying the response file.
- The license key was removed and re-added between creating the request file and applying the response file.

Solution
Delete any old request and response files to make sure they are not used by accident.
Retry the entire process as outlined in chapter 3.6 and refrain from making any other license-related actions between creating the request file and applying the response file.
Make sure that the response file is applied to exactly the same license key in exactly the same location (machine, all users or specific user) where the request file was created.
4 Getting Started

4.1 Configuration

Before starting the Image to PDF Converter Service for the first time, the file `Img2PdfSvr.ini` needs to be modified. Editing this file while the Image to PDF Converter Service is running has no impact. The service first needs to be stopped and restarted after the modification. When opening this file with a text editor, it looks like this:

```
[Img2PdfSvr]
AutoDelete=True
Threads=1
Thread1=-w C:\Img2PdfSvr
```

The meaning of these keys and values in this example is as follows:

- **AutoDelete=True**  This option automatically deletes a PDF file after it is processed successfully. When set to `False`, the processed file will be copied to the sub directory `Succeeded`.

- **Threads=**  The given value stands for the total number of concurrent threads. Each thread can have its own assigned settings. One thread corresponds to one watched folder.

- **Thread1=-w C:\Img2PdfSvr**  (required) Creates a watched folder with the given name for this thread. The path must be an absolute path. Network mapped drive letters or relative paths or driver letters mapped via the `subst` command are not recognized, because the service process per default runs under the “LocalSystem” account. (The user can be changed as described in chapter Managing the Service.)

This means that any image file that is moved or copied to the folder `C:\Img2PdfSvr` will be processed by the service and converted to a PDF document.

**Note:** Any string, such as a file name, that contains spaces must be enclosed in quotation marks. E.g. if the watched folder contains spaces in its path, the entire path needs to be quoted: `-w "C:\A path\with spaces"`.

4.1.1 Retrieve Information about Available Options and Settings

A quick overview over all configuration options and service control commands that the 3-Heights™ Image to PDF Converter Service supports can be output in the form of a usage message on the command line.

To display this information, first open a Windows command line (`cmd.exe`) and then type:

```
Img2PdfSvr
```

(See also Service Control Commands.)

A short overview over all the options that can be configured in the `Img2PdfSvr.ini` is displayed when typing the following in a Windows command line:

```
Img2PdfSvr -i
```
4.2 Managing the Service

Once the configuration is done, the service can be started and controlled by executing `Img2PdfSvr.exe` on the command line. The path can be omitted if the `Img2PdfSvr.exe` is included in the `%PATH%` environment variable.

**Note:** It is essential that the executable `Img2PdfSvr.exe` and the configuration file `Img2PdfSvr.ini` be on a non-mapped drive.

**Note:** To create or delete the service, administrator permissions are required.

1. To create the service, use the option `-c`.

```
Img2PdfSvr -c
```

After executing this command, the service is created. It is now visible in the “Computer Management” window under “Services”. To open the “Computer Management” window, go to Start → Control Panel → Administrative Tools → Computer Management or simply right-click the icon “My Computer” on the desktop and select “manage”. If the services was created correctly it appears as “3-Heights™ Image to PDF Converter Service” as shown in the image below.

2. By default, the 3-Heights™ Image to PDF Converter Service runs in the “LocalSystem” account. After the service has been created, the user can be changed. This will be required in a situation where a network share is used as a watched folder and the process needs to run under a user with the appropriate access permission rights, since the account “LocalSystem” does not have any permissions on remote systems.

To change the user, right-click the service in the Services window and select “Properties”. Then change the user in the tab “Log On”.

3. After its creation, the service can be started with the option `-s`.

```
Img2PdfSvr -s
```

4. Now the 3-Heights™ Image to PDF Converter Service is up and running, and files can be moved, copied or drag-and-dropped into the watched folder.
5. To stop the service, use the option `-t`.

```
Img2PdfSvr -t
```

To restart use `-s` again.
6. To delete the service use the option `-d`.

```
Img2PdfSvr -d
```

### 4.2.1 State Diagram of the Service

The 3-Heights™ Image to PDF Converter Service behaves as described in the state diagram below:

- If “Stop” is called when the service is in the state “Paused”, the current job is aborted. This means the current page is finished processing, then the job is terminated.
- If “Stop” is called when the service is in the state “Running”, the current job (all pages) is finished. Then the service is stopped.

---

### 4.3 Using the Service

Once the service is created and started, the watched folders configured in `Img2PdfSvr.ini` are created automatically. In each watched folder, the following sub-folders are created:

- Jobs
- InProgress
Succeeded
Failed
PDFs (for the Img2PdfSvr.)
Images (for the Img2ImgSvr.)
Logs

When a file is moved, copied, or drag-and-dropped into the configured watched folder, the service will do the following:

1. Each file is moved to the sub folder Jobs. While moving, the file is renamed by adding a 16 character long job-number prefix. This ensures a well defined processing order and unique file names.
2. A worker-thread takes the file from the folder Jobs and moves it to InProgress. The file is then processed.
3. Depending on the outcome of the processing, the following is done:

   **The file was processed successfully**
   - The input file is moved to the folder Succeeded or it is deleted, depending on whether AutoDelete or AutoDeleteAll is set to true or false in the configuration file Img2PdfSvr.ini.
   - The converted file is stored in PDFs (for the Img2PdfSvr) or in Images (for the Img2ImgSvr).

   **The file was not processed successfully**
   - The input file is moved to the folder Failed or it is deleted, depending on whether AutoDeleteAll is set to true or false in the configuration file Img2PdfSvr.ini.
   - A log file is created in the folder Logs. The file name is the same as the input file with the extension substituted by .txt.

4. In any case, an entry in the log file of this thread is created.

### 4.4 Log Files

There are two types of log files.

**The log file per thread** Each thread (watched folder) has a log file. The log file resides in the same directory as the executable Img2PdfSvr.exe and the configuration file Img2PdfSvr.ini. It is named Img2PdfSvr-log-\<n\>.txt, where the number of the log file \(n\) is increased whenever the service is re-started. The log file is locked by the service as long as the service is running.

- The log file contains general messages (including a time stamp that is not shown here) such as:
  
  - [1] Worker thread for directory C:\Img2PdfSvr\Folder started.

- Error messages such as:
  
  * Error 0 while opening file C:\Img2PdfSvr\Folder\InProgress\Job-...

**The error log file per document** For each document which failed to be processed successfully, there is an error log file created. The log file is written to the sub-folder Logs and has the same file name as the input document, with extension .txt. There is no error log available if a document cannot be opened (e.g. it is not an appropriate document type).
5 User’s Guide

5.1 Using the Image to PDF Converter Service

When the service is created and started, there will be so called watched folders. When an image file is placed into a watched folder, the service will do the following:

1. Grab the file, give it a unique file name by adding a conversion job number prefix and move it to the subfolder Jobs/.
2. When a job is converted successfully, the image file will either be deleted or moved to the folder Succeeded/ depending on whether AutoDelete is set to True or False in the configuration file.
3. The converted PDF file will be stored in the folder PDFs/.
4. When a job fails to convert, e.g. when the file is not a valid or supported file format, the file will be copied to the folder Failed/ or deleted according to the AutoDelete setting. There is a log file created for every job where an error occurred. The log file is in the Failed/ folder and has the same name as the document which failed to convert.

These four subfolders are created automatically, and used by the PDF Converter Service. Three of them are hidden folders (all except PDFs/) and should not be modified, nor should any files be copied into any of them directly.

5.2 Output File Name

The generated PDF file are copied to the subfolder PDFs/ which resides within the watched folder. The output file name will be automatically generated and comprises the original file name and a job-number prefix, for example: \PDFs\Job-01C57E37-3ED94B7A_mydocument.pdf

5.3 Single-Page or Multi-Page Images

If the input image file is a multi-page file (e.g. a TIFF), a multi-page PDF file is generated.

5.4 Job-Control Files

Instead of copying or moving the actual file into a watched folder, a job-control file can be used. A job-control file is a text file (file extension .txt) which contains the name of one or multiple files (one file name per line). Copying such a job-control file into a watched folder has a similar effect as copying the actual file. This has the following benefits:

- Multiple input files can be merged into one output file.
- Files don't need to be physically copied, which improves the speed and lowers network traffic (especially for large files).
- Individual configuration options can be set per file (overwriting the default of the watched folder). The following switches are not supported in the control file: -w, -wd, -p
  The following switches are only valid when set before the first input file: -cl, -oi, -o, -p, -u

5.4.1 Example of a Control File

The following lines show how a control text file could look like.

- The first line indicates the resulting PDF document should conform to PDF/A-1a.
- The second and third lines add a 20 points white border and fit the image on the page.
The fourth line adds an alternative text for the first image. It is set to “Sailing boat at sunset”

The fifth line adds the image boat1.jpg according to the previously configuration.

The second image is handled in a similar way, but has a different alternate text.

```
-cl pdfa-1a
-f
-sb 20
-aa "Sailing boat at sunset"
C:\images\boat1.jpg
-aa "Sailing boat in harbor"
C:\images\boat2.jpg
```
# 6 Interface Reference

## 6.1 Service Control Commands

These options are used to control the service. The create and delete functions require administrator rights. The start and stop functions require operator rights.

### 6.1.1 -a Pause Service

<table>
<thead>
<tr>
<th>Command</th>
<th>Options</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pause Service</td>
<td>-a</td>
</tr>
</tbody>
</table>

This option pauses the service.

### 6.1.2 -c Create Service

<table>
<thead>
<tr>
<th>Command</th>
<th>Options</th>
</tr>
</thead>
<tbody>
<tr>
<td>Create Service</td>
<td>-c</td>
</tr>
</tbody>
</table>

The 3-Heights™ Image to PDF Converter Service is created using the option `-c`.

**Important**: It is essential that `Img2PdfSvr.exe` is on a non-mapped drive.

### 6.1.3 -d Delete Service

<table>
<thead>
<tr>
<th>Command</th>
<th>Options</th>
</tr>
</thead>
<tbody>
<tr>
<td>Delete Service</td>
<td>-d</td>
</tr>
</tbody>
</table>

The 3-Heights™ Image to PDF Converter Service can be deleted with the option `-d`. It is best used after the service has already been stopped.

### 6.1.4 -i List the Usage

<table>
<thead>
<tr>
<th>Command</th>
<th>Options</th>
</tr>
</thead>
<tbody>
<tr>
<td>List the Usage</td>
<td>-i</td>
</tr>
</tbody>
</table>

The option `-i` lists the current version and date of the service along with all available settings.
6.1.5  -o Continue Service

| Continue Service  -o |

This option resumes the service.

| Img2PdfSvr  -o |

6.1.6  -q Query Current Status of Service

| Query Current Status of Service  -q |

This option returns the current status of the service.

| Img2PdfSvr  -q |

The service starts automatically during system startup.
The service is stopped.
[Img2PdfSvr] QueryService: The operation completed successfully.

6.1.7  -s Start Service

| Start Service  -s |

Once created, the 3-Heights™ Image to PDF Converter Service can be started with the option -s.

| Img2PdfSvr  -s |

6.1.8  -t Stop Service

| Stop Service  -t |

To stop the service, use the option -t.

| Img2PdfSvr  -t |

If “stop” is called while the service is “running”, the current job (all pages) will be finished, after that the service is stopped.
If the service was “paused” before calling “stop”, the current page will be finished processing. After that page, the job is aborted.

6.1.9  -x Run as Executable

| Run as Executable  -x |
With this option, the Image to PDF Converter Service runs as an executable instead of as a Windows Service. It provides the same functionality as long as the executable is “running”.

```
Img2PdfSvr -x
```

### 6.2 Supported Codecs

The following table lists which capabilities of the different codecs are supported by the 3-Heights™ Image to PDF Converter Service.

<table>
<thead>
<tr>
<th>Codec</th>
<th>Bits per Pixel</th>
<th>Gray</th>
<th>Indexed</th>
<th>Quality</th>
<th>Compression</th>
</tr>
</thead>
<tbody>
<tr>
<td>TIFF</td>
<td>1, 2, 3, 4, 8, 24</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Raw, Flate, LZW, JPEG, Group3, Group3_2D, Group4</td>
</tr>
<tr>
<td>JPEG</td>
<td>8, 24</td>
<td>Yes</td>
<td>No</td>
<td>Yes</td>
<td>JPEG (lossy only)</td>
</tr>
<tr>
<td>BMP</td>
<td>1, 2, 4, 8, 24</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
<td>Raw</td>
</tr>
<tr>
<td>GIF</td>
<td>2-8</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
<td>LZW</td>
</tr>
<tr>
<td>PNG</td>
<td>1-8, 24</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
<td>Flate</td>
</tr>
<tr>
<td>JBIG2</td>
<td>1</td>
<td>Yes</td>
<td>No</td>
<td>No</td>
<td>JBIG2 (lossless only)</td>
</tr>
<tr>
<td>JPEG2000</td>
<td>8, 24</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>JPEG2000 (lossless: Q = 100)</td>
</tr>
<tr>
<td>PBM</td>
<td>1-8, 24</td>
<td>Yes</td>
<td>No</td>
<td>No</td>
<td>Raw</td>
</tr>
</tbody>
</table>

- **Codec**: The Compression/Decompression Type.
- **Bits Per Pixel**: The supported values for bits per pixel. 1 = bi-tonal, 8 = 256 colors/grey scales, 24 = True Color
- **Gray**: This format supports grey scale.
- **Indexed**: This format supports indexed colors.
- **Quality**: This format supports the setting of a quality parameter.
- **Compression**: Supported compression types.

### 6.3 Configuration Options

#### 6.3.1 Configuration File `Img2PdfSvr.ini`

The `Img2PdfSvr.ini` configuration file defines the setting for the watched folders. It is read upon starting the service.

1. For palette creation: The number of palette entries is equal to 2 BitsPerPixel where BitsPerPixel is smaller or equal to 8. This means it is possible to create a 3 bits per pixel TIFF or BMP, but the palette size is equal as for 4 bits. However the 3 bits per pixel image will compress better than the 4 bits per pixel image.
2. To create lossless JPEG2000 images, set the quality parameter to 100. For values <100, a lossy compression algorithm is applied.
[Img2PdfSvr]     required
AutoDelete=...  optional   true or false
AutoDeleteAll=... optional   true or false
LogPath=...    optional   Either a path like C:\mypath\log or the keyword EventLog
PollingInterval=... optional   Value in milliseconds, default 1000
JobPrefix=...   optional   true or false
LogLevel=...   optional   0 or 1
Threads=n      required   The number of threads
Thread1=-w ...  required   Options for the first thread
Thread2=-w ...  Options for the second thread
Threadn=...     There must be exactly as many threads as defined in Threads=n.

Example:

[Img2PdfSvr]
AutoDelete=true
LogPath=EventLog
JobPrefix=false
Threads=3
Thread1=-w C:\Img2PdfSvr\PDF
Thread2=-w C:\Img2PdfSvr\PDF
Thread3=-w C:\Img2PdfSvr\PDFA-1b -cl pdfa-1b -oi
"C:\WINNT\system32\spool\drivers\color\sRGB Color Space Profile.icm"

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>
</tbody>
</table>
Autodelete of Successfully Processed Files

When a job succeeded, the image file will be moved from the folder Jobs to the folder Succeeded. To automatically delete the image files, the value AutoDelete can be set to True in the Img2PdfSvr.ini file. When set to false, the files will remain in the folders Succeeded and Failed.

```
[Img2PdfSvr]
AutoDelete=true
```

To delete failed documents as well use the following setting:

```
[Img2PdfSvr]
AutoDeleteAll=true
```

Job Number Prefix

Every time a document is copied from the watched folder to the Jobs sub folder, it is renamed by adding a 21 character prefix containing a time-stamp of the form Job-8 digits-8 digits. For example

```
Job-01C61DD4-E72E1BCE
```

The job number prefix ensures that several documents with the same name can correctly be processed. Adding the prefix can be prevented with the following line in the configuration file:

```
[Img2PdfSvr]
JobPrefix=false
```

Logpath

Log-messages created by the service are by default written to the sub-directory log. To alter the directory, add a line similar as shown below to the configuration file:

```
[Img2PdfSvr]
LogPath=C:\path\log
```

Messages created by the service can be added to the system's application event log instead of written to a log file. This is achieved by adding the following line to the configuration file:

```
[Img2PdfSvr]
LogPath=EventLog
```
The system’s application log event will then log messages similar as shown below:

- CreateService: The operation completed successfully.
- StartService: The operation completed successfully.

Note: The messages are only fully accessible while the service is created.

Otherwise a message as shown below is displayed:

- The description for Event ID (1) in Source (Img2PdfSvr) cannot be found. The local computer may not have the necessary registry information or message DLL files to display messages from a remote computer. The following information is part of the event: DeleteService: The operation completed successfully.

**Polling Interval**

The polling interval defines the time in milliseconds that the polling-thread pauses between two polls. The time passing until the same watched folder is polled again (maximum pick-up time) is: The value of PollingInterval plus the actual time it takes to poll all watched folders. The higher the polling interval, the lower the network traffic, and the longer it takes until documents are picked up.

Suggested values for the polling intervals are 1000 to 10000 milliseconds.

```
[Img2PdfSvr]
PollingInterval=5000
```

### 6.3.2 Configuration File Img2ImgSvr.ini

Generic settings (AutoDelete, JobPrefix, etc.) are similar to the Image to PDF Service described above.

```
[Img2PdfSvr]
PollingInterval=2000
JobPrefix=false
Threads=3
Thread1=-w C:\Img2ImgSvr\ToTiff -e .tif
Thread2=-w C:\Img2ImgSvr\ToJpeg -e .jpg -s
Thread3=-w C:\Img2ImgSvr\ToJpeg -e .jpg -s
```

If multiple threads have the same configuration, then the corresponding watched folder has multiple worker threads. In order to get the best performance, one should use as many worker threads as CPUs are available.

**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>
</tbody>
</table>
Compression types 7 (Jbig) and 8 (JPEG2000) are not applicable for TIFF.

### 6.3.3  `-w` Set the Watched Folder

**Set the Watched Folder**  `-w`

Use the option `-w` to define the path of the watched folder. This path should not contain mapped drives, since other users (such as LocalSystem) do not recognize them. This parameter must always be the first parameter of a thread.

```
-w C:\output\watchedfolder
```

**Note:** The service supports path lengths including file name of up to 258 characters. This includes the 21 characters of the job ticket. If a file name exceeds this value, its file name is truncated at the end of the file name and before the file extension. It is therefore suggested that watched folder names are kept reasonably short.

**Important:** Watched folders are not to be shared between different services, such as Image to PDF and Image to Image.

### 6.3.4  `-wfi` Ignore Files with Certain Extensions

**Ignore Files with Certain Extensions**  `-wfi <exts>`

By default, the service tries to process all files dropped into the drop-in folder, regardless of the extension. With this option, files with certain file extensions can be ignored.

**Example:** Ignore temporary files.

```
-wfi .temp.tmp
```

### 6.3.5  `-wfs` Process only Files with Certain Extensions

**Process only Files with Certain Extensions**  `-wfs <exts>`
By default, the service tries to process all files dropped into the drop directory, regardless of the extension. With this option, the processing can be restricted to a set of known file extensions.

**Example:**  Restrict the processing to JPEG and PNG files.

```
-wfs .jpeg .jpg .png
```

### 6.4 Options for Image to PDF

This section describes the options that are specific to the 3-Heights™ Image to PDF Service (Img2PdfSvr).

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

<table>
<thead>
<tr>
<th>Adjust the Page Size to the Size of the Image</th>
<th>-a</th>
</tr>
</thead>
</table>

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

#### 6.4.2 -aa  Set Alternate Text

<table>
<thead>
<tr>
<th>Set Alternate Text</th>
<th>-aa <code>&lt;alt&gt;</code></th>
</tr>
</thead>
</table>

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".

```
-cl pdfa-2a -aa "some text"
```

#### 6.4.3 -al  Set Language for Alternate Text

<table>
<thead>
<tr>
<th>Set Language for Alternate Text</th>
<th>-al <code>&lt;lang&gt;</code></th>
</tr>
</thead>
</table>

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.

```
-cl pdfa-2a -aa "Beschreibung" -al DE
```
6.4.4 -ao Adjust page orientation

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.

```
-a0 -f -sp 420 595
```

6.4.5 -b Set Bits per Pixel

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.

```
-b 1 -fb 3
```

6.4.6 -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.

```
-bc 50 100 150 200
```

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

6.4.7 -c Center Images

Center the images on the pages horizontally and vertically. This disables -a.
6.4.8 \(-cl\) 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:

```
-cl pdfa-2b
```

**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.

6.4.9 \(-cs\) Color Space Profile

```
Color Space Profile  -cs
```

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.

```
-cs "C:\Windows\system32\spool\drivers\color\sRGB Color Space Profile.icm"
```
6.4.10 **-d Set Resolution in DPI**

<table>
<thead>
<tr>
<th>Set Resolution in DPI</th>
<th>-d &lt;dpi&gt;</th>
</tr>
</thead>
</table>

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.

- **-d 150**

6.4.11 **-f Fit the Image Size to the Page Size**

<table>
<thead>
<tr>
<th>Fit the Image Size to the Page Size</th>
<th>-f</th>
</tr>
</thead>
</table>

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

6.4.12 **-fb Bi-tonal Image Compression**

<table>
<thead>
<tr>
<th>Bi-tonal Image Compression</th>
<th>-fb &lt;compr&gt;</th>
</tr>
</thead>
</table>

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.

- **-fb 4**

6.4.13 **-fc Color / Grey Scale Image Compression**

<table>
<thead>
<tr>
<th>Color / Grey Scale Image Compression</th>
<th>-fc &lt;compr&gt;</th>
</tr>
</thead>
</table>

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.

- **-fc 8**

6.4.14 **-h Dithering Mode**

<table>
<thead>
<tr>
<th>Dithering Mode</th>
<th>-h &lt;mode&gt;</th>
</tr>
</thead>
</table>

Set the dithering mode. Allowed values are:
### Dithering Mode

<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

```
-h 3 -b 1 -fb 7
```

### 6.4.15 -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.

```
-fi 3
```

### 6.4.16 -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.

### 6.4.17 -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.
**6.4.18 -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>`.

-o owner

**6.4.19 -oi Set Output Intent**

**Set Output Intent**  
-oi <profile>

The output intent holds the output color profile. 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.

-oi "C:\Windows\system32\spool\drivers\color\sRGB Color Space Profile.icm"

**6.4.20 -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>(Default)</td>
<td>inherent</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>
</tbody>
</table>
6.4.21 `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.

6.4.22 `-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>
</tbody>
</table>
Permission Flags

2048  allow high quality printing

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.

```
-o owner -p 260
```

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

```
-o owner -p 2052
```

For further information about the permission flags, see [PDF Reference 1.7 Section 3.5.2.](#)

### 6.4.23 -pg  Page Range

#### Page Range  -pg  \(\langle{\text{first}\rangle \ \langle{\text{last}\rangle}\right)

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.

```
-pg 1 1
```

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

```
-pg 2 -1
```

### 6.4.24 -q  Set Image Quality

#### Set Image Quality  -q  \(\langle{\text{quality}\rangle}\right)

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:

```
-fc 8 -q 100
```
6.4.25  -sb  Set Border Size

**Set Border Size  -sb \( n \)**

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.

- sb 20

6.4.26  -sp  Set Page Dimensions

**Set Page Dimensions  -sp \( w \) \( h \)**

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.

- sp 612 792

6.4.27  -u  User Password

**User Password  -u \( \text{user} \)**

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.

- u userpassword -o ownerpassword

6.5 Options for Image to Image

This section describes the options that are specific to the 3-Heights™ Image to Image Service (Img2ImgSvr).

6.5.1  -cb  Bi-tonal Image Compression

**Bi-tonal Image Compression  -cb \( \text{compr} \)**
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.

- **cb 4**

### 6.5.2 -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.

- **cc 1**

### 6.5.3 -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.

- **ci 2**

### 6.5.4 -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.

- **d 300 -r**

### 6.5.5 -dd Set Default Resolution

**Set Default Resolution**

-dd <dpi>

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3-Heights™ Image to PDF Converter Service, April 21, 2020 | 44/55
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.
- `dd 72`

### 6.5.6 -e Specify Image Type/Extension

The image type of the output file can be specified using the switch `-e`. The output image format is defined by its extension. There is a list of supported extensions and the corresponding file type:

<table>
<thead>
<tr>
<th>Extension</th>
<th>File Format</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 (JPEG)</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>.jpx</td>
<td>Extended JPEG2000</td>
</tr>
<tr>
<td>.pmb .pgm .pnm .ppm</td>
<td>Portable Bitmap File Format</td>
</tr>
<tr>
<td>.eps</td>
<td>Encapsulated PostScript (output only)</td>
</tr>
</tbody>
</table>

If the extension is not set, the default extension `.tif` is selected.

**Example:** Set file extension to `.gif`, i.e. set file type to GIF.
- `e .gif`

### 6.5.7 -fu Unpack Indexed Images

This switch instructs the converter to unpack images with bits per sample of less than 8 to exactly 8 bits.
### 6.5.8 -hp Set Height

**Set Height**  
-hp **<height>**

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.

   -hp 1800

### 6.5.9 -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.

   -ht 500 -r

### 6.5.10 -pg Page Range

**Page Range**  
-pg **<first>** **<last>**

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.

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

   -pg 1 1

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

   -pg 2 -1 -s

### 6.5.11 -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
-q 50
```

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

### 6.5.12 -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
-r -d 72
```

### 6.5.13 -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).

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

**Transform Colors from CMYK to RGB**

```
-t
```

Apply a color conversion and convert CMYK to RGB.

### 6.5.15 -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
-wp 1500 -d 300
```
6.5.16  \texttt{-wt}  \textbf{Set True Width}

| Set True Width  | -wt  \langle\text{true}\_\text{width}\rangle |

Set the true\_width in mm of output image. The true\_height is calculated respecting proportions. If the true\_height is set too (see \texttt{-ht}), the true\_height is omitted. For more information about the behavior see \textit{Specification of Resolution and Image Dimensions}.

\textbf{Example:}  \texttt{Set true\_width of output file to 500 mm and width to 1000 pixels.}

\texttt{-wt 500 -wp 1000}

6.6  \textbf{OCR}

In order to make use of OCR, an OCR engine must be installed. The OCR engine is provided as part of a separate product: The 3-Heights™ OCR Enterprise Add-On.

The recommended options (besides \texttt{-ocr}, \texttt{-ocl} and \texttt{-ocp}) are:

- For scanned documents: \texttt{-oca}  \texttt{-ocri}  \texttt{-occs}
- For born-digital documents: none

6.6.1  \texttt{-ocb}  \textbf{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.

6.6.2  \texttt{-ocbc}  \textbf{Embed barcodes}

| Embed barcodes  | -ocbc |

Embed the recognized barcodes in the XMP metadata.

6.6.3  \texttt{-occs}  \textbf{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.
6.6.4  **-ocd**  Resolution for OCR Recognition

<table>
<thead>
<tr>
<th>Resolution for OCR Recognition</th>
<th>-ocd  (&lt;n&gt;)</th>
</tr>
</thead>
</table>

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.

6.6.5  **-ocl**  Set OCR Language

<table>
<thead>
<tr>
<th>Set OCR Language</th>
<th>-ocl  (&lt;languages&gt;)</th>
</tr>
</thead>
</table>

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:

```bash
-ocr service -ocl "English, German"
```

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

6.6.6  **-ocp**  Set OCR Parameters

<table>
<thead>
<tr>
<th>Set OCR Parameters</th>
<th>-ocp  (&lt;params&gt;)</th>
</tr>
</thead>
</table>

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:

```bash
-ocp "PredefinedProfile = DocumentArchiving_Accuracy"
```

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

6.6.7  **-ocr**  Load OCR Engine

<table>
<thead>
<tr>
<th>Load OCR Engine</th>
<th>-ocr  (&lt;name&gt;)</th>
</tr>
</thead>
</table>

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.

If the switch **-ocr** is not used, no OCR is applied.

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

```bash
-ocr service
```
See also documentation for the 3-Heights™ OCR Add-On.

6.6.8 -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 Service 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.

6.6.9 -oct Threshold Resolution for OCR

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:

-oct 300

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

-oct 400

Example: Do not resample:

-oct -1

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

6.7 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): 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 -ar (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 Service.
<table>
<thead>
<tr>
<th>Options</th>
<th>-d</th>
<th>-wp/-hp</th>
<th>-wt/-ht</th>
<th>-r</th>
<th>Properties of Output Image</th>
</tr>
</thead>
<tbody>
<tr>
<td>not set</td>
<td>not set</td>
<td>not set</td>
<td>set/not set</td>
<td>set/not set</td>
<td>no changes</td>
</tr>
<tr>
<td>not set</td>
<td>set</td>
<td>not set</td>
<td>set/not set</td>
<td>set/not set</td>
<td>true_width/true_height constant, resolution modified</td>
</tr>
<tr>
<td>not set</td>
<td>set</td>
<td>set</td>
<td>set</td>
<td>set/not set</td>
<td>resolution modified</td>
</tr>
<tr>
<td>not set</td>
<td>not set</td>
<td>set</td>
<td>set</td>
<td>set/not set</td>
<td>true_width/true_height constant, width/height modified</td>
</tr>
<tr>
<td>not set</td>
<td>not set</td>
<td>set</td>
<td>not set</td>
<td>not set</td>
<td>width/height constant, true_width/true_height modified</td>
</tr>
<tr>
<td>set</td>
<td>not set</td>
<td>not set</td>
<td>not set</td>
<td>set</td>
<td>true_width/true_height constant, width/height modified</td>
</tr>
<tr>
<td>set</td>
<td>not set</td>
<td>not set</td>
<td>not set</td>
<td>not set</td>
<td>width/height constant, true_width/true_height modified</td>
</tr>
<tr>
<td>set</td>
<td>set</td>
<td>not set</td>
<td>set</td>
<td>set/not set</td>
<td>true_width/true_height modified</td>
</tr>
<tr>
<td>set</td>
<td>not set</td>
<td>set</td>
<td>set</td>
<td>set/not set</td>
<td>width/height modified</td>
</tr>
<tr>
<td>set</td>
<td>set</td>
<td>set</td>
<td>set</td>
<td>set/not set</td>
<td>width/height and true_width/true_height have priority over resolution</td>
</tr>
</tbody>
</table>
7 Troubleshooting

7.1 Output

7.1.1 Poor Image Quality

Increase the DPI value for a higher resolution. This is done with the switch `-d`. If using a lossy compression type, such as JPEG, increase the quality using the switch `-q` and a parameter higher than 80.

7.1.2 Content Is Missing

This can happen when the switch `-s` is used to set dimensions that have a different ratio than the original dimensions. To automatically make the page fit the new dimensions, use the switch `-f`.

7.1.3 Colors Are Gone

The switch `-fb` allows for setting the bits per pixel. JPEG 8 bit is always grey scale, since indexed colors are not supported for this format. For TIFF and GIF, the indexed colors need to be enabled if 8 bit is selected. This is done with the switch `-fi`.

7.2 Service

7.2.1 The Watched Folders are Not Created

Most commonly this happens when the user under which the service is running does not have write permissions to create the watched folder. By default the service starts under the user LocalSystem. Make sure this user, has the required access permissions or use a dedicated user.
8 Version History

8.1 Changes in Version 6

- **Improved** search algorithm for installed fonts: User fonts under Windows are now also taken into account.

8.2 Changes in Version 5

- **New** additional supported operating system: Windows Server 2019.

8.3 Changes in Version 4.12

- **New** OCR plugin "abbyy12" for the ABBYY FineReader 12 engine.
- **Improved** reading and recovery of corrupt TIFF images.
- **New** HTTP proxy setting in the GUI license manager.

Service Img2PdfSvr

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

8.4 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.

8.5 Changes in Version 4.10

Service Img2PdfSvr

- **New** option -ao: Adjust page orientation.

Service Img2ImgSvr

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

8.6 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.
8.7 Changes in Version 4.8

Service Img2ImgSvr

- **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.
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