3-Heights™
PDF to Image Converter Service

Version 4.12.26.6

PDF/A conform

PDF-TOOLS.COM
Premium PDF Technology

Contents

1 Introduction

1.1 Description

The 3-Heights™ PDF to Image Converter Service converts PDF documents into single page or multi-page raster images such as TIFF or JPEG. It can also convert PDF files into rasterized PDF.

Its areas of use include the web, TIFF-based DMS solutions, archive and workflow systems and the protection of PDF documents. The Converter is characterized by its high speed and outstanding quality.
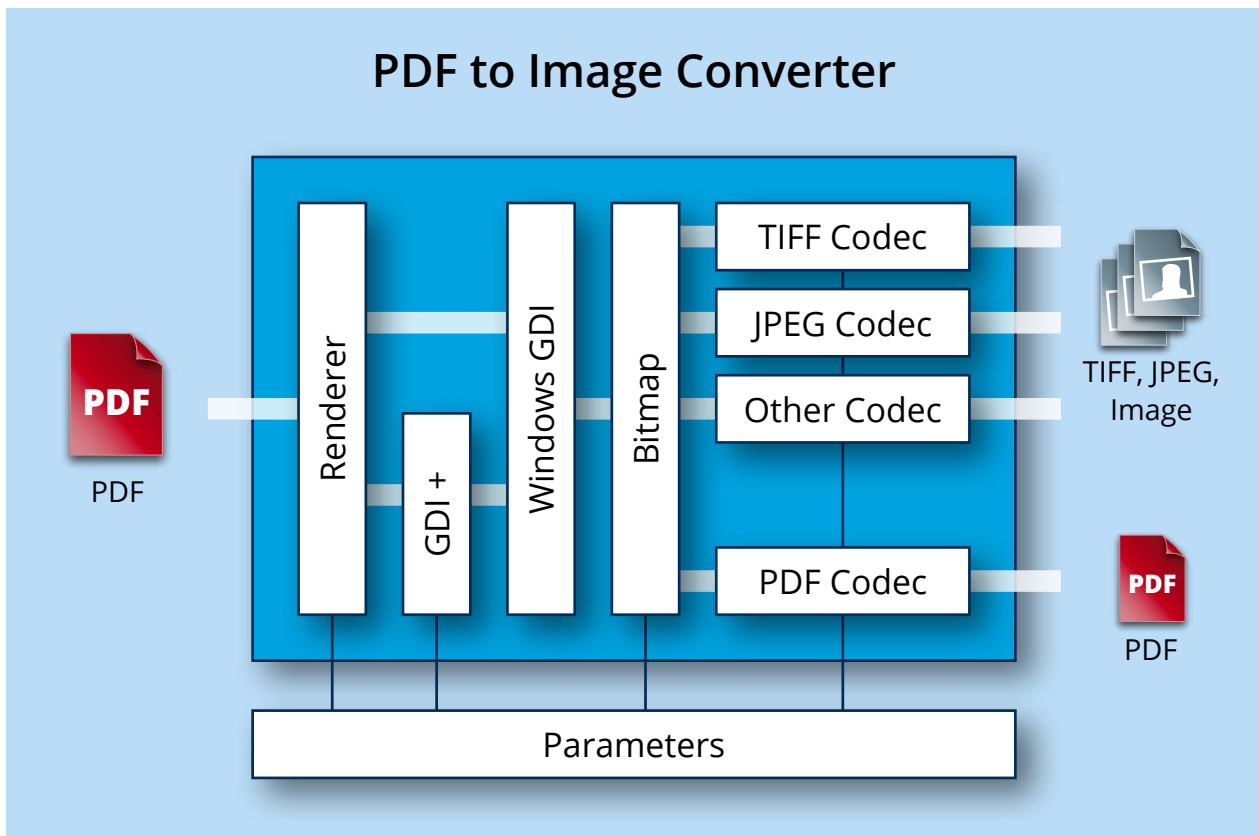
1.2 Functions

The 3-Heights™ PDF to Image Converter Service merges pages from different input files to form one or more files. Color space and image size are defined automatically during the process. The Converter supports scaled and un-scaled conversions and a variety of image formats such as PNG, TIFF, JBIG2 or JPEG2000.

1.2.1 Features

PDF to Image

- Create single page and multi-page image files and rasterized PDF documents
- Convert individual pages
- Convert PDF files to CCITT fax files
- Define page dimensions in points or pixels
- Set rotation (Force portrait or landscape or inherit rotation from original document)

- Set resolution (DPI)
- Dithering (Floyd Steinberg, Halftone Block, Halftone Continuous, Atkinson)
- Set image filters
- Set color depth
- Set color space
- Set TIFF file compression
- Set the quality of lossy image compression
- Set bit filling order for fax files
- Add Watermark images
- Define minimum line width

PDF to PDF Image

- Raster PDF content (image)
- Keep or remove links, outlines or viewer preferences in PDF output document

1.2.2 Formats

Input Formats

- PDF 1.x (PDF 1.0, . . ., PDF 1.7)
- PDF 2.0
- PDF/A-1, PDF/A-2, PDF/A-3

Output Formats

- TIFF (Tagged Image File Format)
- JPEG (Joint Photographic Expert Group)
- PNG (Portable Network Graphics)
- GIF (Graphics Interchange Format)
- BMP (Window Bitmap)
- EPS (Encapsulated PostScript)
- JBIG2 (Joint Bi-level Image Experts Group)
- JPEG2000
- Extended JPEG2000
- PBM (Portable Bitmap File Format)

Compliance

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)

1.3 Service

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

The 3-Heights™ PDF to Image Converter Service combines three programs in one executable.

1. A converting service, that can be run on Windows platforms (Windows 2000 or newer). 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 PDF to Image Converter Service. By means of this interface the service can be installed, started, stopped, paused, resumed 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™ PDF to Image Converter Service is available for the following operating systems:

- Windows 7, 8, 8.1, 10 – 32 and 64 bit
- Windows Server 2008, 2008 R2, 2012, 2012 R2, 2016 – 32 and 64 bit

2 Installation

2.1 Overview

The PDF to Image Converter Service is configured by the file `Pdf2ImgSvr.ini`, which needs to be located in the same directory as the executable `Pdf2ImgSvr.exe`. Before starting the service, the configuration file needs to be adjusted. How this is done is described in the chapter Configuration File Pdf2ImgSvr.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.

2.2 Windows

The 3-Heights™ PDF to Image 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`. Select the product "PDF to Image 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. If another is required, it can be selected using the combo box.
   The product comes as an MSI (Microsoft Installer) that provides an installation routine that installs and uninstalls the product for you.
   The package installs the 64-bit version, which runs on 64-bit platforms only.
3. Start the MSI and follow the steps in the installation routine.
4. Ensure the system environment variable TMP exists and points to an existing directory. This directory is required to temporarily install fonts that are embedded in PDF documents.
   Control Panel → System → Advanced → Environment Variables
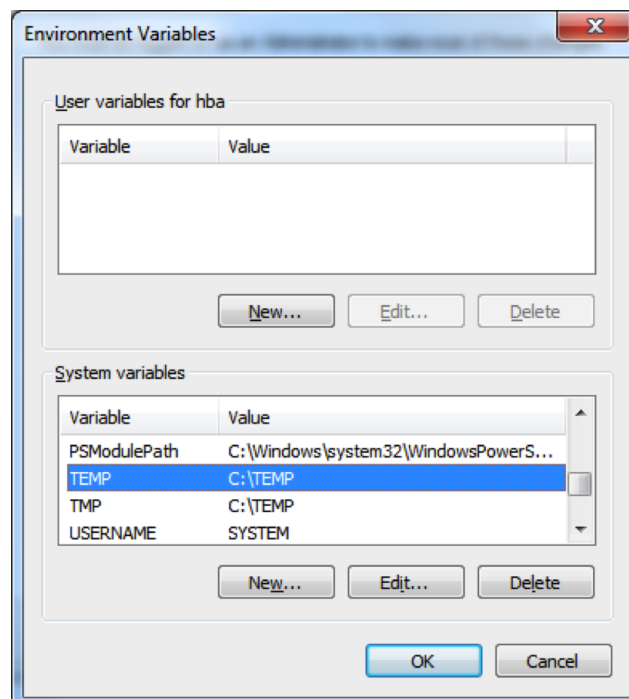
5. Ensure the cache directory exists as described in chapter Special Directories.
6. Make sure your platform meets the requirements regarding color spaces and fonts described in chapters Color Profiles and Fonts respectively.

2.3 Uninstall

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

2.4 Note about the Evaluation License

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

2.5 Special Directories

2.5.1 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.

2.5.2 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.

2.5.3 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. directory `Fonts`, which must be a direct sub-directory of where `Pdf2ImgSvr.exe` resides.

3 License Management

The 3-Heights™ PDF to Image 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 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).
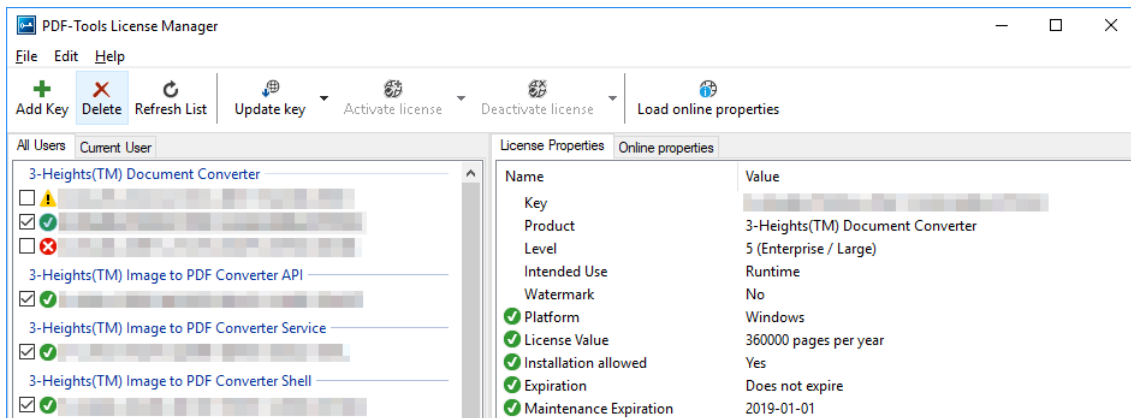
List all installed license keys

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 on request.

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
```

Delete old license key:

```
licmgr delete 1-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:

```
>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.
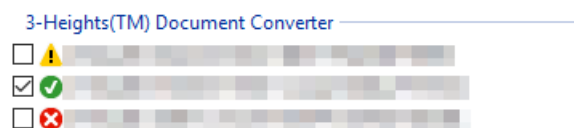
With the Command Line Interface use the `select` subcommand:

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

3.2.2 Precedence

License keys are considered in the following order:

1. License key passed at runtime.
2. License selected for the current user

3. License selected for the current user ([legacy key format](#))
4. License selected for all users
5. 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:
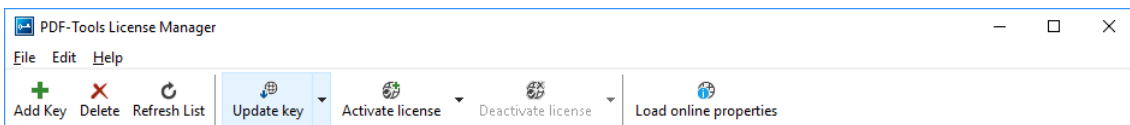
With the Command Line Interface   use the `update` subcommand:

```
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:
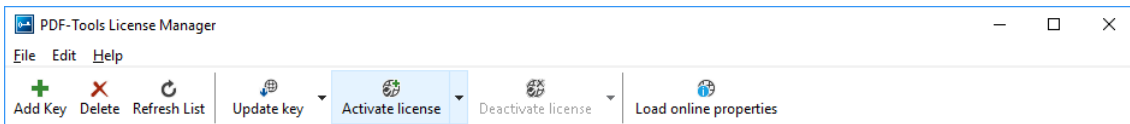
It is recommended to add a comment to the activation request by using the subsequent dialog box.

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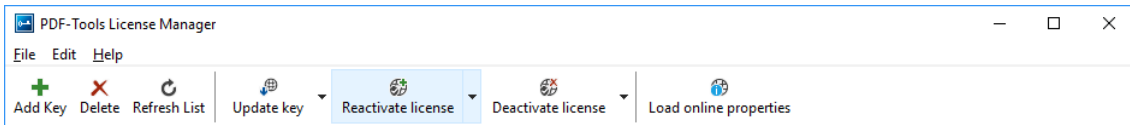
With the Command Line Interface   the subcommand `activate` is used again:

```
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:
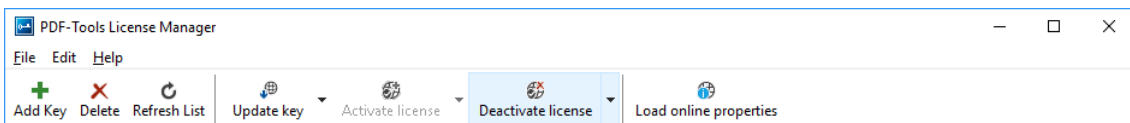
With the Command Line Interface   use the `deactivate` subcommand:

```
licmgr deactivate 1-XXXXX-XXXXX-XXXXX-XXXXX-XXXXX-XXXXX-XXXXX
```

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:
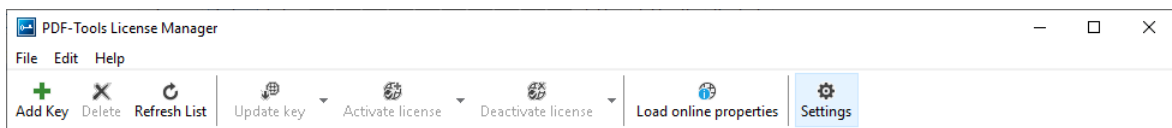
and enter the proxy URL in the respective field:
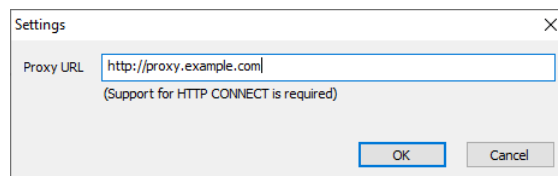
3.6 Offline Usage

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:
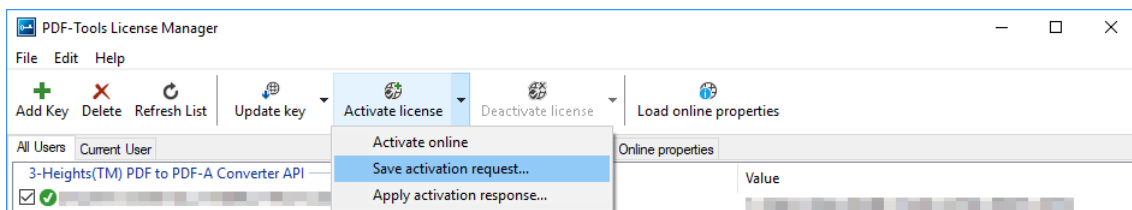
With the Command Line Interface use the -fs option to specify the destination path of the request file:

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

> **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

Open the following website in a web browser: http://www.pdf-tools.com/pdf20/en/mypdftools/licenses-kits/license-activation/ Upload the request by dragging it onto the marked area:

License activation (offline)

Upload your license request. For more information and instructions please check the manual of your product.

Choose the license file or drag it here
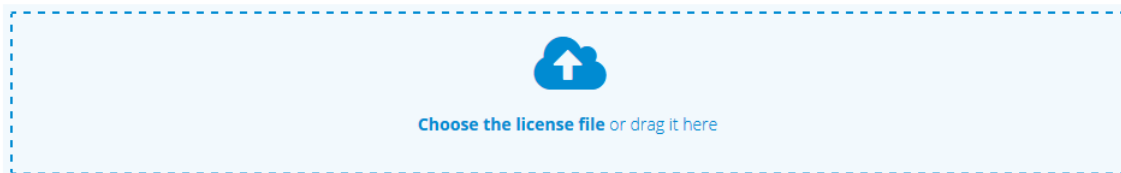
Upon success, the response will be downloaded automatically if necessary.

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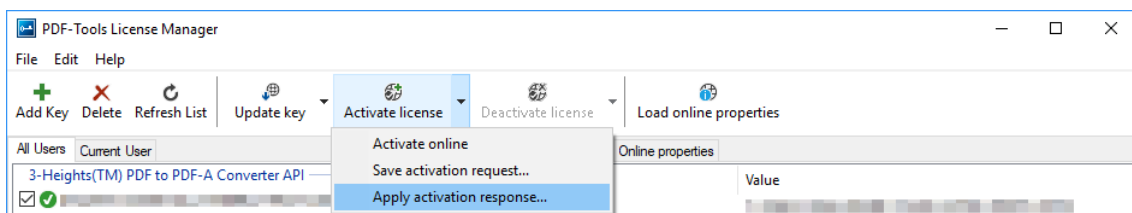
With the Command Line Interface use the -fl option to specify the source path of the response file:

```
licmgr activate -fl activation_response.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 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.

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.

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

- 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:

- The MAC address used for computing the machine fingerprint is not static. This may happen e.g. for virtual network adapters with dynamic MAC address (VPN, Juniper, ...).

Solution

Update to a newer version (>= 4.12) of the PDF Tools product, deactivate the license key using the new license manager and activate it again. After that, an imporved 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.

As an alternative, remove any virtual network adapter with a dynamic MAC address.

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 PDF to Image Converter Service for the first time, the file `Pdf2ImgSvr.ini` needs to be modified. Editing this file while the PDF to Image 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:

```
[Pdf2ImgSvr]
AutoDelete=True
Threads=3
Thread1=-w C:\Pdf2ImgSvr\ToTiff -e .tif
Thread2=-w C:\Pdf2ImgSvr\ToJpeg -e .jpg -1
Thread3=-w C:\Pdf2ImgSvr\ToGif -e .gif -1 -i
```

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.

Threads1=   Sets the options such as name of watched folder and settings etc. for thread 1.

-w C:\Pdf2ImgSvr\ToTiff   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](#).)

-e .tif   (required) Sets the image type. The extension of the image defines the created image type.

-1   (optional) Creates one page per document. This is required for formats that do not support multi-pages.

-i   (optional) Uses indexed color instead of grey-scale.

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

> **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™ PDF to Image 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:

```
Pdf2ImgSvr
```

(See also Service Control Commands.)

A short overview over all the options that can be configured in the `Pdf2ImgSvr.ini` is displayed when typing the following in a Windows command line:

```
Pdf2ImgSvr -i
```

(See also Configuration Options.)

4.2 Managing the Service

Once the configuration is done, the service can be started and controlled by executing `Pdf2ImgSvr.exe` on the command line. The path can be omitted if the `Pdf2ImgSvr.exe` is included in the `%PATH%` environment variable.

> **Note:** It is essential that the executable `Pdf2ImgSvr.exe` and the configuration file `Pdf2ImgSvr.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`.

```
Pdf2ImgSvr -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™ PDF to Image Converter Service" as shown in the image below.
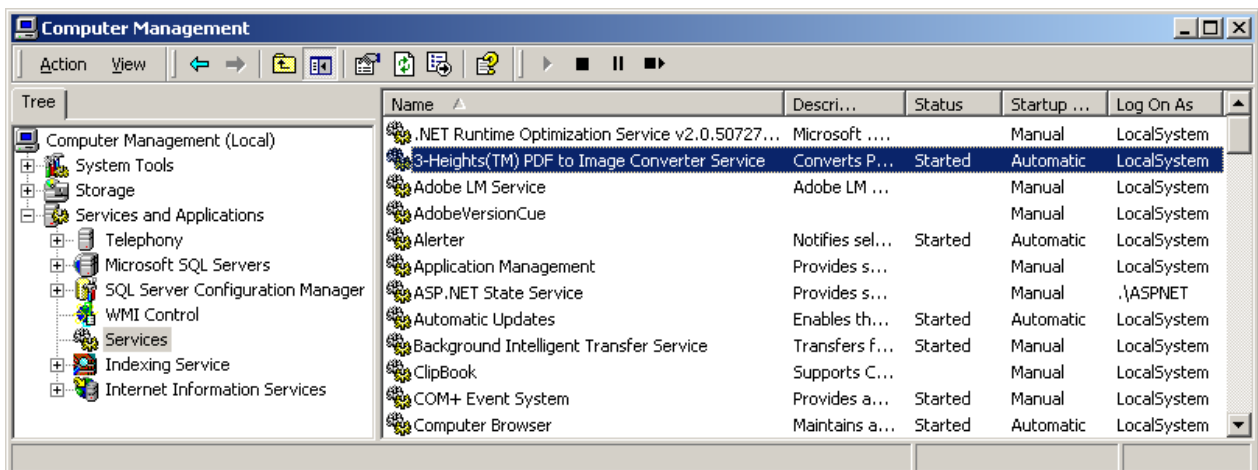
2. By default, the 3-Heights™ PDF to Image Converter Service runs in the "LocalSystem" account. After the service has been created, the user can be changed.
   This will be required in a situation where a network share is used as a watched folder and the process needs to run under a user with the appropriate 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 <u>-s</u>.

```
Pdf2ImgSvr -s
```

4. Now the 3-Heights™ PDF to Image 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 <u>-t</u>.

```
Pdf2ImgSvr -t
```

To restart use <u>-s</u> again.
6. To delete the service use the option <u>-d</u>.

```
Pdf2ImgSvr -d
```

4.2.1 State Diagram of the Service

The 3-Heights™ PDF to Image 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 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 `Pdf2ImgSvr.ini` are created automatically. In each watched folder, the following sub-folders are created:

- `Jobs`
- `InProgress`
- `Succeeded`
- `Failed`
- `Images`
- `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 `Pdf2ImgSvr.ini`.
   - The converted document is stored in `Images`.

   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 `Pdf2ImgSvr.ini`.

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 `Pdf2ImgSvr.exe` and the configuration file `Pdf2ImgSvr.ini`. It is named `Pdf2ImgSvr-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:\Pdf2ImgSvr\Folder started.
```

- Error messages such as:

```
* Error 0 while opening file C:\Pdf2ImgSvr\Folder\InProgress\Job-...
```

5 User's Guide

The 3-Heights™ PDF to Image Converter Service provides two service-executables: `Pdf2ImgSvr` and `Pdf2Pdf-ImgSvr`.

`Pdf2ImgSvr` is used to convert PDF files to raster images, such as TIFF, JPEG, etc. The functionality of this service is documented in this manual.

`Pdf2PdfImgSvr` is used to render PDF files to images and re-embed these images back into a new PDF document. As a result the new PDF document contains exactly one image per page an no further content objects. Alternatively the text can be retained (option `-oa`). That means only images and vector graphics are converted to an image and the text is added on top of the image. `Pdf2PdfImgSvr` is not further described in this documentation. Most of its switches are equivalent to those of `Pdf2ImgSvr`.

All switches are described in the usage of the tool. Type "`Pdf2ImgSvr -i`" or "`Pdf2PdfImgSvr -i`"to list the usage.

5.1 Using the Service

When the service is created and started, there are so called watched folders. When a PDF document 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/`. (The job number prefix can be disabled.)
2. When a job is converted successfully, the PDF file will be moved to the folder `Succeeded/` or deleted, depending on whether `AutoDelete` is set to `True` or `False` in the configuration file. The converted image file(s) will be stored in the folder configured output folder (option `-o`, per default in the `Images/` folder).
3. When a job fails to convert, e.g. when the file is not a valid PDF document, 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.

Subfolders are created automatically, and used by the PDF to Image Converter Service. All subfolders except the output folder `Images/` are marked hidden. None of the subfolders should be modified, nor should any files be copied into any of them directly.

5.2 Output File Name

If no output directory is specified (option `-o`), the generated output file will be copied to the folder `Images/` which resides within the watched folder. The output file name will be automatically generated, for example:

`Images\Job-01C57E37-3ED94B7A_file.tif`

If the created image is a multi-page image (for example a multi-page TIFF), the image is created directly in the Images folder and is called:

`Images\Job-01C57E37-3ED94B7A_file.tif`

For multi-page PDF documents, which are converted to multiple image files, there is a subfolder created which corresponds to the name of the job, for example:

`watched_folder\Images\Job-01C57E37-3ED94B7A_file`

For each image there is then a file created within that folder with the corresponding page number, for example:

`Images\Job-01C57E37-3ED94B7A_file\Job-01C57E37-3ED94B7A_file1.tif`

```
Images\Job-01C57E37-3ED94B7A_file\Job-01C57E37-3ED94B7A_file2.tif
```

5.3 Single-Page or Multi-Page Images

For image types which do not support multi-paging, the option `-1` has to be set to create one image file per page in the PDF. This option can also be used to create single page TIFF images.

5.4 Color Profiles

The 3-Heights™ PDF to Image Converter Service PDF Rendering Engine works in the RGB color space. Other color spaces such as CMYK or spot colors are first converted to RGB before rendering.

For calibrated color spaces (such color spaces with an associated ICC color profile) the color conversion is well defined. For the conversion of uncalibrated device color spaces (DeviceGray, DeviceRGB, DeviceCMYK) however, the 3-Heights™ PDF to Image Converter Service requires apropriate color profiles. Therefore it is important, that the profiles are available and that they describe the colors of the device your input documents are intended for.

> **Note:** When setting an alternative color management system such as Neugebauer, no color profiles are required.

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

5.4.1 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 `Pdf2ImgSvr.exe` resides.

5.4.2 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.pdf-tools.com/public/downloads/resources/colorprofiles.zip
- http://www.color.org/srgbprofiles.html
- https://www.adobe.com/support/downloads/iccprofiles/iccprofiles_win.html

5.5 Fonts

PDF documents may contain both embedded and non-embedded fonts. When rendering non-embedded fonts the best result can be achieved, if the font is available on the system. Therefore it is important to make sure the Font Directories contain all fonts required.

For more information on how to cope with font issues, please refer to section Font and Text Issues.

5.5.1 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™ PDF to Image 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.

5.5.2 Font Configuration File fonts.ini

The font configuration file is optional. It can be used to control the mapping of fonts used in the PDF to fonts pre-installed on the system.

The file `fonts.ini` must reside at the following location :

Windows: In a directory named `Fonts`, which must be a direct sub-directory of where `Pdf2ImgSvr.exe` resides.

It consists of two sections: `[fonts]` and `[replace]`. Both sections are used to map fonts in the PDF to fonts in the installed font collection on the operating system. This comes into play when the font in the PDF document does not have an embedded font program, or the embedded font is not usable.

The mapping only works if the font types of the specified fonts are matching; e.g. if the font in the PDF is a symbolic font, such as "Symbol" or "ZapfDingbats", the mapped font must be symbolic too.

The section `[fonts]` is only considered if the font-matcher does not find an appropriate font amongst the existing installed fonts. It is suggested to only use this section.

The section `[replace]` is stronger and applied before the font-matcher. This means a font will be replaced as defined, even if the correctly installed font is available on the system.

Syntax: The syntax of the mapping file is as follows

```
[fonts]
PDF_font_1=installed_font_1{,font_style}
PDF_font_2=installed_font_2{,font_style}
[replace]
PDF_font_n=installed_font_n{,font_style}
```

PDF_font_* is the name of the font in the PDF.

This name can be found in one of the following ways:

- Use any tool that can list fonts. Such as 3-Heights™ PDF Extract or 3-Heights™ PDF Optimizer. Ignore possible prefixes of font subsets. A subset prefix consists of 6 characters followed by the plus sign. For example "KHFOKE+MonotypeCorsiva", in this case only use "MonotypeCorsiva" as font name in the mapping file.
- Open the document with Adobe Acrobat, use the "MarkUp Text Tool", mark the text of which you would like to know the font name, right-click it, select "Properties..."

installed_font_* is the font family name of the installed font.

To retrieve this name, find the font in the Windows' font directory and open it by double-clicking. The first line in the property window displays the font family name (this may vary depending on the operating system). The font family name does not include font styles; so an example of a font family name is "Arial", but not "Arial Italic".

font_style   is an optional style, that is added coma-separated after the font family name.

The style is always one word. Examples of font styles are "Italic", "Bold", "BoldItalic". Omit the font style, if it is "Regular" or "Normal".

Remove blanks from all font names, i.e. in both the PDF_font_* and the installed_font_*.

Example:

```
[fonts]
Ryumin-Light=MSMincho
GothicBBB-Medium=MSGothic
[replace]
ArialIta=Arial,BoldItalic
```

5.6 How to Reduce the File Size

There are different ways to reduce the file size of an image. One needs to be aware that from a certain point on, a smaller file size results in a poorer visual quality.

The main factors on which the file size of an image depends are:

- Dimensions in pixel (width and height)
- Bits per pixel
- Compression Type
- The content of the image (influenced by dithering)

5.6.1 Dimensions

Reducing the dimensions and therefore the amount of the total pixels reduces also the file size. Obviously a 1024x768 pixel image has a larger file size than an equivalent 600x480 image.

Example: Set the dimensions in pixels.

```
-sp 600 480 -f
```

Example: Set the dimension in points.

```
-s 600 480 -f
```

If the dimensions are set in points, the dimensions in pixel are computed depending on the resolution.

5.6.2 Resolution

The resolution in dots per inch (DPI) lets you specify how detailed the image is. The default value is 150 DPI, which generates an image that looks sharp when not zoomed into. A larger value generates a more detailed image, but also will increases the file size, because it requires more pixels. On the other hand, a lower resolution generates a file with a smaller file size, but the image is also of lower visual quality.

```
-d 75
```

5.6.3 Bits per Pixel

Using 1-bit (black/white) or 8-bit grey scale instead of 24-bit true color will reduce the file size. Keep in mind that not all formats support all color depths.

8-bit grey scale images are a third as large in size as 24-bit color images. With 1-bit images that use dithering, the size heavily depends on the content. It can be as small as 1% of the 8-bit image.

Example: Create a gray scale image.

```
-b 8
```

Example: Create a bi-level image with Atkinson dithering.

```
-b 1 -h 6 -oq
```

5.6.4 Format/Compression Type

The 3-Heights™ PDF to Image Converter Service supports various image formats. For most formats the compression is given. For example a PNG image is always Flate-compressed, a JPEG image is always JPEG-compressed. However for TIFF, the compression type is selectable.

Images formats that are supported by most Internet browsers are JPEG, GIF and PNG.

There are two fundamentally different types of compression: Lossless and lossy.

Lossless compression The transformation from the original to the compressed state of the image does not change the content. Thus the transformation is reversible and the original image can be regained from the compression state.

Lossless compression is normally used for artificial images or scanned text. It is applied to the following types of images: GIF, PNG, BMP, JPEG2000 if quality is set to 100, JBIG2 and TIFF compressed with G3, G4, LZW or Flate.

Lossy compression The compression algorithm alters the content of the image in a way that it compresses better. Thus a lossy compressed image cannot be reverted back to its original state. It also means multiple applications of lossy compression to the same image alter the image every time and thereby reduce the quality every time. How much the image may be altered to improve the compression rate is controlled by a quality index ranging from 1 to 100 and normally defaulted at 75.

Lossy algorithms usually provide a better compression rate, at the cost of visual quality. Lossy compression is normally used for photographs.

It is applied to the following types of images: JPEG, and JPEG2000 if quality is less than 100.

There are various compression types supported for the TIFF image format. These are:

CCITT Group 3, Group 3-2D CCITT Group 3 is the predecessor to CCITT Group 4, it is a simpler algorithm that normally results in a lower compression ratio.

CCITT Group 4   CCITT Group 4 is the standard compression for bi-level TIFF images (i.e. facsimile).

LZW   LZW (Lempel-Ziv-Welch) compression is a lossless compression algorithm for images.

Please consult the copyright laws of your country prior to using this compression algorithm.

JPEG   TIFF allows images to be compressed with JPEG, which is a lossy compression algorithm. JPEG provides a high compression ratio for 8 and 24 bit images. It is best suited for TIFFs containing photographs and little or no text.

ZIP (Flate)   ZIP is a lossless compression algorithm. It is useful for the compression of large images with no loss in quality.

Flate compression (also used by the ZIP format) and JPEG compression can be used for color or grey scale images. CCITT Group 3, 3-2D and 4 as well as Flate can be used for black and white images.

Example: Apply Flate compression to a TIFF image.

```
-z
```

5.6.5 Image Content, Dithering

The content of the image itself has a direct impact on how well it compresses. It seems quite obvious that a plain white image compresses much better than a page filling photograph.

Dithering is an algorithm that arranges the pixels of an image in a way that it creates a visual effect of colors that do not exist in the available colors of the image, such as different grays in a 1-bit black and white image. This complex arrangement of pixels however does not compress well and increase the file size. Disabling dithering therefore reduces the file size. In the 3-Heights™ PDF to Image Converter Service, dithering is also implemented for color images.

Example: Disable dithering (e.g. for scanned text).

```
-h 0
```

For more information, see chapter Dithering.

5.7 Options for Best Results on a Printer

Regular laser printers use a resolution of 600-1200 DPI. For best results on printers, choose a resolution of the same value. In this case, it is also important to generate black and white image and thus set the bits per pixel to 1. So the command would look like this:

Example: Create a bi-tonal, 1200 DPI, CCITT G4 compressed TIFF.

```
-b 1 -d 1200 -g4
```

An A4 black and white image with a resolution of 1200dpi will be about 1MB in size.

> **Note:** that using such a high resolution in combination with 8bit grey scale or 24bit color images will generate huge files (several hundreds of Megabytes un-compressed, and around 10 Megabytes using JPEG compression).

DPI values larger than 2400 will take a lot of CPU power and memory, we recommend not using values above 2400 for A4 paper size PDF documents.

5.8 Dithering

Dithering is a common means used in images to simulate colors that are not available as actual colors. Its use is best observed in image with a low color depth, where colors or shades of grey need to simulated with other colors (e.g. only black/white pixels).

5.8.1 Remarks

1. All images below have quite a low resolution. As a result the effects of the different dithering types become more obvious. The higher the resolution and the large the number of colors is, the higher the quality of the image.
2. The rendering filter and current zoom level of the PDF viewing application may have an additional impact on how the images below are displayed.

5.8.2 Color Images

Color Space	RGB (24 bit)
Dithering	None
File Size as PNG	129 kB
+	Highest quality
-	Highest file size
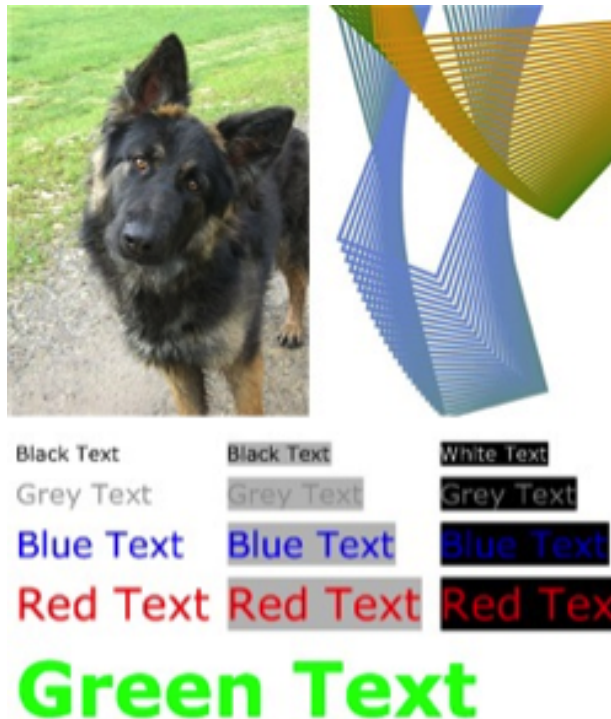
A 24 bit RGB color image can have up to 16.7 millions of different colors. Dithering does not need to be applied since all required colors exist and none need to be simulated.

Color Space	16 colors (4 bit)	
Dithering	None	
File Size as PNG	16 kB	
+	Small file size	
+	Works well for images with a small number of colors (artificial images, text)	
-	Does not work well for images with lots of colors photographic images) - parts of the image can become plain-colored and details get lost	

Color Space	16 colors (4 bit)	
Dithering	Floyd-Steinberg	
File Size as PNG	18 kB	
+	Renders details better	
+	Usually better overall quality, especially in photographic images than without dithering	
-	Sometimes generates unwanted artifacts (striking pixels)	
-	Larger file size then without dithering	

5.8.3 Bi-tonal Images

(The 8 bit image just acts as reference.)

Color Space	Grayscale (8 bit)
Dithering	None
File Size as PNG	46 kB

Black Text Black Text White Text
Grey Text Grey Text Grey Text
Blue Text Blue Text Blue Text
Red Text Red Text Red Tex

Green Text

Color Space	Grayscale (1 bit)
Dithering	None
File Size as PNG	2.6 kB
+	Smallest File Size
+	Works well for documents with high contrast (black text on white background)
+	Does not generate artifacts
-	Details get lost, because shades of gray are not approximated, but converted to either black or white (in fact images or part of them can become completely black or white)
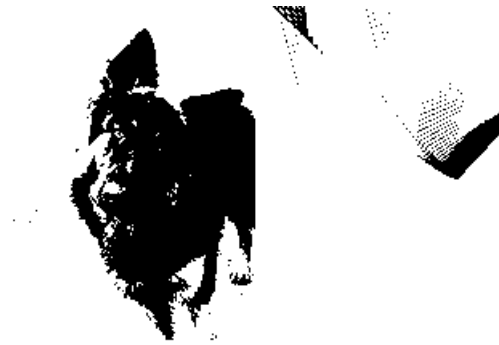
Black Text Black Text White Text
Grey Text
Blue Text Blue Text
Red Text Red Text

Color Space	Grayscale (1 bit)
Dithering	Floyd-Steinberg
File Size as PNG	9 kB
+	Generally higher quality, specially of photographic images
+	Can approximate any shade of gray
-	Larger file size than without dithering
-	Generates artifacts (e.g. a very bright gray paper is approximated by far-spread single black pixels)
-	Not well suited for text, unless the color of the text must be reflected
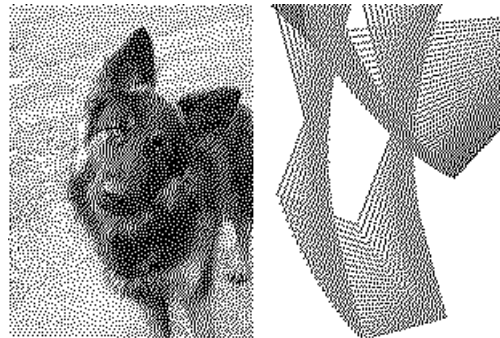
Color Space	Grayscale (1 bit)
Dithering	Halftone
File Size as PNG	4 kB
+	Small file size
+	Approximates shades of gray
-	Not well suited for text or artificial images
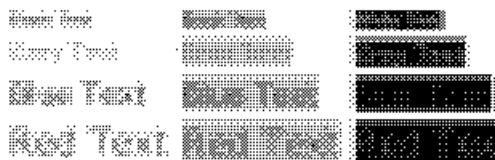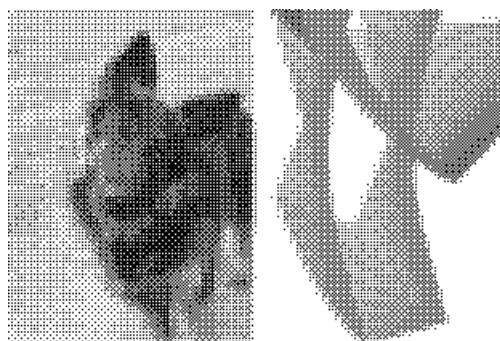
Color Space	Grayscale (1 bit)
Dithering	Pattern
File Size as PNG	5 kB
+	Works acceptable for all types of content (text, photographic images, artificial images)
-	Is not excellent in any type of content
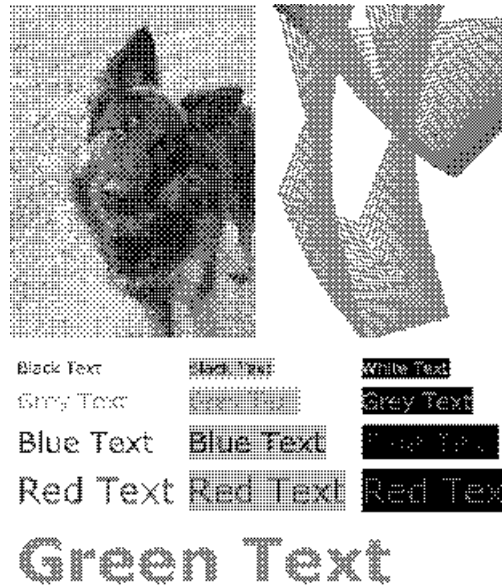
5.8.4 Guidelines

As seen in the examples above, different types of dithering behave different for different types of content. Below are some suggestions, which dithering type is normally best for a give type of content:

Text, OCR   No dithering

Artificial images with few colors and no bright colors   No dithering

Artificial images with many colors   Test which dithering type yields the best result

Photographic images   Floyd-Steinberg

Mixed content   Test which dithering type yields the best result

Mixed content, high-resolution   For resolutions above 300 DPI, Floyd-Steinberg almost always yields the best result (exception: for pure black text on white background, use no dithering)

Keep in mind that dithering should only be applied for images with a low color depth, such as black and white (1 bit). Dithering for images with a color depth of 8 bit or higher (256 colors or grey scale) has little to no visual impact.

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

Pause Service   `-a`

This option pauses the service.

```
Pdf2ImgSvr -a
```

6.1.2 `-c` Create Service

Create Service   `-c`

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

```
Pdf2ImgSvr -c
```

> **Important:**   It is essential that `Pdf2ImgSvr.exe` is on a non-mapped drive.

6.1.3 `-d` Delete Service

Delete Service   `-d`

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

```
Pdf2ImgSvr -d
```

6.1.4 `-i` List the Usage

List the Usage   `-i`

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

```
Pdf2ImgSvr -i
```

6.1.5 -o Continue Service

Continue Service   -o

This option resumes the service.

```
Pdf2ImgSvr -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.

```
Pdf2ImgSvr -q
The service starts automatically during system startup.
The service is stopped.
[Pdf2ImgSvr] QueryService: The operation completed successfully.
```

6.1.7 -s Start Service

Start Service   -s

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

```
Pdf2ImgSvr -s
```

6.1.8 -t Stop Service

Stop Service   -t

To stop the service, use the option -t.

```
Pdf2ImgSvr -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 PDF to Image Converter Service runs as an executable instead of as a Windows Service. It provides the same functionality as long as the executable is "running".

```
Pdf2ImgSvr -x
```

6.2 Supported Codecs

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

Codec Capabilities

Codec	Bits per Pixel	Gray	Indexed	Quality	Compression
TIFF	1,2,3,4,8,24[1]	Yes	Yes	Yes	Raw, Flate, LZW(default), JPEG, Group3, Group3_2D, Group4
JPEG	8, 24	Yes	No	Yes	JPEG (lossy only)
BMP	1, 2, 4, 8, 24[1]	Yes	Yes	No	Raw
GIF	2-8	Yes	Yes	No	LZW
PNG	1-8, 24	Yes	Yes	No	Flate
JBIG2	1	Yes	No	No	JBIG2 (lossless only)
JPEG2000	8, 24	Yes	Yes	Yes	JPEG2000 (lossless: Q = 100)[2]
PBM	1-8, 24	Yes	No	No	Raw
EPS	1, 2, 4, 8, 24[1]	Yes	No	No	Raw

Codec   The **Co**mpression/**Dec**ompression 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.

---

[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.

6.3 Configuration Options

6.3.1 Configuration File Pdf2ImgSvr.ini

The `Pdf2ImgSvr.ini` configuration file defines the setting for the watched folders. It is read upon starting the service.

`[Pdf2ImgSvr]`	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:

```
[Pdf2ImgSvr]
AutoDelete=true
LogPath=EventLog
JobPrefix=false
Threads=2
Thread1=-w C:\Pdf2ImgSvr\ToTiff -e .tif
Thread2=-w C:\Pdf2ImgSvr\ToJpeg -e .jpg -1
```

Autodelete of Successfully Processed Files

When a conversion process has been completed, the input file is handled in the following way depending on the settings in the `Pdf2ImgSvr.ini` file. The option `AutoDelete`, controls whether successfully printed documents are moved to the `Succeeded` folder (`AutoDelete=false`) or are being automatically deleted. Failed documents are not affected by this setting.

```
[Pdf2ImgSvr]
AutoDelete=true
```

To delete failed documents as well use the following setting:

```
[Pdf2ImgSvr]
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

Note: When `JobPrefix=false` then the incoming documents must have unique file names.

`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:

```
[Pdf2ImgSvr]
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:

```
[Pdf2ImgSvr]
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:

```
[Pdf2ImgSvr]
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 (`Pdf2ImgSvr`) 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.

```
[Pdf2ImgSvr]
PollingInterval=5000
```

6.3.2 -w Specify the Path to the Root Directory

Specify the Path to the Root Directory	-w ‹dir›

This option sets the path to the root directory.

> **Note:** This parameter must always be the first parameter of a thread.

Parameter:

‹dir› The given path should not contain mapped drives, since other users (such as LocalSystem) do not recognize them.

Example:

```
-w C:\Pdf2ImgSvr\Root
```

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.

6.3.3 -o Specify the Output Directory for Converted Images

Specify the Output Directory for Converted Images	-o ‹dir›
Default:	\Path{Images/}

This option sets the path for the output directory, where converted images are saved to.

Parameter:

‹dir› The given path should not contain mapped drives, since other users (such as LocalSystem) do not recognize them.

6.3.4 -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 PDF and FDF files.

```
-wfs .pdf.fdf
```

6.3.5 `-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
```

6.3.6 `-wd` Specify the Drop Path

Specify the Drop Path	`-wd ‹dir›`

This option sets the path of the drop directory. If this option is not set, then the drop directory equals the root directory `-w`. The drop directory is the watched folder, where input files are picked up and processed by the service.

Parameter:

`‹dir›` The drop directory can be at any existing (network-) location with the following conditions:

- The directory exists (it is not automatically created unlike the root directory).
- The user under which the service runs has access permissions to this directory.

Example:

```
-wd C:\Path\DropFilesInHere
```

6.3.7 `-1` Create one Image File per PDF Page

Create one Image File per PDF Page	`-1`

By default, the 3-Heights™ PDF to Image Converter Service generates multi-page images if the TIFF format is selected (unless the input PDF document has only one page). To create one TIFF file per PDF page, simply use the option `-1`. This option should also be used for all formats which do not support multi-paging if the input PDF document has more than one page.

This will generate a subfolder in the `Image` folder which contains a list of one-page images that have a number added to their file name.

6.3.8 -b Set the Bits per Pixel

Set the Bits per Pixel	-b ‹n›

The argument for this parameter depends on the image format (see table Codecs).

For JPEG this option has two allowed values: 8 for grey scale and 24 for TrueColor.

Example: The following command creates a grey scale JPEG image.

```
-b 8
```

When using 1 bit per pixel, it is suggested to disable anti-aliasing (option – oq) and set a suitable dithering algorithm (option – h).

6.3.9 -c Compression Type of TIFF Images

Compression Type of TIFF Images	-c ‹compression›

In `pdf2pdfimg` this option specifies the compression filter used for the images in the PDF file.

In `pdf2img` this option specifies the compression filter used for TIFF images.   For all other image types the compression is defined through the image format (.gif, .jpg, etc.).

The default compression is `l` (LZW) for `pdf2img` and `f` for `pdf2pdfimg`.

> **Note:** Not all image viewer support all compression types for TIFF.

Compression Table

Compression	Description
f	**Flate compression (ZIP)** is a lossless compression algorithm. It is useful for the compression of large images with no loss in quality.
g3	**CCITT Fax Group 3** is the predecessor to CCITT Fax Group 4, it is a simpler algorithm that normally results in a weaker compression level.
g3_2D	**CCITT Fax Group 3 2D** is a 2-dimensional version of the CCITT Group 3 Huffman encoding algorithm.
g4	**CCITT Fax Group 4** is the standard compression for bi-level images (i.e. facsimile).
j	**Joint Photographic Expert Group (JPEG)** is a lossy compression algorithm. JPEG provides a high level compression of 8 and 24 bit images. It is best suited for pictures, but not for text images. The option – q can be used to set an image quality.
j6	**TIFF embedded JPEG (6)** is an older version of JPEG. Certain (older) image software may support this compression, but not the newer version of JPEG (e.g. Photoshop 8). Allowed in `pdf2img` only.

Compression Table

`l`	**Lempel-Ziv-Welch (LZW)** is a lossless compression algorithm for images. Please consult the copyright laws of your country prior to using this compression algorithm.
`raw`	**No compression**

6.3.10 `-cn` Center Mode

Center Mode	`-cn`

Center the PDF. This option is useful in combination with setting page dimensions.

```
-s 800 600 -cn
```

6.3.11 `-cms` Set the Color Management Engine

Set the Color Management Engine	`-cms ‹engine›`

The transformation of colors from one color space to another is performed using a color management engine.

Supported engines are:

none   The algorithms specified in the PDF reference are used. This results in the maximum possible contrast.

neugebauer   The Neugebauer algorithm efficiently converts CMYK to RGB. It does not need any color profiles. The results, however, look similar to conversion using color profiles.

lcms   (default): Use ICC color profiles. Default profiles are used for all unmanaged device color spaces as described in section Color Profiles.

‹FileName›   When providing a file name, a configurable version of the Neugebauer algorithm is applied. The coefficients can be defined in the text file. The default Neugebauer coefficients are listed below (Red, Green, Blue; Color):

```
1.000000, 1.000000, 1.000000; White
0.000000, 0.682353, 0.937255; C
0.925490, 0.000000, 0.549020; M
1.000000, 0.949020, 0.000000; Y
0.137255, 0.121569, 0.125490; K
0.180392, 0.188235, 0.572549; CM
0.000000, 0.650980, 0.313725; CY
0.000000, 0.054902, 0.137255; CK
0.929412, 0.109804, 0.141176; MY
0.137255, 0.000000, 0.000000; MK
0.105882, 0.098039, 0.000000; YK
0.211765, 0.211765, 0.223529; CMY
0.000000, 0.000000, 0.003922; CMK
0.000000, 0.070588, 0.000000; CYK
0.133333, 0.000000, 0.000000; MYK
0.000000, 0.000000, 0.000000; CMYK
```

The Neugebauer algorithm mixes the colors based on the amount of color and the corresponding weighted coefficient. Altering the values for a pure color specifically changes the result for this pure color.

The color transition remains smooth.

Example: The following command selects the neugebauer color management engine.

```
-cms neugebauer
```

6.3.12 `-cs` Set the Color Space

Set the Color Space	`-cs ‹n›`

This options sets the color space. Supported values are:

Color Space

Value	Description
0	Grey-Scale
2	RGB
4	CMYK
7	Indexed
9	CMYK with K only

6.3.13 `-d` Set the Resolution in DPI

Set the Resolution in DPI	`-d ‹dpi›`

The default resolution is set to 150 DPI (dots per inch).

This switch is redundant to the specialized options -dx and -dy, meaning the last option set on the command takes precedence.

Example: To set the DPI value to 100 use the option -d like this:

```
-d 100
```

6.3.14 `-dx` Set the X-Resolution in DPI

Set the X-Resolution in DPI	`-dx ‹dpi›`

Set the resolution only for the X-axis. The default resolution is set to 150 DPI.

Example: Set the resolution in X to 72 DPI.

```
-dx 72
```

6.3.15 `-dy` Set the Y-Resolution in DPI

Set the Y-Resolution in DPI `-dy ‹dpi›`

Set the resolution only for the Y-axis. The default resolution is set to 150 DPI.

Example: Set the resolution in Y to 72 DPI.

```
-dy 72
```

6.3.16 `-e` Specify the Image Type/Extension

Specify the Image Type/Extension `-e`

The image type of the output file can be specified using the parameter `-e`. The following table shows a list of supported extensions and the corresponding file type:

File Formats

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

```
-w D:\output\watchfoldergif -e .gif
```

If this parameter is omitted, `.tif` is selected.

6.3.17 `-f` Fit Page Mode

Fit Page Mode `-f`

Make the PDF fit the page (in either width or height). This option is useful in combination with setting page dimensions.

Example: Convert a PDF to a 800 by 600 pixel TIFF image and scale the page of the PDF to fit the page of the image.

```
-s 800 600 -f
```

6.3.18 `-fax` Convert to Class F

Convert to Class F `-fax ‹class F›`

This options creates a Class F TIFF which is used by fax machines. There are two types:

Class F TIFF

Value	Description	Equal to these settings
s	standard	`-rp -sp 1728 0 -dx 204 -dy 98 -c g3`
h	high resolution	`-rp -sp 1728 0 -dx 204 -dy 196 -c g3`

Example: Convert a PDF to a standard Class F TIFF.

```
-fax s
```

6.3.19 `-fo` Bit Fill Order

Bit Fill Order `-fo ‹n›`

Set the fill order of bits used in fax compressions.

Bit Fill Order

Value	Description
1 (default)	Most Significant Bit (MSB) first.
2	Least Significant Bit (LSB) first.

6.3.20 `-fs` Filter Size

Filter Size   `-fs ‹n›`

This setting is used to enable and parameterize super-sampling, a technique to initially render the image at a higher resolution and then sample it down to the target resolution. As a result of that process the final image appears smoother, i.e. anti-aliased.

Applying super-sampling improves the image quality when rendering at low target resolutions (72 DPI or less); the higher the target resolution the less the visual impact.

This setting requires memory and CPU time quadratically to the ratio, therefore only small values, such as 2 or 3 should be used.

If a too high value (in combination with the original image size) is set, it is ignored.

6.3.21 `-g` Gray Color Space

[Deprecated] Gray Color Space   `-g`

Deprecated: Use the option `-cs` instead.

6.3.22 `-h` Dithering Mode

Dithering Mode   `-h ‹mode›`

Set the dithering mode. Allowed values are:

Dithering Mode

Value	Description
0	no dithering
1	(Default) Floyd-Steinberg
2	Halftone block
3	Halftone continuous
6	Atkinson dithering is very fast and produces images that can be compressed really well with reasonably good image quality.

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

Example: Disable dithering for a bi-tonal image.

```
-h 0 -b 1
```

6.3.23 `-i` Indexed Color Mode

[Deprecated] **Indexed Color Mode**   `-i`

No longer supported: Use option `-cs` instead.

6.3.24 `-lf` Set Line Width Multiplication Factor

Set Line Width Multiplication Factor   `-lf ‹factor›`

In cases where lines are rendered with an undesired width (e.g. too thin) the option `-lf` can be applied to scale them.

This option only affects lines. It has no influence when lines are drawn in any another way as by using the PDF operators m and l (move to, line to). It does not affect text unless text is drawn with lines instead of using a font.

6.3.25 `-lw` Set Minimum Line Width

Set Minimum Line Width   `-lw ‹width›`

In cases where lines are rendered too thin, a minimum line width in PDF points can be defined. Any line will then be printed with at least the defined minimum line width. Note that as a result, thin and very thin lines can no longer be distinguished. On order to scale all lines with a certain factor, use the option `-lf` instead.

This option only affects lines. It has no influence when lines are drawn in any another way as by using the PDF operators m and l (move to, line to). It does not affect text unless text is drawn with lines instead of using a font.

6.3.26 `-m` Rendering Mode

Rendering Mode   `-m ‹mode›`

There are two rendering modes: 1 (default) is the accurate mode, and 0 is the fast mode.

The accurate mode uses the Windows GDI+ for rendering. This mode allows for image filtering, sub-pixel rendering and anti-aliasing.

The fast mode uses the Windows GDI for rendering. This mode is generally faster and better suitable to create bitonal output.

6.3.27 `-o1` Use Type1 Fonts

Use Type1 Fonts   `-o1`

This option converts OpenType fonts to Type1 fonts.

6.3.28 `-oaa` Automatically switch to accurate mode if necessary

Automatically switch to accurate mode if necessary   `-oaa`

Detect content that cannot be rendered using fast rendering mode (GDI, see –m) and switch to accurate (GDI+) automatically, e.g. to render transparent tiling patterns.

6.3.29 -oe Do not Use Embedded Fonts

Do not Use Embedded Fonts -oe

This option disables the use of embedded fonts. Instead fonts from the operating system's font directory are used (`%Systemroot%\fonts`).

6.3.30 -ofp Use Pre-Installed fonts

Use Pre-Installed fonts -ofp

When using this switch embedded fonts are replaced by fonts installed in the operating system. Only non-symbolic fonts that have an equal name are replaced. The default behavior is that all embedded fonts are used.

6.3.31 -op Disable Pattern

Disable Pattern -op

This option disables patterns.

6.3.32 -oq Disable High Quality Rendering

Disable High Quality Rendering -oq

This option disables anti-aliasing.

> **Compatibility:** In previous versions, the option also disabled filtering, which is no longer the case with the current version.

6.3.33 -ot Use TrueType Fonts

Use TrueType Fonts -ot

This option converts OpenType and Type1 fonts to TrueType fonts. It is recommended to set this option.

6.3.34 -p Read an Encrypted PDF File

Read an Encrypted PDF File -p ‹password›

When the input PDF file is encrypted and has a user password set (the password to open the PDF), the password can be provided with the option -p.

Example: If the user password were `userpwd`, then the command to read and process the encrypted PDF would look like this:

```
-p userpwd
```

When a PDF is encrypted and the user password is not provided or is incorrect, the 3-Heights™ PDF to Image Converter Service cannot decrypt and read the file.

6.3.35 `-pg` Set Page Range

Set Page Range   `-pg ‹first› ‹last›`

With this switch the page range to be converted can be set. Note that the output image format must support multi-page. TIFF and JBIG2 support multi-page.

Example: Convert only pages 1 through 3.

```
-pg 1 3
```

6.3.36 `-pgs` Set of Pages

Set of Pages   `-pgs ‹page_set›`

A set of pages can be defined using single pages, ranges of pages and comma-separated combinations thereof.

Example: Convert pages 1, 2-4, 6 and 10.

```
-pgs 1,2-4,6,10
```

6.3.37 `-q` Set Image Quality

Set Image Quality   `-q ‹n›`

Set the image quality of lossy image compressions (such as JPEG). Default: 80. If a compression algorithm supports both lossy and lossless compression, a quality value of 100 will apply lossless compression.

6.3.38 `-rl` Rotate Pages to Landscape

Rotate Pages to Landscape   `-rl`

This option rotates all pages to landscape.

6.3.39 `-rp` Rotate Pages to Portrait

Rotate Pages to Portrait   `-rp`

This option rotates all pages to portrait.

6.3.40 `-s` Set Width and Height of Image in Points

Set Width and Height of Image in Points `-s ‹w› ‹h›`

When not specified, the image will have the same dimensions as the input PDF . To set the dimensions manually, use this option, where `‹w›` is the width and `‹h›` the height. If either of the dimensions is set to `0`, the value will be computed proportionally based on the other value.

Example: The following command will generate an image that is 400x300 points.

```
-s 400 300
```

6.3.41 `-sa` Set Width and Height in Pixel and Preserve Ratio

Set Width and Height in Pixel and Preserve Ratio `-sa ‹w› ‹h›`

The option `-sa` has the same effect as `-sp`, but the aspect ratio is preserved. This means you can specify the maximum size allowed, the image will then be scaled to fit one of the dimensions. (Example: a 400 by 400 points PDF is converted with the option `-sa 600 800`. The ratio of the input file is preserved, which is 1:1. The maximum that fits in 600 by 800 pixels is therefore a 600 by 600 pixel image).

6.3.42 `-sp` Set Width and Height of Image in Pixel

Set Width and Height of Image in Pixel `-sp ‹w› ‹h›`

This option can be used to set the dimensions of the image in pixels manually. If either of the dimensions is set to 0, the value will be calculated proportionally based on the other value.

Example: The following command creates a file with a width of 1024 pixels, the height is calculated proportionally.

```
-sp 1024 0
```

6.4 Pdf2PdfImgSvr Specific Options

This section describes the options specific to the 3-Heights™ PDF to PDF Image Converter Service. Most options described in the other chapters apply to both products. The definitive list of options supported is provided by the usage of the `Pdf2PdfImgSvr.exe`.

6.4.1 `-nl` Disable the copying of links

Disable the copying of links `-nl`

Link annotations are not copied to the output document if this switch is used.

6.4.2 `-no` Disable the copying of outlines

Disable the copying of outlines `-no`

Outlines (bookmarks) are not copied to the output document if this switch is used.

6.4.3 `-nv` Disable the copying of viewer preferences

Disable the copying of viewer preferences `-nv`

Viewer preferences are not copied to the output document if this switch is used.

6.4.4 `-oa` Retain text

Retain text `-oa`

Render all non text content on a single image and place the text on top of this image. As a result, text is retained in the output document. Note that if in the original PDF not all of the text content is placed on top of other content, then the text might be un-covered by graphics objects such as white rectangles (redaction objects).

6.4.5 `-ob` Use Rendering engine R2

Use Rendering engine R2 `-ob`

Use Rendering Engine R2 for rendering content.

6.4.6 `-oat` Retain non-transparent text

Retain non-transparent text `-oat`

Do not remove non-transparent text when using Rendering Engine R2.

6.4.7 `-oi` Make text invisible

Make text invisible `-oi`

Copy all text as invisible OCR text such that all text remains extractable.

6.4.8 `-t` Use a bitmap cache to simulate transparency

Use a bitmap cache to simulate transparency `-t`

Transparency is applied to a bitmap cache in memory.

6.4.9 -t1 Use Type1 fonts

Use Type1 fonts   `-t1`

This option converts OpenType fonts to Type1 fonts.

6.4.10 -tt Use TrueType fonts

Use TrueType fonts   `-tt`

This option converts all fonts to TrueType fonts.

7 Troubleshooting

7.1 Output

7.1.1 Images Are of Too Low Quality

Increase the resolution to increase to pixel mass. This is done using the option -d.

In certain cases increasing the filter size can improve the image quality (e.g. -fs 2).

7.1.2 Image Does Not Contain the Whole Content

This can happen when the option -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 option -f.

Alternatively ensure the page dimensions of the image are large enough to hold the complete page.

7.1.3 Colors Are Gone

The option -b allows you to set 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 option -cs 7.

7.2 Font and Text Issues

1. For issues with text using non-embedded fonts:
    1. Ensure the required fonts are available on the system (see Chapter Fonts).
    2. See Section Handle Non-Embedded Fonts.
2. For issues with text using embedded fonts:
    1. Ensure embedded fonts are used (i.e. -oe is not set).
    2. Ensure the two system environment variables TEMP and TMP exist and point to an existing directory. These variables not being set is a common error source for service applications that run under a user that has no temporary directory and thus cannot install fonts. See also Chapter Installation.
    3. See Section Handle Embedded Fonts.

7.2.1 Handle Non-Embedded Fonts

Font Replacement Strategy

This section describes the exact behavior of font handling of the rendering engine. It is rather technical and it is not required to be understood in order to properly use the software.

The following steps are performed sequentially in the search of a font. If a font is found, the search is stopped; otherwise the next step is performed.

1. If the font is not embedded or -ofp is set:

a. If the font name appears in the [replace] section in the configuration file fonts.ini the name is replaced and looked up in the installed font collection.
   b. If it is a standard font[3] it is replaced by the equivalent TrueType font name and it is looked up in the installed font collection.
   c. If the font name appears in the [fonts] section in the configuration file fonts.ini the name is replaced and looked up in the installed font collection.
   d. If the font has "Italic" or "Bold" in its name the font without these styles is looked up in the installed font collection.
2. If a font name is looked up in the installed font collection then the name comparison is performed as follows:
   a. PostScript name.
   b. TrueType name without blanks (a missing style is interpreted as "Regular" or "Normal").
   c. TrueType name without modifications.
3. If the font is embedded, it is converted to a Windows compatible font and temporarily installed. If -oe is used then the glyphs of the fonts are converted to either bitmaps or outlines[4]. If -oo is used then the glyphs are converted to outlines only.
4. If the font is not embedded and the Unicodes are available then the nearest font from the installed font collection is tailored to the metrics of the font.

7.2.2 Handle Embedded Fonts

The following list provides possible work-arounds if text is printed incorrectly. Options should be tried in ascending order.

1. Using the option -oe inhibits all embedded fonts from being used in the spool file and the printer hardware. Instead the glyphs are converted to either bitmaps or outlines. Using the option -oo at the same time the conversion is restricted to outlines.
2. Using the option -ofp inhibits embedded fonts which have the same name as the corresponding installed font from being used. This option can also be used to reduce the number of fonts in a spool file if the printer hardware memory capacity is limited.
3. Pre-render the page in a bitmap and send the pre-rendered image to the printer (-ob). This results in large spool files.

7.3 Transparency

The 3-Heights™ rendering engine supports transparency functions such as a number of blend modes as well as isolated and non-isolated transparency groups, but not transparency in general.

Certain types of tiling and shading patterns may not correctly be reproduced by the rendering engine.

7.4 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 instead.

Another possibility is an invalid configuration file, i.e. it contains paths that do not exist or syntax errors.

4

---

[3] e.g. Times-Roman, Helvetica, Courier
[4] The outline of a glyph is a vector graphic without any reference to the original font program.

8 Version History

8.1 Patches in Version 4.12

Note that the version number of the initial "final release" is 4.12.26.3.

Patch 4.12.26.4

- **Improved** error messages for failed HTTP connections in various situations (including license manager).
- **Added** missing documentation and release note for the proxy setting in the GUI license manager.
- **Improved** license reactivation behavior of the commandline license manager (licmgr): The server is now only contacted if necessary.
- **Improved** behavior of license manager when dealing with licenses of unreleased products.

8.2 Changes in Version 4.12

- **New** HTTP proxy setting in the GUI license manager.

8.3 Changes in Version 4.11

- **New** support for reading PDF 2.0 documents.
- **Improved** search in installed font collection to also find fonts by other names than TrueType or PostScript names.

8.4 Changes in Version 4.10

- **Improved** robustness against corrupt input PDF documents.
- **Improved** annotation appearance generation for polyline, squiggly, and stamp annotations.
- **Removed** the font `ZapfDingbats.ttf` from the product kit as it is not required anymore.

8.5 Changes in Version 4.9

- **Improved** support for and robustness against corrupt input PDF documents.
- **Improved** repair of embedded font programs that are corrupt.
- **New** support for OpenType font collections in installed font collection.
- **Improved** metadata generation for standard PDF properties.

8.6 Changes in Version 4.8

- **Improved** creation of annotation appearances to use less memory and processing time.
- **Added** repair functionality for TrueType font programs whose glyphs are not ordered correctly.

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