



## Creating ZUGFeRD files

**ZUGFeRD** (also known as Factur-X, XRechnung) files are PDF/A-3 documents that contain both human-readable and machine-readable invoice data, making them suitable for use in e-invoicing. The **ZUGFeRD** standard, which stands for “Zentraler User Guide des Forums elektronische Rechnung Deutschland,” was developed in Germany to streamline electronic invoicing between businesses (B2B) and with public entities (B2G).

## What is ZUGFeRD?

**ZUGFeRD** is unique because it combines two formats into one invoice:

- Human-readable PDF/A-3: A visual representation of the invoice, just like a regular PDF.
- Machine-readable XML: Embedded within the PDF, this XML file contains structured invoice data, which can be automatically processed by accounting software.

By including both formats, **ZUGFeRD** allows the recipient to either view and print the invoice or process the structured data electronically, eliminating the need for manual data entry.

## How to create a ZUGFeRD PDF with Ghostscript

### Note

We will assume you have been supplied with, or understand how to make, the XML portion for your invoice.

Ghostscript is just responsible for ensuring that the generated PDF is PDF/A compliant and for embedding the XML - it does not analyse or valid structure.

To create such an e-invoice we can use the **zugferd.ps** PostScript file (found in the `lib` folder) along with some command line options as follows:

```
gs
--permit-file-read=/usr/home/me/zugferd/
-sDEVICE=pdfwrite
-dPDFA=3
-sColorConversionStrategy=RGB
-sZUGFeRDXMLFile=/usr/home/me/zugferd/invoice.xml
-sZUGFeRDProfile=/usr/home/me/zugferd/default_rgb.icc
-sZUGFeRDVersion=2p1
-sZUGFeRDConformanceLevel=BASIC
-o /usr/home/me/zugferd/output.pdf
/usr/home/me/zugferd/zugferd.ps
/usr/home/me/zugferd/input.pdf
```

Let's go through these command line options in more detail:

#### `--permit-file-read`

Grant access to the folder we allow **Ghostscript** to read from.

#### `-sDEVICE`

Select a device to write a PDF.

#### `-dPDFA`

Define the PDF/A version. See: [Creating a PDF/A document](#) for available options.  
Note: version `3` is required for **ZUGFeRD**!

#### `-sColorConversionStrategy`

Define the color conversion strategy. See: [Creating a PDF/A document](#) for available options. Note: this should be consistent with the ICC profile defined in `-sZUGFeRDProfile`. So for example if this value is `RGB` then the associated ICC profile should be an RGB profile.

#### `-sZUGFeRDXMLFile`

Define the path to the invoice XML file.

#### `-sZUGFeRDProfile`

Define the path to the ICC profile.

#### `-sZUGFeRDVersion`

Allows selection of the version of the ZUGFeRD standard, possible values are `rc`, `1p0`, `2p0`, `2p1`. The default is `2p1` which is the 2.1 version of ZUGFeRD.

#### `-sZUGFeRDConformanceLevel`

Defines the level of conformance with the standard, possible values are `MINIMUM`, `BASIC`, `BASIC WL`, `EN 16931`, `EXTENDED` and `XRECHNUNG`. The default is `BASIC`.

`-o`

Defines the output PDF file.

#### ! Note

The final two arguments are the full path and filename of the `zugferd.ps` file, and the full path and filename of the input PDF file respectively.

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