The \texttt{pagegrid} package

Heiko Oberdiek\textsuperscript{*}

\texttt{<heiko.oberdiek at googlemail.com>}

2016/05/16 v1.5

Abstract

The \LaTeX{} package prints a page grid in the background.

Contents

1 Documentation \hfill 2
  1.1 Options \hfill 2
    1.1.1 Options \texttt{enable, disable} \hfill 2
    1.1.2 Grid origins \hfill 2
    1.1.3 Grid unit \hfill 2
    1.1.4 Color options \hfill 3
    1.1.5 Arrow options \hfill 3
    1.1.6 Miscellaneous options \hfill 3

2 Implementation \hfill 3

3 Test \hfill 10
  3.1 Catcode checks for loading \hfill 10

4 Installation \hfill 11
  4.1 Download \hfill 11
  4.2 Bundle installation \hfill 12
  4.3 Package installation \hfill 12
  4.4 Refresh file name databases \hfill 12
  4.5 Some details for the interested \hfill 12

5 Catalogue \hfill 13

6 Acknowledgement \hfill 13

7 History \hfill 13
  [2009/11/06 v1.0] \hfill 13
  [2009/11/06 v1.1] \hfill 13
  [2009/12/02 v1.2] \hfill 13
  [2009/12/03 v1.3] \hfill 14
  [2009/12/04 v1.4] \hfill 14
  [2016/05/16 v1.5] \hfill 14

8 Index \hfill 14

\textsuperscript{*}Please report any issues at https://github.com/ho-tex/oberdiek/issues
1 Documentation

The package puts a grid on the paper. It was written for developers of a class or package who have to put elements on definite locations on a page (e.g. letter class). The grid allows a faster optical check, whether the positions are correct. If the previewer already offers features for measuring, the package might be obsolete. Otherwise it saves the developer from printing the page and measuring by hand.

1.1 Options

Options are evaluated in the following order:

1. Configuration file pagegrid.cfg using \pagegridsetup if the file exists.
2. Package options given for \usepackage.
3. Later calls of \pagegridsetup.

\pagegridsetup{⟨option list⟩}

The options are key value options. Boolean options are enabled by default (without value) or by using the explicit value true. Value false disable the option.

1.1.1 Options enable, disable

enable: This boolean option controls whether the page grid is drawn. As default the page grid drawing is activated.

disable: It is the opposite of option enable. It was added for convenience and allows the abbreviation disable for enable=false.

1.1.2 Grid origins

The package supports up to two grids on a page allowing measurement from opposite directions. As default two grids are drawn, the first from bottom left to top right. The origin of the second grid is at the opposite top right corner. The origins are controlled by the following options. The number of grids (one or two) depend on the number of these options in one call of \pagegridsetup. The following frame shows a paper and in its corners are the corresponding options. At the left and right side alias names are given for the options inside the paper.

left-top, lt, top-left \[ l \quad t \quad r \quad t \]
left-bottom, lb, bottom-left \[ b \quad l \quad b \quad r \]

top-right, rt, right-top
bottom-right, rb, right-bottom

Examples:

\pagegridsetup{bl,tr}

This is the default setting with two grids as described previously. The following setups one grid only. Its origin is the upper left corner:

\pagegridsetup{top-left}

1.1.3 Grid unit

step This option takes a length and setups the unit for the grid. The page width and page height should be multiples of this unit. Currently the default is 1mm. But this might change later by a heuristic based on the paper size.
1.1.4 Color options

The basic grid lines are drawn as ultra thin help lines and is only drawn for the first grid. Each tenth and fifteenth line of the basic net is drawn thicker in a special color for the two grids.

**firstcolor**: Color for the thicker lines and the arrows of the first grid. Default value is red.

**secondcolor**: Color for the thicker lines and the arrows of the second grid. Default value is blue.

Use a color specification that package `tikz` understands. (The grid is drawn with `pgf/tikz`.)

1.1.5 Arrow options

Arrows are put at the origin at the grid to show the grid start and the direction of the grid.

**arrows**: This boolean option turns the arrows on or off. As default arrows are enabled.

**arrowlength**: The length given as value is the length of the edge of a square at the origin within the arrow is put as diagonal. Default is 10 times the grid unit (10 mm). The real arrow length is this length multiplied by $\sqrt{2}$.

1.1.6 Miscellaneous options

**double**: The output page is doubled, one without page grid and the other with page grid. Possible values are shown in the following table:

<table>
<thead>
<tr>
<th>Option</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>false</td>
<td>Turns option off.</td>
</tr>
<tr>
<td>first</td>
<td>Grid page comes first.</td>
</tr>
<tr>
<td>last</td>
<td>Grid page comes after the page without grid.</td>
</tr>
<tr>
<td>true</td>
<td>Same as last.</td>
</tr>
<tr>
<td>⟨no value⟩</td>
<td>Same as true.</td>
</tr>
</tbody>
</table>

**Note**: The double output of the page has side effects. All whatits are executed twice, for example: file writing and anchor setting. Some unwanted actions are caught such as multiple \label definitions, duplicate entries in the table of contents. For bookmarks, use package bookmarks.

**foreground**: Boolean option, default is false. Sometimes there might be elements on the page (e.g. large images) that hide the grid. Then option foreground puts the grids over the current output page.

2 Implementation

1 (*package*)

Reload check, especially if the package is not used with \LaTeX.
\def\pagegrid@height{\paperheight}\
\else
\def\pagegrid@width{\stockwidth}\
\def\pagegrid@height{\stockheight}\
\fi
\SetupKeyvalOptions{%
family=pagegrid,%
prefix=pagegrid@,%
}\
\def\pagegrid@init{%
\let\pagegrid@origin@a\@empty
\let\pagegrid@origin@b\@empty
\let\pagegrid@init\relax
}
\let\pagegrid@@init\pagegrid@init
\def\pagegrid@origin@a{bl}
\def\pagegrid@origin@b{tr}
\def\pagegrid@SetOrigin#1{%
\pagegrid@init
\ifx\pagegrid@origin@a\@empty
\else
\ifx\pagegrid@origin@b\@empty
\else
\let\pagegrid@origin@a\pagegrid@origin@b
\fi
\def\pagegrid@origin@b{#1}%
\fi
}
\def\pagegrid@temp#1{%
\pagegrid@SetOrigin{#1}%
\@namedef{pagegrid@N@#1}{#1}%
}
\pagegrid@temp{bl}
\pagegrid@temp{br}
\pagegrid@temp{tl}
\pagegrid@temp{tr}
\pagegrid@temp{bl}{bottom-left}
\pagegrid@temp{br}{bottom-right}
\pagegrid@temp{tl}{left-bottom}
\pagegrid@temp{tr}{top-right}
\pagegrid@temp{tl}{left-top}
\pagegrid@temp{tr}{right-top}
\DeclareBoolOption[true]{enable}
\DeclareComplementaryOption{disable}{enable}
\DeclareBoolOption{foreground}
\newlength{\pagegrid@step}
\define@key{pagegrid}{step}{%
\setlength{\pagegrid@step}{#1}%
}
\DeclareStringOption[red]{firstcolor}
\DeclareStringOption[blue]{secondcolor}
\DeclareBoolOption{arrows}
\newlength{pagegrid@arrowlength}
\pagegrid@arrowlength=\z@ \setlength{\pagegrid@arrowlength}{\#1}\%
}
\define@key{pagegrid}{arrowlength}{% \setlength{\pagegrid@arrowlength}{#1}%
\define@key{pagegrid}{double}{true}{% \PackageWarning{pagegrid}{Unsupported value `#1' for option `double'.\MessageBreak Known values are:\MessageBreak `false', `first', `last', `true'.\MessageBreak Now `false' is used%}
\chardef\pagegrid@double\z@ \newcommand*{\pagegridsetup}{% \let\pagegrid@init\pagegrid@@init \setkeys{pagegrid} %}
\pagegridsetup{% step=1mm% \InputIfFileExists{pagegrid.cfg}{}% \ProcessKeyvalOptions*\relax \AtBeginDocument{% \ifdim\pagegrid@arrowlength>\z@ \else \pagegrid@arrowlength=10\pagegrid@step \fi %}
\def\pagegridShipoutDoubleBegin{% \begingroup \let\newlabel\@gobbletwo \let\zref@newlabel\@gobbletwo \let\@writefile\@gobbletwo \let\select@language\@gobble \endgroup \def\pagegridShipoutDoubleEnd{% \def\pagegrid@WriteDouble#1#2{% \immediate\write#1{% \@backslashchar csname \pagegridShipoutDouble#2\@backslashchar endcsname% \}}
\def\pagegrid@ShipoutDouble#1{\begingroup \if@filesw \pagegrid@WriteDouble\@mainaux{Begin}% \ifx\@auxout\@partaux \pagegrid@WriteDouble\@mainaux{\#1}% \@writefile\@mainaux{% \pagegrid@WriteDouble\@mainaux{End}% \fi }% \def\pagegrid@ShipoutDouble#1{\begingroup \if@filesw \pagegrid@WriteDouble\@mainaux{Begin}% \ifx\@auxout\@partaux \pagegrid@WriteDouble\@mainaux{\#1}% \@writefile\@mainaux{% \pagegrid@WriteDouble\@mainaux{End}% \fi }%
3 Test

3.1 Catcode checks for loading

\catcode`\{=1 \%
\catcode`\}=2 \%
\catcode`#=6 \%
\catcode`@=11 \%
\expandafter\ifx\csname count@\endcsname\relax
\countdef\count@=255 \%
\fi
\expandafter\ifx\csname @gobble\endcsname\relax
\long\def\@gobble#1{}\%
\fi
\expandafter\ifx\csname @firstofone\endcsname\relax
\long\def\@firstofone#1{#1}\%
\fi
\expandafter\ifx\csname loop\endcsname\relax
\else
\expandafter\@gobble
\fi
{%
\def\loop#1\repeat{%
  \def\body{#1}%
  \iterate
}
\def\iterate{%
  \body
  \let\next\iterate
  \else
  \let\next\relax
  \fi
}\next
\let\repeat=\fi
}\%\%
\def\RestoreCatcodes{}%\%
\count@=0 \%
\loop
  \edef\RestoreCatcodes{}
\RestoreCatcodes%
  \catcode\the\count@=\the\catcode\count@\relax
\}%
\ifnum\count@<255 \%
\advance\count@ 1 \%
\repeat
\def\RangeCatcodeInvalid#1#2{%
\count@=#1\relax
\loop
  \catcode\count@=15 \%
  \ifnum\count@<#2\relax
\advance\count@ 1 \%
\repeat
\def\RangeCatcodeCheck#1#2#3{%
\count@=#1\relax
\loop
  \ifnum#3=\catcode\count@
4.1 Download

Package. This package is available on CTAN\footnote{\url{http://ctan.org/pkg/pagegrid}}:


Bundle. All the packages of the bundle ‘oberdiek’ are also available in a TDS compliant ZIP archive. There the packages are already unpacked and the documentation files are generated. The files and directories obey the TDS standard.

CTAN:install/macros/latex/contrib/oberdiek.tds.zip

\textit{TDS} refers to the standard “A Directory Structure for \TeX\ Files” (CTAN:tds/tds.pdf). Directories with \texttt{texmf} in their name are usually organized this way.
4.2 Bundle installation

**Unpacking.** Unpack the oberdiek.tds.zip in the TDS tree (also known as texmf tree) of your choice. Example (linux):

```
unzip oberdiek.tds.zip -d ~/texmf
```

**Script installation.** Check the directory TDS:scripts/oberdiek/ for scripts that need further installation steps. Package attachfile2 comes with the Perl script pdfatfi.pl that should be installed in such a way that it can be called as pdfatfi. Example (linux):

```
chmod +x scripts/oberdiek/pdfatfi.pl
cp scripts/oberdiek/pdfatfi.pl /usr/local/bin/
```

4.3 Package installation

**Unpacking.** The .dtx file is a self-extracting docstrip archive. The files are extracted by running the .dtx through plain TEX:

```
tex pagegrid.dtx
```

**TDS.** Now the different files must be moved into the different directories in your installation TDS tree (also known as texmf tree):

```
pagegrid.sty → tex/latex/oberdiek/pagegrid.sty
pagegrid.pdf → doc/latex/oberdiek/pagegrid.pdf
test/pagegrid-test1.tex → doc/latex/oberdiek/test/pagegrid-test1.tex
pagegrid.dtx → source/latex/oberdiek/pagegrid.dtx
```

If you have a docstrip.cfg that configures and enables docstrip’s TDS installing feature, then some files can already be in the right place, see the documentation of docstrip.

4.4 Refresh file name databases

If your TeX distribution (teTeX, miktex, ...) relies on file name databases, you must refresh these. For example, teTeX users run texhash or mktexlsr.

4.5 Some details for the interested

**Unpacking with lATEX.** The .dtx chooses its action depending on the format:

plain TeX: Run docstrip and extract the files.

lATEX: Generate the documentation.

If you insist on using lATEX for docstrip (really, docstrip does not need lATEX), then inform the autodetect routine about your intention:

```
latax \let\install=y\input{pagegrid.dtx}
```

Do not forget to quote the argument according to the demands of your shell.

**Generating the documentation.** You can use both the .dtx or the .drv to generate the documentation. The process can be configured by the configuration file ltxdoc.cfg. For instance, put this line into this file, if you want to have A4 as paper format:

```
\PassOptionsToClass{a4paper}{article}
```

An example follows how to generate the documentation with pdflATEX:
5 Catalogue

The following XML file can be used as source for the \TeX Catalogue. The elements \texttt{caption} and \texttt{description} are imported from the original XML file from the Catalogue. The name of the XML file in the Catalogue is \texttt{pagegrid.xml}.

\begin{verbatim}
(*catalogue*)
<?xml version='1.0' encoding='us-ascii'?>
<!DOCTYPE entry SYSTEM 'catalogue.dtd'>
<entry datestamp='$Date$' modifier='$Author$' id='pagegrid'>
  <name>pagegrid</name>
  <caption>Print page grid in background.</caption>
  <authorref id='auth:oberdiek'/>
  <copyright owner='Heiko Oberdiek' year='2009'/>
  <license type='lppl1.3'/>
  <version number='1.5'/>
  <description>
    This package puts a grid on the paper. It was written for developers of a class or package who have to put elements on definite locations on a page (e.g. letter class). The grid allows a faster optical check, whether the positions are correct. If the previewer already offers features for measuring, the package might be unnecessary. Otherwise it saves the developer from printing the page and measuring by hand.
  </description>
  <documentation details='Package documentation' href='ctan:/macros/latex/contrib/oberdiek/pagegrid.pdf'/>
  <ctan file='true' path='/macros/latex/contrib/oberdiek/pagegrid.dtx'/>
  <miktex location='oberdiek'/>
  <texlive location='oberdiek'/>
  <install path='/macros/latex/contrib/oberdiek/oberdiek.tds.zip'/>
</entry>
</catalogue>

6 Acknowledgement

Klaus Braune: He provided the idea and the first \texttt{tikz} code.

7 History

[2009/11/06 v1.0]
- The first version.

[2009/11/06 v1.1]
- Option \texttt{foreground} added.

[2009/12/02 v1.2]
- Color options, arrow options added.
- Names for origin options changed.

[2009/12/03 v1.3]
- Option double added.
- First CTAN release.

[2009/12/04 v1.4]
- Option double: Some unwanted side effects removed.

[2016/05/16 v1.5]
- Documentation updates.

## 8 Index

Numbers written in italic refer to the page where the corresponding entry is described; numbers underlined refer to the code line of the definition; plain numbers refer to the code lines where the entry is used.

<table>
<thead>
<tr>
<th>Symbols</th>
<th>Page Numbers</th>
</tr>
</thead>
<tbody>
<tr>
<td>#</td>
<td>384</td>
</tr>
<tr>
<td>%</td>
<td>460</td>
</tr>
<tr>
<td>@</td>
<td>385, 458</td>
</tr>
<tr>
<td>@auxout</td>
<td>255</td>
</tr>
<tr>
<td>@backslashchar</td>
<td>246, 248</td>
</tr>
<tr>
<td>@empty</td>
<td>144, 145, 153, 156, 313, 328, 344</td>
</tr>
<tr>
<td>@firstofone</td>
<td>393, 396</td>
</tr>
<tr>
<td>@gobble</td>
<td>239, 390, 398</td>
</tr>
<tr>
<td>@gobbletwo</td>
<td>236, 237, 238</td>
</tr>
<tr>
<td>@ifundefined</td>
<td>202, 284</td>
</tr>
<tr>
<td>@mainaux</td>
<td>254, 258, 263</td>
</tr>
<tr>
<td>@namedef</td>
<td>165, 214, 215, 216, 217</td>
</tr>
<tr>
<td>@one</td>
<td>280</td>
</tr>
<tr>
<td>@partaux</td>
<td>255, 256, 259</td>
</tr>
<tr>
<td>@undefined</td>
<td>58</td>
</tr>
<tr>
<td>@writefile</td>
<td>238</td>
</tr>
<tr>
<td>\</td>
<td>459</td>
</tr>
<tr>
<td>{</td>
<td>382</td>
</tr>
<tr>
<td>}</td>
<td>383</td>
</tr>
<tr>
<td>\advance</td>
<td>423, 431, 446</td>
</tr>
<tr>
<td>\aftergroup</td>
<td>29</td>
</tr>
<tr>
<td>\AtBeginDocument</td>
<td>228</td>
</tr>
<tr>
<td>\AtBeginShipout</td>
<td>274</td>
</tr>
<tr>
<td>\AtBeginShipoutBox</td>
<td>281, 287</td>
</tr>
<tr>
<td>\AtBeginShipoutOriginalShipout</td>
<td>270</td>
</tr>
<tr>
<td>\AtBeginShipoutUpperLeft</td>
<td>293</td>
</tr>
<tr>
<td>\AtBeginShipoutUpperLeftForeground</td>
<td>291</td>
</tr>
<tr>
<td>\begin</td>
<td>298</td>
</tr>
<tr>
<td>\body</td>
<td>402, 406</td>
</tr>
<tr>
<td>\catcode</td>
<td>2, 3, 5, 6, 7, 8, 9, 10, 11, 12, 13, 33, 34, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 69, 70, 72, 73, 74, 78, 79, 80, 81, 82, 83, 84, 87, 88, 90, 91, 92, 93, 97, 99, 382, 383, 384, 385, 420, 429, 437, 441, 458, 459, 460</td>
</tr>
<tr>
<td>\chardef</td>
<td>209, 211, 218</td>
</tr>
<tr>
<td>\copy</td>
<td>270, 287</td>
</tr>
<tr>
<td>\count@</td>
<td>387, 416</td>
</tr>
<tr>
<td>\countdef</td>
<td>420, 422, 423, 427, 429, 430, 431, 435, 437, 440, 441, 445, 446</td>
</tr>
<tr>
<td>\csname</td>
<td>387</td>
</tr>
<tr>
<td>\cuserdef</td>
<td>211, 386, 389, 392, 395, 450, 477</td>
</tr>
<tr>
<td>\draw</td>
<td>307, 315, 322, 330, 337, 346, 358</td>
</tr>
<tr>
<td>\endinput</td>
<td>186, 188, 195</td>
</tr>
<tr>
<td>\DeclareComplementaryOption</td>
<td>187</td>
</tr>
<tr>
<td>\DeclareStringOption</td>
<td>193, 194</td>
</tr>
<tr>
<td>\DeclareVoidOption</td>
<td>164, 172</td>
</tr>
<tr>
<td>\define@key</td>
<td>190, 198, 201</td>
</tr>
<tr>
<td>\draw</td>
<td>307, 315, 322, 330, 337, 346, 358</td>
</tr>
<tr>
<td>\empty</td>
<td>17, 18</td>
</tr>
<tr>
<td>\end</td>
<td>370, 478</td>
</tr>
<tr>
<td>\endsname</td>
<td>14, 21, 50, 66, 76, 132, 211, 386, 389, 392, 395, 450, 477</td>
</tr>
<tr>
<td>\endinput</td>
<td>29, 127</td>
</tr>
<tr>
<td>\endlineskip</td>
<td>4, 35, 71, 77, 89</td>
</tr>
<tr>
<td>\errmessage</td>
<td>439</td>
</tr>
<tr>
<td>\if@filesw</td>
<td>29</td>
</tr>
<tr>
<td>\ifdim</td>
<td>229, 275</td>
</tr>
<tr>
<td>\ifnum</td>
<td>280, 283, 374, 422, 430, 437, 445</td>
</tr>
<tr>
<td>\ifpagegrid@arrows</td>
<td>343</td>
</tr>
<tr>
<td>\ifpagegrid@enable</td>
<td>279</td>
</tr>
<tr>
<td>\ifpagegrid@foreground</td>
<td>290</td>
</tr>
</tbody>
</table>