

# The pagegrid package

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## Abstract

The L<sup>A</sup>T<sub>E</sub>X package prints a page grid in the background.

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\*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	tl	tr	top-right, rt, right-top
left-bottom, lb, bottom-left	bl	br	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 fiftyth 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:

Option	Meaning
<code>false</code>	Turns option off.
<code>first</code>	Grid page comes first.
<code>last</code>	Grid page comes after the page without grid.
<code>true</code>	Same as <code>last</code> .
<code>&lt;no value&gt;</code>	Same as <code>true</code> .

**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.
2 \begingroup\catcode61\catcode48\catcode32=10\relax%
3 \catcode13=5 % ^M
4 \endlinechar=13 %
5 \catcode35=6 % #
6 \catcode39=12 % '

```

```

7 \catcode44=12 % ,
8 \catcode45=12 % -
9 \catcode46=12 % .
10 \catcode58=12 % :
11 \catcode64=11 % @
12 \catcode123=1 % {
13 \catcode125=2 % }
14 \expandafter\let\expandafter\x\csname ver@pagegrid.sty\endcsname
15 \ifx\x\relax % plain-TeX, first loading
16 \else
17 \def\empty{}%
18 \ifx\x\empty % LaTeX, first loading,
19 % variable is initialized, but \ProvidesPackage not yet seen
20 \else
21 \expandafter\ifx\csname PackageInfo\endcsname\relax
22 \def\x#1#2{%
23 \immediate\write-1{Package #1 Info: #2.}%
24 }%
25 \else
26 \def\x#1#2{\PackageInfo{#1}{#2, stopped}}%
27 \fi
28 \x{pagegrid}{The package is already loaded}%
29 \aftergroup\endinput
30 \fi
31 \fi
32 \endgroup%

```

Package identification:

```

33 \begingroup\catcode61\catcode48\catcode32=10\relax%
34 \catcode13=5 % ^M
35 \endlinechar=13 %
36 \catcode35=6 % #
37 \catcode39=12 % '
38 \catcode40=12 % (
39 \catcode41=12 % )
40 \catcode44=12 % ,
41 \catcode45=12 % -
42 \catcode46=12 % .
43 \catcode47=12 % /
44 \catcode58=12 % :
45 \catcode64=11 % @
46 \catcode91=12 % [
47 \catcode93=12 % ]
48 \catcode123=1 % {
49 \catcode125=2 % }
50 \expandafter\ifx\csname ProvidesPackage\endcsname\relax
51 \def\x#1#2#3[#4]{\endgroup
52 \immediate\write-1{Package: #3 #4}%
53 \xdef#1{#4}%
54 }%
55 \else
56 \def\x#1#2[#3]{\endgroup
57 #2[#3]}%
58 \ifx#1\undefined
59 \xdef#1{#3}%
60 \fi
61 \ifx#1\relax
62 \xdef#1{#3}%
63 \fi

```

```

64   }%
65   \fi
66   \expandafter\x\csname ver@pagegrid.sty\endcsname
67   \ProvidesPackage{pagegrid}%
68   [2016/05/16 v1.5 Print page grid in background (HO)]%
69   \begingroup\catcode61\catcode48\catcode32=10\relax%
70   \catcode13=5 % ^M
71   \endlinechar=13 %
72   \catcode123=1 % {
73   \catcode125=2 % }
74   \catcode64=11 % @
75   \def\x{\endgroup
76     \expandafter\edef\csname pagegrid@AtEnd\endcsname{%
77       \endlinechar=\the\endlinechar\relax
78       \catcode13=\the\catcode13\relax
79       \catcode32=\the\catcode32\relax
80       \catcode35=\the\catcode35\relax
81       \catcode61=\the\catcode61\relax
82       \catcode64=\the\catcode64\relax
83       \catcode123=\the\catcode123\relax
84       \catcode125=\the\catcode125\relax
85     }%
86   }%
87   \x\catcode61\catcode48\catcode32=10\relax%
88   \catcode13=5 % ^M
89   \endlinechar=13 %
90   \catcode35=6 % #
91   \catcode64=11 % @
92   \catcode123=1 % {
93   \catcode125=2 % }
94   \def\TMP@EnsureCode#1#2{%
95     \edef\pagegrid@AtEnd{%
96       \pagegrid@AtEnd
97       \catcode#1=\the\catcode#1\relax
98     }%
99     \catcode#1=#2\relax
100 }
101 \TMP@EnsureCode{9}{10}% (tab)
102 \TMP@EnsureCode{10}{12}% ^^J
103 \TMP@EnsureCode{33}{12}% !
104 \TMP@EnsureCode{34}{12}% "
105 \TMP@EnsureCode{36}{3}% $
106 \TMP@EnsureCode{38}{4}% &
107 \TMP@EnsureCode{39}{12}% '
108 \TMP@EnsureCode{40}{12}% (
109 \TMP@EnsureCode{41}{12}% )
110 \TMP@EnsureCode{42}{12}% *
111 \TMP@EnsureCode{43}{12}% +
112 \TMP@EnsureCode{44}{12}% ,
113 \TMP@EnsureCode{45}{12}% -
114 \TMP@EnsureCode{46}{12}% .
115 \TMP@EnsureCode{47}{12}% /
116 \TMP@EnsureCode{58}{12}% :
117 \TMP@EnsureCode{59}{12}% ;
118 \TMP@EnsureCode{60}{12}% <
119 \TMP@EnsureCode{62}{12}% >
120 \TMP@EnsureCode{63}{12}% ?
121 \TMP@EnsureCode{91}{12}% [

```

```

122 \TMP@EnsureCode{93}{12}% ]
123 \TMP@EnsureCode{94}{7}% ^ (superscript)
124 \TMP@EnsureCode{95}{8}% _ (subscript)
125 \TMP@EnsureCode{96}{12}% ‘
126 \TMP@EnsureCode{124}{12}% |
127 \edef\pagegrid@AtEnd{\pagegrid@AtEnd\noexpand\endinput}

128 \RequirePackage{tikz}
129 \RequirePackage{atbegshi}[2009/12/02]
130 \RequirePackage{kvoptions}[2009/07/17]

131 \begingroup\expandafter\expandafter\expandafter\endgroup
132 \expandafter\ifx\csname stockwidth\endcsname\relax
133   \def\pagegrid@width{\paperwidth}%
134   \def\pagegrid@height{\paperheight}%
135 \else
136   \def\pagegrid@width{\stockwidth}%
137   \def\pagegrid@height{\stockheight}%
138 \fi

139 \SetupKeyvalOptions{%
140   family=pagegrid,%
141   prefix=pagegrid@,%
142 }
143 \def\pagegrid@init{%
144   \let\pagegrid@origin@a\@empty
145   \let\pagegrid@origin@b\@empty
146   \let\pagegrid@init\relax
147 }
148 \let\pagegrid@@init\pagegrid@init
149 \def\pagegrid@origin@a{bl}
150 \def\pagegrid@origin@b{tr}
151 \def\pagegrid@SetOrigin#1{%
152   \pagegrid@init
153   \ifx\pagegrid@origin@a\@empty
154     \def\pagegrid@origin@a{#1}%
155   \else
156     \ifx\pagegrid@origin@b\@empty
157       \else
158         \let\pagegrid@origin@a\pagegrid@origin@b
159       \fi
160     \def\pagegrid@origin@b{#1}%
161   \fi
162 }
163 \def\pagegrid@temp#1{%
164   \DeclareVoidOption{#1}{\pagegrid@SetOrigin{#1}}%
165   \@namedef{pagegrid@N@#1}{#1}%
166 }
167 \pagegrid@temp{bl}
168 \pagegrid@temp{br}
169 \pagegrid@temp{tl}
170 \pagegrid@temp{tr}
171 \def\pagegrid@temp#1#2{%
172   \DeclareVoidOption{#2}{\pagegrid@SetOrigin{#1}}%
173 }%
174 \pagegrid@temp{bl}{lb}
175 \pagegrid@temp{br}{rb}
176 \pagegrid@temp{tl}{lt}
177 \pagegrid@temp{tr}{rt}
178 \pagegrid@temp{bl}{bottom-left}

```

```

179 \pagegrid@temp{br}{bottom-right}
180 \pagegrid@temp{tl}{top-left}
181 \pagegrid@temp{tr}{top-right}
182 \pagegrid@temp{bl}{left-bottom}
183 \pagegrid@temp{br}{right-bottom}
184 \pagegrid@temp{tl}{left-top}
185 \pagegrid@temp{tr}{right-top}

186 \DeclareBoolOption[true]{enable}
187 \DeclareComplementaryOption{disable}{enable}

188 \DeclareBoolOption{foreground}

189 \newlength{\pagegrid@step}
190 \define@key{pagegrid}{step}{%
191   \setlength{\pagegrid@step}{#1}%
192 }

193 \DeclareStringOption[red]{firstcolor}
194 \DeclareStringOption[blue]{secondcolor}

195 \DeclareBoolOption[true]{arrows}
196 \newlength\pagegrid@arrowlength
197 \pagegrid@arrowlength=\z@
198 \define@key{pagegrid}{arrowlength}{%
199   \setlength{\pagegrid@arrowlength}{#1}%
200 }

201 \define@key{pagegrid}{double}[true]{%
202   \@ifundefined{pagegrid@double@#1}{%
203     \PackageWarning{pagegrid}{%
204       Unsupported value ‘#1’ for option ‘double’.\MessageBreak
205       Known values are:\MessageBreak
206       ‘false’, ‘first’, ‘last’, ‘true’.\MessageBreak
207       Now ‘false’ is used%
208     }%
209     \chardef\pagegrid@double\z@
210   }{%
211     \chardef\pagegrid@double\cname pagegrid@double@#1\endcsname\relax
212   }%
213 }
214 \@namedef{pagegrid@double@false}{0}
215 \@namedef{pagegrid@double@first}{1}
216 \@namedef{pagegrid@double@last}{2}
217 \@namedef{pagegrid@double@true}{2}
218 \chardef\pagegrid@double\z@

219 \newcommand*\pagegridsetup{%
220   \let\pagegrid@init\pagegrid@init
221   \setkeys{pagegrid}%
222 }

223 \pagegridsetup{%
224   step=1mm%
225 }

226 \InputIfFileExists{pagegrid.cfg}{}%
227 \ProcessKeyvalOptions*\relax
228 \AtBeginDocument{%
229   \ifdim\pagegrid@arrowlength>\z@
230   \else
231     \pagegrid@arrowlength=10\pagegrid@step
232   \fi
233 }

```

```

234 \def\pagegridShipoutDoubleBegin{%
235   \begingroup
236   \let\newlabel\@gobbletwo
237   \let\zref@newlabel\@gobbletwo
238   \let\@writefile\@gobbletwo
239   \let\select@language\@gobble
240 }
241 \def\pagegridShipoutDoubleEnd{%
242   \endgroup
243 }
244 \def\pagegrid@WriteDouble#1#2{%
245   \immediate\write#1{%
246     \@backslashchar csname %
247     pagegridShipoutDouble#2%
248     \@backslashchar endcsname%
249   }%
250 }
251 \def\pagegrid@ShipoutDouble#1{%
252   \begingroup
253   \if@filesw
254     \pagegrid@WriteDouble\@mainaux{Begin}%
255     \ifx\@auxout\@partaux
256       \pagegrid@WriteDouble\@partaux{Begin}%
257       \def\pagegrid@temp{%
258         \pagegrid@WriteDouble\@mainaux{End}%
259         \pagegrid@WriteDouble\@partaux{End}%
260       }%
261     \else
262       \def\pagegrid@temp{%
263         \pagegrid@WriteDouble\@mainaux{End}%
264       }%
265     \fi
266   \else
267     \def\pagegrid@temp{}%
268   \fi
269   \let\protect\noexpand
270   \AtBeginShipoutOriginalShipout\copy#1\relax
271   \pagegrid@temp
272   \endgroup
273 }
274 \AtBeginShipout{%
275   \ifdim\pagegrid@step>\z@
276   \else
277     \pagegrid@enablefalse
278   \fi
279   \ifpagegrid@enable
280     \ifnum\pagegrid@double=\@ne
281       \pagegrid@ShipoutDouble\AtBeginShipoutBox
282     \else
283       \ifnum\pagegrid@double=\tw@
284         \ifundefined{pagegrid@DoubleBox}{%
285           \newbox\pagegrid@DoubleBox
286         }{}%
287         \setbox\pagegrid@DoubleBox=\copy\AtBeginShipoutBox
288       \fi
289     \fi
290   \ifpagegrid@foreground
291     \expandafter\AtBeginShipoutUpperLeftForeground

```



```

292 \else
293   \expandafter\AtBeginShipoutUpperLeft
294 \fi
295 {%
296   \put(0,0){%
297     \makebox(0,0)[lt]{%
298       \begin{tikzpicture}[%
299         bl/.style={},%
300         br/.style={xshift=\pagegrid@width,xscale=-1},%
301         tl/.style={yshift=\pagegrid@height,yscale=-1},%
302         tr/.style={xshift=\pagegrid@width,%
303           yshift=\pagegrid@height,scale=-1}%
304       ]%
305       \useasboundingbox
306         (0mm,\pagegrid@height) rectangle (0mm,\pagegrid@height);%
307       \draw[%
308         \pagegrid@origin@a,%
309         step=\pagegrid@step,%
310         style=help lines,%
311         ultra thin%
312       ] (0mm,0mm) grid (\pagegrid@width,\pagegrid@height);%
313       \ifx\pagegrid@origin@b\@empty
314       \else
315         \draw[%
316           \pagegrid@origin@b,%
317           step=10\pagegrid@step,%
318           {\pagegrid@secondcolor},%
319           very thin%
320         ] (0mm,0mm) grid (\pagegrid@width,\pagegrid@height);%
321       \fi
322       \draw[%
323         \pagegrid@origin@a,%
324         step=10\pagegrid@step,%
325         {\pagegrid@firstcolor},%
326         very thin%
327       ] (0mm,0mm) grid (\pagegrid@width,\pagegrid@height);%
328       \ifx\pagegrid@origin@b\@empty
329       \else
330         \draw[%
331           \pagegrid@origin@b,%
332           step=50\pagegrid@step,%
333           {\pagegrid@secondcolor},%
334           thick%
335         ] (0mm,0mm) grid (\pagegrid@width,\pagegrid@height);%
336       \fi
337       \draw[%
338         \pagegrid@origin@a,%
339         step=50\pagegrid@step,%
340         {\pagegrid@firstcolor},%
341         thick%
342       ] (0mm,0mm) grid (\pagegrid@width,\pagegrid@height);%
343       \ifpagegrid@arrows
344       \ifx\pagegrid@origin@b\@empty
345       \else
346         \draw[%
347           \pagegrid@origin@b,%
348           {\pagegrid@secondcolor},%
349           stroke,%

```

```

350         line width=1pt,%
351         line cap=round%
352     ] (0mm,0mm) %
353     -- (\pagegrid@arrowlength,\pagegrid@arrowlength) %
354         (\pagegrid@arrowlength,.5\pagegrid@arrowlength) %
355     -- (\pagegrid@arrowlength,\pagegrid@arrowlength) %
356     -- (.5\pagegrid@arrowlength,\pagegrid@arrowlength);%
357 \fi
358 \draw[%
359     \pagegrid@origin@a,%
360     {\pagegrid@firstcolor},%
361     stroke,%
362     line width=1pt,%
363     line cap=round%
364 ] (0mm,0mm) %
365     -- (\pagegrid@arrowlength,\pagegrid@arrowlength) %
366         (\pagegrid@arrowlength,.5\pagegrid@arrowlength) %
367     -- (\pagegrid@arrowlength,\pagegrid@arrowlength) %
368     -- (.5\pagegrid@arrowlength,\pagegrid@arrowlength);%
369 \fi
370 \end{tikzpicture}%
371 }%
372 }%
373 }%
374 \ifnum\pagegrid@double=\tw@
375     \pagegrid@ShipoutDouble\pagegrid@DoubleBox
376 \fi
377 \fi
378 }
379 \pagegrid@AtEnd%
380 \end{package}

```

## 3 Installation

### 3.1 Download

**Package.** This package is available on CTAN<sup>1</sup>:

[CTAN:macros/latex/contrib/oberdiek/pagegrid.dtx](https://ctan.org/ctan/packages/macros/latex/contrib/oberdiek/pagegrid.dtx) The source file.

[CTAN:macros/latex/contrib/oberdiek/pagegrid.pdf](https://ctan.org/ctan/packages/macros/latex/contrib/oberdiek/pagegrid.pdf) Documentation.

**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](https://ctan.org/ctan/packages/install/macros/latex/contrib/oberdiek.tds.zip)

*TDS* refers to the standard “A Directory Structure for  $\TeX$  Files” ([CTAN:pkg/tds](https://ctan.org/ctan/packages/pkg/tds)). Directories with `texmf` in their name are usually organized this way.

### 3.2 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
```

---

<sup>1</sup>[CTAN:pkg/pagegrid](https://ctan.org/ctan/packages/pkg/pagegrid)

### 3.3 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
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`.

### 3.4 Refresh file name databases

If your `TEX` distribution (`TEX Live`, `MiKTEX`, ...) relies on file name databases, you must refresh these. For example, `TEX Live` users run `texhash` or `mktexlsr`.

### 3.5 Some details for the interested

**Unpacking with L<sup>A</sup>T<sub>E</sub>X.** The `.dtx` chooses its action depending on the format:

**plain T<sub>E</sub>X:** Run `docstrip` and extract the files.

**L<sup>A</sup>T<sub>E</sub>X:** Generate the documentation.

If you insist on using L<sup>A</sup>T<sub>E</sub>X for `docstrip` (really, `docstrip` does not need L<sup>A</sup>T<sub>E</sub>X), then inform the `autodetect` routine about your intention:

```
latex \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`:

```
pdflatex pagegrid.dtx
makeindex -s gind.ist pagegrid.idx
pdflatex pagegrid.dtx
makeindex -s gind.ist pagegrid.idx
pdflatex pagegrid.dtx
```

## 4 Acknowledgement

**Klaus Braune:** He provided the idea and the first `tikz` code.

## 5 History

[2009/11/06 v1.0]

- The first version.

[2009/11/06 v1.1]

- Option 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.

## 6 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.

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