

# The flags package

Heiko Oberdiek\*  
<heiko.oberdiek at googlemail.com>

2016/05/16 v0.5

## Abstract

Package `flags` allows the setting and clearing of flags in bit fields and converts the bit field into a decimal number. Currently the bit field is limited to 31 bits.

## Contents

<b>1</b>	<b>Documentation</b>	<b>1</b>
1.1	User interface . . . . .	2
1.2	Requirements . . . . .	2
1.3	ToDo . . . . .	2
<b>2</b>	<b>Implementation</b>	<b>2</b>
<b>3</b>	<b>Installation</b>	<b>5</b>
3.1	Download . . . . .	5
3.2	Bundle installation . . . . .	5
3.3	Package installation . . . . .	6
3.4	Refresh file name databases . . . . .	6
3.5	Some details for the interested . . . . .	6
<b>4</b>	<b>Catalogue</b>	<b>7</b>
<b>5</b>	<b>History</b>	<b>7</b>
	[2007/02/18 v0.1] . . . . .	7
	[2007/03/07 v0.2] . . . . .	7
	[2007/03/31 v0.3] . . . . .	7
	[2007/09/30 v0.4] . . . . .	7
	[2016/05/16 v0.5] . . . . .	7
<b>6</b>	<b>Index</b>	<b>8</b>

## 1 Documentation

A new powerful package `bitset` is written by me and supersedes this package:

- The bit range is not restricted to 31 bits, only index numbers are objected to  $\TeX$ 's number limit.
- Many more operations are available.
- No dependency of  $\varepsilon\text{-}\TeX$ .

Therefore I consider this package as obsolete and have stopped the development of this package.

---

\*Please report any issues at <https://github.com/ho-tex/oberdiek/issues>

## 1.1 User interface

Flag positions are one-based, thus the flag position must be a positive integer.  
Currently supported range: 1..31

`\resetflags {fname}`

The bit field *fname* is cleared. Currently is also used for initialization, because a `\newflags` macro is not implemented.

`\setflag {fname} {position}`

The flag at bit position *position* is set in the bit field *fname*.

`\clearflag {fname} {position}`

The flag at bit position *position* is cleared in the bit field *fname*.

`\printflags {fname}`

The bit field *fname* is converted to a decimal number. The macro is expandible.

`\extractflag {fname} {position}`

Extracts the flag setting at bit position *position*. `\extractflag` expands to 1 if the flag is set and 0 otherwise.

`\queryflag {fname} {position} {set part} {clear part}`

It is a wrapper for `\extractflag`. *set part* is called if `\extractflag` returns 1. Otherwise *clear part* is executed.

**Example.** See package `bookmark`. It uses package `flags` for its font style options.

## 1.2 Requirements

- $\varepsilon$ -TeX (`\numexpr`)

## 1.3 ToDo

- Named positions.
- Setting positions by a key-value interface.
- Support for more than 31 bits while maintaining expandibility of `\printflags`.
- Eventually `\newflags`, `\newflagstype`.

## 2 Implementation

```
1 (*package)
2 \NeedsTeXFormat{LaTeX2e}
3 \ProvidesPackage{flags}%
4 [2016/05/16 v0.5 Setting/clearing of flags in bit fields (HO)]%
5 \begingroup\expandafter\expandafter\expandafter\endgroup
```

```

6 \expandafter\ifx\csname numexpr\endcsname\relax
7 \PackageError{flags}{%
8   Missing e-TeX, package loading aborted%
9 }{%
10   This packages makes heavy use of \string\numexpr.%
11 }%
12 \expandafter\endinput
13 \fi

\resetflags
14 \newcommand*{\resetflags}[1]{%
15   \expandafter\let\csname flags@#1\endcsname\@empty
16 }

\printflags Macro \printflags converts the bit field into a decimal number.
17 \newcommand*{\printflags}[1]{%
18   \expandafter\@printflags\csname flags@#1\endcsname
19 }
20 \def\@printflags#1{%
21   \expandafter\@firstofone\expandafter{%
22     \number\numexpr
23     \ifx#1\@empty
24       0%
25     \else
26       \expandafter\@@printflags#1%
27     \fi
28   }%
29 }
30 \def\@@printflags#1#2\fi{%
31   \fi
32   #1%
33   \ifx\#2\%
34     \else
35     +2*\numexpr\expandafter\@@printflags#2%
36   \fi
37 }

\setflag
38 \newcommand*{\setflag}[2]{%
39   \ifnum#2>\z@
40     \expandafter\@setflag\csname flags@#1\endcsname
41     \expandafter{\romannumerals\number\numexpr#2-1\relax000}%
42   \else
43     \PackageError{flags}{Position must be a positive number}\@ehc
44   \fi
45 }
46 \def\@setflag#1#2{%
47   \ifx#1\relax
48     \let#1\@empty
49   \fi
50   \edef#1{%
51     \expandafter\@@setflag\expandafter{#1}{#2}%
52   }%
53 }
54 \def\@@setflag#1#2{%
55   \ifx\#1\%
56     \FLAGS@zero#2\relax
57     1%
58   \else
59     \ifx\#2\%
60     1\@gobble#1%
61   \else
62     \@@@setflag#1|#2%

```

```

63 \fi
64 \fi
65 }
66 \def\@@@setflag#1#2|#3#4\fi\fi{%
67 \fi\fi
68 #1%
69 \@@setflag{#2}{#4}%
70 }

\clearflag
71 \newcommand*\clearflag}[2]{%
72 \ifnum#2>\z@
73 \expandafter\@clearflag\csname flags@#1\expandafter\endcsname
74 \expandafter{\romannumeral\number\numexpr#2-1\relax000}%
75 \else
76 \PackageError{flags}{Position must be a positive number}\@ehc
77 \fi
78 }
79 \def\@clearflag#1#2{%
80 \ifx#1\relax
81 \let#1\@empty
82 \fi
83 \edef#1{%
84 \expandafter\@@clearflag\expandafter{#1}{#2}%
85 }%
86 }
87 \def\@@clearflag#1#2{%
88 \ifx\#1\%
89 \else
90 \ifx\#2\%
91 0\@gobble#1%
92 \else
93 \@@@clearflag#1|#2%
94 \fi
95 \fi
96 }
97 \def\@@@clearflag#1#2|#3#4\fi\fi{%
98 \fi\fi
99 #1%
100 \@@clearflag{#2}{#4}%
101 }

102 \def\FLAGS@zero#1{%
103 \ifx#1\relax
104 \else
105 0%
106 \expandafter\FLAGS@zero
107 \fi
108 }

\queryflag
109 \newcommand*\queryflag}[2]{%
110 \ifnum\extractflag{#1}{#2}=\@ne
111 \expandafter\@firstoftwo
112 \else
113 \expandafter\@secondoftwo
114 \fi
115 }

\extractflag
116 \newcommand*\extractflag}[1]{%
117 \expandafter\@extractflag\csname flags@#1\endcsname
118 }

```

```

119 \def\@extractflag#1#2{%
120 \ifx#1\@undefined
121 0%
122 \else
123 \ifx#1\relax
124 0%
125 \else
126 \ifx#1\@empty
127 0%
128 \else
129 \expandafter\expandafter\expandafter\@extractflag
130 \expandafter\expandafter\expandafter{%
131 \expandafter#1\expandafter
132 }\expandafter{%
133 \romannumeral\number\numexpr#2-1\relax000%
134 }%
135 \fi
136 \fi
137 \fi
138 }
139 \def\@@extractflag#1#2{%
140 \ifx\|#1\%
141 0%
142 \else
143 \ifx\|#2\%
144 \@car#1\@nil
145 \else
146 \@@extractflag#1|#2%
147 \fi
148 \fi
149 }
150 \def\@@@extractflag#1#2|#3#4\fi\fi{%
151 \fi\fi
152 \@@extractflag{#2}{#4}%
153 }
154 \end{package}

```

## 3 Installation

### 3.1 Download

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

[CTAN:macros/latex/contrib/oberdiek/flags.dtx](#) The source file.

[CTAN:macros/latex/contrib/oberdiek/flags.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](#)

*TDS* refers to the standard “A Directory Structure for T<sub>E</sub>X Files” ([CTAN:tds/tds.pdf](#)). 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):

---

<sup>1</sup><http://ctan.org/pkg/flags>

```
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/
```

### 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 flags.dtx
```

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

```
flags.sty → tex/latex/oberdiek/flags.sty
flags.pdf → doc/latex/oberdiek/flags.pdf
flags.dtx → source/latex/oberdiek/flags.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 (`te $\TeX$` , `mik $\TeX$` , ...) relies on file name databases, you must refresh these. For example, `te $\TeX$`  users run `texhash` or `mktextlsr`.

### 3.5 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:

```
latex \let\install=y\input{flags.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 `pdf $\LaTeX$` :

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

## 4 Catalogue

The following XML file can be used as source for the [T<sub>E</sub>X Catalogue](#). The elements `caption` and `description` are imported from the original XML file from the Catalogue. The name of the XML file in the Catalogue is `flags.xml`.

```
155 (*catalogue)
156 <?xml version='1.0' encoding='us-ascii'?>
157 <!DOCTYPE entry SYSTEM 'catalogue.dtd'>
158 <entry datestamp='$Date$' modifier='$Author$' id='flags'>
159   <name>flags</name>
160   <caption>Setting and clearing of flags in bit fields.</caption>
161   <authorref id='auth:oberdiek' />
162   <copyright owner='Heiko Oberdiek' year='2007' />
163   <license type='lppl1.3' />
164   <version number='0.5' />
165   <description>
166     This package allows the setting and clearing
167     of flags in bit fields and converts the bit field into a
168     decimal number. Currently the bit field is limited to 31 bits.
169   <p/>
170     It is now deprecated because of new more powerful
171     package <xref refid='bitset'>bitset</xref>.
172   <p/>
173     The package is part of the <xref refid='oberdiek'>oberdiek</xref>
174     bundle.
175   </description>
176   <documentation details='Package documentation'
177     href='ctan:/macros/latex/contrib/oberdiek/flags.pdf' />
178   <ctan file='true' path='/macros/latex/contrib/oberdiek/flags.dtx' />
179   <miktex location='oberdiek' />
180   <texlive location='oberdiek' />
181   <install path='/macros/latex/contrib/oberdiek/oberdiek.tds.zip' />
182 </entry>
183 </catalogue>
```

## 5 History

**[2007/02/18 v0.1]**

- First version.

**[2007/03/07 v0.2]**

- Raise an error if  $\epsilon$ -T<sub>E</sub>X is not detected.

**[2007/03/31 v0.3]**

- `\queryflag` and `\extractflag` added.
- Raise an error if position is not positive in case of `\setflag` and `\clearflag`.

**[2007/09/30 v0.4]**

- Package is deprecated because of new more powerful package `bitset`.

**[2016/05/16 v0.5]**

- 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.

Symbols		F	
<code>\@@@clearflag</code> .....	93, 97	<code>\FLAGS@zero</code> .....	56, 102, 106
<code>\@@@extractflag</code> .....	146, 150	<b>I</b>	
<code>\@@@setflag</code> .....	62, 66	<code>\ifnum</code> .....	39, 72, 110
<code>\@clearflag</code> .....	84, 87, 100	<code>\ifx</code> .....	6, 23, 33, 47, 55, 59, 80, 88, 90, 103, 120, 123, 126, 140, 143
<code>\@extractflag</code> .....	129, 139, 152	<b>N</b>	
<code>\@printflags</code> .....	26, 30, 35	<code>\NeedsTeXFormat</code> .....	2
<code>\@setflag</code> .....	51, 54, 69	<code>\newcommand</code> ..	14, 17, 38, 71, 109, 116
<code>\@car</code> .....	144	<code>\number</code> .....	22, 41, 74, 133
<code>\@clearflag</code> .....	73, 79	<code>\numexpr</code> .....	10, 22, 35, 41, 74, 133
<code>\@ehc</code> .....	43, 76	<b>P</b>	
<code>\@empty</code> .....	15, 23, 48, 81, 126	<code>\PackageError</code> .....	7, 43, 76
<code>\@extractflag</code> .....	117, 119	<code>\printflags</code> .....	2, <u>17</u>
<code>\@firstofone</code> .....	21	<code>\ProvidesPackage</code> .....	3
<code>\@firstoftwo</code> .....	111	<b>Q</b>	
<code>\@gobble</code> .....	60, 91	<code>\queryflag</code> .....	2, <u>109</u>
<code>\@ne</code> .....	110	<b>R</b>	
<code>\@nil</code> .....	144	<code>\resetflags</code> .....	2, <u>14</u>
<code>\@printflags</code> .....	18, 20	<code>\romannumeral</code> .....	41, 74, 133
<code>\@secondoftwo</code> .....	113	<b>S</b>	
<code>\@setflag</code> .....	40, 46	<code>\setflag</code> .....	2, <u>38</u>
<code>\@undefined</code> .....	120	<b>Z</b>	
<code>\@</code> .....	33, 55, 59, 88, 90, 140, 143	<code>\z@</code> .....	39, 72
<b>C</b>			
<code>\clearflag</code> .....	2, <u>71</u>		
<code>\csname</code> .....	6, 15, 18, 40, 73, 117		
<b>E</b>			
<code>\endcsname</code> .....	6, 15, 18, 40, 73, 117		
<code>\endinput</code> .....	12		
<code>\extractflag</code> .....	2, 110, <u>116</u>		