

# The flags package

Heiko Oberdiek\*

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>3</b>
<b>3</b>	<b>Installation</b>	<b>6</b>
3.1	Download . . . . .	6
3.2	Bundle installation . . . . .	6
3.3	Package installation . . . . .	6
3.4	Refresh file name databases . . . . .	6
3.5	Some details for the interested . . . . .	6
<b>4</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>5</b>	<b>Index</b>	<b>7</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  $\epsilon\text{-}\TeX$ .

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{\romannumeral\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 </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: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
```

### 3.3 Package installation

**Unpacking.** The `.dtx` file is a self-extracting `docstrip` archive. The files are extracted by running the `.dtx` through plain T<sub>E</sub>X:

```
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 T<sub>E</sub>X distribution (T<sub>E</sub>X Live, MiK<sub>T</sub>E<sub>X</sub>, ...) relies on file name databases, you must refresh these. For example, T<sub>E</sub>X 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.

---

<sup>1</sup>[CTAN:pkg/flags](#)

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 History

[2007/02/18 v0.1]

- First version.

[2007/03/07 v0.2]

- Raise an error if  $\epsilon\text{-TeX}$  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.

## 5 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	<code>\@@@extractflag</code> . . . . .	146, 150	
<code>\@@@clearflag</code> . . . . .	93, 97	<code>\@@@setflag</code> . . . . .	62, 66

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