

# The **flags** package

Heiko Oberdiek  
<oberdiek@uni-freiburg.de>

2007/09/30 v0.4

## 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 . . . . .	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
<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  $\text{\TeX}$ 's number limit.
- Many more operations are available.
- No dependency of  $\epsilon\text{-}\text{\TeX}$ .

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

## 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  $\langle fname \rangle$  is cleared. Currently is also used for initialization, because a `\newflags` macro is not implemented.

`\setflag {⟨fname⟩} {⟨position⟩}`

The flag at bit position  $\langle position \rangle$  is set in the bit field  $\langle fname \rangle$ .

`\clearflag {⟨fname⟩} {⟨position⟩}`

The flag at bit position  $\langle position \rangle$  is cleared in the bit field  $\langle fname \rangle$ .

`\printflags {⟨fname⟩}`

The bit field  $\langle fname \rangle$  is converted to a decimal number. The macro is expandible.

`\extractflag {⟨fname⟩} {⟨position⟩}`

Extracts the flag setting at bit position  $\langle position \rangle$ . `\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`.  $\langle set part \rangle$  is called if `\extractflag` returns 1. Otherwise  $\langle clear part \rangle$  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 [2007/09/30 v0.4 Flag setting in bit fields (H0)]%
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 \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.

---

<sup>1</sup><http://ftp.ctan.org/tex-archive/>

### 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
```

**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 (`teTeX`, `mikTeX`, ...) relies on file name databases, you must refresh these. For example, `teTeX` users run `texhash` or `mktexlsr`.

### 3.5 Some details for the interested

**Attached source.** The PDF documentation on CTAN also includes the `.dtx` source file. It can be extracted by AcrobatReader 6 or higher. Another option is `pdftk`, e.g. unpack the file into the current directory:

```
pdftk flags.pdf unpack_files output .
```

**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 pdfL<sup>A</sup>T<sub>E</sub>X:

```
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  $\epsilon$ -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`.

## 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; numbers in roman refer to the code lines where the entry is used.

Symbols	
<code>\@@@clearflag</code> . . . . .	93, 97
<code>\@@@extractflag</code> . . . . .	146, 150
<code>\@@@setflag</code> . . . . .	62, 66
<code>\@@clearflag</code> . . . . .	84, 87, 100
<code>\@@extractflag</code> . . . . .	129, 139, 152
<code>\@@printflags</code> . . . . .	26, 30, 35
<code>\@@setflag</code> . . . . .	51, 54, 69
<code>\@car</code> . . . . .	144
<code>\@clearflag</code> . . . . .	73, 79
<code>\@ehc</code> . . . . .	43, 76
<code>\@empty</code> . . . . .	15, 23, 48, 81, 126
<code>\@extractflag</code> . . . . .	117, 119
<code>\@firstofone</code> . . . . .	21
<code>\@firstoftwo</code> . . . . .	111
<code>\@gobble</code> . . . . .	60, 91
<code>\@ne</code> . . . . .	110
<code>\@nil</code> . . . . .	144
<code>\@printflags</code> . . . . .	18, 20
<code>\@secondoftwo</code> . . . . .	113
<code>\@setflag</code> . . . . .	40, 46
<code>\@undefined</code> . . . . .	120
<code>\@</code> . . . . .	33, 55, 59, 88, 90, 140, 143
C	
<code>\clearflag</code> . . . . .	2, 71
<code>\csname</code> . . . . .	6, 15, 18, 40, 73, 117
E	
<code>\endcsname</code> . . . . .	6, 15, 18, 40, 73, 117
<code>\endinput</code> . . . . .	12
<code>\extractflag</code> . . . . .	2, 110, 116
F	
<code>\FLAGS@zero</code> . . . . .	56, 102, 106
I	
<code>\ifnum</code> . . . . .	39, 72, 110
<code>\ifx</code> . . . . .	6, 23, 33, 47, 55, 59, 80, 88, 90, 103, 120, 123, 126, 140, 143

N		Q	
<code>\NeedsTeXFormat</code> .....	2	<code>\queryflag</code> .....	2, <u>109</u>
<code>\newcommand</code> ...	14, 17, 38, 71, 109, 116	R	
<code>\number</code> .....	22, 41, 74, 133	<code>\resetflags</code> .....	2, <u>14</u>
<code>\numexpr</code> .....	10, 22, 35, 41, 74, 133	<code>\romannumeral</code> .....	41, 74, 133
P		S	
<code>\PackageError</code> .....	7, 43, 76	<code>\setflag</code> .....	2, <u>38</u>
<code>\printflags</code> .....	2, <u>17</u>	Z	
<code>\ProvidesPackage</code> .....	3	<code>\z@</code> .....	39, 72