

The **flags** package

Heiko Oberdiek*

<heiko.oberdiek at gmail.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

1	Documentation	1
1.1	User interface	2
1.2	Requirements	2
1.3	ToDo	2
2	Implementation	2
3	Installation	5
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
4	Catalogue	7
5	History	7
	[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

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 $\text{T}_{\text{E}}\text{X}$'s number limit.
- Many more operations are available.
- No dependency of $\varepsilon\text{-T}_{\text{E}}\text{X}$.

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 $\langle fname \rangle$ 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

- ε -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 \end{package}

```

3 Installation

3.1 Download

Package. This package is available on CTAN¹:

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

[CTAN:macros/latex/contrib/oberdiek/flags.pdf](http://ctan.org/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](http://ctan.org/install/macros/latex/contrib/oberdiek.tds.zip)

TDS refers to the standard “A Directory Structure for T_EX Files” ([CTAN:tds/tds.pdf](http://ctan.org/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):

¹<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 $\mathrm{T}_{\mathrm{E}}\mathrm{X}$:

```
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 $\mathrm{T}_{\mathrm{E}}\mathrm{X}$ distribution (`te $\mathrm{T}_{\mathrm{E}}\mathrm{X}$` , `mik $\mathrm{T}_{\mathrm{E}}\mathrm{X}$` , ...) relies on file name databases, you must refresh these. For example, `te $\mathrm{T}_{\mathrm{E}}\mathrm{X}$` users run `texhash` or `mktextlsr`.

3.5 Some details for the interested

Unpacking with $\mathrm{L}^{\mathrm{A}}\mathrm{T}_{\mathrm{E}}\mathrm{X}$. The `.dtx` chooses its action depending on the format:

plain $\mathrm{T}_{\mathrm{E}}\mathrm{X}$: Run `docstrip` and extract the files.

$\mathrm{L}^{\mathrm{A}}\mathrm{T}_{\mathrm{E}}\mathrm{X}$: Generate the documentation.

If you insist on using $\mathrm{L}^{\mathrm{A}}\mathrm{T}_{\mathrm{E}}\mathrm{X}$ for `docstrip` (really, `docstrip` does not need $\mathrm{L}^{\mathrm{A}}\mathrm{T}_{\mathrm{E}}\mathrm{X}$), 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 $\mathrm{L}^{\mathrm{A}}\mathrm{T}_{\mathrm{E}}\mathrm{X}$` :

```
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_EX 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 ε -T_EX 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	I	
<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	N	
<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	P	
<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	Q	
<code>\@gobble</code>	60, 91	<code>\queryflag</code>	2, <u>109</u>
<code>\@ne</code>	110	R	
<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	S	
<code>\@setflag</code>	40, 46	<code>\setflag</code>	2, <u>38</u>
<code>\@undefined</code>	120	Z	
<code>\@</code>	33, 55, 59, 88, 90, 140, 143	<code>\z@</code>	39, 72
C			
<code>\clearflag</code>	2, <u>71</u>		
<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, <u>116</u>		