# The flags package

Heiko Oberdiek
<heiko.oberdiek at googlemail.com>

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**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

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 $\varepsilon$-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 ⟨*fname*⟩ is cleared. Currently is 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

- 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   [2007/09/30 v0.4 Setting/clearing of flags in bit fields (HO)]%
5 \begingroup\expandafter\expandafter\expandafter\endgroup
```

```
\expandafter\ifx\csname numexpr\endcsname\relax
  \PackageError{flags}{%
    Missing e-TeX, package loading aborted%
  }{%
    This packages makes heavy use of \string\numexpr.%
  }%
  \expandafter\endinput
\fi
```

\resetflags

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

\printflags Macro \printflags converts the bit field into a decimal number.

```
\newcommand*{\printflags}[1]{%
  \expandafter\@printflags\csname flags@#1\endcsname
}
\def\@printflags#1{%
  \expandafter\@firstofone\expandafter{%
    \number\numexpr
    \ifx#1\@empty
      0%
    \else
      \expandafter\@@printflags#1%
    \fi
  }%
}
\def\@@printflags#1#2\fi{%
  \fi
  #1%
  \ifx\\#2\\%
  \else
    +2*\numexpr\expandafter\@@printflags#2%
  \fi
}
```

\setflag

```
\newcommand*{\setflag}[2]{%
  \ifnum#2>\z@
    \expandafter\@setflag\csname flags@#1\expandafter\endcsname
      \expandafter{\romannumeral\number\numexpr#2-1\relax000}%
  \else
    \PackageError{flags}{Position must be a positive number}\@ehc
  \fi
}
\def\@setflag#1#2{%
  \ifx#1\relax
    \let#1\@empty
  \fi
  \edef#1{%
    \expandafter\@@setflag\expandafter{#1}{#2}%
  }%
}
\def\@@setflag#1#2{%
  \ifx\\#1\\%
    \FLAGS@zero#2\relax
    1%
  \else
    \ifx\\#2\\%
      1\@gobble#1%
    \else
      \@@@setflag#1|#2%
```

```
    \fi
  \fi
}
\def\@@@setflag#1#2|#3#4\fi\fi{%
  \fi\fi
  #1%
  \@@setflag{#2}{#4}%
}
```

\clearflag

```
\newcommand*{\clearflag}[2]{%
  \ifnum#2>\z@
    \expandafter\@clearflag\csname flags@#1\expandafter\endcsname
      \expandafter{\romannumeral\number\numexpr#2-1\relax000}%
  \else
    \PackageError{flags}{Position must be a positive number}\@ehc
  \fi
}
\def\@clearflag#1#2{%
  \ifx#1\relax
    \let#1\@empty
  \fi
  \edef#1{%
    \expandafter\@@clearflag\expandafter{#1}{#2}%
  }%
}
\def\@@clearflag#1#2{%
  \ifx\\#1\\%
  \else
    \ifx\\#2\\%
      0\@gobble#1%
    \else
      \@@@clearflag#1|#2%
    \fi
  \fi
}
\def\@@@clearflag#1#2|#3#4\fi\fi{%
  \fi\fi
  #1%
  \@@clearflag{#2}{#4}%
}
```

```
\def\FLAGS@zero#1{%
  \ifx#1\relax
  \else
    0%
    \expandafter\FLAGS@zero
  \fi
}
```

\queryflag

```
\newcommand*{\queryflag}[2]{%
  \ifnum\extractflag{#1}{#2}=\@ne
    \expandafter\@firstoftwo
  \else
    \expandafter\@secondoftwo
  \fi
}
```

\extractflag

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

```
\def\@extractflag#1#2{%
  \ifx#1\@undefined
    0%
  \else
    \ifx#1\relax
      0%
    \else
      \ifx#1\@empty
        0%
      \else
        \expandafter\expandafter\expandafter\@@extractflag
        \expandafter\expandafter\expandafter{%
        \expandafter#1\expandafter
        }\expandafter{%
          \romannumeral\number\numexpr#2-1\relax000%
        }%
      \fi
    \fi
  \fi
}
\def\@@extractflag#1#2{%
  \ifx\\#1\\%
    0%
  \else
    \ifx\\#2\\%
      \@car#1\@nil
    \else
      \@@@extractflag#1|#2%
    \fi
  \fi
}
\def\@@@extractflag#1#2|#3#4\fi\fi{%
  \fi\fi
  \@@extractflag{#2}{#4}%
}
```

⟨/package⟩

# 3 Installation

## 3.1 Download

**Package.** This package is available on CTAN[1]:

`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 TEX 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):

[1] `ftp://ftp.ctan.org/tex-archive/`

```
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 pdfLATEX:

```
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 TEX 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`.

```
⟨*catalogue⟩
<?xml version='1.0' encoding='us-ascii'?>
<!DOCTYPE entry SYSTEM 'catalogue.dtd'>
<entry datestamp='$Date$' modifier='$Author$' id='flags'>
  <name>flags</name>
  <caption>Setting and clearing of flags in bit fields.</caption>
  <authorref id='auth:oberdiek'/>
  <copyright owner='Heiko Oberdiek' year='2007'/>
  <license type='lppl1.3'/>
  <version number='0.4'/>
  <description>
    This package 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.
    <p/>
    It is now deprecated because of new more powerful
    package <xref refid='bitset'>bitset</xref>.
    <p/>
    The package is part of the <xref refid='oberdiek'>oberdiek</xref>
    bundle.
  </description>
  <documentation details='Package documentation'
      href='ctan:/macros/latex/contrib/oberdiek/flags.pdf'/>
  <ctan file='true' path='/macros/latex/contrib/oberdiek/flags.dtx'/>
  <miktex location='oberdiek'/>
  <texlive location='oberdiek'/>
  <install path='/macros/latex/contrib/oberdiek/oberdiek.tds.zip'/>
</entry>
⟨/catalogue⟩
```

# 5 History

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

- First version.

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

- Raise an error if $\varepsilon$-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.

# 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.