

# The `undolabl` package\*

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## Abstract

This package allows to override existing labels, especially automatically generated ones.

Note: The main code of this package was invented and published on the internet by **Ulrich Diez** (`eu_angelson@web.de`) in 2008. While Ulrich Diez neither wanted to create a package himself nor have one published under his name, he granted the publication of his code. Therefore: Thanks! I submitted this package to CTAN (after some updates of the documentation, mainly layout, typos and such things.)

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Save per page about 200 ml water, 2 g CO<sub>2</sub> and 2 g wood: Therefore please print only if this is really necessary.

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\*This file has version number v1.0b, last revised 2010/06/03, documentation dated 2010/06/03.

# 1 Introduction

The package's name `undolabl` is an eight-letter abbreviation for the phrases "undo" and "label".

This package allows to override existing labels, especially automatically generated ones.

When an instance of the `\label`-macro occurs in the document (e.g. `\label{foo}`), then a delayed `\write` (a write which is performed at shipout-time when the page-number is determined) to the `.aux` file is issued and you find in the `.aux` file something like:

```
\newlabel{foo}{{<page-no>}{{<sectional no>}{{<probably something else>}}}}
```

During the beginning of the next L<sup>A</sup>T<sub>E</sub>X-run, the `.aux` file will be read and

```
\newlabel{foo}{{<page-no>}{{<sectional no>}{{<probably something else>}}}}
```

is expanded to

```
\@newl@bel r{foo}{{<page-no>}{{<sectional no>}{{<probably something else>}}}}
```

which in turn gets expanded to something like (pseudo code):

```
IF (macro \r@foo is already defined)
THEN
    - Issue an error-message,
    - Make sure that the multiply-defined-labels-warning occurs
      in the log-file
ELSE
    \def\r@foo{{<page-no>}{{<sectional no>}{{<probably something else>}}}}
ENDIF
```

Referencing works as follows:

```
\ref{foo} ->
```

- expand \r@foo: {{<page-no>}{{<sectional no>}{{<probably something else>}}}}
- grab the second from the resulting arguments: <sectional no>

```
\pageref{foo} ->
```

- expand \r@foo: {{<page-no>}{{<sectional no>}{{<probably something else>}}}}
- grab the first from the resulting arguments: <page-no>

Back to the `\label`-mechanism:

- At the beginning of the L<sup>A</sup>T<sub>E</sub>X-run, all the `\r@<label>`-macros get defined from reading the `.aux` file. The `\r@<label>`-macros get used by the referencing-macros (`\ref`, `\pageref`...) during the L<sup>A</sup>T<sub>E</sub>X-run.
- During the L<sup>A</sup>T<sub>E</sub>X-run, the `.aux` file gets rewritten.
- At the end of the L<sup>A</sup>T<sub>E</sub>X-run, the `.aux` file (which was rewritten/newly created during the L<sup>A</sup>T<sub>E</sub>X-run) is read in order to detect whether references have changed during the current L<sup>A</sup>T<sub>E</sub>X-run.

But this time `\@newl@bel` is redefined (`\let equal to \@testdef`) and thus this time

```
\@newl@bel r{foo}{{<page-no>}{{<sectional no>}{{<probably something else>}}}}
```

expands to something like (pseudo code):

```
Compare the (newly written) third argument (that is:  
{{<page-no>}{{<sectional no>}{<probably something else>}} )  
to the (current/former) definition of \r@foo.  
If the two are different, then some page- or section-number  
related to referencing has changed from the last to the current  
LaTeX-run, thus in this case issue a message in the log-file:  
"References may have changed. Rerun LaTeX in order to get  
cross-references right".
```

So what do you need to do in order to override a label:

- First you need to write to the .aux file to silently undefine the associated \r@<label>-macro if it is already defined. That's why \overridelabel writes in terms of \protected@write to the .aux file:

```
\undonewlabel{<label>}{<code-line-number>}
```

\undonewlabel "undefines" the \r@<label>-macro. (How this works will be explained below.)

- Then \overridelabel can call \label{<label>} again and thus produce another \newlabel{<label>}-entry to the .aux file.

In the .aux file all this results in a sequence like:

```
% from the former \label-call:  
\newlabel{<label>}{{...}}  
|->| \r@<label>-macro gets produced.  
% from the \overridelabel-call:  
% - call to \undonewlabel within \overridelabel:  
\undonewlabel{<label>}{{<code-line-number>}}  
|->| \r@<label>-macro gets destroyed.  
% - call to \label within \overridelabel:  
\newlabel{<label>}{{...}}  
|->| a new \r@<label>-macro and no multiply-label-defined warning  
gets produced.
```

There is another issue left:

- It was said that .aux file is read at the beginning and at the end of the LATEX-run for detecting whether references have changed.
- When overriding a <label>, there will be several \newlabel{<label>}-calls associated to the same label-name in the .aux file.
- At the beginning of the LATEX-run only the last one counts for defining the associated \r@<label>-macro.
- But at the end, when the new .aux file is read, they all count and thus with all these entries but the last one, the above-mentioned \@testdef-comparison will yield difference and thus in any case cause a warning-message about references having changed although that might not be a correct statement.

Ulrich Diez decided to catch this up by letting \undonewlabel "count" within the macro \s@<label> how many times the label was overridden. That means: Whenever \r@<label> is overridden, the definition of \s@<label> gets a character "i" attached.

The \@testdef-comparison-mechanism gets enhanced via replacing<sup>1</sup> it by \undolabl@testdef: Before actually executing \@testdef, check whether

---

<sup>1</sup> "replacing" works as follows: When .aux file is read at the beginning of the LATEX-run, newl@bel is not let equal to testdef. When .aux file is read at the end of the LATEX-run, newl@bel is let equal to testdef. Thus it is sufficient to write into the beginning of the .aux file a direction which leads to letting newl@bel equal to \my@testdef in case its definition equals testdef. That direction is called "\reset@newl@bel". Also, when the .aux file is read at the end of the LATEX-run, \undonewlabel-entries therein should do nothing, thus \undonewlabel is let equal to gobbletwo.

`\s@<label>` is defined and empty. If undefined or empty, perform `\@testdef`. If not empty, remove an "i" from its definition-text. This way it is ensured that only the last one of several `\newlabel{<label>}`-entries is used for the `\@testdef`-comparison.

```

\undonewlabel{<label>}{<code-line-number>}
->
\@und@newl@bel rs{<label>}{<code-line-number>}
->
% IF \r@<label> is undefined just \relax, otherwise:
\@ifundefined{r@<label>}\relax{%
    % Inform via .log| file about overriding the label:
\@latex@warning@no@line{Label '<label>' overridden<code-line-number>}%
% Undefine \r@<label> via letting it equal to \relax:
\expandafter\global
\expandafter\let
\csname r@<label>\endcsname\relax
% IF \s@<label> is undefined, define it to {i} ELSE
% add another i to it via \g@addto@macro ENDIF:
\@ifundefined{s@<label>}{\global\@namedef{s@<label>}{i}}{%
    \expandafter\g@addto@macro\csname s@<label>\endcsname{i}}%
}%
}%

```

## 2 Usage

Load the package placing

```
\usepackage{undolabl}
```

in the preamble of your L<sup>A</sup>T<sub>E</sub>X 2<sub>ε</sub> source file.

When an existing label shall be replaced by a new one, say  
`\overridelabel{<label name>}`  
 (where `<label name>` is the name of the label to be replaced by the new one), instead of just `\label{<label name>}`, which would produce a  
 LaTeX Warning: Label '`<label name>`' multiply defined.

### 3 Example

```
1 {*example}
2 \documentclass[british]{article}
3 %%%
4 \usepackage{undolabl}[2010/06/03] % v1.0b
5 %% There are no options for the undolabl package. %%
6 \usepackage{hyperref}[2010/05/13] % v6.81e; if you want to use nameref
7 \hypersetup{%
8   extension=pdf,% 
9   plainpages=false,% 
10  pdfpagelabels=true,% 
11  hyperindex=false,% 
12  pdflang={en},%
13  pdftitle={undolabl package example},%
14  pdfauthor={Hans-Martin Muench},%
15  pdfsubject={Example for the undolabl package},%
16  pdfkeywords={LaTeX, undolabl, Hans-Martin Muench},%
17  pdfview=FitH,%
18  pdfstartview=FitH,%
19  pdfpagelayout=OneColumn,%
20  bookmarksopen=true%
21 }
22 \makeatletter
23 %% Code from tcilatex.tex, Macros for Scientific Word and Scientific WorkPlace 5.5 <06 Oct 2005
24 %% Copyright (C) 2005 Mackichan Software, Inc.
25 %% That macro file is NOT proprietary and may be freely copied and distributed.
26 \def\unit#1{\mathord{\thinspace\rm #1}}%
27 %% End of code from tcilatex.tex
28 \makeatother
29 \listfiles
30 \begin{document}
31 \pagenumbering{arabic}
32 \section*{Example for undolabl}
33
34 This example demonstrates the use of package\newline
35 \textsf{undolabl}, v1.0b as of 2010/06/03 (HMM).\newline
36 The used options were \texttt{linktextcolour=black},\newline
37 \texttt{backgroundcolour=white}, and \texttt{pdfborder={0 0 1}}\newline
38 (the default ones).\newline
39 For more details please see the documentation!\newline
40
41 \noindent Save per page about $200\unit{ml}$ water,\newline
42 $2\unit{g}$ CO$_2$ and $2\unit{g}$ wood:\newline
43 Therefore please print only if this is really necessary.\newline
44
45 \bigskip
46
47 \section{Test}
48
49 text \label{testlabel} \\
50 page-reference: \pageref{testlabel} \\ --> page 4
51 sectional-reference: \ref{testlabel} \\ --> section 4
52 name-reference: \nameref{testlabel} \\ --> Still another test
53
54 \newpage
55
56 \section{Another test}
57
58 text \overridelabel{testlabel} \\
59 page-reference: \pageref{testlabel} \\ --> page 4
60 sectional-reference: \ref{testlabel} \\ --> section 4
61 name-reference: \nameref{testlabel} \\ --> Still another test
62
63 \newpage
64
65 \section{Yet another test}
66
```

```

67 text \overridelabel{testlabel} \\
68 page-reference: \pageref{testlabel} \\ --> page 4
69 sectional-reference: \ref{testlabel} \\ --> section 4
70 name-reference: \nameref{testlabel} \\ --> Still another test
71
72 \newpage
73
74 \section{Still another test}
75
76 text \overridelabel{testlabel} \\
77 page-reference: \pageref{testlabel} \\ --> page 4
78 sectional-reference: \ref{testlabel} \\ --> section 4
79 name-reference: \nameref{testlabel} \\ --> Still another test
80
81 \end{document}
82 
```

## 4 The implementation

For a somewhat longer description see section 1.

We start off by checking that we are loading into L<sup>A</sup>T<sub>E</sub>X 2 <sub>$\varepsilon$</sub>  and announcing the name and version of this package.

```

83 <*package>
84 \NeedsTeXFormat{LaTeX2e}[1994/06/01]
85 \ProvidesPackage{undolabl}[2010/06/03 v1.0b
86   Overriding labels (HMM)]
87

```

**\overridelabel** In order to override a label, first you need to write to the .aux file to silently undefine the associated \r@<label>-macro if it is already defined. That's why \overridelabel writes in terms of \protected@write to the .aux file: \undonewlabel{<label>}{<code-line-number>}, "undefining" the \r@<label>-macro.

```

88 \newcommand\overridelabel[1]{%
89   \@bsphack
90   \protected@write\@auxout{}{\string\undonewlabel{\#1}{\online}}%

```

Then \overridelabel can call \label{<label>} again and thus produce another \newlabel{<label>}-entry to the .aux file.

```

91   \label{\#1}%
92   \@esphack
93 }%
94

```

**\undonewlabel**

```

95 \newcommand\undonewlabel{\@undonewlabel{rs}}%
96

```

**\@undonewlabel**

If \r@<label> is undefined, just \relax

```

97 \newcommand\@undonewlabel[4]{%
98   \@ifundefined{\#1\@#3}\relax{%

```

otherwise:

Inform via .log file about overriding the label:

```

99   \@latex@warning@no@line{Label '#3' overridden#4}%

```

Undefine \r@label via letting it equal to \relax:

```

100   \expandafter\global
101   \expandafter\let
102   \csname #1\@#3\endcsname\relax

```

```

If \s@label is undefined, define it to {i}

103     \@ifundefined{#2@#3}{\global\@namedef{#2@#3}{i}}{%
else add another i to it via \g@addto@macro.

104         \expandafter\g@addto@macro\csname #2@#3\endcsname{i}%
105     }%
106 }%
107 }%
108

\undolabl@testdef

109 \newcommand\undolabl@testdef[3]{%
110   \@ifundefined{s@#2}\@secondoftwo\@firstofone{%
111     \expandafter\ifx\csname s@#2\endcsname\empty
112       \expandafter\@firstofone
113     \else
114       \expandafter\xdef\csname s@#2\endcsname{%
115         \expandafter\expandafter
116         \expandafter\@gobble
117         \csname s@#2\endcsname
118       }%
119       \expandafter\@gobble
120     \fi
121   }%
122 }%
123 \@testdef{#1}{#2}{#3}%
124 }%
125 }%
126

\protected@write
@auxout
127 \protected@write\@auxout{}{\string\reset@newl@bel}%
128

\reset@newl@bel

129 \newcommand\reset@newl@bel{%
130   \ifx\@newl@bel\@testdef
131     \let\@newl@bel\undolabl@testdef
132     \let\undonewlabel\@gobbletwo
133   \fi
134 }%
135 
```

## 5 Installation

### 5.1 Downloads

Everything *should* be available on [CTAN:](http://ftp.ctan.org/tex-archive/), <ftp://ftp.ctan.org/tex-archive/>, but may need additional packages themselves.

**undolabl.dtx** For unpacking the **undolabl.dtx** file and constructing the documentation it is required:

- TeXFormat L<sup>A</sup>T<sub>E</sub>X 2 <sub>$\varepsilon$</sub> , 1994/06/01, v2 <sub>$\varepsilon$</sub> : [CTAN](http://ctan.org):
- document class ltxdoc, 2007/11/11, v2.0u,  
[CTAN:macros/latex/base/ltxdoc.dtx](http://ctan.org/macros/latex/base/ltxdoc.dtx)
- package holtxdoc, 2010/04/18, v0.18,  
[CTAN:macros/latex/contrib/oberdiek/holtxdoc.dtx](http://ctan.org/macros/latex/contrib/oberdiek/holtxdoc.dtx)
- package hypddoc, 2010/03/26, v1.9,  
[CTAN:macros/latex/contrib/oberdiek/hypddoc.dtx](http://ctan.org/macros/latex/contrib/oberdiek/hypddoc.dtx)

**undolabl.sty** The **undolabl.sty** for L<sup>A</sup>T<sub>E</sub>X 2 <sub>$\varepsilon$</sub>  (i. e. all documents using the **undolabl** package) requires:

- TeXFormat L<sup>A</sup>T<sub>E</sub>X 2 <sub>$\varepsilon$</sub> , 1994/06/01, v2 <sub>$\varepsilon$</sub> , [CTAN](http://ctan.org):

**undolabl-example.tex** The **undolabl-example.tex** requires the same files as all documents using the **undolabl** package, and additionally:

- class article, 2007/10/19, v1.4h, from classes.dtx:  
[CTAN:macros/latex/base/classes.dtx](http://ctan.org/macros/latex/base/classes.dtx)
- package hyperref, 2010/05/13, v6.81,  
[CTAN:macros/latex/contrib/hyperref/](http://ctan.org/macros/latex/contrib/hyperref/),  
if nameref shall be used  
(and when the references shall be hyperlinked, of course)
- package undolabl, 2010/06/03, v1.0b,  
[CTAN:macros/latex/contrib/muench/undolabl/undolabl.dtx](http://ctan.org/macros/latex/contrib/muench/undolabl/undolabl.dtx)  
(submitted, should become available at that location soon)  
(Well, it is the example file for this package, and because you are reading the documentation for the **undolabl** package, it can be assumed that you already have some version of it – is it the current one?)

**Oberdiek** All packages of Heiko Oberdiek's bundle 'oberdiek' (especially holtxdoc and hypddoc) are also available in a TDS compliant ZIP archive:  
[CTAN:install/macros/latex/contrib/oberdiek.tds.zip](http://ctan.org/install/macros/latex/contrib/oberdiek.tds.zip).

**Warning:** holtxdoc, 2010/04/24 v0.19, requires the packages

- hypddoc, 2010/03/26, v1.9
- hyperref, 2010/03/30, v6.80u (latest: 2010/05/13, v6.81e)
- pdftexcmds, 2010/04/01, v0.9
- ltxcmds, 2010/03/09, v1.4 (latest: 2010/04/26, v1.7)
- hologo, 2010/04/24, v1.2
- array (latest: 2008/09/09, v2.4c)

(or more recent versions) and does neither work with nor check for earlier versions!  
(It is probably best to download  
[CTAN:install/macros/latex/contrib/oberdiek.tds.zip](http://ctan.org/install/macros/latex/contrib/oberdiek.tds.zip) and use this, because the packages in there should be both recent and compatible.)

## 5.2 Package, unpacking TDS

**Package.** This package should become available on CTAN: soon:

`CTAN:macros/latex/contrib/muench/undolabl/undolabl.dtx`

The source file.

`CTAN:macros/latex/contrib/muench/undolabl/undolabl.ins`

The installation file.

`CTAN:macros/latex/contrib/muench/undolabl/undolabldrv`

The driver to generate the documentation.

`CTAN:macros/latex/contrib/muench/undolabl/ltxdoc.cfg`

The L<sup>A</sup>T<sub>E</sub>Xdocumentation configuration file, also for generating the documentation.

`CTAN:macros/latex/contrib/muench/undolabl/undolabl.pdf`

The documentation.

`CTAN:macros/latex/contrib/muench/undolabl/undolabl.sty`

The style file.

`CTAN:macros/latex/contrib/muench/undolabl/undolabl-example.tex`

The example file.

`CTAN:macros/latex/contrib/muench/undolabl/undolabl-example.pdf`

The compiled example file, as it should look like.

`CTAN:install/macros/latex/contrib/muench/undolabl/undolabl.tds.zip`

Everything in TDS compliant, compiled format.

For required other packages, see the preceding subsection.

**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 undolabl.dtx`

About generating the documentation see paragraph 5.4 below.

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

|                                   |  |
|-----------------------------------|--|
| <code>undolabl.sty</code>         | → <code>tex/latex/muench/undolabl.sty</code>         |
| <code>undolabl.pdf</code>         | → <code>doc/latex/muench/undolabl.pdf</code>         |
| <code>undolabl-example.tex</code> | → <code>doc/latex/muench/undolabl-example.tex</code> |
| <code>undolabl-example.pdf</code> | → <code>doc/latex/muench/undolabl-example.pdf</code> |
| <code>undolabl.dtx</code>         | → <code>source/latex/muench/undolabl.dtx</code>      |

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`.

## 5.3 Refresh file name databases

If your T<sub>E</sub>X distribution (teT<sub>E</sub>X, mikT<sub>E</sub>X,...) relies on file name databases, you must refresh these. For example, teT<sub>E</sub>X users run `texhash` or `mktexlsr`.

## 5.4 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.

If you insist on using L<sup>A</sup>T<sub>E</sub>X for docstrip (really, `docstrip` does not need L<sup>A</sup>T<sub>E</sub>X), then inform the autodetect routine about your intention:

```
latex \let\install=\input{undolabl.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 the following 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 undolabl.dtx
makeindex -s gind.ist undolabl.idx
pdflatex undolabl.dtx
makeindex -s gind.ist undolabl.idx
pdflatex undolabl.dtx
```

and with pdfL<sup>A</sup>T<sub>E</sub>X:

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

## 6 Acknowledgements

I (H.-Martin Münch) would like to thank **Ulrich Diez** (`eu.angelion@web.de`) for writing the main code of this package as well as for the permission to publish it on **CTAN**:. I also thank those anonymous people who had published it on the internet. Further I would like to thank Heiko Oberdiek (`heiko dot oberdiek at googlemail dot com`) for providing a lot (!) of useful packages (from which I also got everything I know about creating a file in `dtx` format, ok, say it: copying), and the `news:comp.text.tex` and `news:de.comp.text.tex` newsgroups for their help in all things T<sub>E</sub>X.

## 7 History

[2008/04/20 v0.3]

- created by Ulrich Diez

[2010/04/08 v0.3b]

- `.dtx` updated by H.-Martin Münch, submitted to **CTAN**:  
(no changes in the style code).

[2010/06/01 v1.0]

- `.dtx` updated by H.-Martin Münch: some minor corrections in the documentation, an internal renaming for possible better compatibility with other packages.
- The main code of this package was invented in 2008 by Ulrich Diez (`eu.angelion@web.de`) and published on the internet. Because Ulrich Diez neither wanted to create a package himself nor have one published under his name, but granted the publication of his code (Thanks!), I had to change author/maintainer of this package and resubmit it.

[2010/06/03 v1.0b]

- Found an unchanged reference to the package author/maintainer.
- Example adapted to other examples of mine.
- Updated references to other packages.
- TDS locations updated.
- Several changes in the documentation and the Readme file.

## 8 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                           |                         |  |
|-----------------------------------|-------------------------|--|
| \@auxout . . . . .                | 90, 127                 | \listfiles . . . . . 29                    |
| \@bsphack . . . . .               | 89                      | M  |
| \@esphack . . . . .               | 92                      | \mathord . . . . . 26                      |
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| \@gobble . . . . .                | 116, 119                | \nameref . . . . . 52, 61, 70, 79          |
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