

# The uniquecounter package

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## Abstract

This package provides a kind of counter that provides unique number values. Several counter can be created by different names. The numeric values are not limited.

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## 1 Documentation

`\UniqueCounterNew {<name>}`

Macro `\UniqueCounterNew` creates a new unique counter `<name>`. An error is thrown, if the counter already exists.

`\UniqueCounterCall {<name>} {<code>}`

Macro `\UniqueCounterCall` calls the given `<code>` with a new value of counter `<name>` as argument.

`\UniqueCounterIncrement {⟨name⟩}`

Macro `\UniqueCounterIncrement` generates a new value for the counter `⟨name⟩` by incrementing by one (globally).

`\UniqueCounterGet {⟨name⟩}`

Expandable macro `\UniqueCounterGet` returns the current value of counter `⟨name⟩`

## 1.1 Example

```
1 ⟨*example⟩
2 \documentclass{minimal}
3 \usepackage{uniquecounter}
4 \UniqueCounterNew{anchor}
5 \makeatletter
6 \newcommand*{\DefNewAnchorName}[2]{%
7   % #1 is unique counter value
8   % #2 is name of anchor
9   \@namedef{anchor@#2}{a#1}%
10 }
11 \newcommand*{\NewAnchorName}[1]{%
12   \UniqueCounterCall{anchor}\DefNewAnchorName{#1}%
13 }
14 \newcommand*{\PrintAnchorName}[1]{%
15   \@nameuse{anchor@#1}%
16 }
17 \begin{document}
18   \NewAnchorName{Top}%
19   \NewAnchorName{Left}%
20   \noindent
21   Top: \PrintAnchorName{Top}\\\\%
22   Left: \PrintAnchorName{Left}%
23 \end{document}
24 ⟨/example⟩
```

## 2 Implementation

```
25 ⟨*package⟩
```

### 2.1 Reload check and package identification

Reload check, especially if the package is not used with L<sup>A</sup>T<sub>E</sub>X.

```
26 \begingroup
27   \catcode44 12 % ,
28   \catcode45 12 % -
29   \catcode46 12 % .
30   \catcode58 12 % :
31   \catcode64 11 % @
32   \catcode123 1 % {
33   \catcode125 2 % }
34   \expandafter\let\expandafter\x\csname ver@uniquecounter.sty\endcsname
35   \ifx\x\relax % plain-TEX, first loading
36   \else
37     \def\empty{}%
38     \ifx\x\empty % LATEX, first loading,
39       % variable is initialized, but \ProvidesPackage not yet seen
40     \else
41       \catcode35 6 % #
42       \expandafter\ifx\csname PackageInfo\endcsname\relax
43       \def\x#1#2{%
```

```

44         \immediate\write-1{Package #1 Info: #2.}%
45     }%
46     \else
47         \def\x#1#2{\PackageInfo{#1}{#2, stopped}}%
48     \fi
49     \x{uniquecounter}{The package is already loaded}%
50     \aftergroup\endinput
51 \fi
52 \fi
53 \endgroup

```

Package identification:

```

54 \begingroup
55 \catcode35 6 % #
56 \catcode40 12 % (
57 \catcode41 12 % )
58 \catcode44 12 % ,
59 \catcode45 12 % -
60 \catcode46 12 % .
61 \catcode47 12 % /
62 \catcode58 12 % :
63 \catcode64 11 % @
64 \catcode91 12 % [
65 \catcode93 12 % ]
66 \catcode123 1 % {
67 \catcode125 2 % }
68 \expandafter\ifx\csname ProvidesPackage\endcsname\relax
69     \def\x#1#2#3[#4]{\endgroup
70         \immediate\write-1{Package: #3 #4}%
71         \xdef#1{#4}%
72     }%
73 \else
74     \def\x#1#2[#3]{\endgroup
75         #2[#{#3}]%
76         \ifx#1@undefined
77             \xdef#1{#3}%
78         \fi
79         \ifx#1\relax
80             \xdef#1{#3}%
81         \fi
82     }%
83 \fi
84 \expandafter\x\csname ver@uniquecounter.sty\endcsname
85 \ProvidesPackage{uniquecounter}%
86 [2009/12/18 v1.1 Provides unlimited unique counter (H0)]

```

## 2.2 Catcodes

```

87 \begingroup
88 \catcode123 1 % {
89 \catcode125 2 % }
90 \def\x{\endgroup
91     \expandafter\edef\csname uqc@AtEnd\endcsname{%
92         \catcode35 \the\catcode35\relax
93         \catcode64 \the\catcode64\relax
94         \catcode123 \the\catcode123\relax
95         \catcode125 \the\catcode125\relax
96     }%
97 }%
98 \x
99 \catcode35 6 % #
100 \catcode64 11 % @
101 \catcode123 1 % {

```

```

102 \catcode125 2 % }
103 \def\TMP@EnsureCode#1#2{%
104   \edef\uqc@AtEnd{%
105     \uqc@AtEnd
106     \catcode#1 \the\catcode#1\relax
107   }%
108   \catcode#1 #2\relax
109 }
110 \TMP@EnsureCode{33}{12}% !
111 \TMP@EnsureCode{39}{12}% '
112 \TMP@EnsureCode{42}{12}% *
113 \TMP@EnsureCode{43}{12}% +
114 \TMP@EnsureCode{46}{12}% .
115 \TMP@EnsureCode{47}{12}% /
116 \TMP@EnsureCode{61}{12}% =
117 \TMP@EnsureCode{96}{12}% `

118 \begingroup\expandafter\expandafter\expandafter\endgroup
119 \expandafter\ifx\csname RequirePackage\endcsname\relax
120   \input bigintcalc.sty\relax
121   \input infwarerr.sty\relax
122 \else
123   \RequirePackage{bigintcalc}[2007/11/11]%
124   \RequirePackage{infwarerr}[2007/09/09]%
125 \fi

\uqc@IncNum

126 \begingroup\expandafter\expandafter\expandafter\endgroup
127 \expandafter\ifx\csname numexpr\endcsname\relax
128   \def\uqc@IncNum#1{%
129     \begingroup
130       \count@=\csname uqc@cnt@#1\endcsname\relax
131       \advance\count@\@ne
132       \expandafter\xdef\csname uqc@cnt@#1\endcsname{%
133         \number\count@
134       }%
135       \ifnum\count@=2147483647 %
136         \global\expandafter\let\csname uqc@inc@#1\endcsname
137         \uqc@IncBig
138       \fi
139     \endgroup
140   }%
141 \else
142   \def\uqc@IncNum#1{%
143     \expandafter\xdef\csname uqc@cnt@#1\endcsname{%
144       \number\numexpr\csname uqc@cnt@#1\endcsname+1%
145     }%
146     \ifnum\csname uqc@cnt@#1\endcsname=2147483647 %
147       \global\expandafter\let\csname uqc@inc@#1\endcsname
148       \uqc@IncBig
149     \fi
150   }%
151 \fi

\uqc@IncBig

152 \def\uqc@IncBig#1{%
153   \expandafter\xdef\csname uqc@cnt@#1\endcsname{%
154     \expandafter\expandafter\expandafter
155     \BigIntCalcInc\csname uqc@cnt@#1\endcsname!%
156   }%
157 }

\uqc@Def

```

```

158 \begingroup\expandafter\expandafter\expandafter\endgroup
159 \expandafter\ifx\csname newcommand\endcsname\relax
160   \def\uqc@Def#1{\def#1##1}%
161 \else
162   \def\uqc@Def#1{\newcommand*{#1}[1]}%
163 \fi

```

`\UniqueCounterNew`

```

164 \uqc@Def\UniqueCounterNew{%
165   \expandafter\ifx\csname uqc@cnt@#1\endcsname\relax
166     \expandafter\xdef\csname uqc@cnt@#1\endcsname{0}%
167     \global\expandafter\let\csname uqc@inc@#1\endcsname\uqc@IncNum
168     \@PackageInfo{uniquecounter}{New unique counter ‘#1’}%
169   \else
170     \@PackageError{uniquecounter}{Unique counter ‘#1’ is already defined}\@ehc
171   \fi
172 }

```

`\UniqueCounterIncrement`

```

173 \uqc@Def\UniqueCounterIncrement{%
174   \expandafter\ifx\csname uqc@cnt@#1\endcsname\relax
175     \@PackageError{uniquecounter}{Unique counter ‘#1’ is undefined}\@ehc
176   \else
177     \csname uqc@inc@#1\endcsname{#1}%
178   \fi
179 }

```

`\UniqueCounterGet`

```

180 \uqc@Def\UniqueCounterGet{%
181   \csname uqc@cnt@#1\endcsname
182 }

```

`\UniqueCounterCall`

```

183 \uqc@Def\UniqueCounterCall{%
184   \expandafter\ifx\csname uqc@cnt@#1\endcsname\relax
185     \@PackageError{uniquecounter}{Unique counter ‘#1’ is undefined}\@ehc
186   \expandafter\uqc@Call\expandafter0%
187   \else
188     \UniqueCounterIncrement{#1}%
189     \expandafter\expandafter\expandafter\uqc@Call
190     \expandafter\expandafter\expandafter{%
191       \csname uqc@cnt@#1\expandafter\endcsname\expandafter
192     }%
193   \fi
194 }

```

`\uqc@Call`

```

195 \long\def\uqc@Call#1#2{#2{#1}}%
196 \uqc@AtEnd
197 </package>

```

## 3 Test

### 3.1 Catcode checks for loading

```

198 <*test1>
199 \catcode‘\{=1 %
200 \catcode‘\}=2 %
201 \catcode‘\#=6 %

```

```

202 \catcode'\@=11 %
203 \expandafter\ifx\csname count@\endcsname\relax
204   \countdef\count@=255 %
205 \fi
206 \expandafter\ifx\csname @gobble\endcsname\relax
207   \long\def\@gobble#1{}%
208 \fi
209 \expandafter\ifx\csname @firstofone\endcsname\relax
210   \long\def\@firstofone#1{#1}%
211 \fi
212 \expandafter\ifx\csname loop\endcsname\relax
213   \expandafter\@firstofone
214 \else
215   \expandafter\@gobble
216 \fi
217 {%
218   \def\loop#1\repeat{%
219     \def\body{#1}%
220     \iterate
221   }%
222   \def\iterate{%
223     \body
224     \let\next\iterate
225   \else
226     \let\next\relax
227   \fi
228   \next
229 }%
230 \let\repeat=\fi
231 }%
232 \def\RestoreCatcodes{
233 \count@=0 %
234 \loop
235   \edef\RestoreCatcodes{%
236     \RestoreCatcodes
237     \catcode\the\count@=\the\catcode\count@\relax
238   }%
239 \ifnum\count@<255 %
240   \advance\count@ 1 %
241 \repeat
242
243 \def\RangeCatcodeInvalid#1#2{%
244   \count@=#1\relax
245   \loop
246     \catcode\count@=15 %
247   \ifnum\count@<#2\relax
248     \advance\count@ 1 %
249   \repeat
250 }
251 \expandafter\ifx\csname LoadCommand\endcsname\relax
252   \def\LoadCommand{\input uniquecounter.sty\relax}%
253 \fi
254 \def\Test{%
255   \RangeCatcodeInvalid{0}{47}%
256   \RangeCatcodeInvalid{58}{64}%
257   \RangeCatcodeInvalid{91}{96}%
258   \RangeCatcodeInvalid{123}{255}%
259   \catcode'\@=12 %
260   \catcode'\=0 %
261   \catcode'\{=1 %
262   \catcode'\}=2 %
263   \catcode'\#=6 %

```

```

264 \catcode'\ [=12 %
265 \catcode'\ ]=12 %
266 \catcode'\ %=14 %
267 \catcode'\ =10 %
268 \catcode13=5 %
269 \LoadCommand
270 \RestoreCatcodes
271 }
272 \Test
273 \csname @@end\endcsname
274 \end
275 </test1>

```

## 3.2 Macro tests

### 3.2.1 Test with L<sup>A</sup>T<sub>E</sub>X

```

276 <*test2>
277 \NeedsTeXFormat{LaTeX2e}
278 \nofiles
279 \documentclass{minimal}
280 \usepackage{uniquecounter}[2009/12/18]
281 \usepackage{qstest}
282 \IncludeTests{*}
283 \LogTests{log}{*}{*}
284
285 \newcommand*\CheckValue[2]{%
286   \Expect*{#2}*\UniqueCounterGet{#1}}%
287 }
288 \newcommand*\CheckSpace[1]{%
289   \sbox0{#1}%
290   \Expect{0.0pt}*\the\wd0}%
291 }
292
293 \begin{qstest}{creation}{creation}
294   \CheckSpace{%
295     \UniqueCounterNew{test}}%
296   }%
297   \CheckValue{test}{0}%
298 \end{qstest}
299
300 \begin{qstest}{increment}{increment}
301   \CheckSpace{%
302     \UniqueCounterIncrement{test}}%
303   }%
304   \CheckValue{test}{1}%
305   \makeatletter
306   \def\uqc@cnt@test{2147483645}%
307   \CheckValue{test}{2147483645}%
308   \CheckSpace{%
309     \UniqueCounterIncrement{test}}%
310   }%
311   \CheckValue{test}{2147483646}%
312   \CheckSpace{%
313     \UniqueCounterIncrement{test}}%
314   }%
315   \Expect{true}*\ifx\uqc@inc\uqc@NumInc true\else false\fi}%
316   \CheckValue{test}{2147483647}%
317   \CheckSpace{%
318     \UniqueCounterIncrement{test}}%
319   }%
320   \CheckValue{test}{2147483648}%
321   \CheckSpace{%

```

```

322     \UniqueCounterIncrement{test}%
323 }%
324 \CheckValue{test}{2147483649}%
325 \end{qstest}
326
327 \begin{qstest}{call}{call}
328   \def\CheckCall#1#2{%
329     \Expect{#1}{#2}%
330   }%
331   \CheckSpace{%
332     \UniqueCounterNew{foo}%
333   }%
334   \CheckValue{foo}{0}%
335   \def\Check#1{%
336     \CheckSpace{%
337       \UniqueCounterCall{foo}{\CheckCall}{#1}%
338     }%
339     \CheckValue{foo}{#1}%
340   }%
341   \Check{1}%
342   \Check{2}%
343   \Check{3}%
344   \Check{4}%
345   \Check{5}%
346   \Check{6}%
347   \Check{7}%
348   \Check{8}%
349   \Check{9}%
350   \Check{10}%
351   \Check{11}%
352   \Check{12}%
353 \end{qstest}
354
355 \csname @@end\endcsname
356 \end{test2}

```

### 3.2.2 Test with plain-TEX

```

357 (*test3)
358 \input uniquecounter.sty\relax
359 \catcode'\@=11 %
360 \def\CheckValue#1#2{%
361   \begingroup
362     \edef\A{#2}%
363     \edef\B{\UniqueCounterGet{#1}}%
364     \ifx\A\B
365     \else
366       \@PackageError{TEST}{Failed: \A\space<> \B}\@ehc
367     \fi
368   \endgroup
369 }
370 \def\CheckSpace#1{%
371   \setbox0=\hbox{#1}%
372   \ifdim\wd0=\z@
373   \else
374     \@PackageError{TEST}{Failed: 0.0pt <> \the\wd0}\@ehc
375   \fi
376 }
377
378 \begingroup
379   \CheckSpace{%
380     \UniqueCounterNew{test}%
381   }%
382   \CheckValue{test}{0}%

```

```

383 \endgroup
384
385 \begingroup
386   \CheckSpace{%
387     \UniqueCounterIncrement{test}%
388   }%
389   \CheckValue{test}{1}%
390   \def\uqc@cnt@test{2147483645}%
391   \CheckValue{test}{2147483645}%
392   \CheckSpace{%
393     \UniqueCounterIncrement{test}%
394   }%
395   \CheckValue{test}{2147483646}%
396   \CheckSpace{%
397     \UniqueCounterIncrement{test}%
398   }%
399   \ifx\uqc@inc\uqc@NumInc
400   \else
401     \@PackageError{TEST}{Failed: wrong inc function}\@ehc
402   \fi
403   \CheckValue{test}{2147483647}%
404   \CheckSpace{%
405     \UniqueCounterIncrement{test}%
406   }%
407   \CheckValue{test}{2147483648}%
408   \CheckSpace{%
409     \UniqueCounterIncrement{test}%
410   }%
411   \CheckValue{test}{2147483649}%
412 \endgroup
413 \begingroup
414   \def\CheckCall#1#2{%
415     \begingroup
416       \def\A{#1}%
417       \def\B{#2}%
418       \ifx\A\B
419       \else
420         \@PackageError{TEST}{Failed: \A\space <> \B}\@ehc
421       \fi
422     \endgroup
423   }%
424   \CheckSpace{%
425     \UniqueCounterNew{foo}%
426   }%
427   \CheckValue{foo}{0}%
428   \CheckSpace{%
429     \UniqueCounterCall{foo}{\CheckCall}{1}%
430   }%
431   \CheckSpace{%
432     \UniqueCounterCall{foo}{\CheckCall}{2}%
433   }%
434   \CheckValue{foo}{2}%
435 \endgroup
436 \csname @@end\endcsname\end
437 /test3

```

## 4 Installation

### 4.1 Download

**Package.** This package is available on CTAN<sup>1</sup>:

---

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

[CTAN:macros/latex/contrib/oberdiek/uniquecounter.dtx](#) The source file.

[CTAN:macros/latex/contrib/oberdiek/uniquecounter.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.

## 4.2 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/
```

## 4.3 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 uniquecounter.dtx
```

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

<code>uniquecounter.sty</code>	→ <code>tex/generic/oberdiek/uniquecounter.sty</code>
<code>uniquecounter.pdf</code>	→ <code>doc/latex/oberdiek/uniquecounter.pdf</code>
<code>uniquecounter-example.tex</code>	→ <code>doc/latex/oberdiek/uniquecounter-example.tex</code>
<code>test/uniquecounter-test1.tex</code>	→ <code>doc/latex/oberdiek/test/uniquecounter-test1.tex</code>
<code>test/uniquecounter-test2.tex</code>	→ <code>doc/latex/oberdiek/test/uniquecounter-test2.tex</code>
<code>test/uniquecounter-test3.tex</code>	→ <code>doc/latex/oberdiek/test/uniquecounter-test3.tex</code>
<code>uniquecounter.dtx</code>	→ <code>source/latex/oberdiek/uniquecounter.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`.

## 4.4 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 `mktextlsr`.

## 4.5 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 uniquecounter.pdf unpack_files output .
```

**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=y\input{uniquecounter.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 uniquecounter.dtx
makeindex -s gind.ist uniquecounter.idx
pdflatex uniquecounter.dtx
makeindex -s gind.ist uniquecounter.idx
pdflatex uniquecounter.dtx
```

## 5 History

[2009/09/11 v1.0]

- First public version.

[2009/12/18 v1.1]

- Bug fix in \UniqueCounterCall for values > 9 (bug report of Lev Bishop).

## 6 Index

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