

# The uniquecounter package

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## Abstract

This package provides a kind of counter that provides unique number values. Several counters 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.

---

\*Please report any issues at <https://github.com/ho-tex/oberdiek/issues>

`\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  $\text{\LaTeX}$ .

```
26 \begingroup\catcode61\catcode48\catcode32=10\relax%
27 \catcode13=5 % ^~M
28 \endlinechar=13 %
29 \catcode35=6 % #
30 \catcode39=12 % '
31 \catcode44=12 % ,
32 \catcode45=12 % -
33 \catcode46=12 % .
```

```

34 \catcode58=12 % :
35 \catcode64=11 % @
36 \catcode123=1 % {
37 \catcode125=2 % }
38 \expandafter\let\expandafter\x\csname ver@uniquecounter.sty\endcsname
39 \ifx\x\relax % plain-TeX, first loading
40 \else
41 \def\empty{}%
42 \ifx\x\empty % LaTeX, first loading,
43 % variable is initialized, but \ProvidesPackage not yet seen
44 \else
45 \expandafter\ifx\csname PackageInfo\endcsname\relax
46 \def\x#1#2{%
47 \immediate\write-1{Package #1 Info: #2.}%
48 }%
49 \else
50 \def\x#1#2{\PackageInfo{#1}{#2, stopped}}%
51 \fi
52 \x{uniquecounter}{The package is already loaded}%
53 \aftergroup\endinput
54 \fi
55 \fi
56 \endgroup%

```

Package identification:

```

57 \begingroup\catcode61\catcode48\catcode32=10\relax%
58 \catcode13=5 % ^^M
59 \endlinechar=13 %
60 \catcode35=6 % #
61 \catcode39=12 % '
62 \catcode40=12 % (
63 \catcode41=12 % )
64 \catcode44=12 % ,
65 \catcode45=12 % -
66 \catcode46=12 % .
67 \catcode47=12 % /
68 \catcode58=12 % :
69 \catcode64=11 % @
70 \catcode91=12 % [
71 \catcode93=12 % ]
72 \catcode123=1 % {
73 \catcode125=2 % }
74 \expandafter\ifx\csname ProvidesPackage\endcsname\relax
75 \def\x#1#2#3[#4]{\endgroup
76 \immediate\write-1{Package: #3 #4}%
77 \xdef#1{#4}%
78 }%
79 \else
80 \def\x#1#2[#3]{\endgroup
81 #2[#{#3}]%
82 \ifx#1\@undefined
83 \xdef#1{#3}%
84 \fi
85 \ifx#1\relax
86 \xdef#1{#3}%
87 \fi
88 }%
89 \fi
90 \expandafter\x\csname ver@uniquecounter.sty\endcsname

```

```

91 \ProvidesPackage{uniquecounter}%
92 [2016/05/16 v1.3 Provide unlimited unique counter (H0)]%

```

## 2.2 Catcodes

```

93 \begingroup\catcode61\catcode48\catcode32=10\relax%
94 \catcode13=5 % ^^M
95 \endlinechar=13 %
96 \catcode123=1 % {
97 \catcode125=2 % }
98 \catcode64=11 % @
99 \def\x{\endgroup
100 \expandafter\edef\csname uqc@AtEnd\endcsname{%
101 \endlinechar=\the\endlinechar\relax
102 \catcode13=\the\catcode13\relax
103 \catcode32=\the\catcode32\relax
104 \catcode35=\the\catcode35\relax
105 \catcode61=\the\catcode61\relax
106 \catcode64=\the\catcode64\relax
107 \catcode123=\the\catcode123\relax
108 \catcode125=\the\catcode125\relax
109 }%
110 }%
111 \x\catcode61\catcode48\catcode32=10\relax%
112 \catcode13=5 % ^^M
113 \endlinechar=13 %
114 \catcode35=6 % #
115 \catcode64=11 % @
116 \catcode123=1 % {
117 \catcode125=2 % }
118 \def\TMP@EnsureCode#1#2{%
119 \edef\uqc@AtEnd{%
120 \uqc@AtEnd
121 \catcode#1=\the\catcode#1\relax
122 }%
123 \catcode#1=#2\relax
124 }
125 \TMP@EnsureCode{33}{12}% !
126 \TMP@EnsureCode{39}{12}% '
127 \TMP@EnsureCode{42}{12}% *
128 \TMP@EnsureCode{43}{12}% +
129 \TMP@EnsureCode{46}{12}% .
130 \TMP@EnsureCode{47}{12}% /
131 \TMP@EnsureCode{91}{12}% [
132 \TMP@EnsureCode{93}{12}% ]
133 \TMP@EnsureCode{96}{12}% `
134 \edef\uqc@AtEnd{\uqc@AtEnd\noexpand\endinput}
135 \begingroup\expandafter\expandafter\expandafter\endgroup
136 \expandafter\ifx\csname RequirePackage\endcsname\relax
137 \def\TMP@RequirePackage#1[#2]{%
138 \begingroup\expandafter\expandafter\expandafter\endgroup
139 \expandafter\ifx\csname ver@#1.sty\endcsname\relax
140 \input #1.sty\relax
141 \fi
142 }%
143 \TMP@RequirePackage{bigintcalc}[2007/11/11]%
144 \TMP@RequirePackage{infixarrr}[2007/09/09]%
145 \else

```

```

146 \RequirePackage{bigintcalc}[2007/11/11]%
147 \RequirePackage{infwarerr}[2007/09/09]%
148 \fi

\uqc@IncNum
149 \begingroup\expandafter\expandafter\expandafter\endgroup
150 \expandafter\ifx\csname numexpr\endcsname\relax
151 \def\uqc@IncNum#1{%
152 \begingroup
153 \count@=\csname uqc@cnt@#1\endcsname\relax
154 \advance\count@\@ne
155 \expandafter\xdef\csname uqc@cnt@#1\endcsname{%
156 \number\count@
157 }%
158 \ifnum\count@=2147483647 %
159 \global\expandafter\let\csname uqc@inc@#1\endcsname
160 \uqc@IncBig
161 \fi
162 \endgroup
163 }%
164 \else
165 \def\uqc@IncNum#1{%
166 \expandafter\xdef\csname uqc@cnt@#1\endcsname{%
167 \number\numexpr\csname uqc@cnt@#1\endcsname+1%
168 }%
169 \ifnum\csname uqc@cnt@#1\endcsname=2147483647 %
170 \global\expandafter\let\csname uqc@inc@#1\endcsname
171 \uqc@IncBig
172 \fi
173 }%
174 \fi

\uqc@IncBig
175 \def\uqc@IncBig#1{%
176 \expandafter\xdef\csname uqc@cnt@#1\endcsname{%
177 \expandafter\expandafter\expandafter
178 \BigIntCalcInc\csname uqc@cnt@#1\endcsname!%
179 }%
180 }

\uqc@Def
181 \begingroup\expandafter\expandafter\expandafter\endgroup
182 \expandafter\ifx\csname newcommand\endcsname\relax
183 \def\uqc@Def#1{\def#1##1}%
184 \else
185 \def\uqc@Def#1{\newcommand*{#1}[1]}%
186 \fi

\UniqueCounterNew
187 \uqc@Def\UniqueCounterNew{%
188 \expandafter\ifx\csname uqc@cnt@#1\endcsname\relax
189 \expandafter\xdef\csname uqc@cnt@#1\endcsname{0}%
190 \global\expandafter\let\csname uqc@inc@#1\endcsname\uqc@IncNum
191 \@PackageInfo{uniquecounter}{New unique counter `#1'}%
192 \else
193 \@PackageError{uniquecounter}{Unique counter `#1' is already defined}\@ehc
194 \fi
195 }

```

```

\UniqueCounterIncrement
196 \uqc@Def\UniqueCounterIncrement{%
197   \expandafter\ifx\csname uqc@cnt@#1\endcsname\relax
198     \@PackageError{uniquecounter}{Unique counter `#1' is undefined}\@ehc
199   \else
200     \csname uqc@inc@#1\endcsname{#1}%
201   \fi
202 }

\UniqueCounterGet
203 \uqc@Def\UniqueCounterGet{%
204   \csname uqc@cnt@#1\endcsname
205 }

\UniqueCounterCall
206 \uqc@Def\UniqueCounterCall{%
207   \expandafter\ifx\csname uqc@cnt@#1\endcsname\relax
208     \@PackageError{uniquecounter}{Unique counter `#1' is undefined}\@ehc
209   \expandafter\uqc@Call\expandafter0%
210   \else
211     \UniqueCounterIncrement{#1}%
212     \expandafter\expandafter\expandafter\uqc@Call
213     \expandafter\expandafter\expandafter{%
214       \csname uqc@cnt@#1\endcsname\expandafter
215     }%
216   \fi
217 }

\uqc@Call
218 \long\def\uqc@Call#1#2{#2{#1}}%
219 \uqc@AtEnd%
220 \endpackage

```

### 3 Test

#### 3.1 Catcode checks for loading

```

221 \test1)
222 \catcode`\{=1 %
223 \catcode`\}=2 %
224 \catcode`\#=6 %
225 \catcode`\@=11 %
226 \expandafter\ifx\csname count@\endcsname\relax
227   \countdef\count@=255 %
228 \fi
229 \expandafter\ifx\csname @gobble\endcsname\relax
230   \long\def@gobble#1{%
231 \fi
232 \expandafter\ifx\csname @firstofone\endcsname\relax
233   \long\def@firstofone#1{#1}%
234 \fi
235 \expandafter\ifx\csname loop\endcsname\relax
236   \expandafter@firstofone
237 \else
238   \expandafter@gobble

```

```

239 \fi
240 {%
241   \def\loop#1\repeat{%
242     \def\body{#1}%
243     \iterate
244   }%
245   \def\iterate{%
246     \body
247     \let\next\iterate
248   \else
249     \let\next\relax
250   \fi
251   \next
252 }%
253 \let\repeat=\fi
254 }%
255 \def\RestoreCatcodes{}
256 \count@=0 %
257 \loop
258   \edef\RestoreCatcodes{%
259     \RestoreCatcodes
260     \catcode\the\count@=\the\catcode\count@\relax
261   }%
262 \ifnum\count@<255 %
263   \advance\count@ 1 %
264 \repeat
265
266 \def\RangeCatcodeInvalid#1#2{%
267   \count@=#1\relax
268   \loop
269     \catcode\count@=15 %
270     \ifnum\count@<#2\relax
271       \advance\count@ 1 %
272     \repeat
273 }
274 \def\RangeCatcodeCheck#1#2#3{%
275   \count@=#1\relax
276   \loop
277     \ifnum#3=\catcode\count@
278   \else
279     \errmessage{%
280       Character \the\count@\space
281       with wrong catcode \the\catcode\count@\space
282       instead of \number#3%
283     }%
284   \fi
285   \ifnum\count@<#2\relax
286     \advance\count@ 1 %
287   \repeat
288 }
289 \def\space{ }
290 \expandafter\ifx\csname LoadCommand\endcsname\relax
291   \def\LoadCommand{\input uniquecounter.sty\relax}%
292 \fi
293 \def\Test{%
294   \RangeCatcodeInvalid{0}{47}%
295   \RangeCatcodeInvalid{58}{64}%
296   \RangeCatcodeInvalid{91}{96}%

```

```

297 \RangeCatcodeInvalid{123}{255}%
298 \catcode`\@=12 %
299 \catcode`\=0 %
300 \catcode`\%=14 %
301 \LoadCommand
302 \RangeCatcodeCheck{0}{36}{15}%
303 \RangeCatcodeCheck{37}{37}{14}%
304 \RangeCatcodeCheck{38}{47}{15}%
305 \RangeCatcodeCheck{48}{57}{12}%
306 \RangeCatcodeCheck{58}{63}{15}%
307 \RangeCatcodeCheck{64}{64}{12}%
308 \RangeCatcodeCheck{65}{90}{11}%
309 \RangeCatcodeCheck{91}{91}{15}%
310 \RangeCatcodeCheck{92}{92}{0}%
311 \RangeCatcodeCheck{93}{96}{15}%
312 \RangeCatcodeCheck{97}{122}{11}%
313 \RangeCatcodeCheck{123}{255}{15}%
314 \RestoreCatcodes
315 }
316 \Test
317 \csname @@end\endcsname
318 \end
319 </test1>

```

## 3.2 Macro tests

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

```

320 <*test2>
321 \NeedsTeXFormat{LaTeX2e}
322 \nofiles
323 \documentclass{minimal}
324 \usepackage{uniquecounter}[2016/05/16]
325 \usepackage{qstest}
326 \IncludeTests{*}
327 \LogTests{log}{*}{*}
328
329 \newcommand*{\CheckValue}[2]{%
330   \Expect*{#2}*{\UniqueCounterGet{#1}}%
331 }
332 \newcommand*{\CheckSpace}[1]{%
333   \sbox0{#1}%
334   \Expect{0.0pt}*{\the\wd0}%
335 }
336
337 \begin{qstest}{creation}{creation}
338   \CheckSpace{%
339     \UniqueCounterNew{test}%
340   }%
341   \CheckValue{test}{0}%
342 \end{qstest}
343
344 \begin{qstest}{increment}{increment}
345   \CheckSpace{%
346     \UniqueCounterIncrement{test}%
347   }%
348   \CheckValue{test}{1}%
349   \makeatletter
350   \def\uqc@cnt@test{2147483645}%

```



```

351 \CheckValue{test}{2147483645}%
352 \CheckSpace{%
353   \UniqueCounterIncrement{test}%
354 }%
355 \CheckValue{test}{2147483646}%
356 \CheckSpace{%
357   \UniqueCounterIncrement{test}%
358 }%
359 \Expect{true}*{\ifx\uqc@inc\uqc@NumInc true\else false\fi}%
360 \CheckValue{test}{2147483647}%
361 \CheckSpace{%
362   \UniqueCounterIncrement{test}%
363 }%
364 \CheckValue{test}{2147483648}%
365 \CheckSpace{%
366   \UniqueCounterIncrement{test}%
367 }%
368 \CheckValue{test}{2147483649}%
369 \end{qstest}
370
371 \begin{qstest}{call}{call}
372   \def\CheckCall#1#2{%
373     \Expect{#1}{#2}%
374   }%
375   \CheckSpace{%
376     \UniqueCounterNew{foo}%
377   }%
378   \CheckValue{foo}{0}%
379   \def\Check#1{%
380     \CheckSpace{%
381       \UniqueCounterCall{foo}{\CheckCall}{#1}%
382     }%
383     \CheckValue{foo}{#1}%
384   }%
385   \Check{1}%
386   \Check{2}%
387   \Check{3}%
388   \Check{4}%
389   \Check{5}%
390   \Check{6}%
391   \Check{7}%
392   \Check{8}%
393   \Check{9}%
394   \Check{10}%
395   \Check{11}%
396   \Check{12}%
397 \end{qstest}
398
399 \csname @@end\endcsname
400 \end{test2}

```

### 3.2.2 Test with plain-TeX

```

401 \begin{test3}
402 \input uniquecounter.sty\relax
403 \catcode`\@=11 %
404 \def\CheckValue#1#2{%
405   \begin{group}
406     \edef\A{#2}%

```

```

407     \edef\B{\UniqueCounterGet{#1}}%
408     \ifx\A\B
409     \else
410         \@PackageError{TEST}{Failed: \A\space<> \B}\@ehc
411     \fi
412 \endgroup
413 }
414 \def\CheckSpace#1{%
415     \setbox0=\hbox{#1}%
416     \ifdim\wd0=\z@
417     \else
418         \@PackageError{TEST}{Failed: 0.0pt <> \the\wd0}\@ehc
419     \fi
420 }
421
422 \begingroup
423     \CheckSpace{%
424         \UniqueCounterNew{test}%
425     }%
426     \CheckValue{test}{0}%
427 \endgroup
428
429 \begingroup
430     \CheckSpace{%
431         \UniqueCounterIncrement{test}%
432     }%
433     \CheckValue{test}{1}%
434     \def\uqc@cnt@test{2147483645}%
435     \CheckValue{test}{2147483645}%
436     \CheckSpace{%
437         \UniqueCounterIncrement{test}%
438     }%
439     \CheckValue{test}{2147483646}%
440     \CheckSpace{%
441         \UniqueCounterIncrement{test}%
442     }%
443     \ifx\uqc@inc\uqc@NumInc
444     \else
445         \@PackageError{TEST}{Failed: wrong inc function}\@ehc
446     \fi
447     \CheckValue{test}{2147483647}%
448     \CheckSpace{%
449         \UniqueCounterIncrement{test}%
450     }%
451     \CheckValue{test}{2147483648}%
452     \CheckSpace{%
453         \UniqueCounterIncrement{test}%
454     }%
455     \CheckValue{test}{2147483649}%
456 \endgroup
457 \begingroup
458     \def\CheckCall#1#2{%
459         \begingroup
460             \def\A{#1}%
461             \def\B{#2}%
462             \ifx\A\B
463             \else
464                 \@PackageError{TEST}{Failed: \A\space <> \B}\@ehc

```

```

465     \fi
466   \endgroup
467 }%
468 \CheckSpace{%
469   \UniqueCounterNew{foo}%
470 }%
471 \CheckValue{foo}{0}%
472 \CheckSpace{%
473   \UniqueCounterCall{foo}{\CheckCall}{1}%
474 }%
475 \CheckSpace{%
476   \UniqueCounterCall{foo}{\CheckCall}{2}%
477 }%
478 \CheckValue{foo}{2}%
479 \endgroup
480 \csname @@end\endcsname\end
481 \</test3>

```

## 4 Installation

### 4.1 Download

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

[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  $\text{\TeX}$  Files” ([CTAN:pkg/tds](#)). 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
```

### 4.3 Package installation

**Unpacking.** The `.dtx` file is a self-extracting `docstrip` archive. The files are extracted by running the `.dtx` through plain  $\text{\TeX}$ :

```
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):

---

<sup>1</sup>[CTAN:pkg/uniquecounter](#)

<code>uniquecounter.sty</code>	$\rightarrow$ <code>tex/generic/oberdiek/uniquecounter.sty</code>
<code>uniquecounter.pdf</code>	$\rightarrow$ <code>doc/latex/oberdiek/uniquecounter.pdf</code>
<code>uniquecounter-example.tex</code>	$\rightarrow$ <code>doc/latex/oberdiek/uniquecounter-example.tex</code>
<code>test/uniquecounter-test1.tex</code>	$\rightarrow$ <code>doc/latex/oberdiek/test/uniquecounter-test1.tex</code>
<code>test/uniquecounter-test2.tex</code>	$\rightarrow$ <code>doc/latex/oberdiek/test/uniquecounter-test2.tex</code>
<code>test/uniquecounter-test3.tex</code>	$\rightarrow$ <code>doc/latex/oberdiek/test/uniquecounter-test3.tex</code>
<code>uniquecounter.dtx</code>	$\rightarrow$ <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  $\text{\TeX}$  distribution ( $\text{\TeX}$  Live,  $\text{mik\TeX}$ , ...) relies on file name databases, you must refresh these. For example,  $\text{\TeX}$  Live users run `texhash` or `mktextlsr`.

## 4.5 Some details for the interested

**Unpacking with  $\text{\LaTeX}$ .** The `.dtx` chooses its action depending on the format:

**plain  $\text{\TeX}$ :** Run `docstrip` and extract the files.

**$\text{\LaTeX}$ :** Generate the documentation.

If you insist on using  $\text{\LaTeX}$  for `docstrip` (really, `docstrip` does not need  $\text{\LaTeX}$ ), 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  $\text{pdf\LaTeX}$ :

```
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).

[2011/01/30 v1.2]

- Already loaded package files are not input in plain  $\text{\TeX}$ .

[2016/05/16 v1.3]

- 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.

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.	193, 198, 208, 410, 418, 445, 464
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