

# The `l3keys2e` package<sup>\*</sup>

## Parsing $\text{\LaTeX}$ 3 keyvals as $\text{\LaTeX}$ 2 $\epsilon$ package options

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### 1 Key–value arguments as $\text{\LaTeX}$ 2 $\epsilon$ class and package options

The key–value method for optional arguments is very popular, as it allows the class or package author to define a large number of options with a simple interface. The `expl3` bundle of  $\text{\LaTeX}$ 3 base code includes the module `l3keys` for defining keys, but to use these when loading  $\text{\LaTeX}$ 2 $\epsilon$  packages and classes requires extra support. That support is provided by this small package, which is intended to enable  $\text{\LaTeX}$ 2 $\epsilon$  packages to benefit from the power of the  $\text{\LaTeX}$ 3 key–value system.

#### 1.1 Creating and using keyval options

As with any key–value input, using key–value pairs as package or class options has two parts. The first stage is to define one or more keys. This should be done using the  $\text{\LaTeX}$ 3 module `l3keys`. For example, an option which simply stores a value would be created using:

```
\keys_define:nn { module } {  
  option .set:N = \l_module_variable_tl  
}
```

On its own, this will not make the key an option for the package or class containing the definition. The second stage is therefore to process the current options, searching for applicable keys.

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`\ProcessKeysOptions` `\ProcessKeysOptions {⟨module⟩}`

The `\ProcessKeysOptions` function is used to check the current option list against the keys defined for `⟨module⟩`. Global (class) options and local (package) options are checked when this function is called in a package. Each option which does match a key name is then used to attempt to set the appropriate key using `\keys_set:nn`. For example, the option defined earlier would be processed by the line

```
\ProcessKeysOptions { module }
```

`\ProcessKeysPackageOptions` `\ProcessKeysPackageOptions {⟨module⟩}`

This function works in a similar manner to `\ProcessKeysOptions`. When used in a LaTeX2e package, `\ProcessKeysPackageOptions` will not examine any class options available. In contrast, `\ProcessKeysOptions` does parse class options (in common with the LaTeX2e kernel function `\ProcessOptions`).

## 1.2 Internal functions and variables

`\keys_latex_options_clist` Local options and applicable global (class) options are collected up here prior to processing using `\keys_set:nn`.

`\keys_latex_options:n` `\keys_latex_options:n {⟨module⟩}`

Examines current global and local options, comparing them to the keys defined for `⟨module⟩`. Option names which match defined keys are then executed by passing the appropriate data to `\keys_set:nn`.

`\keys_latex_options_global:n` `\keys_latex_options_global:n {⟨module⟩}`

Makes appropriate checks on global (class) options, then searches for key matches for `⟨module⟩`.

`\keys_latex_options_class:n` `\keys_latex_options_class:n {⟨module⟩}`

Processes global options when the current file is itself a class, checking the options against keys defined for `⟨module⟩`.

`\keys_latex_options_package:n` `\keys_latex_options_package:n {⟨module⟩}`

Processes global options when the current file is a L<sup>A</sup>T<sub>E</sub>X 2<sub>ε</sub> package, checking the options against keys defined for *⟨module⟩*.

<code>\keys_latex_options_local:</code>	<code>\keys_latex_options_local:</code>
---	---

Finds local (package) options and adds them to the list to be parsed by `\keys_set:nn`.

<code>\keys_latex_remove_equals:n *</code>	<code>\keys_latex_remove_equals:n {⟨option⟩}</code>
<code>\keys_latex_remove_equals:w *</code>	<code>\keys_latex_remove_equals:w ⟨key⟩ = ⟨value⟩ \q_stop</code>

Returns only the key part of a key–value option by removing everything after the first equals sign. It is assumed that, as this will apply in the preamble, equals signs have category code 12.

### 1.3 Implementation

The usual lead-off, using `xparse` at the interface level.

```

1 ⟨*package⟩
2 \ProvidesExplPackage
3   {⟨filename⟩}{⟨filedate⟩}{⟨fileversion⟩}{⟨filedescription⟩}
4 \RequirePackage{xparse}

```

`\keys_latex_options_clist` The module collects all applicable global and local options into a single list before processing them.

```

5 \clist_new:N \keys_latex_options_clist

```

`\_l_keys_process_class_bool` A flag to indicate that class options should be processed for packages.

```

6 \bool_new:N \_l_keys_process_class_bool

```

`\keys_latex_options:n` The main function calls functions to collect up the global and local options into `\keys_latex_options_clist` before calling the main `l3keys` module to actually do the processing. So that a suitable message is produced if the option is unknown, the special `unknown` key is set if it does not already exist for the current module.

```

7 \cs_new:Npn \keys_latex_options:n #1 {
8   \clist_clear:N \keys_latex_options_clist
9   \keys_latex_options_global:n {#1}
10  \keys_latex_options_local:
11  \keys_if_exist:nnF {#1} { unknown } {
12    \keys_define:nn {#1} {
13      unknown .code:n = {
14        \msg_warning:nxxx { Option~Processing } { unknown-option }

```

```

15         { \l_keys_key_tl } { \@currname }
16     }
17 }
18 }
19 \keys_set:nV {#1} \keys_latex_options_clist
20 \AtEndOfPackage { \cs_set_eq:NN \@unprocessedoptions \scan_stop: }
21 }
22 \msg_new:nnn { Option~Processing } { unknown-option } {%
23     Unknown~option~‘#1’\%
24     for~module~#2.%
25 }

```

`\keys_latex_options_global:n` Global (class) options are handled differently for L<sup>A</sup>T<sub>E</sub>X 2<sub>ε</sub> packages and classes. Hence this function is essentially a check on the current file type. The initial test is needed as L<sup>A</sup>T<sub>E</sub>X 2<sub>ε</sub> allows variables to be equal to `\scan_stop:`, which is forbidden in L<sup>A</sup>T<sub>E</sub>X 3 code.

```

26 \cs_new:Npn \keys_latex_options_global:n #1 {
27     \cs_if_eq:NNF \@classoptionslist \scan_stop: {
28         \cs_if_eq:NNTF \@currentxt \@clsextension {
29             \keys_latex_options_class:n {#1}
30         }{
31             \bool_if:NT \l_keys_process_class_bool
32             { \keys_latex_options_package:n {#1} }
33         }
34     }
35 }

```

`\keys_latex_options_class:n` For classes, each option (stripped of any content after ‘=’) is checked for existence as a key. If found, the option is added to the combined list for processing. On the other hand, unused options are stored up in `\@unusedoptionlist`.

```

36 \cs_new:Npn \keys_latex_options_class:n #1 {
37     \clist_map_inline:Nn \@classoptionslist {
38         \keys_if_exist:nnTF {#1} { \keys_latex_remove_equals:n {##1} } {
39             \clist_put_right:Nn \keys_latex_options_clist {##1}
40         }{
41             \clist_put_right:Nn \@unusedoptionlist {##1}
42         }
43     }
44 }

```

`\keys_latex_options_package:n` For global options when processing a package, the tasks are slightly different from those for a class. The check is the same, but here there is nothing to do if the option is not applicable. Each valid option also needs to be removed from `\@unusedoptionlist`.

```

45 \cs_new:Npn \keys_latex_options_package:n #1 {
46     \clist_map_inline:Nn \@classoptionslist {
47         \keys_if_exist:nnT {#1} { \keys_latex_remove_equals:n {##1} } {
48             \clist_put_right:Nn \keys_latex_options_clist {##1}

```

```

49     \clist_remove_element:Nn \@unusedoptionlist {##1}
50   }
51 }
52 }

```

`\keys_latex_options_local:` If local options are found, they are added to the processing list. L<sup>A</sup>T<sub>E</sub>X 2<sub>ε</sub> stores options for each file in a macro which may or may not exist, hence the need to use `\cs_if_exist:c`.

```

53 \cs_new_nopar:Npn \keys_latex_options_local: {
54   \cs_if_eq:NNF \@current \clsextension {
55     \cs_if_exist:cT { opt@ \@currname . \@current } {
56       \exp_args:NNc \clist_put_right:NV \keys_latex_options_clist
57         { opt@ \@currname . \@current }
58     }
59   }
60 }

```

`\keys_latex_remove_equals:n` As the name suggests, this is a simple function to remove an equals sign from the input.  
`\keys_latex_remove_equals:w` This is all wrapped up in an `n` function so that there will always be a sign available.

```

61 \cs_new:Npn \keys_latex_remove_equals:n #1 {
62   \keys_latex_remove_equals:w #1 = \q_stop
63 }
64 \cs_new:Npn \keys_latex_remove_equals:w #1 = #2 \q_stop {#1}

```

`\ProcessKeysOptions` The user macro are simply wrappers around the internal process. In contrast to other  
`\ProcessKeysOptions` similar packages, the module name is always required here.

```

65 \NewDocumentCommand \ProcessKeysOptions { m } {
66   \bool_set_true:N \_l_keys_process_class_bool
67   \keys_latex_options:n {#1}
68 }
69 \NewDocumentCommand \ProcessKeysPackageOptions { m } {
70   \bool_set_false:N \_l_keys_process_class_bool
71   \keys_latex_options:n {#1}
72 }
73 \@onlypreamble \ProcessKeysOptions
74 \@onlypreamble \ProcessKeysPackageOptions
75 </package>

```

## Index

The italic numbers denote the pages where the corresponding entry is described, numbers underlined point to the definition, all others indicate the places where it is used.

### Symbols

`\@classoptionslist` ..... 27, 37, 46 5

\@clsextension	28, 54	K	
\@current	28, 54, 55, 57	\keys_define:nn	12
\@currname	15, 55, 57	\keys_if_exist:nnF	11
\@onlypreamble	73, 74	\keys_if_exist:nnT	47
\@unprocessedoptions	20	\keys_if_exist:nnTF	38
\@unusedoptionlist	41, 49	\keys_latex_options:n	2, 7, 7, 67, 71
\\	23	\keys_latex_options_class:n	2, 29, 36, 36
\_l_keys_process_class_bool	6, 6, 31, 66, 70	\keys_latex_options_clist	2, 5, 5, 8, 19, 39, 48, 56
A		\keys_latex_options_global:n	2, 9, 26, 26
\AtEndOfPackage	20	\keys_latex_options_local:	3, 10, 53, 53
B		\keys_latex_options_package:n	2, 32, 45, 45
\bool_if:NT	31	\keys_latex_remove_equals:n	3, 38, 47, 61, 61
\bool_new:N	6	\keys_latex_remove_equals:w	3, 61, 62, 64
\bool_set_false:N	70	\keys_set:nV	19
\bool_set_true:N	66	L	
C		\l_keys_key_tl	15
\clist_clear:N	8	M	
\clist_map_inline:Nn	37, 46	\msg_new:nnn	22
\clist_new:N	5	\msg_warning:nnxx	14
\clist_put_right:Nn	39, 41, 48	N	
\clist_put_right:NV	56	\NewDocumentCommand	65, 69
\clist_remove_element:Nn	49	P	
\cs_if_eq:NNF	27, 54	\ProcessKeysOptions	2, 65, 65, 73
\cs_if_eq:NNTF	28	\ProcessKeysPackageOptions	2, 69, 74
\cs_if_exist:cT	55	\ProvidesExplPackage	2
\cs_new:Npn	7, 26, 36, 45, 61, 64	Q	
\cs_new_nopar:Npn	53	\q_stop	62, 64
\cs_set_eq:NN	20	R	
E		\RequirePackage	4
\exp_args:NNc	56	S	
F		\scan_stop:	20, 27
\filedate	3		
\filedescription	3		
\filename	3		
\fileversion	3		