

# The `l3pdfdict` module—tools for PDF dictionaries

## L<sup>A</sup>T<sub>E</sub>X PDF management testphase bundle

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## 1 `l3pdfdict` documentation

Many PDF objects are or contain dictionaries—structures containing a number of (pdf-)name/value pairs. Examples are attributes of links, filespec dictionaries, xform dictionaries, the catalog, the info dictionary. The commands in this module offer a number of tools to handle such dictionaries. The module setups a name space for the dictionary names and offers some commands to output dictionaries.

The dictionaries work in many respects like property lists with a few PDF specific changes:

- The keys are always converted with `\str_convert_pdfname:n` to get a correct PDF name;
- a key with a empty value can not be added, it will be ignored;
- there is a dedicated function to output the property as space separated list with keys with slash: `/key1 value1 /key2 value2`.

Local and global dictionaries can be created.

### 1.1 User Commands

---

`\pdfdict_new:n` `\pdfdict_new:n {<dictionary name>}`

Updated: 2020-12-03 This function create a new local or global dictionary. Which one depends on *<dictionary name>*: If it begins with the standard `g` the dictionary is global, with `l` the dictionary is local, other starting chars will give an error. It is recommended to begin the name in the standard expl3 naming scheme with one or two underscores and a module name, so `g_module_XXXX` or `g__module_XXXX`.

---

`\pdfdict_set_eq:nn` `\pdfdict_set_eq:nn {<local dictionary name1>} {<dictionary name2>}`  
`\pdfdict_gset_eq:nn` `\pdfdict_gset_eq:nn {<global dictionary name1>} {<dictionary name2>}`

New: 2020-06-16 This functions copy *<dictionary name<sub>2</sub>>* into *<local/global dictionary name<sub>1</sub>>* locally or globally. If the dictionary *<local/global dictionary name<sub>1</sub>>* doesn't exist yet, it will be created. If *<dictionary name<sub>2</sub>>* doesn't exist yet, an error will be raised.  
Updated: 2020-12-03

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`\pdfdict_put:nnn` `\pdfdict_put:nnn`  $\langle local dictionary \rangle$   $\langle name \rangle$   $\langle value \rangle$   
`\pdfdict_gput:nnn` `\pdfdict_gput:nnn`  $\langle global dictionary \rangle$   $\langle name \rangle$   $\langle value \rangle$

---

New: 2020-04-06

This function puts key  $\langle name \rangle$  and value  $\langle value \rangle$  locally or globally in the  $\langle dictionary \rangle$  created with `\pdfdict_new:n`.  $\langle name \rangle$  should be a PDF Name without the starting slash. It will be stored with `\str_convert_pdfname:n`, so will be automatically correctly escaped in case it contains slashes, spaces or other chars not allowed in a PDF name.  $\langle value \rangle$  should be a valid PDF value for this name in the target dictionary. The value is *neither* converted *nor* escaped automatically. If the value is blank nothing is added to the dictionary.

When adding a value keep in mind that the expansion behaviour of the backends differ. Some backends expand a value always fully when writing to the PDF, with other backends commands could end as strings in the PDF. This makes controlling the expansion quite tricky. It is better to not rely on  $\langle value \rangle$  to be expanded nor not expanded by the backend commands.

---

`\pdfdict_item:nn`  $\star$  `\pdfdict_item:nn`  $\langle key \rangle$   $\langle value \rangle$

`\pdfdict_item:ne`  $\star$  A simple command to output key-value as `/key value`. This is needed to output dictionaries in mapping commands. The command doesn't do any escaping, it expects that the name has been escaped when the value has been stored into the dictionary. If the value is blank nothing is output. The command is expandable if the content is it.

---

New: 2020-12-04

---

`\pdfdict_use:n`  $\star$  `\pdfdict_use:n`  $\langle dictionary \rangle$

---

Updated: 2020-12-03

This outputs the property list of the dictionary as a list of `/key value` pairs. This can be used e.g. when writing a dictionary object with `\pdf_object_write:nxx`

---

`\pdfdict_show:n` `\pdfdict_show:n`  $\langle dictionary \rangle$

---

Updated: 2020-12-03

This shows the content of  $\langle dictionary \rangle$  in the log and on the terminal.

---

`\pdfdict_if_exist_p:n`  $\star$  `\pdfdict_if_exist:n`  $\langle dictionary \rangle$

`\pdfdict_if_exist:nTF`  $\star$  This tests if the dictionary exists.

---

Updated: 2020-12-03

---

`\pdfdict_if_empty_p:n`  $\star$  `\pdfdict_if_empty:n`  $\langle dictionary \rangle$

`\pdfdict_if_empty:nTF`  $\star$  This tests if the dictionary is empty. The result is false if the dictionary doesn't exist.

---

Updated: 2020-12-03

---

`\pdfdict_get:nnN` `\pdfdict_get:nnN`  $\langle dictionary \rangle$   $\langle name \rangle$   $\langle tl var \rangle$

---

New: 2020-07-06

Recovers the  $\langle value \rangle$  stored by `\pdfdict_put:nnn` or `\pdfdict_gput:nnn` for  $\langle name \rangle$  and places this in the  $\langle token list variable \rangle$ . If  $\langle name \rangle$  is not found then the  $\langle token list variable \rangle$  is set to the special marker `\q_no_value`.  $\langle name \rangle$  is first converted with `\str_convert_pdfname:n`. The  $\langle token list variable \rangle$  is set within the current T<sub>E</sub>X group.

---

```

\pdfdict_remove:nn \pdfdict_remove:nn {<local dictionary>} {<name>}
\pdfdict_gremove:nn \pdfdict_gremove:nn {<global dictionary>} {<name>}

```

---

Updated: 2020-12-03

Removes  $\langle name \rangle$  and its associated  $\langle value \rangle$  from the  $\langle dictionary \rangle$ . The removal is local from local dictionaries and global from global dictionaries. If  $\langle name \rangle$  is not found no change occurs, *i.e.* there is no need to test for the existence of a name before trying to remove it.  $\langle name \rangle$  is first converted with `\str_convert_pdfname:n`.

## 2 l3pdfdict implementation

```

1 <@@=pdfdict>
2 <*header>
3 \ProvidesExplPackage{l3pdfdict}{2023-03-09}{0.95x}
4   {Tools for PDF dictionaries (LaTeX PDF management testphase bundle)}
5 </header>

```

### 2.1 messages

```

6 <*package>
7 \cs_new:Npn \__pdfdict_get_type:n #1
8   {
9     \str_case_e:nn { \str_head:n{#1} }
10    {
11      {g}{global}
12      {l}{local}
13    }
14  }
15 \msg_new:nnn { pdfdict } { show-dict }
16   { % #1: name of the dictionary
17     % #2: expanded content
18     % #3: type
19     The~#3~dictionary~'~#1'~
20     \tl_if_empty:nTF {#2}
21       { is-empty \>~ . }
22       { contains~the~pairs~(without~outer~braces): #2 . }
23   }
24 \msg_new:nnn { pdfdict } { unknown-dict }
25   {
26     The~dictionary~'~#1'~is~unknown.
27   }
28 \msg_new:nnn { pdfdict } { dict-already-defined }
29   {
30     The~#2~dictionary~'~#1'~is~already~defined.
31   }
32 \msg_new:nnn { pdfdict } { empty-value }
33   { The~value~#1~for~#2~is~blank~and~will~be~ignored }
34
35 \msg_new:nnn { pdfdict } { invalid-name }
36   { Name~'~#1'~is~not~valid\
37     Names~of~dictionaries~should~start~with~'g'~or~'l' }
38

```

## 2.2 Creating dictionaries

`\g__pdfdict_names_seq` Two seq to store the used names for diagnostics.

```
\g__pdfdict_gnames_seq 39 \seq_new:N \g__pdfdict_lnames_seq
40 \seq_new:N \g__pdfdict_gnames_seq
```

*(End definition for \g\_\_pdfdict\_names\_seq and \g\_\_pdfdict\_gnames\_seq.)*

`\__pdfdict_name:n` This are the commands to create new dictionaries and to access their internal name. All internal names start with `g__pdfdict_/` or `l__pdfdict_/`.

`\__kernel_pdfdict_name:n` For the other modules we also need a kernel command to access the internal name with the dictionaries. For example

```
\__pdfdict_new:n
\pdfdict_new:n
```

```
\prop_clear:c { \__kernel_pdfdict_name:n { name } }
```

```
41 \cs_new:Npn \__pdfdict_name:n #1 % #1 dictionary name
42 {
43   \str_head:n{#1}__pdfdict_/#1_prop
44 }
45 \cs_set_eq:NN \__kernel_pdfdict_name:n \__pdfdict_name:n
46
47 \cs_new_protected:Npn \__pdfdict_new:n #1
48 {
49   \__pdfdict_if_exist:nTF { #1 }
50   {
51     \msg_error:nnxx
52     { pdfdict }
53     { dict-already-defined }
54     { \tl_to_str:n {#1} }
55     { \__pdfdict_get_type:n{#1} }
56   }
57   {
58     \str_case_e:nnF { \str_head:n{#1} }
59     {
60       {g}
61       {
62         \prop_new:c { \__pdfdict_name:n { #1 } }
63         \seq_gput_right:cn {g__pdfdict_gnames_seq} { #1 }
64       }
65       {l}
66       {
67         \prop_new:c { \__pdfdict_name:n { #1 } }
68         \seq_gput_right:cn {g__pdfdict_lnames_seq} { #1 }
69       }
70     }
71     {
72       \msg_error:nnx{pdfdict}{invalid-name}{\tl_to_str:n{#1}}
73     }
74   }
75 }
76
77 \cs_set_eq:NN \pdfdict_new:n \__pdfdict_new:n
```

*(End definition for \\_\_pdfdict\_name:n and others. This function is documented on page 1.)*

```

__pdfdict_set_eq:nn
\pdfdict_set_eq:nn 78 \cs_new_protected:Npn __pdfdict_set_eq:nn #1 #2
__pdfdict_gset_eq:nn 79 {
\pdfdict_gset_eq:nn 80   \__pdfdict_if_exist:nTF { #2 }
81   {
82     \__pdfdict_if_exist:nF { #1 }
83     {
84       \__pdfdict_new:n { #1 }
85     }
86     \prop_set_eq:cc { \__pdfdict_name:n {#1} } { \__pdfdict_name:n {#2} }
87   }
88   {
89     \msg_error:nnn { pdfdict } { unknown-dict } { #1 }
90   }
91 }
92
93 \cs_set_eq:NN \pdfdict_set_eq:nn \__pdfdict_set_eq:nn
94
95 \cs_new_protected:Npn __pdfdict_gset_eq:nn #1 #2
96 {
97   \__pdfdict_if_exist:nTF { #2 }
98   {
99     \__pdfdict_if_exist:nF { #1 }
100    {
101      \__pdfdict_new:n { #1 }
102    }
103    \prop_gset_eq:cc { \__pdfdict_name:n {#1} } { \__pdfdict_name:n {#2} }
104  }
105  {
106    \msg_error:nnn { pdfdict } { unknown-dict } { #1 }
107  }
108 }
109
110 \cs_set_eq:NN \pdfdict_gset_eq:nn \__pdfdict_gset_eq:nn

```

(End definition for `\__pdfdict_set_eq:nn` and others. These functions are documented on page 1.)

```

__pdfdict_if_exist_p:n Existence tests.
__pdfdict_if_exist:nTF 111 %local
\pdfdict_if_exist_p:n 112 \prg_new_conditional:Npnn __pdfdict_if_exist:n #1 { p , T , F , TF }
\pdfdict_if_exist:nTF 113 {
114   \prop_if_exist:cTF
115   { \__pdfdict_name:n { #1 } }
116   { \prg_return_true: }
117   { \prg_return_false: }
118 }
119 \prg_set_eq_conditional:NNn
120 \pdfdict_if_exist:n \__pdfdict_if_exist:n { p , T , F , TF }

```

(End definition for `\__pdfdict_if_exist:nTF` and `\pdfdict_if_exist:nTF`. This function is documented on page 2.)

```

__pdfdict_if_empty_p:n Tests for emptiness.
__pdfdict_if_empty:nTF 121 \prg_new_conditional:Npnn __pdfdict_if_empty:n #1 { p , T , F , TF }
\pdfdict_if_empty_p:n
\pdfdict_if_empty:nTF

```

```

122 {
123   \prop_if_empty:cTF
124   { \__pdfdict_name:n { #1 } }
125   { \prg_return_true: }
126   { \prg_return_false: }
127 }
128
129 \prg_set_eq_conditional:NNn
130 \pdfdict_if_empty:n \__pdfdict_if_empty:n { p , T , F , TF }

```

(End definition for `\__pdfdict_if_empty:nTF` and `\pdfdict_if_empty:nTF`. This function is documented on page 2.)

```

\__pdfdict_put:nnn These are the commands to store values into the dictionaries. The main difference to
\pdfdict_put:nnn adding values to a normal property list is, that the keys are converted with \str_-
\__pdfdict_gput:nnn convert_pdfname:n and that empty values are ignored.
\pdfdict_gput:nnn
131 \cs_new_protected:Npn \__pdfdict_put:nnn #1 #2 #3 % #1 (local) dict, #2 name, #3 value
132 {
133   \tl_if_blank:nTF { #3 }
134   {
135     \msg_warning:nnnn { pdfdict } { empty-value } { #2 } { #1 }
136   }
137   {
138     \__pdfdict_if_exist:nTF { #1 }
139     {
140       \exp_args:Nnx \prop_put:cnn
141       { \__pdfdict_name:n { #1 } } { \str_convert_pdfname:n { #2 } } { #3 }
142     }
143     {
144       \msg_error:nnn { pdfdict } { unknown-dict } { #1 }
145     }
146   }
147 }
148
149 \cs_set_eq:NN \pdfdict_put:nnn \__pdfdict_put:nnn
150 \cs_generate_variant:Nn \pdfdict_put:nnn {nnx, nno}
151
152 \cs_new_protected:Npn \__pdfdict_gput:nnn #1 #2 #3 % #1 global dict, #2 name, #3 value
153 {
154   \tl_if_empty:nTF { #3 }
155   {
156     \msg_warning:nnnn { pdfdict } { empty-value } { #2 } { #1 }
157   }
158   {
159     \__pdfdict_if_exist:nTF { #1 }
160     {
161       \exp_args:Nnx \prop_gput:cnn
162       { \__pdfdict_name:n { #1 } } { \str_convert_pdfname:n { #2 } } { #3 }
163     }
164     {
165       \msg_error:nnn { pdfdict } { unknown-dict } { #1 }
166     }
167   }
168 }

```

```

169
170 \cs_set_eq:NN \pdfdict_gput:nnn \__pdfdict_gput:nnn
171 \cs_generate_variant:Nn \pdfdict_gput:nnn {nnx, nno}

```

(End definition for `\__pdfdict_put:nnn` and others. These functions are documented on page 2.)

`\__pdfdict_get:nnN` Recover the values. The name must be first escaped to match the stored name.

```

\pdfdict_get:nnN
172 \cs_new_protected:Npn \__pdfdict_get:nnN #1 #2 #3 %dict, key, macro
173 {
174   \__pdfdict_if_exist:nTF { #1 }
175   {
176     \exp_args:Nnx \prop_get:cnN
177     { \__pdfdict_name:n { #1 } }
178     { \str_convert_pdfname:n { #2 } } #3
179   }
180   {
181     \msg_error:nnn { pdfdict } { unknown-dict } { #1 }
182   }
183 }
184
185 \cs_set_eq:NN \pdfdict_get:nnN \__pdfdict_get:nnN

```

(End definition for `\__pdfdict_get:nnN` and `\pdfdict_get:nnN`. This function is documented on page 2.)

`\__pdfdict_remove:nn` This removes a name/value pair from a dictionary. The name has to be passed through the escaping.

```

\pdfdict_remove:nn
\__pdfdict_gremove:nn
\pdfdict_gremove:nn
186 \cs_new_protected:Npn \__pdfdict_remove:nn #1 #2 %dict, name
187 {
188   \__pdfdict_if_exist:nTF { #1 }
189   {
190     \exp_args:Nnx \prop_remove:cn
191     { \__pdfdict_name:n { #1 } } { \str_convert_pdfname:n { #2 } }
192   }
193   {
194     \msg_error:nnn { pdfdict } { unknown-dict } { #1 }
195   }
196 }
197 \cs_set_eq:NN \pdfdict_remove:nn \__pdfdict_remove:nn
198
199 \cs_new_protected:Npn \__pdfdict_gremove:nn #1 #2 %dict, name
200 {
201   \__pdfdict_if_exist:nTF { #1 }
202   {
203     \exp_args:Nnx \prop_gremove:cn
204     { \__pdfdict_name:n { #1 } } { \str_convert_pdfname:n { #2 } }
205   }
206   {
207     \msg_error:nnn { pdfdict } { unknown-dict } { #1 }
208   }
209 }
210
211 \cs_set_eq:NN \pdfdict_gremove:nn \__pdfdict_gremove:nn

```

(End definition for `\__pdfdict_remove:nn` and others. These functions are documented on page 3.)

```

\__pdfdict_show:Nn This allows to show the content of dictionaries. It also displays if a dictionary is local or
\pdfdict_show:n global. If both exists both are shown.
212 \cs_new_protected:Npn \__pdfdict_show:Nn #1#2 %#1 message command, #2 dict
213 {
214   \prop_if_exist:cTF { \__pdfdict_name:n { #2 } }
215   {
216     #1
217     { pdfdict }
218     { show-dict }
219     { \tl_to_str:n {#2} }
220     { \prop_map_function:cN { \__pdfdict_name:n { #2 } } \msg_show_item:nn }
221     { \__pdfdict_get_type:n{#2} }
222     { }
223   }
224   {
225     #1 { pdfdict } { unknown-dict } { #2 } {}{}{}
226   }
227 }
228 \cs_new_protected:Npn \pdfdict_show:n #1
229 {
230   \__pdfdict_show:Nn \msg_show:nnxxxx {#1}
231 }

```

(End definition for \\_\_pdfdict\_show:Nn and \pdfdict\_show:n. This function is documented on page 2.)

```

\__pdfdict_item:nn
\__pdfdict_item:ne 232 \cs_new:Npn \__pdfdict_item:nn #1 #2 %#1 name, #2 value
\pdfdict_item:nn 233 {
\pdfdict_item:ne 234   \tl_if_blank:nF {#2} { /#1~#2~ }
235 }
236 \cs_generate_variant:Nn \__pdfdict_item:nn {ne}
237 \cs_set_eq:NN \pdfdict_item:nn \__pdfdict_item:nn
238 \cs_generate_variant:Nn \pdfdict_item:nn {ne}

```

(End definition for \\_\_pdfdict\_item:nn and \pdfdict\_item:nn. This function is documented on page 2.)

\\_\_pdfdict\_use:n \\_\_pdfdict\_use:n outputs a prop as needed in a dictionary: as a list of  $\langle key \rangle \langle value \rangle$  pairs.

```

239 \cs_new:Npn \__pdfdict_use:n #1 %#1 dict
240 {
241   \prop_map_function:cN { \__pdfdict_name:n { #1 } } \__pdfdict_item:ne
242 }
243
244 \cs_set_eq:NN \pdfdict_use:n \__pdfdict_use:n

```

(End definition for \\_\_pdfdict\_use:n and \pdfdict\_use:n. This function is documented on page 2.)

245  $\langle /package \rangle$



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