

The `l3pdffield-action` module

Commands to handle actions of form fields

L^AT_EX PDF management testphase bundle

The L^AT_EX Project*

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1 `l3pdffield-action` Introduction

This is the documentation for actions for formular fields, for general information about form fields check the documentation `l3pdffield`.

A: B:

Please keep in mind

- Not every PDF viewer supports form fields.
- Even if they support it, that doesn't mean that they support actions like Submit.
- The handling can depend on settings in the PDF viewer.
- Standards like pdf/A disable features of form fields too (as you typically can't change the PDF).

2 Actions

Actions must be handled in three places: In the action dictionary (`/A`) of the annotation(s), in the additional action dictionary of the field (`/AA`), and in the additional action dictionary (`/AA`) of the annotation(s). The distinction between the two `/AA` dictionaries is relevant as field actions can only be added when the field is initialized, so typically with the first field command for a specific name, while annotation actions can be added for example only to one specific instance of a checkbox or to pushbuttons belonging to the same field.

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2.1 The additional action dictionaries (AA)

The actions in the /AA dictionaries are JavaScript (ECMAScript) actions. An example is the `calculate/AA/C` action, which is added with the `/C` key:

```
Netto~\pdffield_textfield:n{name=netto}~
\pdf_object_unnamed_write:nx{stream}
{
  {}
  {
    var~f_netto = this.getField("netto");
    event.value = 1.19*f_netto.value;
  }
}
\tl_set:Nx\l_tmpa_tl{\pdf_object_ref_last:}
Brutto~\pdffield_textfield:n{name=brutto,AA/C={\l_tmpa_tl}}
```

The main problem with scripts is to get the escaping right. While it is possible to pass the script as string, it is less error prone to include it as (file) stream and to reference the object number as done in the example.

2.2 The action dictionary (A)

The action dictionary can contain much more action types. The PDF reference lists 20 different types¹: `GoTo`, `GoToR`, `GoToE`, `GoToDp`, `Launch`, `Thread`, `URI`, `Sound`, `Movie`, `Hide`, `Named`, `SubmitForm`, `ResetForm`, `ImportData`, `SetOCGState`, `Rendition`, `Trans`, `GoTo3DView`, `JavaScript`, `RichMediaExecute`.

And action dictionary typically looks like this:

```
/A << /Type /Action
      /S ... % type name, e.g. /URI
      /Next ... % optional, next action
      ... % more keys
>>
```

The `/Next` key allows to chain actions. The value can be a reference to a single action, or an array of actions.

It depends on the action type which other keys should be used.

While almost all actions are usable in the annotations of a field, the three actions `SubmitForm`, `ResetForm` and `ImportData` are specific to fields and need explicit support. This support is the main task of this module.

2.2.1 ResetForm

The `ResetForm` action resets the fields of a form. The action is typically attached to a pushbutton.

In simple cases the action only need to contain the subtype entry and then resets everything (sadly with some side-effect on the appearance of the pushbutton, sigh).

¹Sound and Movie are deprecated in PDF 2.0

```

\group_begin:
\pdfannot_dict_put:nnn{widget}{A}{<</Type/Action/S/ResetForm>>}
\pdffield_pushbutton:n{name=R,caption=Reset}
\group_end:

```

A **ResetForm** action knows two optional keys: **/Fields** allows to describe or restrict the fields which should be reset. Depending on the setting of the **/Flags** key the value of **/Fields** describes the fields to reset or the fields to leave unchanged.

The commands of this module allow to store actions under a name which can then be used in the key-val list of a field annotation.

A reset action can be defined and used like this

```

\pdffield_reset_new:nn
{myreset}
{
  fields= {A,B,C},
  exclude    % or include
}
\pdffield_pushbutton:n{name=r,caption=Reset,reset=myreset}

```

myreset is the name the action can be referred to with the **reset** key.

It is possible to define and use a reset action before all fields it refers too have been created. The list of names can contain names that are actually not used by the form.

The reset action **all** is predefined.

2.2.2 ImportData

The **ImportData** action allows to import field data from an external file, for example a **.fdf** created with the **submit** action. The action is typically attached to a **pushbutton**, its only value is a file name.

2.2.3 SubmitForm

SubmitForm is the most challenging action. There are more keys in the dictionary, 13 flags, and there are four export options, which require each some flag settings. And the main argument is an url, which can contain special chars like **#** or **%** and so need special handling.

A submit action can be defined like this

```

\pdffield_submit_new:nnn
{mysubmit}
{
  export = fdf,
  fields= {A,B,C},
  exclude,    % or include
  setsubmitflags={...}
  ...
}
{URL}
\pdffield_pushbutton:n{name=s,caption={Submit~A,B,C},submit=mysubmit}

```

The export options are `html`, `pdf`, `fdf` and `xfdf`. The `html` export uses my default the POST method, the GET method can be forced by setting the `GetMethod` flag—at least according to the reference, I wasn't able yet to test it.

The following tabular describes the relation between these export options and the flags. 0 and 1 in the tabular means that the value is set by the code. * can be set by the user with the `setFlags` or `setsubmitflags` key.

Flag	html	pdf	fdf	xfdf
Include/Exclude	*	0	*	*
IncludeNoValueFields	*	0	*	*
ExportFormat	1	0	0	0
GetMethod	*	0	0	0
SubmitCoordinates	*	0	0	0
XPDF	0	0	0	1
IncludeAppendSaves	0	0	*	0
IncludeAnnotations	0	0	*	0
SubmitPDF	0	1	0	0
CanonicalFormat	*	0	*	*
ExclNonUserAnnots	0	0	*	0
ExclFKey	0	0	*	0
EmbedForm	0	0	*	0

2.3 Commands

```
\pdffield_reset_new:nn \pdffield_reset_new:nn{<name>}{<key val list>}
```

This defines an new reset action with the name `<name>`. The keys are described below.

```
\pdffield_submit_new:nnn \pdffield_submit_new:nn{<name>}{<key val list>}{<URL>}
```

This defines an submit action with the name `<name>`. The keys are described below. `<URL>` should be given verbatim. That means `#` and `%` should not be escaped. The URL should be correctly percent encoded, or the `urlencode` key should be used then the code will create the percent encoding.

`<URL>` can be a mail address and should then start with `mailto:.` A subject can be attached with `?subject=...`. This normally works quite fine as it only needs a correctly working mail programm. (But for some unknown reason my mail program don't like mail addresses with hyphens in them).

Alternatively it should be an URL of a script, which should return the correct answer (which one this is, is rather unclear).

2.4 Keys for the commands to create actions

fields	<code>fields = {<comma list of fully qualified field names>}</code>
---------------	---

`fields` is a comma list of *fully qualified* field names, typically this can be the short name set with `name` in a field declaration, but in complex fieldsets it is needed to include the parents in the name too, separated by periods. If `exclude` is set, this list describes the fields that should be excluded from the reset or the submission. The default is `include`: the list describes the fields to reset or submit. Descendant of fields are reset or submitted too!

The key is relevant for reset and submit actions.

include	<code>include</code>
exclude	<code>exclude</code>

These keys are shorthands to unset/set the `Include/Exclude` flag and decide if the list of fields in the `fields` key are included or excluded. The default is `include`: the list describes the fields to reset or submit.

The keys are relevant for reset and submit actions.

urlencode	<code>urlencode = true false</code>
------------------	-------------------------------------

When this is true the code will percent encode the submission URL. This is needed if the URL contains for example non-ascii chars or spaces.

setsubmitflags	<code>setsubmitflags = {<comma list of flags>}</code>
setFlags	<code>setFlags = {<comma list of flags>}</code>
unsetsubmitflags	<code>unsetsubmitflags = all {<comma list of flags>}</code>
unsetFlags	<code>unsetFlags = all {<comma list of flags>}</code>

These keys accept a list of flag names and then sets or unsets them, the resulting value is then used with the `/Flags` key of a submit action. `Include/Exclude` is also used by a reset action and can also be set with the `exclude` and `include` keys. Depending on the export type of the submit action some flags are set by the code. See the tabular above for details. The flag name can be given in PDF spelling (`IncludeNoValueFields`), in lowercase (`includenovaluefields`), and as number. `unsetFlags` and its alias `unsetsubmitflags` know the special value `all` which clears all the fields.

The list of flags are: `Include/Exclude`, `IncludeNoValueFields`, `ExportFormat`, `GetMethod`, `SubmitCoordinates`, `XFDF`, `IncludeAppendSaves`, `IncludeAnnotations`, `SubmitPDF`, `CanonicalFormat`, `ExclNonUserAnnots`, `ExclFKey`, `EmbedForm`

next	<code>next = <object reference></code>
-------------	--

This allows to add a follow up action to the `/Next` key. The value is expanded, so can be given as `\pdf_object_ref:n{name}` and point to a suitable object.

2.5 Keys for fields

With the following keys actions can be attached to the annotation of a form field, for example a pushbutton.

```

reset reset = <name>
submit submit = <name>

```

This adds the reset or submit action *<name>* as action to the annotation. The action should be defined first. The actions are mutually exclusive, only one action can be added. If more actions are needed use the **next** key. For reset the default value **all** exists and it is used if the key is used without value.

```

import import = <file name>

```

This adds an import action to the annotation. *<file name>* should be for example the name of a **.fdf** file. If the name contains a path use a slash as separator. non-ascii chars should work, but ascii is safer. The action is mutually exclusive to submit and reset.

3 l3pdffield-action Implementation

```

1 <*package>
2 <@@=pdffield>

```

3.1 Messages

```

3 \msg_new:nnn {pdffield}{action-name-undefined}
4 {
5   The~'#1'~action-name~'#2'~is~not~defined~and~
6   will~be~ignored.
7 }
8

```

3.2 Variables

```

\l__pdffield_action_export_tl
\l__pdffield_action_Fields_seq
\l__pdffield_action_next_tl

```

We need to store the export, fields and next value into variables.

```

9 \tl_new:N \l__pdffield_action_export_tl
10 \seq_new:N \l__pdffield_action_Fields_seq
11 \tl_new:N \l__pdffield_action_next_tl

```

(End definition for *\l__pdffield_action_export_tl*, *\l__pdffield_action_Fields_seq*, and *\l__pdffield_action_next_tl*.)

3.3 dictionaries

```

l__pdffield/ResetForm
l__pdffield/SubmitForm

```

We define two dictionaries to handle the reset and submit code.

```

12 \pdfdict_new:n {l__pdffield/ResetForm}
13 \pdfdict_put:nnn {l__pdffield/ResetForm}{Type}{/Action}
14 \pdfdict_put:nnn {l__pdffield/ResetForm}{S}{/ResetForm}
15 \pdfdict_new:n {l__pdffield/SubmitForm}
16 \pdfdict_put:nnn {l__pdffield/SubmitForm}{Type}{/Action}
17 \pdfdict_put:nnn {l__pdffield/SubmitForm}{S}{/SubmitForm}

```

(End definition for *l__pdffield/ResetForm* and *l__pdffield/SubmitForm*.)

3.4 bitset for submit action

\l__pdffield_Flags_bitset A bitset for the submit (and the one reset) flags:

```

18 \bitset_new:Nn \l__pdffield_Flags_bitset
19 {
20     Include/Exclude      = 1
21     ,IncludeNoValueFields = 2
22     ,ExportFormat        = 3
23     ,GetMethod           = 4
24     ,SubmitCoordinates   = 5
25     ,XFDF                = 6
26     ,IncludeAppendSaves  = 7
27     ,IncludeAnnotations  = 8
28     ,SubmitPDF           = 9
29     ,CanonicalFormat     = 10
30     ,ExclNonUserAnnots   = 11
31     ,ExclFKey            = 12
32     ,EmbedForm           = 14
33     ,include/exclude     = 1
34     ,includenvaluefields = 2
35     ,exportformat        = 3
36     ,getmethod           = 4
37     ,submitcoordinates   = 5
38     ,xpdf                = 6
39     ,includeappendsaves  = 7
40     ,includeannotations  = 8
41     ,submitpdf           = 9
42     ,canonicalformat     = 10
43     ,exclnonuserannots   = 11
44     ,exclfkey            = 12
45     ,embedform           = 14
46 }

```

(End definition for \l__pdffield_Flags_bitset.)

__pdffield_action_flags_pdf: The following commands sets the forced flags for the export options.

```

\__pdffield_action_flags_html: 47 \cs_new_protected:Npn \__pdffield_action_flags_pdf:
\__pdffield_action_flags_fdf: 48 {
\__pdffield_action_flags_xfdf: 49     \bitset_clear:N \l__pdffield_Flags_bitset
50     \bitset_set_true:Nn \l__pdffield_Flags_bitset { SubmitPDF }
51 }
52
53 \cs_new_protected:Npn \__pdffield_action_flags_html:
54 {
55     \bitset_set_true:Nn \l__pdffield_Flags_bitset { ExportFormat }
56     \bitset_set_false:Nn \l__pdffield_Flags_bitset { XFDF }
57     \bitset_set_false:Nn \l__pdffield_Flags_bitset { IncludeAppendSaves }
58     \bitset_set_false:Nn \l__pdffield_Flags_bitset { IncludeAnnotations }
59     \bitset_set_false:Nn \l__pdffield_Flags_bitset { SubmitPDF }
60     \bitset_set_false:Nn \l__pdffield_Flags_bitset { ExclNonUserAnnots }
61     \bitset_set_false:Nn \l__pdffield_Flags_bitset { ExclFKey }
62     \bitset_set_false:Nn \l__pdffield_Flags_bitset { EmbedForm }
63 }
64

```

```

65 \cs_new_protected:Npn \__pdffield_action_flags_fdf:
66 {
67   \bitset_set_false:Nn \l__pdffield_Flags_bitset { ExportFormat }
68   \bitset_set_false:Nn \l__pdffield_Flags_bitset { GetMethod }
69   \bitset_set_false:Nn \l__pdffield_Flags_bitset { SubmitCoordinates }
70   \bitset_set_false:Nn \l__pdffield_Flags_bitset { XFDF }
71   \bitset_set_false:Nn \l__pdffield_Flags_bitset { SubmitPDF }
72 }
73
74 \cs_new_protected:Npn \__pdffield_action_flags_xfdf:
75 {
76   \bitset_set_false:Nn \l__pdffield_Flags_bitset { ExportFormat }
77   \bitset_set_false:Nn \l__pdffield_Flags_bitset { GetMethod }
78   \bitset_set_false:Nn \l__pdffield_Flags_bitset { SubmitCoordinates }
79   \bitset_set_true:Nn \l__pdffield_Flags_bitset { XFDF }
80   \bitset_set_false:Nn \l__pdffield_Flags_bitset { IncludeAppendSaves }
81   \bitset_set_false:Nn \l__pdffield_Flags_bitset { IncludeAnnotations }
82   \bitset_set_false:Nn \l__pdffield_Flags_bitset { SubmitPDF }
83   \bitset_set_false:Nn \l__pdffield_Flags_bitset { ExclNonUserAnnots }
84   \bitset_set_false:Nn \l__pdffield_Flags_bitset { ExclFKey }
85   \bitset_set_false:Nn \l__pdffield_Flags_bitset { EmbedForm }
86 }

```

(End definition for __pdffield_action_flags_pdf: and others.)

3.5 Keys

reset
submit
import

These are the three additional keys for the field annotations

```

87 \keys_define:nn { pdffield }
88 {
89   reset .code:n =
90   {
91     \cs_if_exist:cTF { __pdffield_action_reset_#1: }
92     {
93       \use:c { __pdffield_action_reset_#1: }
94       \pdfannot_dict_put:nnx{widget}
95       {A}
96       {\tl_use:c { c__pdffield_action_reset_#1_tl } }
97     }
98     {
99       \msg_warning:nnnn{pdffield}{action-name-undefined}{reset}{#1}
100     }
101   }
102   ,reset .default:n = all
103 }
104
105 \keys_define:nn { pdffield }
106 {
107   submit .code:n =
108   {
109     \cs_if_exist:cTF { __pdffield_action_submit_#1: }
110     {
111       \use:c { __pdffield_action_submit_#1: }
112       \pdfannot_dict_put:nnx{widget}

```



```

113         {A}
114         {\tl_use:c { c__pdffield_action_submit_#1_tl } }
115     }
116     {
117         \msg_warning:nnnn{pdffield}{action-name-undefined}{submit}{#1}
118     }
119 }
120 }
121
122 \keys_define:nn { pdffield }
123 {
124     import .code:n =
125     {
126         \pdf_string_from_unicode:nnN {utf8/string}{#1}\l__pdffield_tmpa_str
127         \pdf_object_unnamed_write:nx {dict}{/Type/Action/S/ImportData/F\l__pdffield_tmpa_str}
128         \pdfannot_dict_put:nnx{widget}
129         {A}
130         {\pdf_object_ref_last: }
131     }
132 }
133

```

(End definition for `reset`, `submit`, and `import`. These functions are documented on page 6.)

```

fields These are keys used when defining the actions.
exclude 134 \keys_define:nn { pdffield / action }
include 135 {
export 136     fields .code:n =
charset 137     {
urlencode 138         \clist_map_inline:nn {#1}
next 139         {
140             \pdf_string_from_unicode:nnN {utf8/string}{##1}\l__pdffield_tmpa_str
141             \seq_put_right:NV\l__pdffield_action_Fields_seq \l__pdffield_tmpa_str
142         }
143     }
144     ,exclude .code:n = { \bitset_set_true:Nn \l__pdffield_Flags_bitset {Include/Exclude }}
145     ,include .code:n = { \bitset_set_false:Nn \l__pdffield_Flags_bitset {Include/Exclude }}
146     ,export .choices:nn = {pdf,fd,html,xfdf}
147     {
148         \tl_set:Nn \l__pdffield_action_export_tl {#1}
149     }
150     ,export .initial:n = {html}
151     ,charset .choices:nn =
152         {utf-8, utf-16, Shift-JIS, BigFive, GBK, UHC}
153         { \pdfdict_put:nnn { l__pdffield/SubmitForm }{#1} }
154     ,urlencode .bool_set:N = \l__pdffield_url_encode_bool
155     ,next .tl_set:N = \l__pdffield_action_next_tl
156 }

```

(End definition for `fields` and others. These functions are documented on page 5.)

```

setFlags
setsubmitflags 157 \keys_define:nn { pdffield / action }
unsetFlags 158 {
unsetsubmitflags 159     ,setFlags .code:n =

```

```

160     {
161         \clist_map_inline:nn {#1}
162         {
163             \bitset_set_true:Nn \l__pdffield_Flags_bitset {##1}
164         }
165     }
166     ,setsubmitflags .meta:n = {setFlags={#1}}
167     ,unsetFlags .multichoice:
168     ,unsetFlags / all .code:n = { \bitset_clear:N \l__pdffield_Flags_bitset}
169     ,unsetFlags / unknown .code:n =
170     {
171         \bitset_set_false:Nn \l__pdffield_Flags_bitset {#1}
172     }
173     ,unsetsubmitflags .meta:n = {unsetFlags={#1}}
174 }

```

(End definition for *setFlags* and others. These functions are documented on page 5.)

3.6 New reset action

`__pdffield_action_reset_new:nn`

The command defines a command which will setup the dictionary at first use, and then store the reference in a constant.

```

175 \cs_new_protected:Npn \__pdffield_action_reset_new:nn #1 #2 % #1 name, #2 keyval
176 {
177     \cs_new_protected:cpn {\__pdffield_action_reset_#1:}
178     {
179         \group_begin:
180         \seq_clear:N \l__pdffield_action_Fields_seq
181         \keys_set:nn { pdffield / action } { #2 }
182         \pdf_object_unnamed_write:nx
183         { array }
184         { \seq_use:Nn \l__pdffield_action_Fields_seq {~} }
185         \tl_if_empty:NF \l__pdffield_action_next_tl
186         {
187             \pdfdict_put:nxx {l__pdffield/ResetForm}{Next}{\l__pdffield_action_next_tl}
188         }
189         \pdfdict_put:nxx
190         { l__pdffield/ResetForm }
191         { Fields }
192         { \pdf_object_ref_last: }
193         \pdfdict_put:nxx
194         { l__pdffield/ResetForm }
195         { Flags }
196         { \bitset_item:Nn \l__pdffield_Flags_bitset {Include/Exclude} }
197         \pdf_object_unnamed_write:nx
198         { dict }
199         { \pdfdict_use:n{l__pdffield/ResetForm} }
200         \tl_const:cx { c__pdffield_action_reset_#1_tl } { \pdf_object_ref_last: }
201         \cs_gset_eq:cN {\__pdffield_action_reset_#1:} \prg_do_nothing:
202         \group_end:
203     }
204 }
205
206 \__pdffield_action_reset_new:nn {all}{fields={},exclude}

```

(End definition for `_pdffield_action_reset_new:nn`.)

3.7 New submit action

`_pdffield_action_submit_new:nn` Quite similar to the reset command, only that we have to use an auxiliary to grab the URL with suitable catcodes.

```

207 \cs_new_protected:Npn \_pdffield_action_submit_new:nn #1 #2 %#1 name, #2 keyval
208 {
209   \group_begin:
210   \char_set_catcode_other:N \%
211   \char_set_catcode_other:N \#
212   \_pdffield_action_submit_new:nnn {#1}{#2}
213 }
214 \cs_new_protected:Npn \_pdffield_action_submit_new:nnn #1 #2 #3 %#1 name, #2 keyval, #3 url
215 {
216   \group_end:
217   \cs_new_protected:cpn {\_pdffield_action_submit_#1:}
218   {
219     \group_begin:
220     \seq_clear:N \l__pdffield_action_Fields_seq
221     \bitset_clear:N \l__pdffield_Flags_bitset
222     \keys_set:nn {pdffield/action}{#2}
223     \use:c{ \_pdffield_action_flags\_l__pdffield_action_export_tl :}
224     \pdfdict_put:nnx
225     { l__pdffield/SubmitForm }
226     { Flags }
227     { \bitset_to_arabic:N \l__pdffield_Flags_bitset }
228     \tl_if_empty:NF \l__pdffield_action_next_tl
229     {
230       \pdfdict_put:nnx {l__pdffield/SubmitForm}{Next}{\l__pdffield_action_next_tl}
231     }
232     \bool_if:NTF \l__pdffield_url_encode_bool
233     { \pdf_string_from_unicode:nnN { utf8/URI } {#3}\l__pdffield_tmpa_str }
234     { \pdf_string_from_unicode:nnN { utf8/string } {#3}\l__pdffield_tmpa_str }
235     \pdf_object_unnamed_write:nx {dict}
236     {
237       /FS/URL
238       /F \l__pdffield_tmpa_str
239     }
240     \pdfdict_put:nnx
241     { l__pdffield/SubmitForm }
242     { F }
243     { \pdf_object_ref_last: }
244     \pdf_object_unnamed_write:nx
245     { dict }
246     { \pdfdict_use:n{ l__pdffield/SubmitForm } }
247     \tl_const:cx { c__pdffield_action_submit_#1_tl } { \pdf_object_ref_last: }
248     \cs_gset_eq:cN { \_pdffield_action_submit_#1: } \prg_do_nothing:
249     \group_end:
250   }
251 }
252

```

(End definition for `_pdffield_action_submit_new:nn`.)

3.8 User commands

```

\pdffield_reset_new:nn
\pdffield_submit_new:nnn
253 \cs_set_eq:NN \pdffield_reset_new:nn \__pdffield_action_reset_new:nn
254 \cs_set_eq:NN \pdffield_submit_new:nnn \__pdffield_action_submit_new:nn
255 \end{package}

```

(End definition for `\pdffield_reset_new:nn` and `\pdffield_submit_new:nnn`. These functions are documented on page 4.)

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