

The `xprintlen` Package^{*†}

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2015/01/26

Abstract

The `xprintlen` package is designed to print \TeX lengths in a variety of units. It uses `l3fp` to do the calculating and uses `siunitx` to print the result.

1 Requirements

`xprintlen` requires the following packages. Please make sure these packages are available and reasonably up to date on your system.

- `expl3`,
- `xparse`,
- `siunitx`.

2 Installation

To install this package, you should

- copy `xprintlen.sty` to `TEXMF/tex/latex/xprintlen`,
- copy `xprintlen.dtx` to `TEXMF/source/latex/xprintlen` and
- copy other files to `TEXMF/doc/latex/xprintlen`.

^{*}This Document corresponds to `xprintlen` 2.0a, dated 2015/01/26.

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3 Usage

3.1 Options

The package has several options described below. You could specify them at the time you load the package, while there is a `\xplsetup` provided to do this later. These two methods share the same effect.

<code>\xplsetup</code>	<code>\xplsetup{<key-value list>}</code>
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New: 2015-01-26

The `precision` option is used to define the default precision of rounding. Be aware that this is an option that requires a value, and if no value is given, an error would be raised.

The `unit` option is used to define the default unit to be converted to. This option is also requiring a value, and will raise an error if no value is given.

3.2 `\printlen`

<code>\printlen</code>	<code>\printlen[<precision>][<unit>]{<dim to be converted>}</code>
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New: 2014-12-25
Updated: 2015-01-26

`\printlen` receives three arguments. The first two are optional while the last is mandatory. The first optional argument sets the precision, the length of digits behind the decimal dot. The default precision is 2. The second optional argument sets the unit that is to be converted to, whose default is mm. The last mandatory argument is the dimension to be converted.

4 Change Log

Version 1.0, 2014/12/25

- The first public release.

5 The Implementation

```
1 <*style>
2 <@@=xprintlen>
```

5.1 Loading Packages

`siunitx` is used to round the results and print them and `xparse` is required to define user commands.

```
3 \RequirePackage{siunitx}
4 \RequirePackage{xparse}
```

5.2 Options

We use `l3keys` to define options.

Firstly, default values should be defined as constant values.

```

5 \tl_set:Nn \c__xprintlen_precision_default_tl { 2 }
6 \tl_set:Nn \c__xprintlen_unit_default_tl { mm }

7 \keys_define:nn { xprintlen }
8 {

```

The `precision` option is used to define the default precision of rounding. Be aware that this is an option that requires a value, and if no value given, an error would be raised.

```

9   precision .tl_set:N = \l__xprintlen_precision_tl ,
10   precision .value_required: ,
11   precision .initial:n = { \c__xprintlen_precision_default_tl } ,

```

The `unit` option is used to define the default unit to be converted to. This option is also requiring a value, and will raise an error if no value give.

```

12   unit      .tl_set:N = \l__xprintlen_unit_tl ,
13   unit      .value_required: ,
14   unit      .initial:n = { \c__xprintlen_unit_default_tl } ,
15 }

16 \ProcessKeysOptions { xprintlen }

```

`\xplsetup` User command to set the options.

```

17 \DeclareDocumentCommand { \xplsetup } { m }
18 { \keys_set:nn { xprintlen } {#1} }

```

(End definition for `\xplsetup`. This function is documented on page 2.)

5.3 Defining `px` if using pdf \TeX

`__xprintlen_new_unit:w`

New: 2015-01-26

`__xprintlen_new_unit:w` is used to define `__fp_parse_word_#1:N` which would be used by `l3fp` to test if `\#1` is a valid \TeX unit. Since `px` is not a Knuth \TeX 's unit, and is not defined by `l3fp` itself, we should define this by ourselves.

```

19 \cs_new_protected:Npn \__xprintlen_new_unit:w #1 #2
20 {
21   \cs_new_nopar:cpn { __fp_parse_word_#1:N }
22   {
23     \__fp_exp_after_f:nw { \__fp_parse_infix:NN }
24     \s__fp \__fp_chk:w 10 #2 ;
25   }
26 }

```

Declare `__fp_parse_word_px:N`, if we are working under pdf \TeX . Note that, `px` = `bp`.

```

27 \pdfTEX_if_engine:T

```

```

28 {
29   \_xprintlen_new_unit:w {px} { {1} {1003} {7500} {0000} {0000} }
30 }

```

5.4 Main

<code>_xprintlen_convert_dim</code>	<code>_xprintlen_convert_dim{<dim to be converted>}{<unit to be converted to>}</code>
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New: 2015-01-26

This is the main function for calculating. `\fp_eval` from `l3fp` is used to do the job. `_xprintlen_convert_dim` absorbs two mandatory arguments, while the first is the *<dim to be convert>* and the second is the *<unit to be converted to>*, the second one, should be a valid unit of current \TeX engine.

`zw` and `zh` defined by $\text{p}\text{\TeX}$ series are not supported at present, but will soon be taken into the list.

```

31 \cs_new:Npn \_xprintlen_convert_dim #1#2
32 {
33   \fp_eval:n { (#1) / (1#2) }
34 }

```

<code>_xprintlen_output_result</code>	<code>_xprintlen_output_result{<precision>}{<value>}{<unit>}</code>
--	--

New: 2015-01-26

This is the function used to print the result. It uses `\SI` from the `siunitx` package and its options to round the *<value>* and to typeset the unit.

```

35 \cs_new:Npn \_xprintlen_output_result #1#2#3
36 {
37   \SI [ round-mode = places, round-precision = #1 ]
38     {#2} {#3}
39 }

```

`\printlen` This is the user command. The first two arguments are optional and their default are respectively `\l__xprintlen_precision_tl` and `\l__xprintlen_unit_tl`.

```

40 \NewDocumentCommand {\printlen}
41 { 0{ \l__xprintlen_precision_tl } 0{ \l__xprintlen_unit_tl } m}
42 {
43   \_xprintlen_output_result {#1}
44   {
45     \_xprintlen_convert_dim {#3} {#2}
46   }
47   {#2}
48 }

```

(End definition for `\printlen`. This function is documented on page 2.)

```

49 \endstyle
50 \endinput

```