Abstract

There are macro and environment arguments that expect numbers that will internally be multiplied with \unitlength. This package extends the syntax of these arguments that dimens with calculation support can be added for these arguments.

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∗Please report any issues at https://github.com/ho-tex/oberdiek/issues
1 User interface

1.1 Introduction

The environment `picture` and macros such as `\put`, `\line`, `\vector` and other macros have arguments that expect numbers that are used as factor for `\unitlength`. This package redefines such macros and adds code that detects whether such an argument is given as number or as length. In the latter case, the length is used directly without multiplying with `\unitlength`.

1.2 Options

Depending on the available features, also length expressions can be given. Option `calc` loads package `calc`. Then expressions of this package may be used. Otherwise `etex` wraps the length argument inside `\dimexpr`...`\relax`, if `ɛ-TEx` is available. Otherwise option `plain` uses plain assignments without calculation support.

The default is `calc` if package `calc` is loaded before package `picture`. If you specify option `calc` the loading of `calc` is ensured. Otherwise package `picture` looks whether `\dimexpr` is available and uses then option `etex` as default. If `ɛ-TEx` also could not be found, then `plain` is used.

1.3 Example

```latex
\documentclass{article}
\usepackage[calc]{picture}
\begin{document}
\setlength{\unitlength}{1pt}
\begin{picture}(%width of Hello World, 10mm)
  \put(0, 0){\makebox(0,0)[lb]{Hello World}}%
  \put(0, \heightof{Hello World} + \fboxsep){% \line(1, 0){\widthof{Hello World}}%}
  \put(\widthof{Hello World}, 10mm){% \line(0, -1){10mm}%}
\end{picture}
\end{document}
```

1.4 Supported packages

Packages `pspicture` and `pic2e` are supported, but they must be loaded before package `picture`.

New macros can be supported by `\picture@redefine`. The first argument is the macro which contains the arguments in its parameter text that you want to support by package `picture`. The second argument contains the parameter text. Change `#` to `&` for the arguments in question. Examples (already used by package `picture`):

```
\picture@redefine\put{(\&1,\&2)}
\picture@redefine\line{((\#1,\#2)\&3}
```
2 Implementation

2.1 Identification

\NeedsTeXFormat{LaTeX2e}
\ProvidesPackage{picture}[]{2016/05/16 v1.4 Dimens for picture macros (HO)]

2.2 Options

\def\Pc@calcname{calc}
\def\Pc@etexname{etex}
\def\Pc@plainname{plain}

\Pc@method
Macro \Pc@method stores the method to use for calculations. Check which features are available and set the default for \Pc@method.

\if@ifpackageloaded{calc}{%
  \let\Pc@method\Pc@calcname
}{{%
  \begingroup\expandafter\expandafter\expandafter\endgroup
  \expandafter\ifx\csname dimexpr\endcsname\relax
    \let\Pc@method\Pc@plainname
  \else
    \let\Pc@method\Pc@etexname
  \fi
}{%}
\DeclareOption{plain}{%
  \let\Pc@method\Pc@plainname
}{{%
  \DeclareOption{etex}{%
    \begingroup\expandafter\expandafter\expandafter\endgroup
    \expandafter\ifx\csname dimexpr\endcsname\relax
      \PackageError{picture}{e-\TeX is not available}{}\@ehc
    \else
      \let\Pc@method\Pc@etexname
    \fi
  }{%}
  \DeclareOption{calc}{%
    \let\Pc@method\Pc@calcname
  }{{%
  \ProcessOptions*
  \begingroup
  \let\on@line\@empty
  \PackageInfo{picture}{Calculation method: \Pc@method}%
  \endgroup
}}

2.3 Calculation method

\if\Pc@method\Pc@calcname
\RequirePackage{calc}%
\fi

2.3.1 Method calc

\if\Pc@method\Pc@calcname
\def\Pc@tokslength#1{%
  \begingroup
    \let\calc@error\Pc@calc@error
  \endgroup
  \setlength\dimen@{#1\unitlength}\Pc@next\Pc@nil{#1}\%
  \let\PcOrg@calc@error\calc@error
}\fi
\@ifpackagelater{calc}{2007/08/22}{\% v4.3
\def\Pc@calc@error#1{\%\relax
  \def\calc@next##1!{\%\relax
    \expandafter\ifx\expandafter\unitlength\noexpand#1\relax
      \def\calc@next##1!{\%\relax
        \aftergroup\afterassignment\Pc@next\%\relax
      }{\%\relax
        \PcOrg@calc@error{#1}{\%\relax
      }{\%\relax
        \def\Pc@calc@error#1{\%\relax
  \expandafter\ifx\expandafter\unitlength\noexpand#1\relax
    \def\calc@next##1!{\%\relax
      \expandafter\@gobble\else\expandafter\@firstofone\fi\relax
      {\%\relax
        \PcOrg@calc@error{#1}{\%\relax
      }{\%\relax
      }{\%\relax

  \def\Pc@method\etexname\relax
  \def\Pc@tokslength#1{\%\relax
    \begingroup\afterassignment\Pc@next\%\relax
    \dimen@=#1\unitlength\Pc@nil{#1}{\%\relax
  }{\%\relax
  }{\%\relax
\def\Pc@method\etexname\relax
  \def\Pc@tokslength#1{\%\relax
    \begingroup\afterassignment\Pc@next\%\relax
    \dimen@=#1\unitlength\Pc@nil{#1}{\%\relax
      \PcOrg@calc@error{#1}{\%\relax
      }{\%\relax
      }{\%\relax

  \def\Pc@next#1\Pc@nil#2{\%\relax
  \ifx\#1\%
    \endgroup\Pc@addtoks{{#2}}\%\relax
  \else\expandafter\endgroup\relax

2.3.2 Method etex

\if\Pc@method\etexname\relax
  \def\Pc@tokslength#1{\%\relax
    \begingroup\afterassignment\Pc@next\%\relax
    \dimen@=#1\unitlength\Pc@nil{#1}{\%\relax
  }{\%\relax
  }{\%\relax

2.3.3 Method plain

\if\Pc@method\plannename\relax
  \def\Pc@tokslength#1{\%\relax
    \begingroup\afterassignment\Pc@next\%\relax
    \dimen@=#1\unitlength\Pc@nil{#1}{\%\relax
  }{\%\relax
  }{\%\relax

2.3.4 Help macros

\def\Pc@next#1\Pc@nil#2{\%\relax
  \ifx\#1\%
    \endgroup\Pc@addtoks{{#2}}\%\relax
  \else\expandafter\endgroup\relax
  \expandafter\\endgroup
}
\texttt{\textbackslash Pc\addtoks} must not have the meaning of \texttt{relax} because of \texttt{dimexpr}.

\texttt{\textbackslash Pc\nil} \texttt{\textbackslash Pc\nil} must not have the meaning of \texttt{relax} because of \texttt{dimexpr}.

\texttt{\def\Pc\addtoks\texttt{#1}{}}
\texttt{\toks@=\texttt{\expandafter{\texttt{#1}}}}

\texttt{\def\Pc\init\texttt{#1}{}}
\texttt{\begingroup}
\texttt{\toks@={#1}}
\texttt{\endgroup}

\texttt{\def\Pc\finish\texttt{#1}{}}
\texttt{\expandafter\endgroup}
\texttt{\expandafter\texttt{#1\the\toks@}}

\textbf{2.4 Redefinitions}

\texttt{\def\picture@redefine\texttt{#1}{}}
\texttt{\toks@0={#1}}

\texttt{\def\picture@redefine\texttt{#1}{}}
\texttt{\begingroup}
\texttt{\edef\reserved@a{}}
\texttt{\noexpand\noexpand}
\texttt{\expandafter\noexpand}
\texttt{\csname PcOrg@\expandafter\@gobble\string#1\endcsname}}
\texttt{\toks@={#1}}

\texttt{\def\Pc@first\texttt{#1}{}}
\texttt{\toks1={#1}}
\texttt{\toks2={\Pc@init{#1}}}

\texttt{\def\Pc@scanlength\texttt{#1}{}}
\texttt{\ifcase#1}
\texttt{\expandafter\Pc@last}
\texttt{\else}
\texttt{\toks1=\expandafter{\the\toks1 ###1}}
\texttt{\toks2=\expandafter{\Pc@tokslength{###1}}}
\ifx\#1\%
\else
\toks1=\expandafter{\the\toks1 #1}\%
\toks2=\expandafter{\the\toks2 \Pc@addtoks{#1}}\%
\fi
\Pc@scanlength

\Pc@last
\def\Pc@last{\
\edef\x{\endgroup
\let\reserved@a\the\toks0 \%
\def\the\toks0 \the\toks1 {\
\the\toks2 \%
\noexpand\Pc@finish\reserved@a
}}\
\x}

2.4.1 \TeX\ base macros
\picture@redefine\@picture{(\&1,\&2)(&3,\&4)}
\picture@redefine\put{(\&1,\&2)}
\picture@redefine\multiput{(\&1,\&2)}
\picture@redefine\@multiput{(\&1,\&2)}
\picture@redefine\line{(#1,#2)&3}
\picture@redefine\vector{(#1,#2)&3}
\picture@redefine\dashbox{&1(&2,&3)}
\picture@redefine\@circle{&1}
\picture@redefine\@dot{&1}
\picture@redefine\@bezier{#1(&2,&3)(&4,&5)(&6,&7)}
\picture@redefine\imakepicbox{(\&1,\&2)}

2.4.2 Package \pspicture
Package \pspicture changes the signature of \@oval by adding an optional argument.
\@ifpackageloaded{pspicture}{\
\picture@redefine\@oval{[\&1]\&2,\&3,\&4)}
\picture@redefine\Line{\(\&1,\&2)}
\picture@redefine\Curve{\(\&1,\&2)}
\picture@redefine\Vector{\(\&1,\&2)}
\picture@redefine\@bezier{\(\&1,\&2,\&3)(\&4,\&5)(\&6,\&7)}
\picture@redefine\imakepicbox{\&1,\&2)}
\}

2.5 Check package loading order
\PC@checkpackage
\def\PC@checkpackage#1{\
\@ifpackageloaded{#1}{\%
\AtBeginDocument{\%
\@ifpackageloaded{#1}{\%
\PackageWarningNoLine{picture}{Package `#1' is loaded after `picture'.\MessageBreak
Load package `picture' afterwards to get full support\%
\MessageBreak
of its additional syntax with length specifications}\%
\}%
}}\%
}%
\%
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3 Installation

3.1 Download

Package. This package is available on CTAN¹:


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 TEX Files” (CTAN:tds/tds.pdf). Directories with texmf in their name are usually organized this way.

3.2 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

Script installation. Check the directory TDS:scripts/oberdiek/ for scripts that need further installation steps. Package attachfile2 comes with the Perl script pdfatfi.pl that should be installed in such a way that it can be called as pdfatfi. Example (linux):

chmod +x scripts/oberdiek/pdfatfi.pl

cp scripts/oberdiek/pdfatfi.pl /usr/local/bin/

3.3 Package installation

Unpacking. The .dtx file is a self-extracting docstrip archive. The files are extracted by running the .dtx through plain TEX:

tex picture.dtx

TDS. Now the different files must be moved into the different directories in your installation TDS tree (also known as texmf tree):

picture.sty → tex/latex/oberdiek/picture.sty
picture.pdf → doc/latex/oberdiek/picture.pdf
picture-example.tex → doc/latex/oberdiek/picture-example.tex
picture.dtx → source/latex/oberdiek/picture.dtx

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.

¹http://ctan.org/pkg/picture
3.4 Refresh file name databases

If your \TeX{} distribution (\TeX, \mikTex, \ldots) relies on file name databases, you must refresh these. For example, \TeX users run \texttt{texhash} or \texttt{mktexlsr}.

3.5 Some details for the interested

Unpacking with \LaTeX.

The \texttt{.dtx} chooses its action depending on the format:

plain \TeX: Run \texttt{docstrip} and extract the files.

\LaTeX: Generate the documentation.

If you insist on using \LaTeX for \texttt{docstrip} (really, \texttt{docstrip} does not need \LaTeX), then inform the autodetect routine about your intention:

\begin{verbatim}
latex \let\install=y\input{picture.dtx}
\end{verbatim}

Do not forget to quote the argument according to the demands of your shell.

Generating the documentation.

You can use both the \texttt{.dtx} or the \texttt{.drv} to generate the documentation. The process can be configured by the configuration file \texttt{ltxdoc.cfg}. For instance, put this line into this file, if you want to have A4 as paper format:

\begin{verbatim}
\PassOptionsToClass{a4paper}{article}
\end{verbatim}

An example follows how to generate the documentation with \texttt{pdf\LaTeX}:

\begin{verbatim}
pdflatex picture.dtx
makeindex -s gind.ist picture.idx
pdflatex picture.dtx
makeindex -s gind.ist picture.idx
pdflatex picture.dtx
\end{verbatim}

4 Catalogue

The following XML file can be used as source for the \TeX Catalogue. The elements \texttt{caption} and \texttt{description} are imported from the original XML file from the Catalogue. The name of the XML file in the Catalogue is \texttt{picture.xml}.

\begin{verbatim}
<?xml version='1.0' encoding='us-ascii'?>
<!DOCTYPE entry SYSTEM 'catalogue.dtd'>
<entry datestamp='$Date$' modifier='$Author$' id='picture'>
<name>picture</name>
<caption>Dimens for picture macros.</caption>
<authorref id='auth:oberdiek'/>
<copyright owner='Heiko Oberdiek' year='2006-2009'/>
<license type='lppl1.3'/>
<version number='1.4'/>
<description>
There are macro and environment arguments that expect numbers that will internally be multiplied by \texttt{\unitlength}. This package extends the syntax of these arguments, so that dimensions with calculation support may be used for these arguments.

The package is part of the \texttt{\xref{oberdiek}} bundle.
</description>
<documentation details='Package documentation'
href='ctan:/macros/latex/contrib/oberdiek/picture.pdf'/>
<ctan file='true' path='/macros/latex/contrib/oberdiek/picture.dtx'/>
<miktex location='oberdiek'/>
\end{verbatim}
5 History

[2006/08/26 v1.0]
- First released version. (First start of the project was June/July 2002.)

[2007/04/11 v1.1]
- Line ends sanitized.

[2008/11/26 v1.2]
- Package pict2e added to documentation section “Supported packages”.
- Package order of supported packages is checked.

[2009/10/11 v1.3]
- Fix because of new version v4.3 of package calc.

[2016/05/16 v1.4]
- Documentation updates.

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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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