

# The listingsutf8 package

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2016/05/16 v1.3

## Abstract

Package `listings` does not support files with multi-byte encodings such as UTF-8. In case of `\lstinputlisting` a simple workaround is possible if an one-byte encoding exists that the file can be converted to. Also  $\varepsilon$ -TeX and pdfTeX regardless of its mode are required.

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\*Please report any issues at <https://github.com/ho-tex/oberdiek/issues>

# 1 Documentation

## 1.1 User interface

Load this package after or instead of package listings [2]. The package does not define own options and passes given options to package listings.

The syntax of package listings' key `inputencoding` is extended:

`inputencoding=utf8/⟨one-byte-encoding⟩`

Example: `inputencoding=utf8/latin1`

That means the file is encoded in UTF-8 and can be converted to the given `⟨one-byte-encoding⟩`. The available encodings for `⟨one-byte-encoding⟩` are listed in section “1.2 Supported encodings” of package `stringenc`'s documentation [3]. Of course, the encoding must encode its characters with one byte exactly. This excludes the unicode encodings (`utf8`, `utf16`, ...).

Only `\lstinputlisting` is supported by the syntax extension of key `inputencoding`.

Internally package `listingsutf8` reads the file as binary file via primitives of pdfTeX (`\pdffiledump`). Then the file contents is converted as string using package `stringenc` and finally the string is read as virtual file by  $\varepsilon$ -TeX's `\scantokens`.

## 1.2 Future

Workarounds are not provided for

- `\lstinline`
- Environment `lstlisting`.
- Environments defined by `\lstnewenvironment`.

Perhaps someone will find time to extend package listings with full native support for UTF-8. Then this package would become obsolete.

# 2 Implementation

1 `⟨*package⟩`

## 2.1 Catcodes and identification

```
2 \begingroup\catcode61\catcode48\catcode32=10\relax%
3 \catcode13=5 % ^^M
4 \endlinechar=13 %
5 \catcode123=1 % {
6 \catcode125=2 % }
7 \catcode64=11 % @
8 \def\x{\endgroup
9 \expandafter\edef\csname lstU@AtEnd\endcsname{%
10 \endlinechar=\the\endlinechar\relax
11 \catcode13=\the\catcode13\relax
12 \catcode32=\the\catcode32\relax
13 \catcode35=\the\catcode35\relax
14 \catcode61=\the\catcode61\relax
15 \catcode64=\the\catcode64\relax
16 \catcode123=\the\catcode123\relax
17 \catcode125=\the\catcode125\relax
18 }%
19 }%
20 \x\catcode61\catcode48\catcode32=10\relax%
21 \catcode13=5 % ^^M
22 \endlinechar=13 %
```

```

23 \catcode35=6 % #
24 \catcode64=11 % @
25 \catcode123=1 % {
26 \catcode125=2 % }
27 \def\TMP@EnsureCode#1#2{%
28   \edef\lstU@AtEnd{%
29     \lstU@AtEnd
30     \catcode#1=\the\catcode#1\relax
31   }%
32   \catcode#1=#2\relax
33 }
34 \TMP@EnsureCode{10}{12}% ^^J
35 \TMP@EnsureCode{33}{12}% !
36 \TMP@EnsureCode{36}{3}% $
37 \TMP@EnsureCode{38}{4}% &
38 \TMP@EnsureCode{39}{12}% '
39 \TMP@EnsureCode{40}{12}% (
40 \TMP@EnsureCode{41}{12}% )
41 \TMP@EnsureCode{42}{12}% *
42 \TMP@EnsureCode{43}{12}% +
43 \TMP@EnsureCode{44}{12}% ,
44 \TMP@EnsureCode{45}{12}% -
45 \TMP@EnsureCode{46}{12}% .
46 \TMP@EnsureCode{47}{12}% /
47 \TMP@EnsureCode{58}{12}% :
48 \TMP@EnsureCode{60}{12}% <
49 \TMP@EnsureCode{62}{12}% >
50 \TMP@EnsureCode{91}{12}% [
51 \TMP@EnsureCode{93}{12}% ]
52 \TMP@EnsureCode{94}{7}% ^ (superscript)
53 \TMP@EnsureCode{95}{8}% _ (subscript)
54 \TMP@EnsureCode{96}{12}% `
55 \TMP@EnsureCode{124}{12}% |
56 \TMP@EnsureCode{126}{13}% ~ (active)
57 \edef\lstU@AtEnd{\lstU@AtEnd\noexpand\endinput}

Package identification.
58 \NeedsTeXFormat{LaTeX2e}
59 \ProvidesPackage{listingsutf8}%
60 [2016/05/16 v1.3 Allow UTF-8 in listings input (HO)]

```

## 2.2 Package options

Just pass options to package listings.

```

61 \DeclareOption*{%
62   \PassOptionsToPackage\CurrentOption{listings}%
63 }
64 \ProcessOptions*

```

Key inputencoding was introduced in version 2002/04/01 v1.0 of package listings.

```

65 \RequirePackage{listings}[2002/04/01]

```

Ensure that \inputencoding is provided.

```

66 \AtBeginDocument{%
67   \@ifundefined{inputencoding}{%
68     \RequirePackage{inputenc}%
69   }{}%
70 }

```

## 2.3 Check prerequisites

```

71 \RequirePackage{pdftexcmds}[2011/04/22]
72 \def\lstU@temp#1#2{%
73   \begingroup\expandafter\expandafter\expandafter\endgroup

```

```

74 \expandafter\ifx\csname #1\endcsname\relax
75 \PackageWarningNoLine{listingsutf8}{%
76   Package loading is aborted because of missing %
77   \@backslashchar#1.\MessageBreak
78   #2%
79 }%
80 \expandafter\lstU@AtEnd
81 \fi
82 }
83 \lstU@temp{scantokens}{It is provided by e-TeX}%
84 \lstU@temp{pdf@unescapehex}{It is provided by pdfTeX >= 1.30}%
85 \lstU@temp{pdf@filedump}{It is provided by pdfTeX >= 1.30}%
86 \lstU@temp{pdf@filesize}{It is provided by pdfTeX >= 1.30}%
87 \RequirePackage{stringenc}[2010/03/01]

```

## 2.4 Add support for UTF-8

\iflstU@utfviii

```
88 \newif\iflstU@utfviii
```

\lstU@inputenc

```

89 \def\lstU@inputenc#1{%
90   \expandafter\lstU@@inputenc#1utf8/utf8/\@nil
91 }

```

\lstU@@inputenc

```

92 \lst@Key{inputencoding}\relax{%
93   \def\lst@inputenc{#1}%
94   \lstU@inputenc{#1}%
95 }

```

### 2.4.1 Conversion

\lstU@input

```

96 \def\lstU@input#1{%
97   \iflstU@utfviii
98     \edef\lstU@text{%
99       \pdf@unescapehex{%
100         \pdf@filedump{0}{\pdf@filesize{#1}}{#1}%
101       }%
102     }%
103     \lstU@CRLFtoLF\lstU@text
104     \StringEncodingConvert\lstU@text\lstU@text{utf8}\lst@inputenc
105     \def\lstU@temp{%
106       \scantokens\expandafter{\lstU@text}%
107     }%
108   \else
109     \def\lstU@temp{%
110       \input{#1}%
111     }%
112   \fi
113   \lstU@temp
114 }

```

### 2.4.2 Convert CR/LF pairs to LF

\lstU@CRLFtoLF

```

115 \begingroup
116 \endlinechar=-1 %
117 \@makeother\^^J %
118 \@makeother\^^M %

```

```

119 \gdef\lstU@CRLFtoLF#1{%
120   \edef#1{%
121     \expandafter\lstU@CRLFtoLF@aux#1^^M^^J\@nil
122   }%
123 }%
124 \gdef\lstU@CRLFtoLF@aux#1^^M^^J#2\@nil{%
125   #1%
126   \ifx\relax#2\relax
127     \@car
128   \fi
129   ^^J%
130   \lstU@CRLFtoLF@aux#2\@nil
131 }%
132 \endgroup %

```

### 2.4.3 Patch \lst@InputListing

```

133 \def\lstU@temp#1\def\lst@next#2#3\@nil{%
134   \def\lst@InputListing##1{%
135     #1%
136     \def\lst@next{\lstU@input{##1}}%
137     #3%
138   }%
139 }
140 \expandafter\lstU@temp\lst@InputListing{#1}\@nil
141 \lstU@AtEnd%
142 \</package>

```

## 3 Test

### 3.1 Catcode checks for loading

```

143 \<test1>
144 \NeedsTeXFormat{LaTeX2e}
145 \documentclass{minimal}
146 \makeatletter
147 \def\RestoreCatcodes{}
148 \count@=0 %
149 \loop
150   \edef\RestoreCatcodes{%
151     \RestoreCatcodes
152     \catcode\the\count@=\the\catcode\count@\relax
153   }%
154 \ifnum\count@<255 %
155   \advance\count@\@ne
156 \repeat
157
158 \def\RangeCatcodeInvalid#1#2{%
159   \count@=#1\relax
160   \loop
161     \catcode\count@=15 %
162   \ifnum\count@<#2\relax
163     \advance\count@\@ne
164   \repeat
165 }
166 \def\Test{%
167   \RangeCatcodeInvalid{0}{47}%
168   \RangeCatcodeInvalid{58}{64}%
169   \RangeCatcodeInvalid{91}{96}%
170   \RangeCatcodeInvalid{123}{127}%
171   \catcode`\@=12 %
172   \catcode`\=0 %

```

```

173 \catcode`\{=1 %
174 \catcode`\}=2 %
175 \catcode`\#=6 %
176 \catcode`\[=12 %
177 \catcode`\]=12 %
178 \catcode`\%=14 %
179 \catcode`\ =10 %
180 \catcode\l3=5 %
181 \RequirePackage{listingsutf8}[2016/05/16]\relax
182 \RestoreCatcodes
183 }
184 \Test
185 \csname @@end\endcsname
186 \end
187 </test1>

```

## 3.2 Test example for latin1

```

188 (*test2)
189 \NeedsTeXFormat{LaTeX2e}
190 \documentclass{minimal}
191 \usepackage{filecontents}
192 \def\do#1{%
193   \ifx#1\^%
194   \else
195     \noexpand\do\noexpand#1%
196   \fi
197 }
198 \expandafter\let\expandafter\dospecials\expandafter\empty
199 \expandafter\edef\expandafter\dospecials\expandafter{\dospecials}
200 \begin{filecontents*}{ExampleUTF8.java}
201 public class ExampleUTF8 {
202     public static String testString =
203         "Umlauts: " +
204         "\u00c3\u0084\u00c3\u0096\u00c3\u009c\u00c3\u00a4\u00c3\u00b6\u00c3\u00bc\u00c3\u009f";
205     public static void main(String[] args) {
206         System.out.println(testString);
207     }
208 }
209 \end{filecontents*}
210 \usepackage{listingsutf8}[2016/05/16]
211 \def\Text{%
212   Umlauts: %
213   \u00c3\u0084\u00c3\u0096\u00c3\u009c\u00c3\u00a4\u00c3\u00b6\u00c3\u00bc\u00c3\u009f%
214 }
215 \begin{document}
216 \lstinputlisting[%
217   language=Java,%
218   inputencoding=utf8/latin1,%
219 ]{ExampleUTF8.java}
220 \end{document}
221 </test2>

```

## 4 Installation

### 4.1 Download

**Package.** This package is available on CTAN<sup>1</sup>:

[CTAN:macros/latex/contrib/oberdiek/listingsutf8.dtx](http://ctan.org/macros/latex/contrib/oberdiek/listingsutf8.dtx) The source file.

[CTAN:macros/latex/contrib/oberdiek/listingsutf8.pdf](http://ctan.org/macros/latex/contrib/oberdiek/listingsutf8.pdf) Documentation.

<sup>1</sup><http://ctan.org/pkg/listingsutf8>

**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 T<sub>E</sub>X Files” ([CTAN:tds/tds.pdf](#)). Directories with `texmf` in their name are usually organized this way.

## 4.2 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/
```

## 4.3 Package installation

**Unpacking.** The `.dtx` file is a self-extracting docstrip archive. The files are extracted by running the `.dtx` through plain T<sub>E</sub>X:

```
tex listingsutf8.dtx
```

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

<code>listingsutf8.sty</code>	→ <code>tex/latex/oberdiek/listingsutf8.sty</code>
<code>listingsutf8.pdf</code>	→ <code>doc/latex/oberdiek/listingsutf8.pdf</code>
<code>test/listingsutf8-test1.tex</code>	→ <code>doc/latex/oberdiek/test/listingsutf8-test1.tex</code>
<code>test/listingsutf8-test2.tex</code>	→ <code>doc/latex/oberdiek/test/listingsutf8-test2.tex</code>
<code>test/listingsutf8-test3.tex</code>	→ <code>doc/latex/oberdiek/test/listingsutf8-test3.tex</code>
<code>test/listingsutf8-test4.tex</code>	→ <code>doc/latex/oberdiek/test/listingsutf8-test4.tex</code>
<code>test/listingsutf8-test5.tex</code>	→ <code>doc/latex/oberdiek/test/listingsutf8-test5.tex</code>
<code>listingsutf8.dtx</code>	→ <code>source/latex/oberdiek/listingsutf8.dtx</code>

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`.

## 4.4 Refresh file name databases

If your T<sub>E</sub>X distribution (teT<sub>E</sub>X, miK<sub>T</sub>E<sub>X</sub>, ...) relies on file name databases, you must refresh these. For example, teT<sub>E</sub>X users run `texhash` or `mktextlsr`.

## 4.5 Some details for the interested

**Unpacking with L<sup>A</sup>T<sub>E</sub>X.** The `.dtx` chooses its action depending on the format:  
**plain T<sub>E</sub>X:** Run `docstrip` and extract the files.

**L<sup>A</sup>T<sub>E</sub>X:** Generate the documentation.

If you insist on using L<sup>A</sup>T<sub>E</sub>X for `docstrip` (really, `docstrip` does not need L<sup>A</sup>T<sub>E</sub>X), then inform the autodetect routine about your intention:

```
latex \let\install=y\input{listingsutf8.dtx}
```

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

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

```
\PassOptionsToClass{a4paper}{article}
```

An example follows how to generate the documentation with pdfL<sup>A</sup>T<sub>E</sub>X:

```
pdflatex listingsutf8.dtx
makeindex -s gind.ist listingsutf8.idx
pdflatex listingsutf8.dtx
makeindex -s gind.ist listingsutf8.idx
pdflatex listingsutf8.dtx
```

## 5 Catalogue

The following XML file can be used as source for the [T<sub>E</sub>X Catalogue](#). The elements `caption` and `description` are imported from the original XML file from the Catalogue. The name of the XML file in the Catalogue is `listingsutf8.xml`.

```
222 (*catalogue)
223 <?xml version='1.0' encoding='us-ascii'?>
224 <!DOCTYPE entry SYSTEM 'catalogue.dtd'>
225 <entry datestamp='$Date$' modifier='$Author$' id='listingsutf8'>
226   <name>listingsutf8</name>
227   <caption>Allow UTF-8 in listings input.</caption>
228   <authorref id='auth:oberdiek'>/>
229   <copyright owner='Heiko Oberdiek' year='2007,2011'>/>
230   <license type='lppl1.3'>/>
231   <version number='1.3'>/>
232   <description>
233     Package <xref refid='listings'>listings</xref> does not support files
234     with multi-byte encodings such as UTF-8. In the case of
235     <tt>\lstinputlisting</tt>, a simple workaround is possible if a
236     one-byte encoding exists that the file can be converted to. The
237     package requires the e-TeX extensions under pdfTeX (in either PDF
238     or DVI output mode).
239   <p/>
240   The package is part of the <xref refid='oberdiek'>oberdiek</xref> bundle.
241 </description>
242 <documentation details='Package documentation'
243   href='ctan:/macros/latex/contrib/oberdiek/listingsutf8.pdf'>/>
244 <ctan file='true' path='/macros/latex/contrib/oberdiek/listingsutf8.dtx'>/>
245 <miktex location='oberdiek'>/>
246 <texlive location='oberdiek'>/>
247 <install path='/macros/latex/contrib/oberdiek/oberdiek.tds.zip'>/>
248 </entry>
249 </catalogue>
```

## 6 References

- [1] Alan Jeffrey, Frank Mittelbach, *inputenc.sty*, 2006/05/05 v1.1b. [CTAN:macros/latex/base/inputenc.dtx](#)
- [2] Carsten Heinz, Brooks Moses: *The listings package*; 2007/02/22; [CTAN:macros/latex/contrib/listings/](#).
- [3] Heiko Oberdiek: *The stringenc package*; 2007/10/22; [CTAN:macros/latex/contrib/oberdiek/stringenc.pdf](#).



## 7 History

[2007/10/22 v1.0]

- First version.

[2007/11/11 v1.1]

- Use of package `pdftexcmds`.

[2011/11/10 v1.2]

- DOS line ends CR/LF normalized to LF to avoid empty lines (Bug report of Thomas Benkert in `de.comp.text.tex`).

[2016/05/16 v1.3]

- Documentation updates.

## 8 Index

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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