

# The listingsutf8 package

Heiko Oberdiek  
<oberdiek@uni-freiburg.de>

2007/11/11 v1.1

## 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.

## Contents

<b>1</b>	<b>Documentation</b>	<b>1</b>
1.1	User interface	1
1.2	Future	2
<b>2</b>	<b>Implementation</b>	<b>2</b>
2.1	Catcodes and identification	2
2.2	Package options	3
2.3	Check prerequisites	3
2.4	Add support for UTF-8	3
2.4.1	Conversion	4
2.4.2	Patch <code>\lst@InputListing</code>	4
<b>3</b>	<b>Test</b>	<b>4</b>
3.1	Catcode checks for loading	4
3.2	Test example for latin1	5
<b>4</b>	<b>Installation</b>	<b>6</b>
4.1	Download	6
4.2	Bundle installation	6
4.3	Package installation	6
4.4	Refresh file name databases	7
4.5	Some details for the interested	7
<b>5</b>	<b>References</b>	<b>7</b>
<b>6</b>	<b>History</b>	<b>7</b>
	[2007/10/22 v1.0]	7
	[2007/11/11 v1.1]	8
<b>7</b>	<b>Index</b>	<b>8</b>

## 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  $\langle one\text{-}byte\text{-}encoding \rangle$ . The available encodings for  $\langle one\text{-}byte\text{-}encoding \rangle$  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
3   \catcode123 1 % {
4   \catcode125 2 % }
5   \def\x{\endgroup
6     \expandafter\edef\csname lstU@AtEnd\endcsname{%
7       \catcode35 \the\catcode35\relax
8       \catcode64 \the\catcode64\relax
9       \catcode123 \the\catcode123\relax
10      \catcode125 \the\catcode125\relax
11    }%
12  }%
13 \x
14 \catcode35 6 % #
15 \catcode64 11 % @
16 \catcode123 1 % {
17 \catcode125 2 % }
18 \def\TMP@EnsureCode#1#2{%
19   \edef\lstU@AtEnd{%
20     \lstU@AtEnd
21     \catcode#1 \the\catcode#1\relax
22   }%
23   \catcode#1 #2\relax
24 }
25 \TMP@EnsureCode{10}{12}% ^^J
26 \TMP@EnsureCode{33}{12}% !
27 \TMP@EnsureCode{36}{3}% $
28 \TMP@EnsureCode{38}{4}% &
29 \TMP@EnsureCode{39}{12}% '
30 \TMP@EnsureCode{40}{12}% (
```

```

31 \TMP@EnsureCode{41}{12}% )
32 \TMP@EnsureCode{42}{12}% *
33 \TMP@EnsureCode{43}{12}% +
34 \TMP@EnsureCode{44}{12}% ,
35 \TMP@EnsureCode{45}{12}% -
36 \TMP@EnsureCode{46}{12}% .
37 \TMP@EnsureCode{47}{12}% /
38 \TMP@EnsureCode{58}{12}% :
39 \TMP@EnsureCode{60}{12}% <
40 \TMP@EnsureCode{61}{12}% =
41 \TMP@EnsureCode{62}{12}% >
42 \TMP@EnsureCode{94}{7}% ^ (superscript)
43 \TMP@EnsureCode{95}{8}% _ (subscript)
44 \TMP@EnsureCode{96}{12}% '
45 \TMP@EnsureCode{124}{12}% |
46 \TMP@EnsureCode{126}{13}% ~ (active)
47 \g@addto@macro\lstU@AtEnd{\endinput}

Package identification.
48 \NeedsTeXFormat{LaTeX2e}
49 \ProvidesPackage{listingsutf8}%
50 [2007/11/11 v1.1 Adding support for UTF-8 to listings (HO)]

```

## 2.2 Package options

Just pass options to package listings.

```

51 \DeclareOption*{%
52   \PassOptionsToPackage\CurrentOption{listings}%
53 }
54 \ProcessOptions*

```

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

```

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

```

Ensure that \inputencoding is provided.

```

56 \AtBeginDocument{%
57   \ifundefined{inputencoding}{%
58     \RequirePackage{inputenc}%
59   }{}%
60 }

```

## 2.3 Check prerequisites

```

61 \RequirePackage{pdftexcmds}[2007/11/11]
62 \def\lstU@temp#1#2{%
63   \begingroup\expandafter\expandafter\expandafter\endgroup
64   \expandafter\ifx\csname #1\endcsname\relax
65     \PackageWarningNoLine{listingsutf8}{%
66       Package loading is aborted because of missing %
67       \@backslashchar#1.\MessageBreak
68       #2%
69     }%
70     \expandafter\lstU@AtEnd
71   \fi
72 }
73 \lstU@temp{scantokens}{It is provided by e-TeX}
74 \lstU@temp{pdf@unescapehex}{It is provided by pdfTeX >= 1.30}
75 \lstU@temp{pdf@filedump}{It is provided by pdfTeX >= 1.30}
76 \lstU@temp{pdf@filesize}{It is provided by pdfTeX >= 1.30}
77 \RequirePackage{stringenc}[2007/10/22]

```

## 2.4 Add support for UTF-8

```
\iflstU@utfviii
```

```

78 \newif\iflstU@utfviii

\lstU@inputenc

79 \def\lstU@inputenc#1{%
80   \expandafter\lstU@@inputenc#1utf8/utf8/\@nil
81 }

```

\lstU@@inputenc

```

82 \lst@Key{inputencoding}\relax{%
83   \def\lst@inputenc{#1}%
84   \lstU@inputenc{#1}%
85 }

```

### 2.4.1 Conversion

\lstU@input

```

86 \def\lstU@input#1{%
87   \iflstU@utfviii
88     \edef\lstU@text{%
89       \pdf@unescapehex{%
90         \pdf@filedump{0}{\pdf@filesize{#1}}{#1}%
91       }%
92     }%
93     \StringEncodingConvert\lstU@text\lstU@text{utf8}\lst@inputenc
94     \def\lstU@temp{%
95       \scantokens\expandafter{\lstU@text}%
96     }%
97   \else
98     \def\lstU@temp{%
99       \input{#1}%
100     }%
101   \fi
102   \lstU@temp
103 }

```

### 2.4.2 Patch \lst@InputListing

```

104 \def\lstU@temp#1\def\lst@next#2#3\@nil{%
105   \def\lst@InputListing##1{%
106     #1%
107     \def\lst@next{\lstU@input{##1}}%
108     #3%
109   }%
110 }
111 \expandafter\lstU@temp\lst@InputListing{#1}\@nil
112 \lstU@AtEnd
113 \</package>

```

## 3 Test

### 3.1 Catcode checks for loading

```

114 \<test1>
115 \NeedsTeXFormat{LaTeX2e}
116 \documentclass{minimal}
117 \makeatletter
118 \def\RestoreCatcodes{}
119 \count@=0 %
120 \loop
121   \edef\RestoreCatcodes{%

```

```

122     \RestoreCatcodes
123     \catcode\the\count@=\the\catcode\count@\relax
124 }%
125 \ifnum\count@<255 %
126     \advance\count@\@ne
127 \repeat
128
129 \def\RangeCatcodeInvalid#1#2{%
130     \count@=#1\relax
131     \loop
132         \catcode\count@=15 %
133     \ifnum\count@<#2\relax
134         \advance\count@\@ne
135     \repeat
136 }
137 \def\Test{%
138     \RangeCatcodeInvalid{0}{47}%
139     \RangeCatcodeInvalid{58}{64}%
140     \RangeCatcodeInvalid{91}{96}%
141     \RangeCatcodeInvalid{123}{127}%
142     \catcode'\@=12 %
143     \catcode'\=0 %
144     \catcode'\{=1 %
145     \catcode'\}=2 %
146     \catcode'\#=6 %
147     \catcode'\[=12 %
148     \catcode'\]=12 %
149     \catcode'\%=14 %
150     \catcode'\ =10 %
151     \catcode13=5 %
152     \RequirePackage{listingsutf8}[2007/11/11]\relax
153     \RestoreCatcodes
154 }
155 \Test
156 \csname @@end\endcsname
157 \end
158 </test1>

```

### 3.2 Test example for latin1

```

159 <*test2>
160 \NeedsTeXFormat{LaTeX2e}
161 \documentclass{minimal}
162 \usepackage{filecontents}
163 \def\do#1{%
164     \ifx#1\^%
165     \else
166         \noexpand\do\noexpand#1%
167     \fi
168 }
169 \expandafter\let\expandafter\dospecials\expandafter\empty
170 \expandafter\edef\expandafter\dospecials\expandafter{\dospecials}
171 \begin{filecontents*}{ExampleUTF8.java}
172 public class ExampleUTF8 {
173     public static String testString =
174         "Umlauts: " +
175         "^^c3^^84^^c3^^96^^c3^^9c^^c3^^a4^^c3^^b6^^c3^^bc^^c3^^9f";
176     public static void main(String[] args) {
177         System.out.println(testString);
178     }
179 }
180 \end{filecontents*}
181 \usepackage{listingsutf8}[2007/11/11]

```

```

182 \def\Text{%
183   Umlauts: %
184   ^^c3^^84^^c3^^96^^c3^^9c^^c3^^a4^^c3^^b6^^c3^^bc^^c3^^9f%
185 }
186 \begin{document}
187 \lstinputlisting[%
188   language=Java,%
189   inputencoding=utf8/latin1,%
190 ]{ExampleUTF8.java}
191 \end{document}
192 </test2>

```

## 4 Installation

### 4.1 Download

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

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

[CTAN:macros/latex/contrib/oberdiek/listingsutf8.pdf](#) Documentation.

**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):

```

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

```

<sup>1</sup><http://ftp.ctan.org/tex-archive/>

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  $\text{\TeX}$  distribution (`te\TeX`, `mik\TeX`, ...) relies on file name databases, you must refresh these. For example, `te\TeX` users run `texhash` or `mktextlsr`.

## 4.5 Some details for the interested

**Attached source.** The PDF documentation on CTAN also includes the `.dtx` source file. It can be extracted by AcrobatReader 6 or higher. Another option is `pdftk`, e.g. unpack the file into the current directory:

```
pdftk listingsutf8.pdf unpack_files output .
```

**Unpacking with  $\text{\LaTeX}$ .** The `.dtx` chooses its action depending on the format:

**plain- $\text{\TeX}$ :** Run `docstrip` and extract the files.

**$\text{\LaTeX}$ :** Generate the documentation.

If you insist on using  $\text{\LaTeX}$  for `docstrip` (really, `docstrip` does not need  $\text{\LaTeX}$ ), 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 `pdf\LaTeX`:

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

## 5 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](#).

## 6 History

[2007/10/22 v1.0]

- First version.

- Use of package pdf texcmds.

## 7 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; numbers in roman refer to the code lines where the entry is used.

Symbols		L	
<code>\#</code>	146	<code>\loop</code>	120, 131
<code>\%</code>	149	<code>\lst@inputenc</code>	83, 93
<code>\@</code>	142	<code>\lst@InputListing</code>	105, 111
<code>\@backslashchar</code>	67	<code>\lst@Key</code>	82
<code>\@ifundefined</code>	57	<code>\lst@next</code>	104, 107
<code>\@ne</code>	126, 134	<code>\lstinputlisting</code>	187
<code>\@nil</code>	80, 104, 111	<code>\lstU@inputenc</code>	80, <u>82</u>
<code>\[</code>	147	<code>\lstU@AtEnd</code>	19, 20, 47, 70, 112
<code>\]</code>	143	<code>\lstU@input</code>	<u>86</u> , 107
<code>\{</code>	144	<code>\lstU@inputenc</code>	<u>79</u> , 84
<code>\}</code>	145	<code>\lstU@temp</code>	62,
<code>\]</code>	148		73, 74, 75, 76, 94, 98, 102, 104, 111
<code>\^</code>	164	<code>\lstU@text</code>	88, 93, 95
A		M	
<code>\_</code>	150	<code>\makeatletter</code>	117
		<code>\MessageBreak</code>	67
B		N	
<code>\advance</code>	126, 134	<code>\NeedsTeXFormat</code>	48, 115, 160
<code>\AtBeginDocument</code>	56	<code>\newif</code>	78
C		P	
<code>\catcode</code>	3,	<code>\PackageWarningNoLine</code>	65
	4, 7, 8, 9, 10, 14, 15, 16, 17,	<code>\PassOptionsToPackage</code>	52
	21, 23, 123, 132, 142, 143, 144,	<code>\pdf@filedump</code>	90
	145, 146, 147, 148, 149, 150, 151	<code>\pdf@filesize</code>	90
<code>\count@</code>	119,	<code>\pdf@unescapehex</code>	89
	123, 125, 126, 130, 132, 133, 134	<code>\ProcessOptions</code>	54
<code>\csname</code>	6, 64, 156	<code>\ProvidesPackage</code>	49
<code>\CurrentOption</code>	52	R	
D		<code>\RangeCatcodeInvalid</code>	
<code>\DeclareOption</code>	51		129, 138, 139, 140, 141
<code>\do</code>	163, 166	<code>\repeat</code>	127, 135
<code>\documentclass</code>	116, 161	<code>\RequirePackage</code>	55, 58, 61, 77, 152
<code>\dospecials</code>	169, 170	<code>\RestoreCatcodes</code>	118, 121, 122, 153
E		S	
<code>\empty</code>	169	<code>\scantokens</code>	95
<code>\end</code>	157, 180, 191	<code>\StringEncodingConvert</code>	93
<code>\endcsname</code>	6, 64, 156	T	
<code>\endinput</code>	47	<code>\Test</code>	137, 155
G		<code>\Text</code>	182
<code>\g@addto@macro</code>	47	<code>\the</code>	7, 8, 9, 10, 21, 123
I		<code>\TMP@EnsureCode</code>	18, 25, 26, 27,
<code>\iflstU@utfviii</code>	<u>78</u> , 87		28, 29, 30, 31, 32, 33, 34, 35, 36,
<code>\ifnum</code>	125, 133		37, 38, 39, 40, 41, 42, 43, 44, 45, 46
<code>\ifx</code>	64, 164	U	
<code>\input</code>	99	<code>\usepackage</code>	162, 181
		X	
		<code>\x</code>	5, 13