Bar Codes

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Abstract

The package contains macros for printing various 2/5 bar codes and Code 39 bar codes. The macros do not use fonts but create the bar codes directly by vrules. It is therefore possible to vary width to height ratio, ration of thin and thick bars. The package is therefore convenient for printing ITF bar codes as well as bar codes for identification labels for HP storage media.

Contents

1 Introduction

The development of the package started due to practical need. Bar code labels for HP storage media are quite expensive. However, the bar codes may easily be produced by TeX. The documentation clearly specifies that the bar code is of the Code39 type [1, 2]. It may seem that the task is easy.

The common denominator of the 2/5 codes and Code39 is that they are formed of thin and thick bars. The ratio of thin and thick bars may vary as well as the width-to-height ratio. It may therefore be impossible to use bar code fonts for a particular application. On the other hand a bar code may simply be created by rules. This approach was inspired by the `ean13.tex` file developed by Petr Olšák [3].

Since the HP documentation does not specify dimensions, it was clear that some experimentation will be necessary. The macro should thus be general with dimensions controlled by parameters. It is not much work to make the macro really general with bar codes defined in tables. The same macro can thus produce several types of barcodes. Moreover, the 2/5 bar codes are simpler and serve therefore better to debugging and testing the macro during development.

The structure of the package allows for implementation of other types of the bar codes. Some of them will be implemented in the next version.

The bar codes may contain a checksum digit. The macro in this package is able neither to generate them nor to check them. It is up to the user to specify the full code.

2   Usage

The package is loaded simply by:

    \usepackage[⟨options⟩]{makebarcode}

The bar code may then be printed by command

    \barcode[⟨options⟩]{⟨code⟩}

Options that ar not given in the \barcode command are taken form those specified for the whole package or the default values are used. Typically you will specify the most frequently options in the \usepackage command. Notice that the options in the square brackets of both commands are optional. In the extreme case you may wish to print the bar codes of type Code39, module width 0.5 mm, ratio of thin and thick bars 2.25 and height 1 cm. You therefore load the package using

    \usepackage[code=Code39,X=.5mm,ratio=2.25,H=1cm]{makebarcode}

and produce the bar codes simply by

    \barcode{MAKEBARCODE.STY}
    \barcode{ZDENEK WAGNER}

These commands will produce the following bar codes:
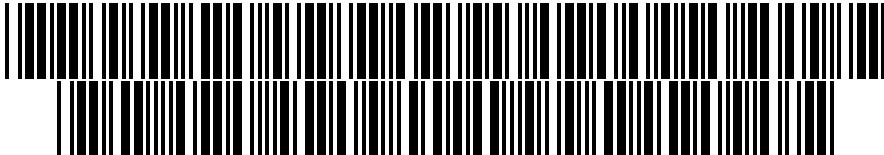
3   General Options

The general options are available both for the \usepackage command and for the \barcode macro. They cannot be used with high-level macros \ITFbarcode and \HPlabel.

Almost all options have default values and may also be used without specification of a value. This will reset the option to the default value. It may be useful if you wish to reset the default in the \barcode macro.

The HELP option can only be used with the \usepackage command. It prints the list   HELP of the supported bar codes to the log file.

Some applications require correction of the bar and blank width. The BCORR option   BCORR defines dimension that is subtracted from each bar and added to each blank. The default value is 0 mm.

4 Low-Level Options

The CODE option select the type of the bar code. The list of valid values will be given in CODE
later sections. This is the only option that has no default value.

Option X specifies the module width, i. e. the width of a thin line. Its default value is X
the smallest allowed width 0.19 mm.

The H option is the width of the bar code. The default value is calculated dynamically H
as 40 times the module width.

The RATIO option defines the ratio of thin and thick bars. The default value is 3. RATIO
Remember that some applications require a particular value.

The K option specifies the width of a bar used in the start/stop characters of the 2/5 K
Matrix bar code as a multiple of the width of the thick bar. It must hold $1.5 \leq K \leq 4$. The
default value is 2.

The characters in most bar codes start and end with a bar so that they must be MtoXratio
separated with w blank space. The width of the space must be wide at least as the module
width but may be larger. The width of such a space is defined as a ration to the module
width by the MtoXratio option. Its default value is 1. It will rarely be changed.

5 Family of 2/5 Bar Codes

The package implements the whole family of 2/5 bar codes. Their list is given in table 1.
Remember that the 2/5 Interleaved bar code requires even number of digits. If odd number
of digits is given, zero is prepended.

Table 1: Samples of 2/5 barcodes, encoded sequence is 0123456789, module width 0,19 mm,
ratio 3, height 3 mm

Code name	Bar code
2/5-Industrial	
2/5-Inverted	
2/5-IATA	
2/5-Matrix	
2/5-Datalogic	
2/5-Interleaved	

6 Code39

The package currently supports only the basic version of the Code39 bar code. The sample
is given in section 2. The full ASCII bar code will be implemented in a later version of the
package.

7 Labels for HP Storage Media

The labels for HP storage media are produced by the \HPlabel command. Its parametr is \HPlabel
the requested code. The code must contain exactly 8 characters. The syntax is fixed but
not verified by the macro. It is only checked whether the number of charactes is correct. It

is required that the ROTATING package is loaded manually. Options described in section 4 cannot be used as an optional argument and are ignored if given in the \usepackage command because all dimensions are fixed.

The author of the package gives no warranty that the code produced by this macro will be usable. HP requires high printing quality saying that laser printers are not good enough for such purpose. However, bars on the labels bought from HP were grey, not black. As already written the dimensions are not given in the documentation. The dimensions used here were determined by careful measuring a bought label. A label printed on an HP laser printer with resolution 600 dpi was tested on a real hardware and it worked.

An example of such a bar code is given in figure 1. The frame is not a part of the \HPlabel macro output but is displayed here in order to show the real size of the label.

![barcode label with text "This edge of the label toward hub of tape"]

Figure 1: Example of a label for an HP cleaning casette, code CLNU01L1

8   ITF-6, ITF-14, And ITF-16 Bar Codes

The ITF bar codes are basically 2/5 Interleaved codes with 6, 14 or 16 digits. The last \ITFbarcode digit is a checksum calculated by the same algorithm as for EAN13 bar codes. The macro verifies the number of digits supplied, not the checksum. The bar code must be printed in a frame. Sometimes only horizontal lines are sufficient. Human readable information is printed below the bar code. The author has seen several types of formatting the human readable information on real bar codes. The one that seemed most reasonable was therefore chosen.

The bar code is always composed in a \vbox. It might be necessary to use \leavevmode in front of the \ITFbarcode macro.

Dimensions of the ITF bar codes are fixed. Options defines in section 4 are thus ignored, only the BCORR option is allowed. Properties of the ITF bar codes are selected by a special set of options that can be given either as an optional argument to the \ITFbarcode macro or in the \usepackage command.

The FRAME option is boolean, i.e. allowed values are *true* and *false*. The default value   FRAME is *true*. It requires prining the bar code inside a frame. An example is shown in figure 2.

![ITF-14 barcode with digits 1 5 4 1 2 3 4 5 6 7 8 9 0 8]
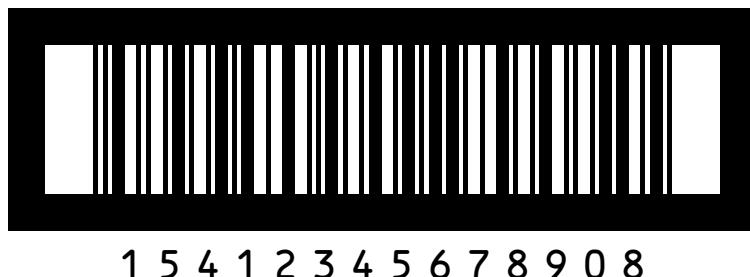
Figure 2: ITF-14 bar code with a frame

The LINES option is complementary to the FRAME options. Its default value is therefore   LINES *false*. It requires printing the bar code within lines as shown in figure 3.
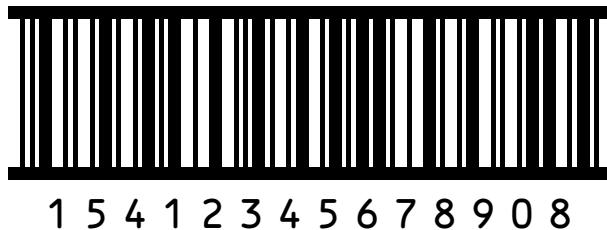
Figure 3: ITF-14 bar code with lines

Size of the ITF bar code can be selected from the list of predefined options. The names of these options are derived from the values of the scaling factors. By choosing the size options the low-level options X and H are set to proper values. Option RATIO is always 2.5 and MTOXRATIO is 1. Option CODE is 2/5-Interleaved. The framed form requires a blank area in front of and after the bar code (inside the frame). All dimensions are given in table 2. If no size option is given, S1 is the default. Human readable information is always typeset with the OCR-B font at 12 pt.

S.6
S.7
S.8
S.9
S1
S1.1
S1.2

Table 2: Dimensions of the ITF bar codes (in milimeters)

Option	Scale	Module	Blank area	Height
S1.2	1.2	1.219	13.1	38.2
S1.1	1.1	1.118	12.0	35.0
S1	1.0	1.016	10.9	31.8
S.9	0.9	0.914	9.8	28.7
S.8	0.8	0.813	8.7	25.4
S.7	0.7	0.711	7.1	22.3
S.6	0.625	0.635	6.4	19.8

9 License

The package can be used and distributed according to the LaTeX Project Public License version 1.3 or later the text of which can be found at the `License.txt` file in the `doc` directory or at `http://www.latex-project.org/lppl.txt`

10 References

1. Storage Media from HP. `http://www.hp.com/go/storagemedia`

2. HP Bar Code Label Packs. `http://h18006.www1.hp.com/storage/tapestorage/storagemedia/bar_code_label.html`

3. Petr Olšák: The EAN barcodes by TeX. TUGboat 15 (December 1994), No. 4, pp. 459–464. `http://www.tug.org/TUGBoat/Articles/tb15-4/tb45olsa.pdf`

4. Adriana Benadiková, Stefan Mada and Stanislav Weinlich: *Čárové kódy, automatická identifikace (Barcodes, the Automatic Identification)*. Grada 1994, 272 pp., ISBN 80-85623-66-8.