

**Using the BarDIMM / BarSIMM[®]
JetCAPS[®] Barcodes Printing System**

BarDIMM / BarSIMM[®] V1.9E



**Installation and
Programmer's Guide**

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JetCAPS Europe S.A.

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F-92514 BOULOGNE Cedex

FRANCE

WEB: <http://www.barsimm.com>

Tel: +33 (0) 1-46-94-80-10

Fax: +33 (0) 1-46-94-00-83

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Table of contents

INTRODUCTION	7
BAR CODE READABILITY	8
WHEN PRINTING WITH A NEW TONER CARTRIDGE.....	8
PRINT DENSITY SETTINGS	8
INSTALLING THE SIMM/DIMM BOARD	9
PROTECTING THE SIMM/DIMM BOARD	9
TESTING THE BARSIMM	10
PRESENTATION	11
HOW BARSIMM WORKS	12
SINCE BARSIMM 1.8E: MODIFIED BARCODE ID FOR CODE 128C	14
FREESCAPE FEATURE	14
OCR-A AND OCR-B FONTS	15
HOW TO USE BARSIMM	15
FONT-LIKE PARAMETERS DESCRIPTION	16
P PARAMETER ESC(S#P).....	17
H PARAMETER ESC(S#H).....	17
V PARAMETER ESC(S#V).....	18
B PARAMETER ESC(S#1,#2,#3,#4B)	18
S PARAMETER ESC(S#1,#2,#3,#4s).....	18
CODE 128 CONTROL CODES	19
MS-WINDOWS SUPPORT	19
SAP R/3 SUPPORT	20
PCL ESCAPE SEQUENCES EXAMPLES	21
DEFAULT PARAMETERS	22
BAR CODE FORMATS CHARACTERISTICS : SIZE	23

ERROR MESSAGES FOR BAR CODES	24
BAR CODE FORMATS CHARACTERISTICS: USAGE AND FORMAT	26
UPC-A.....	26
UPC-E.....	26
EAN-8.....	26
EAN-13.....	27
CODE 39.....	27
DANISH POSTAL 39 BAR CODE (DENMARK ONLY):	27
FRENCH POSTAL 39 BAR CODE (FRANCE ONLY):	27
EXTENDED 39.....	27
INTERLEAVED 2 OF 5 (ALSO NAMED 25 INTERLEAVED)	27
INDUSTRIAL AND MATRIX 2 OF 5	28
CODE 128.....	28
EAN-128 AND UCC-128.....	28
GERMAN 25 POSTAL BARCODE (GERMANY ONLY).....	28
CODABAR/MONARCH	28
CODE 93.....	28
EXTENDED CODE 93.....	28
MSI PLESSEY.....	28
ZIP+4 POSTNET (USA ONLY).....	29
USPS TRAY BARCODE (USA ONLY).....	29
USPS 'ZEBRA' BARCODE (USA ONLY).....	29
USPS SACK BARCODE (USA ONLY).....	29
SINGAPORE 4 STATE BARCODE	29
AUSTRALIA POST 4 STATE BARCODES.....	29
EURO CURRENCY SYMBOL AND ADDITIONAL FONTS.....	31
EURO AND OTHER CURRENCY SYMBOLS	31
MANUFACTURING AND SAFETY SYMBOLS	31
ELECTRONICS AND SAFETY SYMBOLS.....	32
TROUBLESHOOTING.....	32
FOR MORE INFORMATION	33

Introduction

Bar codes technology provides an easy, inexpensive and highly accurate means of data entry and storage for computerized information management systems.

Item identification information (e.g., inventory control, work-in-process tracking, distribution tracking, and other materiel management) is the most common type of data stored in bar code systems.

The BarSIMM/BarDIMM board is an intelligent SIMM/DIMM module adding sophisticated BARCODE printing capabilities to Hewlett-Packard corporate printers (All 4, 5, 6, 4000, 5000, 8000 and Mopier 240 series except 4L, 5L and 6L). With BarSIMM/BarDIMM in the HP LaserJet printer, it never has been so easy and so fast to print professional barcodes.

BarSIMM and BarDIMM features are totally similar. Their only difference is the board on which they are provided: SIMM for BarSIMM, and DIMM for BarDIMM. Some HP LaserJet printers only accept SIMM boards, the latest printers only accept DIMM boards. In that manual, we will use « BarSIMM » to name both products.

BarSIMM includes the standard HP Barcode & More cartridge/SIMM fonts. As a result, BarSIMM can also print OCR-A and OCR-B characters and is then backward compatible with older applications as well as HP Barcode&More printer drivers.

BarSIMM 1.9 includes a complete set of fully scalable symbols:

- The EURO symbol, the new european currency
- Safety symbols
- Electronic and manufacturing symbols

Those symbols are available from built-in fonts, and Windows drivers are available from the <http://www.barsimm.com> WEB site.

BarSIMM also features the Freescape system. With Freescape, the Escape code can have a synonyme, a user-defined Escape Code or Alternate Escape Code (AEC). That character acts exactly like the standard Escape Code when found at the beginning of a regular PCL sequence, and can be a printable character. This functionality does allow all systems to use PCL and BarSIMM, even if they can not send binary data to a printer.

Bar Code Readability

The special consideration discussed in this section may pertain to all the bar codes or, in some cases, to a specific bar code which is generated by the BARSIMM product.

When Printing With a New Toner Cartridge

On some printers, a slight degradation of image quality may occur immediately after replacing the EP cartridge; To assure that the bar code images are printed with sufficient quality for later reading with electronic devices, follow these instructions;

1. Be certain that the storage and care instruction that are supported with the EP cartridge were followed before installing the new EP cartridge in your printer.
2. Be sure to change the EP cartridge when necessary. Carefully follow the installation instructions (especially those relating to proper agitation of the cartridge) before you install the EP cartridge.

Print Density Settings

When printing bar codes, it is recommended that you start at the mid-range of the printer density dial or front panel value (3). Run several bar code samples and check them for readability. Then, if necessary, adjust the printer's density setting accordingly.

The color and type of paper that you are using can also affect the readability of printed bar codes. You should closely monitor this type of printing.

The fonts and bar code algorithms available in the BARSIMM product have been found to be highly readable.

HOWEVER:

JETCAPS DOES NOT WARRANT AND HAS NOT TESTED THAT THE BAR CODES, OCR-A AND OCR-B CONTAINED OR GENERATED BY BARSIMM ARE READABLE BY ALL READING DEVICES.

JETCAPS RECOMMENDS THAT YOU TEST THE READ/WRITE COMPATIBILITY OF THESE BARCODES AND FONTS BEFORE IMPLEMENTING APPLICATIONS.

Installing the SIMM/DIMM Board

Please verify that the BarSIMM/BarDIMM you are installing is compatible with your printer model. Your HP LaserJet has three or four SIMM (Single Inline Memory Module) or DIMM (Dual Inline Memory Module) slots. The BarSIMM SIMM or DIMM can be installed in any of these slots. Because the slots are close together, we recommend installing them from right to left or top to down (depending on the printer), starting with the slot 1 and ending with slot 3 or 4.

Protecting the SIMM/DIMM Board

SIMM boards can easily be damaged by small amounts of static electricity. To remove any static electricity from your body touch the surface of the antistatic package before removing the board from its package. When handling the board, frequently touch bare metal on the printer or the antistatic bag or wear an antistatic wrist strap.

Avoid moving around the work area to prevent static electricity to be generated.

Do not touch the BarSIMM components, and handle the SIMM/DIMM carefully at all times.

CAUTION:

When removing a board from the antistatic bag, do not touch the metal traces on the board.

WARNING:

Hazardous voltages are present in the printer. Never remove any access cover or work near exposed electrical parts while power is connected.

BarSIMM has to be installed exactly like a RAM SIMM/DIMM board. Please refer to your HP LaserJet user manual for the SIMM/DIMM modules installation procedure.

NOTE:

BarSIMM is a PCL firmware. Therefore, BarSIMM can not be installed in the printer together with another PCL personality as a conflict can then happen. Such PCL personalities like E-Forms, secured MICR or data compression SIMM/DIMMs are proposed by other developers/publishers. Please check with your supplier if those personalities are PCL personalities and can conflict with the BarSIMM.

Testing the BarSIMM

If, when booted, the printer display indicates « BarSIMM » or « BarDIMM », then there is no need to do any further test. The BarSIMM works fine. This feature is available on a few HP LaserJet models only.

There are two different features built in the BarSIMM: fonts and firmware. They work totally independantly, so you may have to test them both.

- Fonts: The BarSIMM contains the HP Barcode&More fonts. From the front panel of the printer (if there is any), generate a PCL Font List. If OCR-A, OCR-B fonts appear in the font list, the BarSIMM fonts are recognized by the printer.

- Firmware: The two following operations can be performed.

* From the front panel of the printer, generate a Printer Auto Test. A page is printed, on which the list of « Personalities » appears. A date next to « PCL » should have been updated to a recent date (maximum 18 months before purchase date of the BarSIMM).

* A test file is provided with the BarSIMM. Send it to the printer to test if BarSIMM is working correctly. If a MEMORY OVERFLOW error message appear on the front panel (or if error LEDs blink on some printers), the BarSIMM is not recognized and the printer gets out of memory trying to map barcode parameters to the default text font.

If both tests are successful, the BarSIMM is recognized by the HP LaserJet and operates correctly.

If those two tests fail, verify if the BarSIMM you have purchased is compatible with your printer (a label on the board should indicate the compatibility). There is one version of BarSIMM for every HP LaserJet printer model, and the BarSIMM board is not cross-printers compatible. Make sure you have specified the model with your BarSIMM order.

One other possibility is that your printer was manufactured after your version of BarSIMM. Please fax a printer auto-test to your distributor if your printer is very recent (less than 3 months) and if the BarSIMM (compatible with that printer model) does not work. Your distributor can then update your BarSIMM to fix the problem.

Presentation

The BARSIMM chip is an intelligent SIMM/DIMM adding sophisticated BARCODE printing capabilities to Hewlett-Packard corporate printers (All 4, 5 and 6 series except L models). The only real fonts it includes are the fonts of the now discontinued "Barcode&More" font cartridge from HP, which have been included for backward compatibility purpose, and the scalable OCR-B (ASCII set) as stand-alone font and font-for-barcode-text.

BarSIMM also features the unique FREESCAPE capability.

BARSIMM supports more than 40 bar code formats in its version 1.9, from the most passive to the most complex system (interleaved, triple checksum, etc...).

Each of these formats can be declined in any height from 1/254 inch to 13 inches (1mm to 33 cm) with 1/72 inch increasement, bar widths can be defined in 1/600 inch units, code value can be printed as text together with code in many different embeddings with 20 different scalable fonts. As a result, you can generate million different kind of bar code formats from BARSIMM!

BARSIMM is not made of scalable fonts. It is hooked to font calls within the LaserJet PCL5 interpreter. Typeface numbers from 24600 to 24800 activate the BARSIMM intelligence. All data mapped to one of those special fonts is analysed and converted into bar code directly by the firmware.

For backward compatibility, BARSIMM also contains the HP Barcode & More bitmap barcode fonts supported by many applications.

For more information on specific barcodes, please refer to the « Bar Code Formats Characteristics: Usage » paragraph at the end of that manual.

NOTE: In this manual, the escape code is indicated as <Esc>. Those five characters must not be entered as individual symbols, but must be replace with the unique character of ASCII value 27.

How BarSIMM works

1. A typeface in the BARSIMM range (24580-24800) is activated with a classical combined PCL font call sequence: <Esc>(s#p#h#v#b#s#T where # are parameters.
2. The firmware gets from the I/O port the data corresponding to the font. The end of bar code data is determined according to the bar code type:
 - * Bar code data is numeric only: ended by space/CR/LF/FF/Escape code.
 - * Bar code data is alphanumeric: ended by CR/LF/FF/Escape code.

Some bar code format support full 128 character set, from ASCII code 0 to ASCII code 127. (Bar codes Extended 39, Extended 93, 128A, 128auto, EAN/UCC128). If you want to print special characters (ASCII code < 32) with those bar codes, a "Transparent Print Data" PCL sequence (Esc&p#X, where # is replaced with the number of following data bytes) must follow immediately the font selection sequence. This is the only way to know how many characters have to be printed as bar codes. Please analyse the sample Code/EAN/UCC 128 test files for more information.

3. Once the data is received, it is analyzed to verify it fits in the bar code specs:
 - * Correct data size (25 must have an even size, EAN 8/13 and UPC have fixed lengths etc...).
 - * Valid data: some systems, like UPC-E, accept only specially structured data.
 - * Data only Numeric or Alphanumeric, allowed characters.

If data is invalid (incorrect size or invalid characters), an error message describing the problem is systematically printed below the bars, preventing the user from blindly printing invalid bar codes.

4. Some code systems, like UPC-E, print compressed data but the compressed value is not always available to the user. For such codes, BARSIMM verify if data is compressed. If not, it performs automatically the compression.
5. Some formats require what is called a checksum. A checksum is a value, result of a complex calculation on the code data. That value is added to the end of the data and used by the code reader to proof the reading. BARSIMM calculates automatically the checksum(s) of bar codes which need it. Bar codes can have up to 2 checksums (MSI Plessey, UCC128). If the checksum was provided with fixed length data (EAN 8/13, UPC) it is ignored.
6. BARSIMM then generates the shape of the bar code, according to parameters in the font-like PCL sequence. For BARSIMM bar codes, PCL font parameters are don't have the standard meaning (besides the V and T parameter):

- p** parameter: Controls if/how text is printed with bars
- h** parameter: Controls what font to use for that text
- v** parameter: Barcode vertical size in points (like fonts, 1 point = 1/72 inch).
- b** parameter: Black bars widths (has up to 4 values separated by commas)
- s** parameter: White bars widths (has up to 4 values separated by commas)
- T** parameter: Bar code format number

As BARSIMM is algorithms-only, the user can apply the scaling independently in the X and Y axis. In the past with standard scalable fonts, bigger size meant larger bars, resulting in a too-wide and unreadable code, and small size meant thinner bars resulting also in unreadable codes. Some barcodes are standardized and can not be resized.

The bar code can be of any height, in the 3 to 960 pointsize range (1 point size = 1/72 inch). The current cursor position is the location of the bottom left corner of the leftmost black bar, whatever bar code text parameter is provided.

If text is to be printed by BARSIMM together with bars (**p** and **h** parameters), bars heights will be automatically adapted in order not to overlap possibly embedded characters.

Every bar code system has default options, activated when parameters are not provided. The user does not need to provide all parameters. As an example, if the height is omitted, the default size is used. Every code has its specific default values, based on international standards.

7. If required, BARSIMM prints the code value as text with the bars, either under, half-embedded in, full-embedded in, or above the bars. Checksum and flag characters are automatically placed in the right place for some systems (EAN 8/13 and UPC), according to the international standards.

BARSIMM centers automatically the text and support 6 typefaces: Courier, Letter Gothic, Univers, Univers Condensed, CG-Times and OCR-B. By default, BARSIMM scales automatically the font proportionally to the code width and bars height and the kind of text-embedding activated. Automatic sizing limits the pointsize to 14 (no limit for text above or under bar code). Automatic centering is done for both fixed pitch and proportional fonts.

8. After bar code printing completion, cursor is set after the bottom right corner of the rightmost black bar.
 9. If another bar code then needs to be printed, just locate the cursor to a new position and send the barcode data. The Bar code font-like PCL sequence does not need to be sent again.
-

Since BarSIMM 1.8E: modified barcode ID for Code 128C

BarSIMM 1.8E and next versions have a minor modification compared to previous versions. Code 128C used to have an ID of 24703. Due to a new font numbering system in the HP LaserJet 4000, Code 128C now needs to be moved from ID 24703 to ID 24704. The obsolete ID (24703) will not be supported on new HP LaserJet printers (released after September 1997 and starting with the HP LaserJet 4000). The obsolete ID will still be supported on printers released before October 1997, for backward compatibility purpose. If you are already using the BarSIMM with Code 128C, we recommend you change it for the Code 128 Autoswitch ID. The resulting barcodes will be the same (Code 128C), as BarSIMM will detect data for Code 128C.

If you are not using the Code 128C barcode ID, that modification will not affect your application.

FREESCAPE feature

PCL codes always begin with the non-printable Escape code (Hexa: 1B, Dec: 27). Some systems can not use or send binary data to a device. Binary means any character other than a letter, punctuation or a digit. Such systems include Mainframes where printers are connected to terminals, and AS/400. That can be a problem to use the HP PCL language, and to use Barcodes. With the FREESCAPE feature, the Escape code has a synonyme, a user-defined Escape Code or Alternate Escape Code (AEC). That character acts exactly like the standard Escape Code when found at the beginning of a regular PCL sequence. Default value for the AEC is the TILDE '~'. Freescape is smart enough to ignore the EAC if it is found as pure data. You can mix regular Escape Codes and Alternate Escape Codes. The AEC can be one of 10 characters.

In case the ~ character does not fit your system, a new PCL sequence makes it possible to change the Alternate Escape code:

```
<Esc or AEC>**#J
```

Where # is the ASCII decimal value of the new AEC: 34 (*), 35 (#), 36 (\$), 47 (/), 92 (()), 63 (?), 123 ({}), 125 (}), 124 (|), 126 (~) and 27. **Indicating 27 disables Freescape (send ~**27 to the printer to disable the Freescape mode).**

OCR-A and OCR-B fonts

PCL Escape Sequences to call those fixed-size fonts:

OCR-A: <Esc>(00<Esc>(sp10h12vsb104T

OCR-B: <Esc>(10<Esc>(sp10h12vsb110T

	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
32		!	¢	#	§	%	&		()	*	+	,	-	.	/
48	0	1	2	3	4	5	6	7	8	9	:	;	<	=	>	?
64	@	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
80	P	Q	R	S	T	U	V	W	X	Y	Z	(\)	^	Y
96	H	a	b	c	d	e	f	g	h	i	j	k	l	m	n	o
112	p	q	r	s	t	u	v	w	x	y	z	{		}	ſ	

This table shows the OCR-A character set.

The «Barcode&More» OCR-B font character table is the same, except characters <95>, <96> and <126> which in OCR-B match the standard ASCII characters.

How to use BARSIMM

Barcodes are activated using a font-like escape sequence, generated:

- * from specific developments, where developers write code that generate PCL code with BARSIMM functionalities,
- * from standard software, using drivers for HP LaserJet printers. Bar codes should be driven by bitmap-font-like drivers, with one entry per size and kind of bar code. A scalable font driver can not be used as with barcodes the horizontal width is not a factor of the height.

FONT-LIKE PARAMETERS DESCRIPTION

T parameter Esc(s#T (Typeface): Controls what bar code system to use

24600,	UPC-A	24620,	EAN/JAN-8
24601,	UPC-A +2	24621,	EAN/JAN-8 +2
24602,	UPC-A +5	24622,	EAN/JAN-8 +5
24610,	UPC-E	24630,	EAN/JAN-13
24611,	UPC-E +2	24631,	EAN/JAN-13 +2
24612,	UPC-E +5	24632,	EAN/JAN-13 +5
24640,	25 (2 of 5) interleaved	24650,	25 industrial
24641,	25 interleaved + CHK	24651,	25 indust + CHK
24642,	German Postal 25 Leitcode 13	24660,	25 matrix
24643,	German Postal 25 Leitcode 11	24661,	25 matrix + CHK
24670,	39 (3 of 9), no starting blanks	24700,	128 autoswitch
24671,	39 + CHK, no starting blanks	24701,	128 A
24672,	39 (3 of 9)	24702,	128 B
24673,	39 + CHK	24704,	128 C
24680,	39 extended	24703,	128 C (<i>obsolete</i>)
24681,	39 extended + CHK	24710,	UCC-128
24675,	Danish PTT 39 barcode	24720,	EAN-128
24676	French Postal 39 A/R		
24690,	93	24770,	ZIP+4 POSTNET 5
24691,	93 extended	24771,	ZIP+4 POSTNET 9
		24772,	ZIP+4 POSTNET 11
24644,	USPS 25, 11 digits Tray Label barcode	23591,	USPS ZEBRA
24645,	USPS 25, 8 digits Sack Label barcode		
24750,	CODABAR	24760,	MSI
24751,	CODABAR +CHKmod16	24761,	MSI +CHK10
		24762,	MSI+CHK10 +CHK10
24780,	Singapore 4 State	24763,	MSI+CHK11+CHK10
24785,	Australia 4 State 37-CUST		
24786,	Australia 4 State 52-FF-MET		
24787,	Australia 4 State 67-FF-MET		
24788,	Australia 4 State FCC-45 REPLY PAID		

p parameter Esc(s#p

Control if/how human-readable (caption) text is printed with bar code

0	Use default value
1	Don't print human readable text
2	Print human readable text embedded
3	Print human readable text half embedded
4	Print human readable text under code
5	Print human readable text above code
<u>Specials:</u>	- Add 10 to print UPC/EAN/JAN checksum middle left rather than bottom left of bar code.
	- Add 10 to print start&end * characters with 39 bar code text
	- Add 20 to format text for French and German postal barcodes
	- Add 100 to print checksum character with text.

Example: text under code for French post : 24p

h parameter Esc(s#h

Controls what font is used for the human-readable (caption) text

Format: CBA, numeric value, where

A: Typeface	0	Use Courier to print text (default)
	1	Use Letter Gothic to print text
	2	Use Univers to print text
	3	Use Univers Condensed to print text
	4	Use CG-Times to print text
	5	Use OCR-B to print text (great with UPC/EAN)
B: Size	0	Use automatic font size
	1	Reserved for futur use
C: Style	0	Use Default (Bold)
	1	Use Regular
	2	Use Italics
	3	Use Bold
	4	Use Bold Italic

Example: text in Univers Bold Italic, automatic* size: 402h

v parameter Esc(s#v

Short bar height in points (1/72 inch)

Same unit as fonts. Minimum sizes apply.

Example: Bar code in pointsize 87: 87v

b parameter Esc(s#1,#2,#3,#4b

Bar Widths

- #1, bar width, first (thin) width in dots (1/600 inch)
- #2, bar width, second width in dots (1/600 inch)
- #3, bar width, third width in dots (1/600 inch)
- #4, bar width, fourth width in dots (1/600 inch)

Example: Thin bars 4 dots, thick bars 8 dots : 4,8b

s parameter Esc(s#1,#2,#3,#4s

Space Widths

- #1, space width, first (thin) width in dots (1/600 inch)
- #2, space width, second width in dots (1/600 inch)
- #3, space width, third width in dots (1/600 inch)
- #4, space width, fourth width in dots (1/600 inch)

Example: Thin spaces 4 dots, thick spaces 8 dots : 4,8s

Note: the **s** and **b** parameters must be specified together; it is not possible to specify only the **s** or only the **b** parameter.

Note: Barcode parameters must be combined in a unique PCL font escape sequence.

e.g.: <ESC> (s4p305h24v7,21s7,21b24670T

Code 128 Control Codes

Code 128 has five non-data special control codes, called FUNCTION CODES, and 2 control codes to switch from one 128 set (A, B or C) to another one. The switching control codes are used by BARSIMM to force one 128 set. As an example, the string "123456" can be printed with both sets A, B and C. Inserting a character with ASCII value = 134 at the beginning of the string will force BARSIMM to use the set B of code 128.

Note that both Code 128 Autoswitch and EAN 128 analyse the data and optimize the barcode length by switching automatically between sets A, B and C. EAN128 and UCC-128 already include the FNC1 code as the first character: you should not send it with the data.

Special control codes are inserted by passing the following special decimal characters in the bar code:

128 = SHIFT
129 = FNC 1
130 = FNC 2
131 = FNC 3
132 = FNC 4
133 = CODE A
134 = CODE B
135 = CODE C

MS-Windows Support

Due to the millions of possible settings like symbologies/text/size parameters, there is no standard Windows driver provided with BarSIMM. We don't recommend using BarSIMM from Windows application, due to the various way MS-Windows sends data through the driver.

However, you may use BarSIMM functionalities from your Word Processor, spreadsheet or other Windows based applications by entering directly the PCL sequence in the document (in Word: use a printer field). The Escape code can be entered by holding down the Alt key and type 027 on the keypad (the result should be a square on the screen), or by using the default AEC, the tilde ~. To switch back the font to a normal text font after the data, you should format the BarSIMM selection escape sequence and the barcode data to a printer internal font (not a TrueType font) in a different size, e.g. Univers 6pt.

Note: There is a problem with MS Word 97 and the Microsoft PCL printer driver. Sometime, the print field is not sent to the printer. We then recommend to always use a genuine PCL-5 Hewlett-Packard printer driver to drive your LaserJet printers (never use the enhanced PCL-XL printer driver). All HP printer drivers are available on the web from <http://www.hp.com>.

SAP R/3 Support

BarSIMM functionalities are supported standard by the SAP R/3 software.

- OSS note #5196 lists standard R/3 barcode names and supported device types for printing barcode
- PCL-5 commands for JetCAPS BarSIMM are built into the HP device types by SAP
- Modifications are only required for special Barcode types and sizes
- OSS note #45643 lists PCL-5 command details for barcode attribute selection
- PCL-5 commands are maintained as « Print Controls » in SPAD
- SE73 transaction lists barcode names and print-controls for every device type
- Barcode on: Print-control SBPxx
- Barcode off (regular font): SBSxx
- A test text is built into R/3: SO10, SAPSCRIPT-BARCODETEST (client 000)
- The SAP print control for OCR-A is SF400 and SF500 for OCR-B

Note: in the early release of the device type, there were a few errors in the escape sequences. It is then recommended to verify the escape sequence syntax in R/3.

SAP has pre-defined a list of size and parameters for barcodes. If those don't match your needs, we recommend you purchase the AFE SAPSCRIPT toolbox for SAP R/3 (available from your local JetCAPS partner, see <http://www.jetcaps.com>) or modify the controls (copy the controls into the user Z-environment and modify them based on your needs).

Note: all print controls are defined in R/3 using Hexadecimal values (1B for <Esc>...).

PCL Escape Sequences Examples

A valid PCL escape sequence to select a barcode is like the following:

```
<Esc>(s4p102h40v10,30b10,30s24670T
```

24670T	Symbology: code 39
4p	Readable text below bars, without start/stop chars (*)
102h	Caption text in Univers Regular
40v	Bars height: 40 points $40/72=0.555$ inches $40*2.54/72=1.41$ cm
10,30b	Thin bars are 10 dots wide, thick bars are 30 dots wide
10,30s	Thin spaces are 10 dots wide, thick spaces are 30 dots wide

Barcode Rotation:

To rotate a barcode, you can use regular PCL rotation commands. It is recommended you save the cursor position before activating the barcode, and restore that position after the barcode. Here is an example:

<Esc>&fS	Save cursor position
<Esc>&a3000h2000V	Cursor positioning
<Esc>&a90P	90° rotation
<Esc>(s4p102h40v10,30b10,30s24670T	Select Barcode
JETCAPSBARSIMM	Barcode Data
<Esc>(10U<Esc>(sp10hsb4099T	Switch back to Courier 10cpi font
<Esc>&aP	No more rotation
<Esc>&f1S	Restore saved cursor position

Other Information

Permanent and secondary fonts switching can be used with barcode fonts. It is highly recommended that a text font is used as primary font, and barcode font as secondary font. (please refer to your PCL developer's guide for all information on primary and secondary fonts).

Warning:

If barcodes are generated using a font-like sequence, they are still not PCL fonts. Therefore, some limitation on font sequences apply:

- No font ID can be linked to a barcode
- BarSIMM barcodes can not be used from HPGL2 language
- BarSIMM barcodes can not be used from PCL-XL language

Default Parameters

Barcode Name	Height	TextFlag	Bar width	Bar width	Bar width	Bar width
			1	2	3	4
UPC-A	62	3	8	16	24	32
UPC-E	24	3	8	16	24	32
EAN-8	42	3	8	16	24	32
EAN-13	62	3	8	16	24	32
CODE 2/5	24	1	6	18	-	-
CODE 39	24	1	6	18	-	-
39 EXT	24	1	6	18	-	-
CODE 93	24	1	6	18	-	-
93 EXT	24	1	6	18	-	-
CODE 128	24	1	6	12	18	24
EAN 128	24	1	6	12	18	24
UCC 128	24	105	6	12	18	24
CODABAR	24	1	6	12	-	-
MSI PLESSEY	24	1	6	12	-	-
ZIP+4	9*	1*	-	-	-	-
USPS Tray Label	50.4	4	9*	27*	-	-
USPS Sack Label	50.4	1	9*	27*	-	-
German Postal 25	50	124	10	30	-	-
French Postal 39	36*	124*	7*	21*	-	-
Singapore 4 State	13.5*	1*	-	-	-	-
Australia 4 State	14.2*	1*	-	-	-	-

*: Fixed values, can not be overridden by the user

Note: Spaces default values are the same as for bars.

Bar Code Formats Characteristics : Size

Barcode type	Characters encoded (1)	Input length * (2)	Char width Unit=thin bar width	Compression	Start/Stop (3) size (in thin bar)	Checksums * = optional
UPC-A	D	11	7	N	11	1
UPC-E	D	11 or 6	3,5 (for 11) 7 (for 6)	Y (for 11)	14,5 (for 11) 11 (for 6)	1 (for 11)
EAN/JAN-8	D	7	7	N	11	1
EAN/JAN-13	D	12	7	N	11	1
Supplemental 2 or 5	D	2	9	N	13	
CODE 39	DPU	1 to 99	16	N	32	*1
39 EXT	DPULC	1 to 99	DU:16 PLC:32	N	32	*1
Interleaved 2/5	D	2 to 30	9	Y	12	*1
Industrial 2/5	D	2 to 30	14	N	20	*1
Matrix 2/5	D	1 to 30	10	N	18	*1
EAN-128	DPUCL	1 to 99		Y	>=35	1
Code 128 Auto	DPUCL	1 to 99		Y	24	1
Code 128A	DPUC	1 to 99	11	N	24	1
Code 128B	DPUL	1 to 99	22	N	24	1
Code 128C	D	1 to 99	5,5	Y	24	1
UCC128	D	1 to 99	5,5	Y	51,5 (CHK)	2
Codabar/ Monarch	DP	1 to 30	12	N	0	*1
MSI PLESSEY	D	1 to 30	12	N	8	*1 or 2
CODE 93	DPU	1 to 30	9	N	19	2
93 EXT	DPULC	1 to 99	DU:9 PLC:18	N	19	2
ZIP+4	D	5,9 or 11	29/600 Inch	N	5,8/600 Inch	1
Singap. 4State	D	6	88/600 Inch	N	22/600 Inch	1
AP 37-CUST	D	8	44/600 Inch	N	44/600 Inch	1
AP 52-FF-MET	DUL	8+8D/5UL	44/600 Inch	Y (N table)	44/600 Inch	1
AP 67-FF-MET	DUL	8+15D/10UL	44/600 Inch	Y (N table)	44/600 Inch	1
ZIP+4	D	5,9 or 11	29/600 Inch	N	5,8/600 Inch	1

(1) D = Digits - P = Punctuation - L = Lower case letters - U = Upper case letters
C = Control characters (ASCII 0 to 31)

(2) Checksum character not counted

(3) Checksum size not counted except when indicated with « CHK »

Error Messages for Bar Codes

BARSIMM features a built-in debugging system for your bar codes. When an error condition occurs, a **X** is printed on top of the bars and one of the following error messages appears automatically under the bars.

!Err: Char=nn

Symbologies: All

An invalid character was entered in the string to be printed as a bar code. 'nn' is the ASCII value of that character. Such an error occurs for example if you include a letter in a numeric-only bar code like EAN or 25.

Action: verify the data for the barcode.

!Err: Odd

Symbologies: 2of5 Interleaved, with/without CHK

The string you try to print in 2 of 5 Interleaved format has an odd number of digits. With 25 interleaved barcode, digits are grouped by pair. Note that if you use the 25 Interleaved with checksum calculation, you must send an odd number of digits as the checksum digit will round it to an even number of digits.

Action: verify the string size, and send an even or odd number of digits

!Err: Length

Symbologies: All

Invalid length for data to be printed as a bar code. Can mean data string is too short or too long. Please read the tables and barcode formats characteristics pages in this manual.

Action: Verify if the data length fit the symbology specs

!Err: NonZero and !Err: InvVal

Symbology: UPC-E

There is a minimum of four zeros in a UPC-E barcode, and some positions must have very specific values. If BarSIMM finds an unexpected value, this error message is printed.

Action: Verify if the data for the barcode fit the UPC-E symbology specs

!Err: R/A/B

Symbology: French Postal 39 A/R

The french registred mail barcode must start either with 'RA' or 'RB'. The string supplied to BarSIMM to generate such a barcode does not start with those characters.

Action: Verify if the data for the barcode fits the symbology specs

!Err: Fmt=00000000

Symbologies: Australia Post 4 State 37-CUST

The 37-CUST barcode encodes the DPID, an 8 digits number. The DPID string supplied to BarSIMM to generate such a barcode is not made of 8 digits.

Action: Verify the length of the DPID string

!Err: Fmt=00000000,<CustInfo>

Symbologies: Australia Post 4 State 52-FF-MET and 67-FF-MET

The 52-FF-MET and 67-FF-MET barcodes encode the DPID, an 8 digits number, and the customer information which can be encoded using the N table if it only includes digits. Either the DPID string is not made of 8 digits, or there is no customer information defined in the string, or the comma separator is missing.

Action: Verify if the data for the barcode fits the symbology specs

!Err: CustInfo: nonDigit

Symbologies: Australia Post 4 State 52-FF-MET and 67-FF-MET

The 52-FF-MET and 67-FF-MET barcodes encode the DPID and the customer information which can be encoded using the N table if it only includes digits. The customer information defined in the string supplied to BarSIMM to generate such a barcode includes at least one non-digit character.

Action: Verify the Customer Information data for the barcode

!Err: CustInfo>NN (where NN is a value)

Symbologies: Australia Post 4 State 52-FF-MET and 67-FF-MET

The 52-FF-MET and 67-FF-MET barcodes encode the DPID and the customer information which maximum length depend from the encoding table (N or C) defined with the p parameter. The customer information defined in the string supplied to BarSIMM to generate such a barcode is too long, the maximum size is NN for the current parameters.

Action: Adapt the length for Customer Information data

!Err: InvCharInCustInfo

Symbologies: Australia Post 4 State 52-FF-MET and 67-FF-MET

The 52-FF-MET and 67-FF-MET barcodes encodes the DPID and the customer information which can include encode a predefined set of characters. The customer information defined in the string supplied to BarSIMM includes illegal characters.

Action: Verify the Customer Information data

Bar Code Formats Characteristics: Usage and format

There are many standard used to encode the information as bars. BARSIMM supports most of the Barcode standards:

UPC-A

Standard in the USA, for items sold to the public. UPC-A contains numeric data only and encodes a 12 digits number. The first one is the number system character, the next 5 digits are the supplier ID, the next 5 digits are the product number and the last one the required checksum character. You don't need to specify the checksum digit as BARSIMM recalculate it.

A digit is described by 2 bars and 2 spaces and its width is calculated as 7 thins bars. The number character is printed as text on the left side or the bar code and the checksum on the right side.

The system number can have the following values:

- 0 or 7: Regular UPC codes
- 2: Random weight items
- 3: National Drug Code and National Health Related Items Code
- 4: For use without code format restriction and with checksum for non-food items
- 5: For use on coupons
- 1,6,8,9: Reserved

UPC-E

Ideal for small packages because of its data compression. It contains the same information as the UPC-A except that there are minimum 4 zeros, which are suppressed. It reduces the number of digits from 12 to 6. BARSIMM accept the Zero Suppressed version of UPC-E in both version of data, compressed and uncompressed. If data comes uncompressed, BARSIMM will perform automatically the compression.

A digit is described by 2 bars and 2 spaces and its width is calculated as 7 thin bars. Note that caption text below the barcode can be activated to verify checksum calculation.

EAN-8

Used in Europe for items sold to the public. EAN-8 contains numeric data only and encodes a 8 digits number. The first two are the country code, the next 5 digits are the product number and the last one required checksum character. You don't need to specify the checksum digit as BARSIMM recalculates it.

A digit is described by 2 bars and 2 spaces and its width is calculated as 7 thin bars.

EAN-13

Standard in Europe for items sold to the public, EAN-13 contains numeric data only and encodes 13 digits number. The first two are the country code, the next 6 digits are the supplier ID, the next 4 digits are the product number and the last one the required checksum character (that split varies from country to country). You don't need to specify the checksum digit as BARSIMM recalculated it. If the checksum is sent as a 13th digit, it is ignored and recalculated.

A digit is described by 2 bars and 2 spaces and its width is calculated as 7 thin bars. The number character is printed as text on the left side of the bar code and the checksum on the right side.

All the EAN and UPC codes can be followed with two or five digits of supplemental information. If the checksum is sent as the 13th digit, it is ignored and recalculated.

Code 39

The real name is « 3 of 9 bar code ». It is probably the most commonly used bar code as it encodes not only digits, but also upper-case letters and punctuation. Spaces are encoded as bars. Text is encoded between start and stop characters « * » which are automatically generated by BARSIMM.

BarSIMM features two flavors of 39 barcode call : with and without starting blanks. IDs 24670 and 24671 do not encode the space characters starting the data to barcode. IDs 24672 and 24673 do encode the starting spaces.

Danish Postal 39 bar code (Denmark only):

Special 39 code used on parcel labels for shipment through postal service in Denmark. Contains ten digits, a special checksum and ends with « DK ». BARSIMM only needs the 10 digits.

BarSIMM features two flavors of 39 barcode call : with and without starting/trailing blanks. IDs 24670 and 24671 do not encode the space characters starting and ending the data to barcode. IDs 24672 and 24673 do encode the starting/ending spaces.

French postal 39 bar code (France only):

Special 39 code used on registered letters forms (« Recommandés ») in France. Starts with « RA » or « RB », then contains 8 digits, a special checksum and ends with « FR ». BARSIMM only needs « RA » and « RB » and the 8 digits.

Extended 39

Based on the standard 3 of 9, it encodes all the ASCII characters by generating two characters for each character in the string to encode. Supports all ASCII codes from 0 to 126. Bar code pattern is quite large.

Interleaved 2 of 5 (also named 25 Interleaved)

Numeric-only code, requires an even number of digits in the string to be encoded. It can have from 2 to 30 digits.

Industrial and Matrix 2 of 5

Numeric-only codes, can have from 1 to 30 digits.

Code 128

New standard for most barcode labels. Code 128 is a very compact bar code for numeric and alpha-numeric strings. It has 3 modes: A, B and C, which encode different range of characters. Code 128 auto is an exclusive BARSIMM feature that allows you to encode all the 128 ASCII characters without analysing the string to encode and use the required Code 128 modes. BARSIMM makes the analyse and switches dynamically between sets A, B and C to provide the most compact code. Code 128 Auto is fully compliant with the new worldwide standard for pallet labels, which uses Code 128 mode B and C within the same pattern (ECR labels standard).

EAN-128 and UCC-128

Variable length bar code starting with FNC1 code and based on Code 128 sets A, B and C to encode the string. EAN-128 is used for palets labels and EDI related barcode labels. BARSIMM adds automatically the FNC1 code at the beginning and the checksums at the end.

German 25 Postal Barcode (Germany only)

Those special 25 interleaved codes are used on parcel labels for shipment through the postal service in Germany. Two codes are used on a label:

- The Leitcode is used to encode the destination area and requires 13 digits
- The Identcode is used to encode the tracking number and requires 11 digits

Codabar/Monarch

Encodes digits and punctuation characters. Used mostly for blood labeling.

Code 93

Compressed version of Code 39.

Extended Code 93

Compressed version of Extended Code 39.

MSI Plessey

Numeric-only, it is used on labels for the grocery industry.

ZIP+4 Postnet (USA only)

Prints the zip code as a bar code to speed mail through the postal service. (US Post system)

USPS Tray barcode (USA only)

Effective July 1st, 1997, barcoded tray labels with a special 25 interleaved barcode are required for automation rate mailings of First-Class, Regular Periodicals, and Regular and Enhanced Carrier Route Standard Mail letter-size pieces and for First-Class flat-size pieces.

USPS 'Zebra' Barcode (USA only)

The US Post system has defined the Zebra code. This is a series of diagonal lines to the right of the barcode that serves solely as a visual indication that a tray contains barcoded mail. The code must not appear on tray labels for non barcoded mail.

This standard is applicable starting July 1997. Due to its simplicity, the Zebra code is implemented in BarSIMM as a font with just one diagonal thick bar coded in the slash character '/' (ASCII value 47). As a result, you have to call the font and send three consecutive slash characters without any space in between. Here are the PCL codes to send: `<Esc>(10U<Esc>(s0p2.50h29vsb23591T///`

USPS Sack barcode (USA only)

Effective July 1st, 1997, barcoded sack labels with a special 25 interleaved barcode are required for automation rate Regular Periodicals and Standard Mail flat-size pieces prepared in sacks.

Singapore 4 State barcode

The Singapore Postal Service is promoting the use of a 4 State barcode to speed mail sorting. This 4 State barcode encodes a 6 digits number and has a checksum appended to the data. You must make sure you give a 6 digits number to the BarSIMM, and BarSIMM will calculate and print automatically the checksum

Note that 4 state barcodes must be ended with a regular text font escape sequence.

Australia Post 4 State Barcodes

Effective in 1998, 4 State barcodes are used to allow Australia Post to sort incoming mail via barcode read from letters (those barcodes are totally different from the 4 State barcode used in Singapore). There are three different types of barcodes corresponding respectively to FCC values 11, 59 and 62. BarSIMM only needs the DPID and Customer information, and generates automatically all the other information like the FCC or Reed-Solomon checksum.

For each type or code, that data must be sent in a specific BarSIMM-specific format:

- Standard Customer Barcode (37-CUST) with only the Sorting Code (DPID)
<DIPD>
- Replied Paid barcode, DPID only
<DIPD>
- Customer Barcode 2 (52-FF-MET), DPID and 16 bars of customer information
<DIPD> , <CustomerInfo>
- Customer Barcode 3 (67-FF-MET), DPID and 31 bars of customer information
<DIPD> , <CustomerInfo>

<DIPD> is the Sorting Code, and must be 8 digits long

<CustomerInfo> is customer information.

Example: <Esc>(s0p24787T12345678,7V 5<Esc>(s0p12h10v4099T

Note that 4 state barcode data must be ended with a regular text font escape sequence.

Euro Currency Symbol and Additional Fonts

BarSIMM features the old HP Barcode & More cartridge (C2053A) fonts and some scalable logos that can be used together with barcodes, on labels and other documents: Euro symbols, manufacturing, electronics and safety symbols. Barcode & More fonts and special logos are accessible through fonts, using standard PCL-5 font commands. To use those fonts from Windows 3.X/95, a PCM file for the PCL driver is available from the www.barsimm.com WEB site. The Euro symbols font is available on all HP LaserJet models, but the « Manufacturing and Safety Symbols » and « Electronics and Safety Symbols » scalable logo fonts are not available in BarSIMM for HP LaserJet 4, 4Plus, 4Si, 4P, 4V and 4Si for technical reasons.

Euro and other currency symbols

Escape sequence: <Esc>(10Q<Esc>(s1p<size>vsb10452T
 where <size> is the symbol size in points (1/72th inch)

	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
64		□	□	□	□	□	□	□								
80																
96		□	€	€	€	£	¢	¤	¥	□	□	□	□			

Manufacturing and safety symbols

Escape sequence: <Esc>(10Q<Esc>(s1p<size>vsb10400T
 where <size> is the symbol size in points (1/72th inch)

	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
64					↶	↷	CE	CE	♿	♻️	☢	☣	☵	☶	☷	♻️
80	♻️	♻️	♻️	⊕	⊖	⚡	⚡	⚡	⚡	☔	☔	☔	☔			
96	☠	Ⓜ	Ⓜ	♻️	♻️	♻️	♻️	♻️	♻️	♻️	♻️	♻️	♻️	♻️	♻️	♻️
112	⚠															

Special multi-characters symbols:

- Green point <Esc>)10Q<Esc>)s1p20vsb10400TE
- with text <Esc>)10Q<Esc>)s1p20vsb10400TDE
- with grey arrows<Esc>)10Q<Esc>)s1p20vsb10400Td
- <Esc>*c15G<Esc>*v2Te<Esc>*vT
- Recycling logo <Esc>(10Q<Esc>(s1p20vsb10400Tghij<8>123

Electronics and safety symbols

Escape sequence: <Esc>(10Q<Esc>(s1p<size>vs3b10400T
 where <size> is the symbol size in points (1/72th inch)

	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
32																
48																
64																
80																
96																
112																

Those symbols are from the font library of Elsner und Flake Fontinform GmbH, Hamburg.

Note: Other special symbols like the ODETTE symbol or even your company scalable logo can be made available in BarSIMM. Please contact your local JetCAPS distributor for more information.

Troubleshooting

No barcode is printed, or the printer goes into « MEMORY OVERFLOW »:

Please read the « Testing the BarSIMM » chapter in this manual.

How to stop barcode printing:

Just send any other font selection sequence after the barcode data.

Under Windows, no barcode is printed:

Don't use any enhanced (PCL XL) or PostScript HP LaserJet printer driver. Only PCL 5 printer language is supported by BarSIMM.

Under Windows, only part of the barcode is printed:

Try to use a fixed pitch font like Letter Gothic font in 6pt or smaller.

Formatting the German Post barcode:

To print the code with the correct layout, use 124 for the p parameter and 300 for the h parameter: <Esc>(s124p300h...T

Error message with 2of5 interleaved barcode:

The number of encoded digits must be even (multiple of 2). If you use a checksum, then you need to send an odd number of digits (the calculated checksum will add one character, making the total data length an even number).

Narrow barcodes are sometime not readable:

Please read the « Bar Code Readability » chapter at the beginning of that manual.

In all lasers printers, very thin lines don't have a perfectly clean edge, due to the toner particle shape which is not square. The result is that narrow black bars are wider than blank spaces of the same width. The solution is to tune the width by using the B and S parameters to reduce the horizontal width of the thin black bars, or the S parameter to widen the thin white bars.

Barcodes on the very top of the page are not printed correctly

As barcodes are printed at the current cursor position from the baseline to the top of the page, they may not be printed correctly (wrong height or caption text in the middle of the barcode) if there is not enough room on top of that current cursor position. Make sure you set the cursor in a vertical position compatible with the barcode height.

HP LaserJet 6P status page

When the BarSIMM is plugged into the HP LaserJet 6P printer, the status page is not always printed correctly. This does not affect the printer or BarSIMM functionality.

HP LaserJet 5Si PCL font list page

When the BarSIMM is plugged into the HP LaserJet 5Si printer with firmware 7.X, the PCL font list crashes the printer with a 79 ERROR message. The problem is due to the printer firmware revision level and has been fixed on 5Si with firmware 8.X and 9.X. This does not affect the printer or BarSIMM normal functionality. To print a PCL font list, remove temporarily the BarSIMM from the printer.

39 barcode is much longer than it should be, typically as wide as the page

When you position horizontally the cursor using blanks to put the barcode at the right place, you must send the barcode selection sequence **after** sending the space characters to move horizontally. If you don't do that, the spaces are part of the barcode data and the barcode is much wider than expected (usually across the page).

If you can only send the barcode selection sequence at the beginning of the line, use the special 39 symbologies with no starting spaces (IDs 24670 and 24671). This symbology will not include the starting spaces in the barcode data.

For more information

- The latest BarSIMM / BarDIMM manuals
- File samples
- Information on latest/future features
- Frequently Asked Questions with their answers
- Integration in ERP and other softwares
- List of support centers per country

Please consult the BarSIMM WEB site:

<http://www.barsimm.com>

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BarSIMM/BarDIMM 1.9 Registration Form

To receive more information about new versions of BarSIMM/BarDIMM, please fill out that card and return it by fax or mail to the address on the back.

What system is using BarSIMM barcoding or Freescape features?

PC HP-9000 HP-3000 Mainframe Other: _____

Where do you put barcodes? _____ LaserJet model: _____

Your name, company, address:

**Your
eMail:** _____

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JetCAPS Europe S.A.
Tel: +33 (0) 1-46-94-80-10
Fax: +33 (0) 1-46-94-00-83
WEB: <http://www.barsimm.com>

Please complete this card and return it by fax or in an envelope to:

JetCAPS Europe S.A.
8, Blvd de la République
F-92514 BOULOGNE Cedex
FRANCE
Fax: +33 (0) 1-46-94-00-83