BAR CODE CONTROL

CONTENTS

1. INTRODUCTION

Some of the HL series printers can print bar codes in the HP LaserJet, EPSON FX-850, and IBM Proprinter XL emulation modes, refer to the printer User guide for information.

2. PRINT BAR CODES OR EXPANDED CHARACTERS

`ESC i n ... n \`   `(27)(105)n ... n (92)`   `<1Bh><69h>n ... n <5Ch>`

Creates bar codes or expanded characters according to the parameters "n ... n". For further information about the parameters, see the following "Definition of Parameters." This command must end with the " \ " code (5CH).

3. DEFINITION OF PARAMETERS

This bar code command can have the following parameters in the parameter segment (n ... n). Parameters are effective only within the single command sequence using the syntax **ESC i n ... n **. They do not take effect in any subsequent bar code commands. If any parameters are not specified, they take the default settings. The last parameter must be the bar code data start identifier ("b" or "B") or the expanded character data start identifier ("l" or "L"). Other parameters can be specified in any sequence. The prefix of each parameter can be either a lower-case or upper-case character, - for example, "t0" or "T0", "s3" or "S3", etc.

3.1. Bar Code Mode

n = "t0" or "T0"	CODE 39 (default)
n = "t1" or "T1"	Interleaved 2 of 5
n = "t3" or "T3"	FIM (US-Post Net)
n = "t4" or "T4"	Post Net (US-Post Net)
n = "t5" or "T5"	EAN 8, EAN 13, or UPC A
n = "t6" or "T6"	UPC E
n = "t9" or "T9"	Codabar
n = "t12" or "T12"	Code 128 set A
n = "t13" or "T13"	Code 128 set B
n = "t14" or "T14"	Code 128 set C
n = "t130" or "T130"	ISBN (EAN)
n = "t131" or "T131"	ISBN (UPC-E)
n = "t132" or "T132"	EAN 128 set A
n = "t133" or "T133"	EAN 128 set B
n = "t134" or "T134"	EAN 128 set C

This parameter selects the bar code mode as above. When n is "t5" or "T5", the bar code mode (EAN 8, EAN 13, or UPC A) varies according to the number of characters in the data.

3.2. Bar Code Style, Expanded Character Shading, Line Block Drawing & Box Drawing Shading

• Bar Code Style

n = "s0" or "S0"	3 : 1 (default)
n = "s1" or "S1"	2 : 1
n = "s3" or "S3"	2.5 : 1

This parameter selects the bar code style as above. When the EAN 8, EAN 13 or UPC-A bar code mode is selected, this bar code style parameter is ignored.

• Expanded Character shading

"S"   0 = White
        1 = Black
        2 = Vertical stripes
        3 = Horizontal stripes
        4 = Cross hatch

e.g.   "S" n1 n2

            n1 = Background fill pattern
            n2 = Foreground fill pattern

If "S" is followed by only one parameter, the parameter is a foreground fill pattern.

• Line Block Drawing & Box Drawing Shading

    "S"   1 = Black

             2 = Vertical stripes

             3 = Horizontal stripes

             4 = Cross hatch

3.3. Bar Code Scaling (Width only)

n = "mnnn" or "Mnnn" (nnn = 0 ~ 32767)

This parameter specifies the bar code width scaling. The unit of "nnn" is %. The default value is m100 (100%).

3.4. Bar Code Human Readable Line On or Off

n = "r0" or "R0"   Human readable line OFF

n = "r1" or "R1"   Human readable line ON

Default: Human readable line ON when the following barcode types are selected.

    (1) "T5" or "t5"

    (2) "T6" or "t6"

    (3) "T130" or "t130"

    (4) "T131" or "t131"

Default: Human readable line OFF

          All others

This parameter specifies whether or not the printer prints the human readable line below the bar code. Human readable characters are always printed with OCR-B font at 10 cpi pitch and all the current character style enhancements are masked. Note that the default setting is subject to the bar code mode selected by "t" or "T".

3.5. Quiet Zone

n = "onnn" or "Onnn" (nnn = 0 ~ 32767)

Quiet Zone is the space on both side of the bar codes. Its width can be specified using the units which are set by the "u" or "U" parameter. (For the description of "u" or "U" parameter, see the next section.) The default setting of Quiet Zone width is 1 inch.

3.6. Bar Code, Expanded Character Unit, Line Block Drawing & Box Drawing Units

n = "u0" or "U0"   Millimeters (default)

n = "u1" or "U1"   1/10"

n = "u2" or "U2"   1/100"

n = "u3" or "U3"   1/12"

n = "u4" or "U4"   1/120"

n = "u5" or "U5"   1/10 Millimeter

n = "u6" or "U6"   1/300"

n = "u7" or "U7"   1/720"

This parameter specifies the measurement units of X-axis offset, Y-axis offset and bar code height.

3.7. Bar Code, Expanded Character, Line, Block Drawing & Box Drawing Offset in the X-axis

n = "xnnn" or "Xnnn"

This parameter specifies the offset from the current print position in the "u"- or "U"-specified units.

3.8. Bar Code & Expanded Character Offset in the Y-axis

n = "ynnn" or "Ynnn"

This parameter specifies the downward offset from the current print position in the "u"- or "U"-specified units.

3.9. Bar Code, Expanded Character, Line, Block Drawing & Box Drawing Height

n = "hnnn", "Hnnn", "dnnn", or "Dnnn"

Default heights

(1)	EAN13, EAN8, UPC-A, ISBN (EAN13, EAN8, UPC-A),	
	ISBN (UPC-E):	22 mm
(2)	UPC-E:	18 mm
(3)	Others:	12 mm

Expanded characters	→	2.2 mm (default)
Line Block Drawing & Box Drawing	→	1 dot

This parameter specifies the height of bar codes or expanded characters as above. It can take the prefix "h", "H", "d", or "D". The height is specified in the "u"- or "U"-specified units. Note that the default setting of the bar code height (12 mm, 18 mm or 22 mm) is subject to the bar code mode selected by "t" or "T".

3.10. Expanded Character, Line Block Drawing & Box Drawing Width

n = "wnnn" or "Wnnn"

Default widths

Expanded character	→	1.2 mm
Line Block Drawing & Box Drawing	→	1 dot

This parameter specifies the width of expanded characters in the selected units as above.

3.11. Expanded Character Rotation

n = "a0" or "A0"	Upright (default)
n = "a1" or "A1"	Rotated 90 degrees clockwise
n = "a2" or "A2"	Upside down, rotated 180 degrees clockwise
n = "a3" or "A3"	Rotated 270 degrees clockwise

3.12. Bar Code Data Start

n = "b" or "B"

- Data that follows "b" or "B" is read in as bar code data. Bar code data must end with the " \ " code (5CH), which also terminates this command. The acceptable bar code data is subject to the bar code mode selected by "t" or "T" as listed below.

- When the CODE 39 is selected with the parameter "t0" or "T0":

Forty three characters "0" to "9", "A" to "Z", "–", " . ", " (space)", "$", " / ", "+", and "%" can be accepted as bar code data. Other characters cause data error. The number of characters for bar codes is not limited. The bar code data automatically starts and ends with an asterisk " * " (start character and stop character). If the received data has an asterisk " * " at its beginning or end, the asterisk is regarded as a start character or stop character. When you put "?" on the end of the data, a check digit is automatically added.

- When the Interleaved 2 of 5 is selected with the parameter "t1" or "T1":

Ten numerical characters "0" to "9" can be accepted as bar code data. Other characters cause data error. The number of characters for bar codes is not limited. Since this mode of bar codes require even characters, if the bar code data has odd characters, the zero character "0" is automatically added to the end of the bar code data. When you put "?" on the end of the data, a check digit is automatically added.

- When the FIM (US-Post Net) is selected with the parameter "t3" or "T3":

Characters "A" to "D" are valid and 1 digit of data can be printed. Uppercase and lowercase alphabet characters can be accepted.

- When the Post Net (US-Post Net) is selected with the parameter "t4" or "T4":

Characters "0" to "9" can be accepted as bar code data and it must be terminated by a check digit. "?" can be used in place of a check digit.

- When the EAN 8, EAN 13, or UPC A is selected with the parameter "t5" or "T5":

Ten numerical characters "0" to "9" can be accepted as bar code data. The number of characters for bar codes is limited as follows.

EAN 8:	Total 8 digits (7 digits + 1 check digit)
EAN 13:	Total 13 digits (12 digits + 1 check digit)
UPC A:	Total 12 digits (11 digits + 1 check digit)

Any number of characters other than as above causes a data error and the bar code data is printed as normal print data. If the check digit is incorrect, the printer calculates it and replaces it with the correct check digit so that the correct bar code data will be printed. When EAN13 is selected, adding "+" and a 2-or 5-digit number after the data will create the add-on code.

When UPC-E is selected with the parameter "t6" or "T6":
The numerical characters "0" to "9" can be accepted as bar code data.
    8 digits   Standard format. The first character must be "0" and the data must be terminated by a check digit.
    Total 8 digits = "0" + 6 digits + 1 check digit
    6 digits   The first character "0" and the last check digit are removed from the 8 digit data.
    *1:   For 8 digits, "?" can be used in place of a check digit.
    *2:   Adding "+" and 2- or 5-digit number after the data creates an add-on code
        for all 6 and 8 digit formats.

- When Codabar is selected with the parameter "t9" or "T9":

Characters "0" to "9", "–", " . ", "$", "/", "+", " : " can be printed. Characters "A" to "D" can be printed as a start-stop code, which can be uppercase or lowercase. If there is no start-stop code, an error will occur. The check digit cannot be added and "?" causes an error.

- When Code 128 Set A, Set B, or Set C is selected with the parameter "t12" or "12," "t13" or "T13," or "t14" or "T14" respectively:

  Code sets A, B and C are individually selectable. Set A encodes characters in the range Hex 00 to 5F. Set B encodes characters in the range Hex 20 to 7F. Set C encodes numeric pairs in the range 00 to 99.

  - Switching is allowed between the code sets by sending %A, %B, or %C.

  - FNC 1, 2, 3, and 4 are produced with %1, %2, %3, and %4.

  - The SHIFT code, %S, allows temporary switching (for 1 character only) between set A and set B and vice versa.

  - To print the "%" character, it must be sent twice.

- When ISBN (EAN) is selected with the parameter "t130" or "T130":

  The rules are the same as for "t5" or "T5"

- When the ISBN (UPC-E) is selected with the parameter "t131" or "T131":

  The rules are the same as for "t6" or "T6"

- When EAN 128 set A, set B or set C is selected with the parameter "t132" or "T132," "t133" or "T133" or "t134" or "T134" respectively: Same rules apply as for "t12" or "T12," "t13" or "T13", or "t14" or "T14."

3.13. Box Drawing

ESC i ... E (or e)

"E" or "e" is a terminator.

3.14. Line Block Drawing

ESC i … V (or v)

"V" or "v" is a terminator.

3.15. Expanded Character Data Start

n = "l" or "L"

Data that follows "l" or "L" is read in as expanded character data (or labeling data). Expanded character data must end with the " \ " code (5CH), which also terminates this command. To print the '\' character, you must input '\\'.

4. EXAMPLE PROGRAM LISTINGS

```
10 ' Barcode
20 WIDTH "LPT1:", 255
30 ' CODE 39
40 LPRINT CHR$(27); "it0r1s0x00y00b123456\";
50 'INTER LEAVED
60 LPRINT CHR$(27); "it1r1s0x70y00b123456\";
70 ' EAN-13
80 LPRINT CHR$(27); "it5r1s0x00y020b123456789012?\";
90 LPRINT CHR$(27); "it5r1s0x70y020b123456789012?+12345\";
100 ' UPC-A
110 LPRINT CHR$(27); "it5r1s0x00y050b123456789012?\";
120 LPRINT CHR$(27); "it5r1s0x70y050b12345678901?+12345\";
130 ' EAN-8
140 LPRINT CHR$(27); "it5r1s0x00y080b1234567?\";
150 LPRINT CHR$(27); "it5r1s0x70y080b1234567?+12345\";
160 ' UPC-E
170 LPRINT CHR$(27); "it6r1s0x00y110b0123456?\";
180 LPRINT CHR$(27); "it6r1s0x70y110b0123456?+12344\";
190 ' CODABAR
195 LPRINT CHR$(27); "it9r1s0x00y140bA123456A\";
210 ' POST NET
220 LPRINT CHR$(27); "it4r1x70y140b1234567?\";
230 ' FIM
240 LPRINT CHR$(27); "iT3R1x130Y140BA\";
250 ' ISBN
260 LPRINT CHR$(27); "it130r1s0x00y170b123456789012?+12345\";
270 LPRINT CHR$(27); "it130r1s0x70y170b12345678901?+12345\";
280 LPRINT CHR$(27); "it130r1s0x00y200b1234567?+12345\";
300 ' LABEL PRINT
310 LPRINT CHR$(27); "ih10w10x25y230lSample\";
320 LPRINT CHR$(27); "ix90y230s4h10w10f2g2e";
330 LPRINT CHR$(27); "ix105y230s4h10w10v";
400 LPRINT CHR$(&HC);
```

< Sample 19 >