

CHAPTER 8

BAR CODE CONTROL

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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 (“I” 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 | <input type="radio"/> | 1.2 mm |
| Line Block Drawing & Box Drawing | <input type="radio"/> | 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 you put “?” on the end of the data, a check digit is automatically added.

- 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 “\\”.

3.16. Table of Code(EAN) 128 set C

Code(EAN) 128 set C describes an original command. The correspondence table is as follows.

No.	Code 128 Set C	Input command	Hex	No.	Code 128 Set C	Input command	Hex
0	00	NUL	0x00	52	52	4	0x34
1	01	SOH	0x01	53	53	5	0x35
2	02	STX	0x02	54	54	6	0x36
3	03	ETX	0x03	55	55	7	0x37
4	04	EOT	0x04	56	56	8	0x38
5	05	ENQ	0x05	57	57	9	0x39
6	06	ACK	0x06	58	58	:	0x3a
7	07	BEL	0x07	59	59	;	0x3b
8	08	BS	0x08	60	60	<	0x3c
9	09	HT	0x09	61	61	=	0x3d
10	10	LF	0x0a	62	62	>	0x3e
11	11	VT	0x0b	63	63	?	0x3f
12	12	NP	0x0c	64	64	@	0x40
13	13	CR	0x0d	65	65	A	0x41
14	14	SO	0x0e	66	66	B	0x42
15	15	SI	0x0f	67	67	C	0x43
16	16	DLE	0x10	68	68	D	0x44
17	17	DC1	0x11	69	69	E	0x45
18	18	DC2	0x12	70	70	F	0x46
19	19	DC3	0x13	71	71	G	0x47
20	20	DC4	0x14	72	72	H	0x48
21	21	NAK	0x15	73	73	I	0x49
22	22	SYN	0x16	74	74	J	0x4a
23	23	ETB	0x17	75	75	K	0x4b
24	24	CAN	0x18	76	76	L	0x4c
25	25	EM	0x19	77	77	M	0x4d
26	26	SUB	0x1a	78	78	N	0x4e
27	27	ESC	0x1b	79	79	O	0x4f
28	28	FS	0x1c	80	80	P	0x50
29	29	GS	0x1d	81	81	Q	0x51
30	30	RS	0x1e	82	82	R	0x52
31	31	US	0x1f	83	83	S	0x53
32	32	SP	0x20	84	84	T	0x54
33	33	!	0x21	85	85	U	0x55
34	34	"	0x22	86	86	V	0x56
35	35	#	0x23	87	87	W	0x57
36	36	\$	0x24	88	88	X	0x58
37	37	%	0x25	89	89	Y	0x59
38	38	&	0x26	90	90	Z	0x5a
39	39	'	0x27	91	91	[0x5b
40	40	(0x28	92	92	\\	0x5c5c
41	41)	0x29	93	93]	0x5d
42	42	*	0x2a	94	94	^	0x5e
43	43	+	0x2b	95	95	_	0x5f
44	44	,	0x2c	96	96	`	0x60
45	45	-	0x2d	97	97	a	0x61
46	46	.	0x2e	98	98	b	0x62
47	47	/	0x2f	99	99	c	0x63
48	48	0	0x30	100	Set B	d	0x64
49	49	1	0x31	101	Set A	e	0x65
50	50	2	0x32	102	FNC 1	f	0x66
51	51	3	0x33				

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$(27); "it5r1s0x00y050b12345678901?\\";
120 LPRINT CHR$(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 >