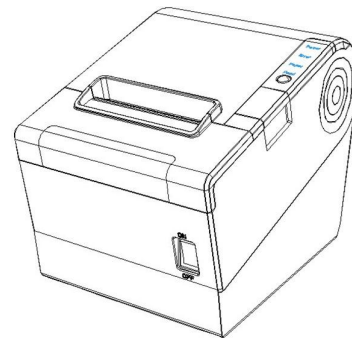
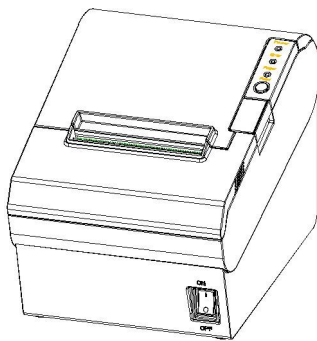
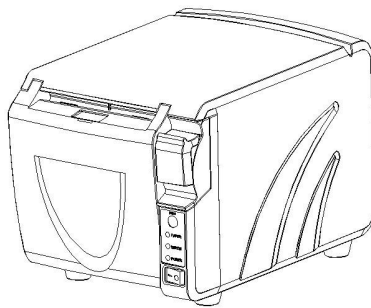

TP801/TP805/TP806

Programming Manual



Xiamen Hanin Electronic Technology Co.Ltd.

ADD: Room 305A,Angye Building,Pioneering Park,
Torch High-tech Zone,Xiamen,China 361009

Tel.: +86-(0)592-5885993

Fax: +86-(0)592-5885992

Web: www.hpert.com

REVISION RECORDS

[illegible]

Contents

1. Overview.....	6
1.1 Key terms.....	6
1.2 Command Notation.....	6
2. Commands.....	7
HT.....	7
LF.....	7
FF (In page mode).....	7
CR.....	7
CAN.....	8
DLE EOT n.....	8
DLE ENQ n.....	10
DLE DC4 fn m t (fn = 1).....	11
DLE DC4 fn a b (fn = 2).....	12
DLE DC4 fn d1...d7 (fn = 8).....	13
ESC FF.....	13
ESC SP n.....	14
ESC ! n.....	14
ESC \$ n L n H.....	15
ESC % n.....	15
ESC & y c1 c2 [x1 d1...d(y × x1)]...[xk d1...d(y × xk)].....	15
ESC * m nL n H d1...dk.....	16
ESC – n.....	17
ESC 2.....	18
ESC 3 n.....	18
ESC = n.....	18
ESC ? n.....	19
ESC @.....	19
ESC D n1...nk NUL.....	20

ESC E n.....	20
ESC G n.....	20
ESC J n.....	21
ESC L.....	21
ESC M n.....	21
ESC R n.....	22
ESC S.....	23
ESC T n.....	23
ESC V n.....	24
ESC W xL x H y L y H dx L dx H dy L dy H.....	24
ESC \ nL n H.....	25
ESC a n.....	25
ESC c 3 n.....	26
ESC c 4 n.....	27
ESC c 5 n.....	27
ESC d n.....	28
ESC p m t1 t2.....	28
ESC t n.....	28
ESC { n.....	30
FS g 1 m a1 a2 a3 a4 nL n H d1...dk.....	30
FS g 2 m a1 a2 a3 a4 nL n H.....	31
GS ! n.....	32
GS \$ nL n H.....	32
GS (A pL p H n m.....	33
GS (D pL p H m [a1 b1]...[ak bk].....	33
GS (L pL p H m fn [parameters].....	34
GS 8 L p1 p2 p3 p4 m fn [parameters].....	34
<Function 48> GS (L pL p H m fn (fn = 0, 48).....	36
<Function 50> GS (L pL p H m fn (fn = 2, 50).....	36
<Function 51> GS (L pL p H m fn (fn = 3, 51).....	37

<Function 64> GS (L pL p H m fn d1 d2 (fn = 64).....	37
<Function 65> GS (L pL p H m fn d1 d2 d3 (fn = 65).....	37
<Function 66> GS (L pL p H m fn kc1 kc2 (fn = 66).....	38
<Function 67> GS (L pL p H m fn a kc1 kc2 b x L x H y L y H [c d1...dk]1...[c d1....dk]b (fn = 67).....	38
<Function 69> GS (L pL p H m fn kc1 kc2 x y (fn = 69).....	40
<Function 112> GS (L pL p H m fn a bx by c x L x H y L y H d1...dk (fn = 112).....	41
GS (k pL p H cn fn [parameters].....	42
<Function 065> GS (k pL p H cn fn n (cn = 48, fn = 65).....	43
<Function 066> GS (k pL p H cn fn n (cn = 48, fn = 66).....	43
<Function 067> GS (k pL p H cn fn n (cn = 48, fn = 67).....	44
<Function 068> GS (k pL p H cn fn n (cn = 48, fn = 68).....	45
<Function 069> GS (k pL p H cn fn m n (cn = 48, fn = 69).....	45
<Function 070> GS (k pL p H cn fn m (cn = 48, fn = 70).....	46
<Function 080> GS (k pL p H cn fn m d1 ...dk (cn = 48, fn = 80).....	47
<Function 081> GS (k pL p H cn fn m (cn = 48, fn = 81).....	47
<Function 082> GS (k pL p H cn fn m (cn = 48, fn = 82).....	48
<Function 165> GS (k pL p H cn fn n1 n2 (cn = 49, fn = 65).....	48
<Function 167> GS (k pL p H cn fn n (cn = 49, fn = 67).....	49
<Function 169> GS (k pL p H cn fn n (cn = 49, fn = 69).....	49
<Function 180> GS (k pL p H cn fn m d1 ...dk (cn = 49, fn = 80).....	50
<Function 181> GS (k pL p H cn fn m (cn = 49, fn = 81).....	50
<Function 182> GS (k pL p H cn fn m (cn = 49, fn = 82).....	51
GS * x y d1...dk.....	51
GS / m.....	52
GS :.....	53
GS B n.....	53
GS H n.....	53
GS I n.....	54
GS L nL n H.....	55

GS P x y.....	55
<A> GS V m.....	56
 GS V m n.....	56
GS W nL n H.....	56
GS \ nL n H.....	57
GS ^ r t m.....	57
GS a n.....	58
GS f n.....	60
GS g 0 m nL n H.....	60
GS g 2 m nL n H.....	61
GS h n.....	62
<A> GS k m d1...dk NUL.....	62
 GS k m n d1...dn.....	62
GS r n.....	64
GS w n.....	64
ESC v.....	65
FS p n m.....	66
FS q n [x L x H y L y H d1...dk]1 ... [x L x H y L y H d1...dk]n.....	66
GS v 0 m xL x H y L y H d1...dk.....	68
ESC (A p L p H fn n c t1 t2 < Function 97 >.....	68
Appendix A.....	70

1. Overview

1.1 Key terms

Real-time commands: These commands are acted on immediately upon being received by the printer ;

Page mode: Under this mode, the printer stores all data in a specified memory and thinks of this as a virtual page. The page is printed when the printer receives print command either FF or ESC FF;

Standard mode: Standard mode is the default mode of printer, namely line mode. Under this mode, the printer prints data and feeds paper upon print line buffer full (data is enough for one print line) or receiving print command like LF;

HRI character: Barcode note character. Human Readable Interface;

NV: Non-volatile memory in which data stored does not loss when powered off. NV: Non-volatile;

RAM : Random Access Memory;

ASB : Auto Send Back

DPI: Print dots per inch (one inch equals to 25.4mm). It is used to identify the resolution of a printer.

Example, 203DPI means 203 print dots per inch. DPI: Dot Per Inch

1.2 Command Notation

[Name] The name of the command.

[Format] The code sequence.

[]k indicates the contents in brackets [] should be repeated k times.

[Range] Gives the allowable ranges, if any, for the command parameters.

[Default] Gives the default values, if any, for the arguments.

[Description] Describes the function of the command.

" – " in the table indicates 0 or 1.

[Notes] Provides important information on setting and using the printer command, if necessary.

[Reference] Gives references, if any.

2. Commands

HT

[Name] Horizontal tab

[Format] ASCII HT

Hex 09

Decimal 9

[Description] • Moves the print position to the next horizontal tab position.

LF

[Name] Print and line feed

[Format] ASCII LF

Hex 0A

Decimal 10

[Description] • Prints the data in the print buffer and feeds one line, based on the current line spacing.

FF (In page mode)

[Name] Print and return to standard mode (in page mode)

[Format] ASCII FF

Hex 0C

Decimal 12

[Description] • Prints all the data in the print buffer collectively and switches from page mode to standard mode.

CR

[Name] Print and carriage return

[Format] ASCII CR

Hex 0D

Decimal 13

[Description] • Executes one of the following operations.

Condition	Function
When automatic line feed is enabled.	Functions the same as LF .
When automatic line feed is disabled and when using the serial interface model.	This command is ignored.

CAN

[Name] Cancel print data in page mode

[Format] ASCII CAN

Hex 18

Decimal 24

[Description] • In page mode, deletes all the print data in the current print area.

DLE EOT n

[Name] Transmit real-time status

[Format] ASCII DLE EOT n

Hex 10 04 n

Decimal 16 4 n

[Range] $1 \leq n \leq 4$

[Description] • Transmits the real-time status.

<i>n</i>	Function
1	Transmits printer status.
2	Transmits offline cause status.
3	Transmits error cause status.
4	Transmits roll paper sensor status.

- This printer transmits the following status in real time.
- Printer status ($n = 1$)

Bit	Off/On	Hex	Decimal	Status
0	Off	00	0	Fixed.
1	On	02	2	Fixed.
2	Off	00	0	Drawer kick-out connector pin 3 is LOW.
	On	04	4	Drawer kick-out connector pin 3 is HIGH.
3	Off	00	0	Online.
	On	08	8	Offline.
4	On	10	16	Fixed.
5, 6	--	--	--	Reserved.
7	Off	00	0	Fixed.

- Offline cause status (n = 2)

Bit	Off/On	Hex	Decimal	Status
0	Off	00	0	Fixed.
1	On	02	2	Fixed.
2	Off	00	0	Cover is closed.
	On	04	4	Cover is open.
3	Off	00	0	Paper is not being fed with the paper FEED button.
	On	08	8	Paper is being fed with the paper FEED button.
4	On	10	16	Fixed.
5	Off	00	0	No paper end stop.
	On	20	32	Printing stopped due to paper end.
6	Off	00	0	No error.
	On	40	64	Error occurred.
7	Off	00	0	Fixed.

- Error cause status (n = 3)

Bit	Off/On	Hex	Decimal	Status
0	Off	00	0	Fixed.
1	On	02	2	Fixed.
2	--	--	--	Reserved.
3	Off	00	0	No autocutter error.
	On	08	8	Autocutter error occurred.
4	On	10	16	Fixed.
5	Off	00	0	No unrecoverable error.
	On	20	32	Unrecoverable error occurred.
6	Off	00	0	No automatically recoverable error.
	On	40	64	Automatically recoverable error occurred.
7	Off	00	0	Fixed.

- Roll paper sensor status (n = 4)

Bit	Off/On	Hex	Decimal	Status
0	Off	00	0	Fixed.
1	On	02	2	Fixed.
2, 3	Off	00	0	Roll paper near-end sensor: paper adequate.
	On	0C	12	Roll paper near-end sensor: paper near end.
4	On	10	16	Fixed.
5, 6	Off	00	0	Roll paper end sensor (paper sensor): paper present.
	On	60	96	Roll paper end sensor (paper sensor): paper not present.
7	Off	00	0	Fixed.

[Notes] • Take the following into consideration:

- If the received data includes a data string matching this command, the printer performs this command. Users must consider this.

Example: Graphic data might accidentally include a data string matching this command.

- Do not embed this command within another command.

Example: Graphic data might include this command.

- Transmit this command using the following method:
- When this command is transmitted, the subsequent data must not be transmitted until the status is received.
- However, if this command must be transmitted continuously, it is possible to transmit up to 4 commands at once.

In this case, the subsequent data must not be transmitted until the all status is received.

If this command is transmitted without using the above method, the status may not be received.

DLE ENQ n

[Name] Send real-time request to printer

[Format] ASCII DLE ENQ n

Hex 10 05 n

Decimal 16 5 n

[Range] n = 1, 2

[Description] • Responds to a request in real-time from the host computer.

<i>n</i>	Function
1	Recovers from a recoverable error and restarts printing from the line where the error occurred. • This command is ignored unless a recoverable error has occurred.
2	Recovers from a recoverable error after clearing the receive and print buffers. • This command is ignored unless a recoverable error has occurred.

[Notes] • Use this command after removing the cause of the error.

• Take the following into consideration:

• If the received data includes a data string matching this command, the printer performs the command. Users must consider this.

Example: Graphic data might accidentally include a data string matching this command.

• Do not embed this command within another command.

Example: Graphic data might include this command.

[Reference] APPENDIX C

DLE DC4 fn m t (fn = 1)

[Name] Generate pulse in real-time

[Format] ASCII DLE DC4 fn m t

Hex 10 14 fn m t

Decimal 16 20 fn m t

[Range] fn = 1

m = 0, 1

$1 \leq t \leq 8$

[Description] • Outputs the pulse specified by t in real-time to connector pin m.

<i>m</i>	Connector pin
0	Drawer kick-out connector pin 2.
1	Drawer kick-out connector pin 5.

• t specifies the pulse on time or off time as $[t \times 100 \text{ ms}]$.

[Notes] • Take the following into consideration:

• If the received data includes a data string with this command, the printer performs the command. Users must consider this.

Example: Graphic data might accidentally include a data string matching this command.

- Do not embed this command within another command.

Example: Graphic data might include this command.

[Reference] APPENDIX F

DLE DC4 fn a b (fn = 2)

[Name] Execute power-off sequence

[Format] ASCII DLE DC4 fn a b

Hex 10 14 fn a b

Decimal 16 20 fn a b

[Range] fn = 2

a = 1

b = 8

[Description] • Executes the printer power-off sequence and transmits the power-off notice.

- Stores the values of the maintenance counter.
- Sets the interface to BUSY.
- Sets the printer to standby mode.

[Notes] • Take the following into consideration:

- If the received data includes a data string matching this command, the printer performs the command. Users must consider this.

Example: Graphic data might accidentally include a data string matching this command.

- Do not embed this command within another command.

Example: Graphic data might include this command.

- This command does not shut the power off. The operator must turn the power off after receiving the power-off notice.
- If this command is executed, the printer will not continue to process anything. To recover the printer to print again, it is necessary to turn the power on again or execute a hardware reset.

[Reference] APPENDIX G

DLE DC4 fn d1...d7 (fn = 8)

[Name] Clear buffer(s)

[Format] ASCII DLE DC4 fn d1...d7

Hex 10 14 fn d1...d7

Decimal 16 20 fn d1...d7

[Range] fn = 8

d1 = 1, d2 = 3, d3 = 20, d4 = 1, d5 = 6, d6 = 2, d7 = 8

[Description] • Clears all data stored in the receive buffer and the print buffer and transmits Clear response.

- If a recoverable error occurs, recovers from the error.

[Notes] • Do not use this command in a system that uses the printer with the OPOS driver or the JavaPOS driver provided by Seiko Epson Corporation.

- Take the following into consideration:
 - If the received data includes a data string matching this command, the printer performs the command. Users must consider this.

Example: Graphic data might accidentally include a data string matching this command.

- Do not embed this command within another command.

Example: Graphic data might include this command.

- Do not transmit the subsequent data until the status is received after transmitting this command.

ESC FF

[Name] Print data in page mode

[Format] ASCII ESC FF

Hex 1B 0C

Decimal 27 12

[Description] • In page mode, prints all the data in the print buffer collectively.

ESC SP n

[Name] Set right-side character spacing

[Format] ASCII ESC SP n

Hex 1B 20 n

Decimal 27 32 n

[Range] $0 \leq n \leq 255$

[Default] $n = 0$

[Description] • Sets the right-side character spacing to $[n \times (\text{horizontal or vertical motion unit})]$.

[Note] • The maximum right-side spacing is 31.875 mm {203/180"}.

ESC ! n

[Name] Select print mode(s)

[Format] ASCII ESC ! n

Hex 1B 21 n

Decimal 27 33 n

[Range] $0 \leq n \leq 255$

[Default] $n = 0$

[Description] • Selects the character font and styles (emphasized, double-height, double-width, and underlined) together.

(n) Bit	Off/On	Hex	Decimal	Function
0	Off	00	0	Character font A (12 × 24) selected.
	On	01	1	Character font B (9 × 17) selected.
1, 2	Off	00	0	Reserved.
3	Off	00	0	Emphasized mode is turned off.
	On	08	8	Emphasized mode is turned on.
4	Off	00	0	Double-height canceled.
	On	10	16	Double-height selected.
5	Off	00	0	Double-width canceled.
	On	20	32	Double-width selected.
6	Off	00	0	Reserved.
7	Off	00	0	Underline mode is turned off.
	On	80	128	Underline mode is turned on.

ESC \$ n L n H

[Name] Set absolute print position

[Format] ASCII ESC \$ n L n H

Hex 1B 24 n L n H

Decimal 27 36 n L n H

[Range] $0 \leq (n L + n H \times 256) \leq 65535$ ($0 \leq n L \leq 255, 0 \leq n H \leq 255$)

[Description] • Moves the print position to $[(n L + n H \times 256) \times (\text{horizontal or vertical motion unit})]$ from the left edge of the print area.

ESC % n

[Name] Select/cancel user-defined character set

[Format] ASCII ESC % n

Hex 1B 25 n

Decimal 27 37 n

[Range] $0 \leq n \leq 255$

[Default] $n = 0$

[Description] • Selects or cancels the user-defined character set.

- When the LSB of n is 0, the user-defined character set is canceled.
- When the LSB of n is 1, the user-defined character set is selected.

ESC & y c1 c2 [x1 d1...d(y × x1)]...[xk d1...d(y × xk)]

[Name] Define user-defined characters

[Format] ASCII ESC & y c1 c2 [x1 d1...d(y × x1)]...[xk d1...d(y × xk)]

Hex 1B 26 y c1 c2 [x1 d1...d(y × x1)]...[xk d1...d(y × xk)]

Decimal 27 38 y c1 c2 [x1 d1...d(y × x1)]...[xk d1...d(y × xk)]

[Range] $y = 3$

$32 \leq c1 \leq c2 \leq 126$

$0 \leq x \leq 12$ [when Font A (12 × 24) is selected]

$0 \leq x \leq 9$ [when Font B (9 × 17) is selected]

$0 \leq d \leq 255$

$k = c2 - c1 + 1$

[Description] • Defines the user-defined character pattern for the specified character codes.

- y specifies the number of bytes in the vertical direction.
- $c1$ specifies the beginning character code for the definition, and $c2$ specifies the final code.
- x specifies the number of dots in the horizontal direction from the left edge.
- d specifies the defined data (column format).

[Note] • User-defined characters and a downloaded bit image (GS *) cannot be defined

simultaneously. When this command is executed, the downloaded bit image is deleted.

ESC * m nL n H d1...dk

[Name] Select bit-image mode

[Format] ASCII ESC * m nL n H d1...dk

Hex 1B 2A m nL n H d1...dk

Decimal 27 42 m nL n H d1...dk

[Range] $m = 0, 1, 32, 33$

$1 \leq (nL + nH \times 256) \leq 2047$ ($0 \leq nL \leq 255, 0 \leq nH \leq 7$)

$$0 \leq d \leq 255$$

$$k = nL + nH \times 256 \text{ [when } m = 0, 1]$$

$$k = (nL + nH \times 256) \times 3 \text{ [when } m = 32, 33]$$

[Description] • Stores the bit image data in the print buffer using the bit image mode specified by *m*.

<i>m</i>	Bit image mode	Vertical direction	Horizontal direction
0	8-dot single-density	60dip	101dip
1	8-dot double-density	68dip	203dip
32	24-dot single-density	203dip	101dip
33	24-dot double-density	203dip	203dip

- *nL*, *nH* specify the number of dots of the image data in the horizontal direction as (*nL* + *nH* × 256).
- *d* specifies the bit image data (column format).

ESC – *n*

[Name] Turn underline mode on/off

[Format] ASCII ESC – *n*

Hex 1B 2D *n*

Decimal 27 45 *n*

[Range] $0 \leq n \leq 2, 48 \leq n \leq 50$

[Default] *n* = 0

[Description] • Turns underline mode on or off.

<i>n</i>	Function
0, 48	Turns off underline mode.
1, 49	Turns on underline mode, set at 1-dot width.
2, 50	Turns on underline mode, set at 2-dot width.

ESC 2

[Name] Select default line spacing

[Format] ASCII ESC 2

Hex 1B 32

Decimal 27 50

[Description] • Sets the line spacing to approximately 3.75 mm {1/6"}.

ESC 3 n

[Name] Set line spacing

[Format] ASCII ESC 3 n

Hex 1B 33 n

Decimal 27 51 n

[Range] $0 \leq n \leq 255$

[Default] Equivalent to approximately 4.23 mm {1/6"}.

[Description] • Sets the line spacing to $[n \times (\text{vertical or horizontal motion unit})]$.

[Note] • The maximum is 1016 mm {40"}.

ESC = n

[Name] Select peripheral device

[Format] ASCII ESC = n

Hex 1B 3D n

Decimal 27 61 n

[Range] $0 \leq n \leq 255$

[Default] $n = 1$

[Description] • Selects the device to which the host computer transmits data.

<i>n</i>	Function
1, 3	Enables printer.
2	Disables printer.

- When the printer is disabled ($n = 2$), all data except this command and the real-time commands are ignored.

ESC ? n

[Name] Cancel user-defined characters

[Format] ASCII ESC ? n

Hex 1B 3F n

Decimal 27 63 n

[Range] $32 \leq n \leq 126$

[Description] • Deletes the user-defined character pattern specified by character code n .

ESC @

[Name] Initialize printer

[Format] ASCII ESC @

Hex 1B 40

Decimal 27 64

[Description] • Clears the data in the print buffer and resets the printer modes to the modes that were in effect when the power was turned on.

Keeps the following data:

- Macro definition data.
- Contents stored in the NV user memory.
- Contents defined for the NV graphics (NV bit image).
- Maintenance counter value.
- Setting value specified with GS (E .

ESC D n1...nk NUL

[Name] Set horizontal tab positions

[Format] ASCII ESC D n1...nk NUL

Hex 1B 44 n1...nk 00

Decimal 27 68 n1...nk 0

[Range] $1 \leq n1 \leq n2 \leq \dots \leq nk \leq 255$

$0 \leq k \leq 32$

[Default] $n = 8, 16, 24, 32, 40, \dots, 232, 240, 248$

[for Font A (12 × 24) in a standard character size width]

[Description] • Sets horizontal tab positions.

- n specifies the number of digits from the setting position to the left edge of the print area.
- k is used to indicate the number of bytes set for the horizontal tab position.

ESC E n

[Name] Turn emphasized mode on/off

[Format] ASCII ESC E n

Hex 1B 45 n

Decimal 27 69 n

[Range] $0 \leq n \leq 255$

[Default] $n = 0$

[Description] • Turns emphasized mode on or off.

- When the LSB of n is 0, turns off emphasized mode.
- When the LSB of n is 1, turns on emphasized mode.

ESC G n

[Name] Turn double-strike mode on/off

[Format] ASCII ESC G n

Hex 1B 47 n

Decimal 27 71 n

[Range] $0 \leq n \leq 255$

[Default] n = 0

[Description] • Turns double-strike mode on or off.

- When the LSB of n is 0, turns off double-strike mode.
- When the LSB of n is 1, turns on double-strike mode.

ESC J n

[Name] Print and feed paper

[Format] ASCII ESC J n

Hex 1B 4A n

Decimal 27 74 n

[Range] $0 \leq n \leq 255$

[Description] • Prints the data in the print buffer and feeds the paper [n × (vertical or horizontal motion unit)].

[Note] • The maximum paper feed amount is 1016 mm {40"}.

ESC L

[Name] Select page mode

[Format] ASCII ESC L

Hex 1B 4C

Decimal 27 76

[Description] • Switches from standard mode to page mode.

ESC M n

[Name] Select character font

[Format] ASCII ESC M n

Hex 1B 4D n

Decimal 27 77 n

[Range] $n = 0, 1, 48, 49$

[Default] $n = 0$

[Description] • Selects a character font.

n	Character font
0, 48	Character font A (12 × 24)
1, 49	Character font B (9 × 17)

ESC R n

[Name] Select an international character set

[Format] ASCII ESC R n

Hex 1B 52 n

Decimal 27 82 n

[Range] $0 \leq n \leq 15$

[Default] $n = 0$ [Other than the following models]

$n = 15$ [Simplified Chinese model]

[Description] • Selects an international character set.

<i>n</i>	International character set
0	U.S.A.
1	France
2	Germany
3	U.K.
4	Denmark I
5	Sweden
6	Italy
7	Spain I
8	Japan
9	Norway
10	Denmark II
11	Spain II
12	Latin America
13	Korea
14	Slovenia / Croatia
15	China

[Reference] " International Character Sets"

ESC S

[Name] Select standard mode

[Format] ASCII ESC S

Hex 1B 53

Decimal 27 83

[Description] • Switches from page mode to standard mode.

ESC T *n*

[Name] Select print direction in page mode

[Format] ASCII ESC T *n*

Hex 1B 54 *n*

Decimal 27 84 *n*

[Range] $0 \leq n \leq 3, 48 \leq n \leq 51$

[Default] *n* = 0

[Description] • In page mode, selects the print direction and starting position.

<i>n</i>	Print direction	Starting position
0, 48	Left to right	Upper left
1, 49	Bottom to top	Lower left
2, 50	Right to left	Lower right
3, 51	Top to bottom	Upper right

ESC V *n*

[Name] Turn 90 ° clockwise rotation mode on/off

[Format] ASCII ESC V *n*

Hex 1B 56 *n*

Decimal 27 86 *n*

[Range] $0 \leq n \leq 2, 48 \leq n \leq 50$

[Default] *n* = 0

[Description] • In standard mode, turns 90° clockwise rotation mode on or off for characters.

<i>n</i>	Function
0, 48	Turns off 90° clockwise rotation mode.
1, 49 2, 50	Turns on 90° clockwise rotation mode.

ESC W *xL xH yL yH dxL dxH dyL dyH*

[Name] Set print area in page mode

[Format] ASCII ESC W *xL xH yL yH dxL dxH dyL dyH*

Hex 1B 57 *xL xH yL yH dxL dxH dyL dyH*

Decimal 27 87 *xL xH yL yH dxL dxH dyL dyH*

[Range] $0 \leq (xL + xH \times 256) \leq 65535$ ($0 \leq xL \leq 255, 0 \leq xH \leq 255$)

$0 \leq (yL + yH \times 256) \leq 65535$ ($0 \leq yL \leq 255, 0 \leq yH \leq 255$)

$1 \leq (dxL + dxH \times 256) \leq 65535$ ($0 \leq dxL \leq 255, 0 \leq dxH \leq 255$)

$1 \leq (dyL + dyH \times 256) \leq 65535$ ($0 \leq dyL \leq 255, 0 \leq dyH \leq 255$)

[Default] $(xL + xH \times 256) = 0$ ($xL = 0, xH = 0$)

$(yL + yH \times 256) = 0$ ($yL = 0, yH = 0$)

$(dxL + dxH \times 256) = 512$ ($dxL = 0, dxH = 2$) [80 mm paper width model]

$(dxL + dxH \times 256) = 360$ ($dxL = 104, dxH = 4$) [58 mm paper width model]

$(dyL + dyH \times 256) = 1662$ ($dyL = 126, dyH = 6$)

[Description] • In page mode, sets the size and the logical origin of the print area.

- xL, xH specify the horizontal logical origin as $[(xL + xH \times 256) \times (\text{horizontal motion unit})]$ from absolute origin.
- yL, yH specify the vertical logical origin as $[(yL + yH \times 256) \times (\text{vertical motion unit})]$ from absolute origin.
- dxL, dxH specify the horizontal dimension of print area as $[(dxL + dxH \times 256) \times (\text{horizontal motion unit})]$.
- dyL, dyH specify the vertical dimension of print area as $[(dyL + dyH \times 256) \times (\text{vertical motion unit})]$.

[Note] • When single-color print control is selected, the vertical dimension of the print area can be set to 207.95 mm {3324/406"} maximum.

ESC \ nL nH

[Name] Set relative print position

[Format] ASCII ESC \ nL nH

Hex 1B 5C nL nH

Decimal 27 92 nL nH

[Range] $-32768 \leq (nL + nH \times 256) \leq 32767$

- [Description] • Moves the print position to $[(nL + nH \times 256) \times (\text{horizontal or vertical motion unit})]$ from the current position.
- A positive number specifies movement to the right, and a negative number specifies movement to the left.

ESC a n

[Name] Select justification

[Format] ASCII ESC a n

Hex 1B 61 n

Decimal 27 97 n

[Range] $0 \leq n \leq 2, 48 \leq n \leq 50$

[Default] n = 0

[Description] • In standard mode, aligns all the data in one line to the selected layout.

n	Justification
0, 48	Left justification
1, 49	Centering
2, 50	Right justification

ESC c 3 n

[Name] Select paper sensor(s) to output paper-end signals

[Format] ASCII ESC c 3 n

Hex 1B 63 33 n

Decimal 27 99 51 n

[Range] $0 \leq n \leq 255$

[Default] n = 0 [when DIP switch [SW 1-3] is on.]

n = 15 [when DIP switch [SW 1-3] is off.]

[Description] • Selects whether the paper sensor(s) to output paper end signals or not when a paper end is detected.

(n) Bit	Off/On	Hex	Decimal	Function
0	Off	00	0	Disables roll paper near-end sensor.
	On	01	1	Enables roll paper near-end sensor.
1	Off	00	0	Disables roll paper near-end sensor.
	On	02	2	Enables roll paper near-end sensor.
2	Off	00	0	Disables roll paper end sensor (paper sensor).
	On	04	4	Enables roll paper end sensor (paper sensor).
3	Off	00	0	Disables roll paper end sensor (paper sensor).
	On	08	8	Enables roll paper end sensor (paper sensor).
4 - 7	Off	00	0	Reserved.

[Note] • This command is enabled only with a parallel interface model.

ESC c 4 n

[Name] Select paper sensor(s) to stop printing

[Format] ASCII ESC c 4 n

Hex 1B 63 34 n

Decimal 27 99 52 n

[Range] $0 \leq n \leq 255$

[Default] $n = 0$

[Description] • Selects the paper sensor(s) whether to use to stop printing or not when a paper end is detected.

(n) Bit	Off/On	Hex	Decimal	Function
0	Off	00	0	Roll paper near-end sensor disabled.
	On	01	1	Roll paper near-end sensor enabled.
1	Off	00	0	Roll paper near-end sensor disabled.
	On	02	2	Roll paper near-end sensor enabled.
2 - 7	Off	00	0	Reserved.

ESC c 5 n

[Name] Enable/disable panel buttons

[Format] ASCII ESC c 5 n

Hex 1B 63 35 n

Decimal 27 99 53 n

[Range] $0 \leq n \leq 255$

[Default] $n = 0$

[Description] • Enables or disables the panel buttons.

- When the LSB of n is 0, the panel buttons are enabled.
- When the LSB of n is 1, the panel buttons are disabled.

[Notes] • This command affects the FEED button.

- The FEED button is disabled regardless of the settings with this command, when the cover is open.

ESC d n

[Name] Print and feed n lines

[Format] ASCII ESC d n

Hex 1B 64 n

Decimal 27 100 n

[Range] $0 \leq n \leq 255$

[Description] • Prints the data in the print buffer and feeds the paper [n × (current line spacing)].

[Note] • The maximum paper feed amount is 1016 mm {40"}.

ESC p m t1 t2

[Name] Generate pulse

[Format] ASCII ESC p m t1 t2

Hex 1B 70 m t1 t2

Decimal 27 112 m t1 t2

[Range] m = 0, 1, 48, 49

$0 \leq t1 \leq 255$

$0 \leq t2 \leq 255$

[Description] • Outputs the pulse specified by t1 and t2 to connector pin m.

m	Connector pin
0, 48	Drawer kick-out connector pin 2.
1, 49	Drawer kick-out connector pin 5.

• t1 specifies the pulse on time as [t1 × 2 ms].

• t2 specifies the pulse off time as [t2 × 2 ms].

[Note] • Specify a value (t1 < t2) so that the off time is longer than the on time.

ESC t n

[Name] Select character code table

[Format] ASCII ESC t n

Hex 1B 74 n

Decimal 27 116 n

[Range] $0 \leq n \leq 5$; $13 \leq n \leq 21$; $n=26$; $32 \leq n \leq 34$; $n=36, 37$; $39 \leq n \leq 40$; $45 \leq n \leq 52$;

$54 \leq n \leq 66$

[Default] n = 0

[Description] • Selects page n from the character code table.

n	Character Code table	n	Character Code table
0	[PC437 (USA: Standard Europe)]	40	[ISO8859-15 (Latin9)]
1	[Katakana]	45	[WPC1250]
2	[PC850 (Multilingual)]	46	[WPC1251(Cyrillic)]
3	[PC860 (Portuguese)]	47	[WPC1253]
4	[PC863 (Canadian-French)]	48	[WPC1254]
5	[PC865 (Nordic)]	49	[WPC1255]
13	[PC857 (Turkish)]	50	[WPC1256]
14	[PC737 (Greek)]	51	[WPC1257]
15	[ISO8859-7 (Greek)]	52	[WPC1258]
16	[WPC1252]	54	[MIK(Cyrillic /Bulgarian)]
17	[PC866 (Cyrillic #2)]	55	[CP755 (East Europe , Latvian 2)]
18	[PC852 (Latin 2)]	56	[Iran]
19	[PC858 (Euro)]	57	[Iran II]
20	[KU42]	58	[Latvian]
21	[TIS11 (Thai)]	59	[ISO-8859-1 (West Europe)]
26	[TIS18 (Thai)]	60	[ISO-8859-3(Latin 3)]
32	[PC720]	61	[ISO-8859-4(Baltic)]
33	[WPC775]	62	[ISO-8859-5(Cyrillic)]
34	[PC855 (Cyrillic)]	63	[ISO-8859-6(Arabic)]
36	[PC862 (Hebrew)]	64	[ISO-8859-8(Hebrew)]
37	[PC864 (Arabic)]	65	[ISO-8859-9(Turkish)]

39	[ISO8859-2 (Latin2)]	66	[PC856]
----	----------------------	----	---------

[Notes] Page 0/page 2/page 3/page 4/page 5/ page 14/page 17/ page 18/ page 19/ page 20/ page 21/ page 26/ page 32 /page 47 supports both 12 x 24 fonts and 9 x 17 fonts.

[Reference] " Appendix A"

ESC { n

[Name] Turn upside-down print mode on/off

[Format] ASCII ESC { n

Hex 1B 7B n

Decimal 27 123 n

[Range] $0 \leq n \leq 255$

[Default] $n = 0$

[Description] • In standard mode, turns upside-down print mode on or off.

- When the LSB of n is 0, turns off upside-down print mode.
- When the LSB of n is 1, turns on upside-down print mode.

FS g 1 m a1 a2 a3 a4 nL n H d1...dk

[Name] Write to NV user memory

[Format] ASCII FS g 1 m a1 a2 a3 a4 nL n H d1...dk

Hex 1C 67 31 m a1 a2 a3 a4 nL n H d1...dk

Decimal 28 103 49 m a1 a2 a3 a4 nL n H d1...dk

[Range] $m = 0$

$0 \leq (a1 + a2 \times 256 + a3 \times 65536 + a4 \times 16777216) \leq 1023$

$(0 \leq a1 \leq 255, 0 \leq a2 \leq 3, a3 = 0, a4 = 0)$

$1 \leq (nL + nH \times 256) \leq 1024 (0 \leq nL \leq 255, 0 \leq nH \leq 4)$

$32 \leq d \leq 255$

$$k = (nL + nH \times 256)$$

The entire capacity size = 1KB.

[Description] • Stores the data (d1...dk) in the area from (a1 + a2 × 256 + a3 × 65536 + a4 × 16777216) to (nL + nH × 256) bytes in the NV user memory.

- [Notes] • Frequent write command executions by an NV memory write command may damage the NV memory. Therefore, it is recommended to limit writing the commands into the NV memory to less than 10 times a day.
- If the power is turned off or the printer is reset via an interface while this command is being executed, the printer may go into an abnormal condition. Be careful not to turn the power off or let the printer be reset via an interface while this command is being executed.
 - While processing this command, the printer may become BUSY while writing the data to the NV memory and stops receiving data. Therefore, be sure not to transmit data, including the real-time commands while the printer is BUSY.

FS g 2 m a1 a2 a3 a4 nL n H

[Name] Read from NV user memory

[Format] ASCII FS g 2 m a1 a2 a3 a4 nL n H

Hex 1C 67 32 m a1 a2 a3 a4 nL n H

Decimal 28 103 50 m a1 a2 a3 a4 nL n H

[Range] m = 0

$$0 \leq (a1 + a2 \times 256 + a3 \times 65536 + a4 \times 16777216) \leq 1023$$

$$(0 \leq a1 \leq 255, 0 \leq a2 \leq 3, a3 = 0, a4 = 0)$$

$$1 \leq (nL + nH \times 256) \leq 80 \quad (1 \leq nL \leq 80, nH = 0)$$

[Description] • Transmits the data in the area from (a1 + a2 × 256 + a3 × 65536 + a4 × 16777216) to (nL + nH × 256) bytes in the NV user memory.

- [Note] • When this command is transmitted, do not transmit the subsequent data until the status is received.

GS ! n

[Name] Select character size

[Format] ASCII GS ! n

Hex 1D 21 n

Decimal 29 33 n

[Range] $0 \leq n \leq 7, 16 \leq n \leq 23, 32 \leq n \leq 39, 48 \leq n \leq 55, 64 \leq n \leq 71,$

$80 \leq n \leq 87, 96 \leq n \leq 103, 112 \leq n \leq 119$

$(1 \leq \text{Enlargement in vertical direction} \leq 8, 1 \leq \text{Enlargement in horizontal direction} \leq 8)$

[Default] n = 0

[Description] • Selects character size (height magnification and width magnification).

(n) Bit	Off/On	Hex	Decimal	Function
0 - 2	See table [Height magnification].			Selects the height magnification.
3	Off	00	0	Reserved.
4 - 6	See table [Width magnification].			Selects the width magnification.
7	Off	00	0	Reserved.

[Height magnification]

Hex	Decimal	Enlargement
00	0	1 time (standard)
01	1	2 times
02	2	3 times
03	3	4 times
04	4	5 times
05	5	6 times
06	6	7 times
07	7	8 times

[Width magnification]

Hex	Decimal	Enlargement
00	0	1 time (standard)
10	16	2 times
20	32	3 times
30	48	4 times
40	64	5 times
50	80	6 times
60	96	7 times
70	112	8 times

GS \$ nL n H

[Name] Set absolute vertical print position in page mode

[Format] ASCII GS \$ nL n H

Hex 1D 24 nL n H

Decimal 29 36 nL n H

[Range] $0 \leq (nL + nH \times 256) \leq 65535$ ($0 \leq nL \leq 255, 0 \leq nH \leq 255$)

[Description] • In page mode, moves the vertical print position to $[(n L + n H \times 256) \times (\text{vertical or horizontal motion unit})]$ from the starting position set with ESC T .

GS (A pL p H n m

[Name] Execute test print

[Format] ASCII GS (A p L p H n m

Hex 1D 28 41 p L p H n m

Decimal 29 40 65 p L p H n m

[Range] $(p L + p H \times 256) = 2$ ($p L = 2, p H = 0$)

$0 \leq n \leq 2, 48 \leq n \leq 50$

$1 \leq m \leq 3, 49 \leq m \leq 51$

[Description] • Executes a specified test print.

- p L , p H specify $(p L + p H \times 256)$ as the number of bytes after p H (n and m).
- n specifies the paper used for the test print.

<i>n</i>	Paper source
0, 48	Basic sheet (roll paper)
1, 49 2, 50	Roll paper

• m specifies a test pattern.

<i>m</i>	Test pattern
1, 49	Hexadecimal dump print
2, 50	Printer status print
3, 51	Rolling pattern print

[Notes] • The printer executes a software reset after processing this command.

- Clears the receive and print buffers.
- Resets all setting values in RAM (the print area, the character styles, and others) that were in effect at power on. (The data in the NV memory is not reset.)

GS (D pL p H m [a1 b1]...[ak bk]

[Name] Enable/disable real-time command

[Format] ASCII GS (D p L p H m [a1 b1]...[ak bk]

Hex 1D 28 44 p L p H m [a1 b1]...[ak bk]

Decimal 29 40 68 p L p H m [a1 b1]...[ak bk]

[Range] $3 \leq (pL + pH \times 256) \leq 65535$ ($0 \leq pL \leq 255, 0 \leq pH \leq 255$)

$m = 20$

$a = 1, 2$

$b = 0, 1, 48, 49$

[Default] $b = 1$ [when $a = 1$]

$b = 0$ [when $a = 2$]

[Description] • Enables or disables the real-time command specified by a .

- pL , pH specify $(pL + pH \times 256)$ as the number of bytes after pH (m and $[a1 b1]...[ak bk]$).

<i>a</i>	<i>b</i>	Function
1	0, 48	DLE DC4 <i>fn m t</i> (<i>fn</i> = 1): Not processed (disabled).
	1, 49	DLE DC4 <i>fn m t</i> (<i>fn</i> = 1): Processed (enabled).
2	0, 48	DLE DC4 <i>fn a b</i> (<i>fn</i> = 2): Not processed (disabled).
	1, 49	DLE DC4 <i>fn a b</i> (<i>fn</i> = 2): Processed (enabled).

[Note] • If graphics data includes a data string matching DLE DC4 ($fn = 1$ or 2), it is recommended to use this command in advance to disable the real-time commands.

GS (L pL p H m fn [parameters]

GS 8 L p1 p2 p3 p4 m fn [parameters]

[Name] Set graphics data

[Format] ASCII GS (L p L p H m fn [parameters]

Hex 1D 28 4C p L p H m fn [parameters]

Decimal 29 40 76 p L p H m fn [parameters]

ASCII GS 8 L p1 p2 p3 p4 m fn [parameters]

Hex 1D 38 4C p1 p2 p3 p4 m fn [parameters]

Decimal 29 56 76 p1 p2 p3 p4 m fn [parameters]

- In the description below, only GS (L is used for explanation.
- Note that GS (L and GS 8 L have the same function.

- If the [parameters] in the Format column in the table below exceed 65533 bytes, use GS 8 L.
- The only differences between GS (L and GS 8 L are as listed below. The format for GS 8 L is not provided in the following descriptions; however, [Range], [Default], [Description], and [Notes] for parameters other than those listed in the table below are the same as for GS (L .

<Parameters specifying the number of parameters after p H or p4>

Command	Parameters	Structure	Maximum value
GS (L	pL, pH	2 bytes	65,535
GS 8 L	p1, p2, p3, p4	4 bytes	4,294,967,295

- [Description]
- Processes graphics data.
 - p L , p H specify (p L + p H × 256) as the number of bytes after p H (m, fn , and [parameters]).
 - fn specifies the function.
 - [parameters] specify the process of each function.

fn	Format	Function No.	Function name
0, 48	GS (L pL pH m fn	48	Transmit the NV graphics memory capacity
2, 50	GS (L pL pH m fn	50	Print the graphics data in the print buffer
3, 51	GS (L pL pH m fn	51	Transmit the remaining capacity of the NV graphics memory
64	GS (L pL pH m fn d1 d2	64	Transmit the key code list for defined NV graphics
65	GS (L pL pH m fn d1 d2 d3	65	Delete all NV graphics data
66	GS (L pL pH m fn kc1 kc2	66	Delete the specified NV graphics data
67	GS (L pL pH m fn a kc1 kc2 b xL xH yL yH [c d1...dk]1... [c d1...dk]b	67	Define the NV graphics data (raster format)
69	GS (L pL pH m fn kc1 kc2 x y	69	Print the specified NV graphics data
112	GS (L pL pH m fn a bx by c xL xH yL yH d1...dk	112	Store the graphics data in the print buffer (raster format)

- [Notes]
- Frequent write command executions by an NV memory write command may damage the NV memory. Therefore, it is recommended to limit writing the commands into the NV memory to less than 10 times a day.
 - If the power is turned off or the printer is reset via an interface while this command is being executed, the printer may go into an abnormal condition. Be careful not to turn the power off or let the printer be reset via an interface while this command is being executed.
 - While processing this command, the printer is BUSY while writing the data to the NV

memory and stops receiving data. Therefore, be sure not to transmit data, including the real-time commands, while the printer is BUSY.

- When <Function 48, 51, or 64> is transmitted, do not transmit the subsequent data until the status is received. ESC/POS Handshaking Protocol procedures is required when using <Function 64>.

<Function 48> GS (L p L p H m fn (fn = 0, 48)

[Name] Transmit the NV graphics memory capacity

[Format] ASCII GS (L p L p H m fn

Hex 1D 28 4C p L p H m fn

Decimal 29 40 76 p L p H m fn

[Range] (p L + p H × 256) = 2 (p L = 2, p H = 0)

m = 48

fn = 0, 48

[Description] • Transmits the entire capacity of the NV graphics area (number of bytes in the NV graphics area).

<Function 50> GS (L pL p H m fn (fn = 2, 50)

[Name] Print the graphics data in the print buffer

[Format] ASCII GS (L p L p H m fn

Hex 1D 28 4C p L p H m fn

Decimal 29 40 76 p L p H m fn

[Range] (p L + p H × 256) = 2 (p L = 2, p H = 0)

m = 48

fn = 2, 50

[Description] • Prints the buffered graphics data stored by processing of GS (L <Function 112>.

<Function 51> GS (L pL p H m fn (fn = 3, 51)

[Name] Transmit the remaining capacity of the NV graphics memory

[Format] ASCII GS (L pL p H m fn

Hex 1D 28 4C pL p H m fn

Decimal 29 40 76 pL p H m fn

[Range] $(pL + pH \times 256) = 2$ ($pL = 2, pH = 0$)

m = 48

fn = 3, 51

[Description] • Transmits the number of bytes of remaining memory (unused area) in the NV graphics area.

<Function 64> GS (L pL p H m fn d1 d2 (fn = 64)

[Name] Transmit the key code list for defined NV graphics

[Format] ASCII GS (L pL p H m fn d1 d2

Hex 1D 28 4C pL p H m fn d1 d2

Decimal 29 40 76 pL p H m fn d1 d2

[Range] $(pL + pH \times 256) = 4$ ($pL = 4, pH = 0$)

m = 48

fn = 64

d1 = 75

d2 = 67

[Description] • Transmits the key code list for defined NV graphics.

<Function 65> GS (L pL p H m fn d1 d2 d3 (fn = 65)

[Name] Delete all NV graphics data

[Format] ASCII GS (L pL p H m fn d1 d2 d3

Hex 1D 28 4C pL p H m fn d1 d2 d3

Decimal 29 40 76 pL p H m fn d1 d2 d3

[Range] ($pL + pH \times 256$) = 5 ($pL = 5, pH = 0$)

$m = 48$

$fn = 65$

$d1 = 67$

$d2 = 76$

$d3 = 82$

[Description] • Deletes all NV graphics data.

<Function 66> GS (L pL p H m fn kc1 kc2 (fn = 66)

[Name] Delete the specified NV graphics data

[Format] ASCII GS (L pL p H m fn kc1 kc2

Hex 1D 28 4C pL p H m fn kc1 kc2

Decimal 29 40 76 pL p H m fn kc1 kc2

[Range] ($pL + pH \times 256$) = 4 ($pL = 4, pH = 0$)

$m = 48$

$fn = 66$

$32 \leq kc1 \leq 126$

$32 \leq kc2 \leq 126$

[Description] • Deletes the NV graphics data defined by the key codes (kc1 and kc2).

<Function 67> GS (L pL p H m fn a kc1 kc2 b x L x H y L y H [c d1...dk]1...[c d1...dk]b (fn = 67)

[Name] Define the NV graphics data (raster format)

[Format] ASCII GS (L pL p H m fn a kc1 kc2 b x L x H y L y H [c d1...dk]1...[c d1...dk]b

Hex 1D 28 4C pL p H m fn a kc1 kc2 b x L x H y L y H [c d1...dk]1...[c d1...dk]b

Decimal 29 40 76 pL p H m fn a kc1 kc2 b x L x H y L y H [c d1...dk]1...[c d1...dk]b

[Range] (pL , pH) for GS (L :

$12 \leq (pL + pH \times 256) \leq 65535$ ($0 \leq pL \leq 255, 0 \leq pH \leq 255$)

(p1, p2, p3, p4) for GS 8 L:

$$12 \leq (p1 + p2 \times 256 + p3 \times 65536 + p4 \times 16777216) \leq 4294967295$$

$$(0 \leq p1 \leq 255, 0 \leq p2 \leq 255, 0 \leq p3 \leq 255, 0 \leq p4 \leq 255)$$

Common parameters for GS (L and GS 8 L:

$$m = 48$$

$$fn = 67$$

$$a = 48$$

$$32 \leq kc1 \leq 126$$

$$32 \leq kc2 \leq 126$$

$$b = 1 \quad [\text{when single-color print control is selected}]$$

$$1 \leq (xL + xH \times 256) \leq 8192 \quad (0 \leq xL \leq 255, 0 \leq xH \leq 32)$$

$$1 \leq (yL + yH \times 256) \leq 2304 \quad (0 \leq yL \leq 255, 0 \leq yH \leq 9)$$

$$c = 49 \quad [\text{when single-color print control is selected}]$$

$$0 \leq d \leq 255$$

$$k = (\text{int}((xL + xH \times 256) + 7) / 8) \times (yL + yH \times 256)$$

The entire capacity size = 256 KB maximum.

[Description] • Defines the NV graphics data (raster format) as a record specified by the key codes (kc1 , kc2) in the NV graphics area.

- b specifies the number of the color of the defined data.
- x L , x H specify the number of dots in the horizontal direction as (x L + x H ×256).
- y L , y H specify the number of dots in the vertical direction as (y L + y H × 256).
- c specifies the color of the defined data.

c	Defined data color (*)
49	Color 1

(*) Color 1 means black (a high level of energy) in the specified two-color thermal paper.

- d specifies the defined data (raster format).

[Notes] • In cases where there is sufficient capacity is not available for storing NV graphics data specified by (x L + x H × 256) and (y L + y H × 256), this function is ignored.

- The number of items of NV graphics registered should be within 50 to shorten the execution time of this function. The execution time is 60 seconds or less when the number of items registered is within 50. The execution time for 100 items is 120 seconds or less.
- The [data value (k) + control information data value (24 bytes)] area of the NV graphics data domain is used when this function is executed.
- NV graphics and NV bit image (FS q) cannot be defined simultaneously. When this function is executed, all NV bit images are deleted.

<Function 69> GS (L p L p H m fn kc1 kc2 x y (fn = 69)

[Name] Print the specified NV graphics data

[Format] ASCII GS (L p L p H m fn kc1 kc2 x y

Hex 1D 28 4C p L p H m fn kc1 kc2 x y

Decimal 29 40 76 p L p H m fn kc1 kc2 x y

[Range] (p L + p H × 256) = 6 (p L = 6, p H = 0)

m = 48

fn = 69

32 ≤ kc1 ≤ 126

32 ≤ kc2 ≤ 126

x = 1, 2

y = 1, 2

[Description] • Prints the NV graphics data defined by the key codes (kc1 and kc2).

- The graphics data is enlarged by x and y in the horizontal and vertical directions.

x,y	Vertical direction	Horizontal direction
1	203dip	203dip
2	101dip	101dip

<Function 112> GS (L pL p H m fn a bx by c xL x H y L y H d1...dk (fn = 112)

[Name] Store the graphics data in the print buffer (raster format).

[Format]

ASCII	GS (L	pL pH m fn a bx by c xL xH yL yH d1...dk
Hex	1D 28 4C	pL pH 30 70 30 bx by c xL xH yL yH d1...dk
Decimal	29 40 76	pL pH 48 112 48 bx by c xL xH yL yH d1...dk
ASCII	GS 8 L	p1 p2 p3 p4 m fn a bx by c xL xH yL yH d1...dk
Hex	1D 38 4C	p1 p2 p3 p4 30 70 30 bx by c xL xH yL yH d1...dk
Decimal	29 56 76	p1 p2 p3 p4 48 112 48 bx by c xL xH yL yH d1...dk

[Range] $11 \leq (\mathbf{pL} + \mathbf{pH} \times 256) \leq 65535$ ($0 \leq \mathbf{pL} \leq 255$, $0 \leq \mathbf{pH} \leq 255$)

[When using **GS 8 L**: $11 \leq (\mathbf{p1} + \mathbf{p2} \times 256 + \mathbf{p3} \times 65536 + \mathbf{p4} \times 16777216) \leq 4294967295$]

m = 48, **fn** = 112, **a** = 48, **a** = 52

$0 \leq \mathbf{d} \leq 255$

k = $(\text{int}((\mathbf{xL} + \mathbf{xH} \times 256) + 7)/8) \times (\mathbf{yL} + \mathbf{yH} \times 256)$

bx = 1, 2

by = 1, 2

c = 49 (when single-color printing control is selected)

c = 49, 50 (when two-color printing control is selected)

$1 \leq (\mathbf{xL} + \mathbf{xH} \times 256) \leq 2047$ ($0 \leq \mathbf{xL} \leq 255$, $0 \leq \mathbf{xH} \leq 7$)

[When single-color printing control is selected]

(**by** = 1): $1 \leq (\mathbf{yL} + \mathbf{yH} \times 256) \leq 1662$ ($0 \leq \mathbf{yL} \leq 255$, $0 \leq \mathbf{yH} \leq 6$)

(**by** = 2): $1 \leq (\mathbf{yL} + \mathbf{yH} \times 256) \leq 831$ ($0 \leq \mathbf{yL} \leq 255$, $0 \leq \mathbf{yH} \leq 3$)

[When two-color printing control is selected]

(**by** = 1): $1 \leq (\mathbf{yL} + \mathbf{yH} \times 256) \leq 831$ ($0 \leq \mathbf{yL} \leq 255$, $0 \leq \mathbf{yH} \leq 3$)

(**by** = 2): $1 \leq (\mathbf{yL} + \mathbf{yH} \times 256) \leq 415$ ($0 \leq \mathbf{yL} \leq 255$, $\mathbf{yH} = 0, 1$)

GS (k pL p H cn fn [parameters]

[Name] Set up and print symbol

- [Description]
- Processes the data for symbols.
 - p L , p H specify (p L + p H × 256) as the number of bytes after p H (cn, fn , and [parameters]).
 - cn specifies the type of symbol.
 - fn specifies the function.
 - [parameters] specify the process of each function

cn	Type of Symbol
48	PDF417 (two-dimensional codes)
49	QR Code (two-dimensional codes)

cn	fn	Format	Function No.	Function name
48	65	GS (k pL p H cn fn n	065	PDF417: Set the number of columns in the data region.
	66	GS (k pL p H cn fn n	066	PDF417: Set the number of rows.
	67	GS (k pL p H cn fn n	067	PDF417: Set the width of the module.
	68	GS (k pL p H cn fn n	068	PDF417: Set the row height.
	69	GS (k pL p H cn fn m n	069	PDF417: Set the error correction level.
	70	GS (k pL p H cn fn m	070	PDF417: Select the options.
	80	GS (k pL p H cn fn m d1...dk	080	PDF417: Store the data in the symbol storage area.
	81	GS (k pL p H cn fn m	081	PDF417: Print the symbol data in the symbol storage area.
	82	GS (k pL p H cn fn m	082	PDF417: Transmit the size information of the symbol data in the symbol storage area.
49	65	GS (k pL p H cn fn n1 n2	165	QR Code: Select the model.
	67	GS (k pL p H cn fn n	167	QR Code: Set the size of module.
	69	GS (k pL p H cn fn n	169	QR Code: Select the error correction level.
	80	GS (k pL p H cn fn m d1...dk	180	QR Code: Store the data into the symbol storage area.
	81	GS (k pL p H cn fn m	181	QR Code: Print the symbol data in the symbol storage area.
	82	GS (k pL p H cn fn m	182	QR Code: Transmit the size information of the symbol data in the symbol storage area.

- "Symbol data" means the data received with <Function 080 or 180> before encoding.
- "Symbol storage area" means the area where the data received with <Function 080 or 180> before encoding is stored.

[Notes] • When <Function 082 or 182> is transmitted, do not transmit the subsequent data until the status is received.

- PDF417 (cn=48) is supported in ANK model.

[Reference] APPENDIX H, APPENDIX I

<Function 065> GS (k pL p H cn fn n (cn = 48, fn = 65)

[Name] PDF417: Set the number of columns in the data region

[Format] ASCII GS (k p L p H cn fn n

Hex 1D 28 6B p L p H cn fn n

Decimal 29 40 107 p L p H cn fn n

[Range] (p L + p H × 256) = 3 (p L = 3, p H = 0)

cn = 48

fn = 65

0 ≤ n ≤ 30

[Default] n = 0

[Description] • Sets the number of columns in the data region for PDF417.

- When n = 0, specifies automatic processing. In this case, the number of columns in the data region is calculated from the number of codewords or the range of the print area.

- When n ≠ 0, sets the number of columns in the data region to n codewords:

[Notes] • The following data is not included in the number of columns.

- Start pattern and stop pattern
- Left-row indicator codewords and right-row indicator codewords

<Function 066> GS (k pL p H cn fn n (cn = 48, fn = 66)

[Name] PDF417: Set the number of rows

[Format] ASCII GS (k p L p H cn fn n

Hex 1D 28 6B p L p H cn fn n

Decimal 29 40 107 p L p H cn fn n

[Range] (p L + p H × 256) = 3 (p L = 3, p H = 0)

cn = 48

fn = 66

n = 0, 3 ≤ n ≤ 90

[Default] n = 0

[Description] • Sets the number of rows for PDF417.

- When n = 0, specifies automatic processing. In this case, the number of rows in the data region is calculated from the number of codewords or the range of the print area.
- When n ≠ 0, sets the number of rows to n rows.

<Function 067> GS (k p L p H cn fn n (cn = 48, fn = 67)

[Name] PDF417: Set the width of the module

[Format] ASCII GS (k p L p H cn fn n

Hex 1D 28 6B p L p H cn fn n

Decimal 29 40 107 p L p H cn fn n

[Range] (p L + p H × 256) = 3 (p L = 3, p H = 0)

cn = 48

fn = 67

2 ≤ n ≤ 8

[Default] n = 3

[Description] • Sets the width of the module for PDF417 to n dots.

<Function 068> GS (k pL p H cn fn n (cn = 48, fn = 68)

[Name] PDF417: Set the row height

[Format] ASCII GS (k p L p H cn fn n

Hex 1D 28 6B p L p H cn fn n

Decimal 29 40 107 p L p H cn fn n

[Range] (p L + p H × 256) = 3 (p L = 3, p H = 0)

cn = 48

fn = 68

2 ≤ n ≤ 8

[Default] n = 3

[Description] • Sets the row height for PDF417 to [n × (the width of the module)].

<Function 069> GS (k pL p H cn fn m n (cn = 48, fn = 69)

[Name] PDF417: Set the error correction level

[Format] ASCII GS (k p L p H cn fn m n

Hex 1D 28 6B p L p H cn fn m n

Decimal 29 40 107 p L p H cn fn m n

[Range] (p L + p H × 256) = 4 (p L = 4, p H = 0)

cn = 48

fn = 69

m = 48, 49

48 ≤ n ≤ 56 [when m = 48]

1 ≤ n ≤ 40 [when m = 49]

[Default] m = 49, n = 1

[Description] • Sets the error correction level for PDF417.

- When m = 48, the error correction level is set by the "Level Setting" and the error correction level set by "Ratio Setting" is canceled. The number of error correction

codewords are as follows:

<i>n</i>	Function	Number of error correction codewords
48	Select error correction level 0	2
49	Select error correction level 1	4
50	Select error correction level 2	8
51	Select error correction level 3	16
52	Select error correction level 4	32
53	Select error correction level 5	64
54	Select error correction level 6	128
55	Select error correction level 7	256
56	Select error correction level 8	512

- When $m = 49$, the error correction level is set by the "Ratio Setting" to the level indicated by the number for encoded data, and the error correction level set by the "Level Setting" is canceled. The rate is set to $[n \times 10\%]$.

The error correction levels in the following table are determined by the calculation $[\text{Data codeword} \times n \times 0.1 = (A)]$ (Fractions of 0.5 and over are rounded up, and others are truncated.)

Result (A)	Use the error correction level	Number of error correction codeword
0 to 3	Error correction level 1	4
4 to 10	Error correction level 2	8
11 to 20	Error correction level 3	16
21 to 45	Error correction level 4	32
46 to 100	Error correction level 5	64
101 to 200	Error correction level 6	128
201 to 400	Error correction level 7	256
401 or more	Error correction level 8	512

<Function 070> GS (k pL p H cn fn m (cn = 48, fn = 70)

[Name] PDF417: Select the options

[Format] ASCII GS (k p L p H cn fn m

Hex 1D 28 6B p L p H cn fn m

Decimal 29 40 107 p L p H cn fn m

[Range] (p L + p H $\times$ 256) = 3 (p L = 3, p H = 0)

cn = 48

fn = 70

m = 0, 1

[Default] m = 0

[Description] • Selects the options for PDF417.

<i>m</i>	Function
0	Selects the standard PDF417.
1	Selects the truncated PDF417.

<Function 080> GS (k pL p H cn fn m d1 ...dk (cn = 48, fn = 80)

[Name] PDF417: Store the data in the symbol storage area

[Format] ASCII GS (k p L p H cn fn m d1...dk

Hex 1D 28 6B p L p H cn fn m d1...dk

Decimal 29 40 107 p L p H cn fn m d1...dk

[Range] $4 \leq (p L + p H \times 256) \leq 65535$ ($0 \leq p L \leq 255, 0 \leq p H \leq 255$)

cn = 48

fn = 80

m = 48

$0 \leq d \leq 255$

$k = (p L + p H \times 256) - 3$

[Description] • Stores the PDF417 symbol data (d1...dk) in the symbol storage area.

<Function 081> GS (k pL p H cn fn m (cn = 48, fn = 81)

[Name] PDF417: Print the symbol data in the symbol storage area

[Format] ASCII GS (k p L p H cn fn m

Hex 1D 28 6B p L p H cn fn m

Decimal 29 40 107 p L p H cn fn m

[Range] $(p L + p H \times 256) = 3$ ($p L = 3, p H = 0$)

cn = 48

fn = 81

m = 48

[Description] • Encodes and prints the PDF417 symbol data in the symbol storage area with GS (k <Function 080>.

- [Notes] • User must secure the quiet zone (left, right, upward, and downward space areas defined by the PDF417 symbol specifications) for PDF417 printing.
- In standard mode, symbols higher than 831 dots cannot be printed with this printer.

<Function 082> GS (k p L p H cn fn m (cn = 48, fn = 82)

[Name] PDF417: Transmit the size information of the symbol data in the symbol storage area

[Format] ASCII GS (k p L p H cn fn m

Hex 1D 28 6B p L p H cn fn m

Decimal 29 40 107 p L p H cn fn m

[Range] (p L + p H × 256) = 3 (p L = 3, p H = 0)

cn = 48

fn = 82

m = 48

[Description] • Transmits the size information for the encoded PDF417 symbol data in the symbol storage area with GS (k <Function 080>.

- [Notes] • This function does not print.
- The size information does not include the quiet zone (left, right, upward, and downward space areas defined by the PDF417 symbol specifications).

<Function 165> GS (k p L p H cn fn n1 n2 (cn = 49, fn = 65)

[Name] QR Code: Select the model

[Format] ASCII GS (k p L p H cn fn n1 n2

Hex 1D 28 6B p L p H cn fn n1 n2

Decimal 29 40 107 p L p H cn fn n1 n2

[Range] (p L + p H × 256) = 4 (p L = 4, p H = 0)

cn = 49

fn = 65

n1 = 49, 50

n2 = 0

[Default] n1 = 50, n2 = 0

[Description] • Selects the model for QR Code.

n1	Function
49	Selects model 1 conversion processing.
50	Selects model 2 conversion processing.

<Function 167> GS (k p L p H cn fn n (cn = 49, fn = 67)

[Name] QR Code: Set the size of module

[Format] ASCII GS (k p L p H cn fn n

Hex 1D 28 6B p L p H cn fn n

Decimal 29 40 107 p L p H cn fn n

[Range] (p L + p H × 256) = 3 (p L = 3, p H = 0)

cn = 49

fn = 67

1 ≤ n ≤ 16

[Default] n = 3

[Description] • Sets the size of the module for QR Code to n dots.

<Function 169> GS (k p L p H cn fn n (cn = 49, fn = 69)

[Name] QR Code: Select the error correction level

[Format] ASCII GS (k p L p H cn fn n

Hex 1D 28 6B p L p H cn fn n

Decimal 29 40 107 p L p H cn fn n

[Range] (p L + p H × 256) = 3 (p L = 3, p H = 0)

cn = 49

fn = 69

48 ≤ n ≤ 51

[Default] n = 48

[Description] • Selects the error correction level for QR Code.

<i>n</i>	Function	Reference: Approx. figure of recovery
48	Select error correction level L	7 %
49	Select error correction level M	15 %
50	Select error correction level Q	25 %
51	Select error correction level H	30 %

<Function 180> GS (k pL p H cn fn m d1 ...dk (cn = 49, fn = 80)

[Name] QR Code: Store the data in the symbol storage area

[Format] ASCII GS (k p L p H cn fn m d1...dk

Hex 1D 28 6B p L p H cn fn m d1...dk

Decimal 29 40 107 p L p H cn fn m d1...dk

[Range] $4 \leq (pL + pH \times 256) \leq 7092$ ($0 \leq pL \leq 255, 0 \leq pH \leq 27$)

cn = 49

fn = 80

m = 48

$0 \leq d \leq 255$

$k = (pL + pH \times 256) - 3$

[Description] • Stores the QR Code symbol data (d1...dk) into the symbol storage area.

<Function 181> GS (k pL p H cn fn m (cn = 49, fn = 81)

[Name] QR Code: Print the symbol data in the symbol storage area

[Format] ASCII GS (k p L p H cn fn m

Hex 1D 28 6B p L p H cn fn m

Decimal 29 40 107 p L p H cn fn m

[Range] $(pL + pH \times 256) = 3$ ($pL = 3, pH = 0$)

cn = 49

fn = 81

m = 48

[Description] • Encodes and prints the QR Code symbol data in the symbol storage area with GS

(k <Function 180>.

[Note] • User must secure the quiet zone (left, right, upward, and downward space areas defined by the QR Code symbol specifications) for QR Code printing.

<Function 182> GS (k p L p H cn fn m (cn = 49, fn = 82)

[Name] QR Code: Transmit the size information of the symbol data in the symbol storage area

[Format] ASCII GS (k p L p H cn fn m

Hex 1D 28 6B p L p H cn fn m

Decimal 29 40 107 p L p H cn fn m

[Range] (p L + p H × 256) = 3 (p L = 3, p H = 0)

cn = 49

fn = 82

m = 48

[Description] • Transmits the size information for the encoded QR Code symbol data in the symbol storage area with GS (k <Function 180>.

[Notes] • This function does not print data.
• The size information does not include the quiet zone (left, right, upward, and downward space areas defined by the QR Code symbol specifications).

GS * x y d1...dk

[Name] Define downloaded bit image

[Format] ASCII GS * x y d1...dk

Hex 1D 2A x y d1...dk

Decimal 29 42 x y d1...dk

[Range] $1 \leq x \leq 255$

$1 \leq y \leq 48$ [where $1 \leq x \times y \leq 1536$]

$0 \leq d \leq 255$

$k = x \times y \times 8$

- [Description] • Defines the downloaded bit image in the downloaded graphic area.
- x specifies the number of bytes in the horizontal direction as x bytes.
 - y specifies the number of bytes in the vertical direction as y bytes.
 - d specifies the defined data (column format).

- [Note] • A downloaded bit image and user-defined characters (ESC &) cannot be defined simultaneously. When this command is executed, all user-defined characters are deleted.

GS / m

[Name] Print downloaded bit image

[Format] ASCII GS / m

Hex 1D 2F m

Decimal 29 47 m

[Range] $0 \leq m \leq 3, 48 \leq m \leq 51$

- [Description] • Prints downloaded bit image defined by GS * and using the mode specified by m.

M	mode	Vertical direction	Horizontal direction
0,48	normal	203dip	203dip
1,49	double-width	203dip	101dip
2,50	double-height	101dip	203dip

3,51	quadruple	101dip	101dip
------	-----------	--------	--------

GS :

[Name] Start/end macro definition

[Format] ASCII GS :

Hex 1D 3A

Decimal 29 58

[Description] • Starts or ends macro definition.

[Note] • The contents of the macro can be defined up to 2048 bytes.

GS B n

[Name] Turn white/black reverse print mode on/off

[Format] ASCII GS B n

Hex 1D 42 n

Decimal 29 66 n

[Range] $0 \leq n \leq 255$

[Default] $n = 0$

[Description] • Turns white/black reverse print mode on or off.

- When the LSB of n is 0, turns off white/black reverse mode.
- When the LSB of, n is 1, turns on white/black reverse mode.

GS H n

[Name] Select print posit ion of HRI characters

[Format] ASCII GS H n

Hex 1D 48 n

Decimal 29 72 n

[Range] $0 \leq n \leq 3, 48 \leq n \leq 51$

[Default] $n = 0$

[Description] • Selects the print position of HRI characters when printing a bar code.

n	Print position
0, 48	Not printed.
1, 49	Above the bar code.
2, 50	Below the bar code.
3, 51	Both above and below the bar code.

GS I n

[Name] Transmit printer ID

[Format] ASCII GS I n

Hex 1D 49 n

Decimal 29 73 n

[Range] $n = 1, 2, 49, 50$ [the printer ID]

$65 \leq n \leq 69$ [printer information B]

[Description] • Transmits the printer ID or the information of the printer specified.

• The printer IDs that can be specified are as follows:

n	Type of printer ID	ID
1,49	Printer model ID	hexadecimal : 20/ decimal32
2,50	Type ID	See table[type ID]

[type ID]

Bit	off/on	hex	decimal	contents
0	Off	00	0	Multi-byte code charactera not supported
	On	01	1	Multi-byte code characters supported
1	On	02	2	Autocutter installed (fixed)
2,3	--	--	--	Not used
4	off	00	0	Fixed
5	--	--	--	Reserved
6	--	--	--	Not used
7	关	00	0	Fixed

The information B that can be specified is as follows:

n	Type of printer information	contents
65	Firmware version	Depends on firmware version
66	Manufacturer	"HPRT"
67	Printer name	"TP801" or "TP805" or "TP806"
68	Product ID	Serial number
69	Type of mounted additional fonts	Simplified Chinese model: CHINA GB18030
		Chinese traditional model : TAIWAN BIG-5

[Note] • When this command is transmitted, do not transmit the subsequent data until the status is received.

GS L nL n H

[Name] Set left margin

[Format] ASCII GS L n L n H

Hex 1D 4C n L n H

Decimal 29 76 n L n H

[Range] $0 \leq (nL + nH \times 256) \leq 65535$ ($0 \leq nL \leq 255, 0 \leq nH \leq 255$)

[Default] $(nL + nH \times 256) = 0$ ($nL = 0, nH = 0$)

[Description] • In standard mode, sets the left margin to $[(nL + nH \times 256) \times (\text{horizontal motion unit})]$.

GS P x y

[Name] Set horizontal and vertical motion units

[Format] ASCII GS P x y

Hex 1D 50 x y

Decimal 29 80 x y

[Range] $0 \leq x \leq 255$

$0 \leq y \leq 255$

[Default] $x = 180, y = 360$

[Description] • Sets the horizontal and vertical motion units to approximately $25.4/x$ mm $\{1/x''\}$

and approximately 25.4/ y mm {1/ y "}, respectively.

- When x = 0, the default value of the horizontal motion unit is used.
- When y = 0, the default value of the vertical motion unit is used.

<A> GS V m

 GS V m n

[Name] Select cut mode and cut paper

[Format] <A> ASCII GS V m

Hex 1D 56 m

Decimal 29 86 m

 ASCII GS V m n

Hex 1D 56 m n

Decimal 29 86 m n

[Range] <A> m = 0, 1, 48, 49

 m = 65, 66, 0 ≤ n ≤ 255

[Description] • Executes paper cutting specified by m.

	m	Function
<A>	0, 48 1, 49	Cuts paper.
	65, 66	Feeds paper to (cutting position + [n × (vertical motion unit)]) and cuts the paper.

[Note] • This printer executes a partial cut (one point left uncut).

GS W nL n H

[Name] Set print area width

[Format] ASCII GS W n L n H

Hex 1D 57 n L n H

Decimal 29 87 n L n H

[Range] 0 ≤ (n L + n H × 256) ≤ 65535 (0 ≤ n L ≤ 255, 0 ≤ n H ≤ 255)

[Default] $(nL + nH \times 256) = 576$ ($nL = 40, nH = 2$) [80 mm paper width model]

$(nL + nH \times 256) = 384$ ($nL = 80, nH = 1$) [58 mm paper width model]

[Description] • In standard mode, sets the print area width to $[(nL + nH \times 256) \times$
(horizontal motion unit)].

GS \ nL nH

[Name] Set relative vertical print position in page mode

[Format] ASCII GS \ nL nH

Hex 1D 5C nL nH

Decimal 29 92 nL nH

[Range] $-32768 \leq (nL + nH \times 256) \leq 32767$

[Description] • In page mode, moves the vertical print position to $[(nL + nH \times 256) \times$
(vertical or horizontal motion unit)] from the current position.

- A positive number specifies downward movement, and a negative number specifies upward movement.

GS ^ r t m

[Name] Execute macro

[Format] ASCII GS ^ r t m

Hex 1D 5E r t m

Decimal 29 94 r t m

[Range] $1 \leq r \leq 255$

$0 \leq t \leq 255$

$m = 0, 1$

[Description] • Executes the macro that was defined with

<i>m</i>		Function
<A>	0, 48 1, 49	Cuts paper.
	65, 66	Feeds paper to (cutting position + $[n \times (\text{vertical motion unit})]$) and cuts the paper.

GS :.

GS a n

[Name] Enable/disable Automatic Status Back (ASB)

[Format] ASCII GS a n

Hex 1D 61 n

Decimal 29 97 n

[Range] $0 \leq n \leq 255$

[Default] n = 0

[Description] • Enables or disables basic ASB (Automatic Status Back).

(n) Bit	Off/On	Hex	Decimal	Function
0	Off	00	0	Drawer kick-out connector status disabled.
	On	01	1	Drawer kick-out connector status enabled.
1	Off	00	0	Online/offline status disabled.
	On	02	2	Online/offline status enabled.
2	Off	00	0	Error status disabled.
	On	04	4	Error status enabled.
3	Off	00	0	Roll paper sensor status disabled.
	On	08	8	Roll paper sensor status enabled.
4 - 7	Off	00	0	Reserved.

- While basic ASB is active, the selected enabled basic ASB status is transmitted whenever the status changes.
- The basic ASB status to be transmitted is the four bytes that follow:
 - First byte (printer information)

Bit	Off/On	Hex	Decimal	Status
0, 1	Off	00	0	Fixed.
2	Off	00	0	Drawer kick-out connector pin 3 is LOW.
	On	04	4	Drawer kick out connector pin 3 is HIGH.
3	Off	00	0	Online.
	On	08	8	Offline.
4	On	10	16	Fixed.
5	Off	00	0	Cover is closed.
	On	20	32	Cover is open.
6	Off	00	0	Paper is not being fed with the paper FEED button.
	On	40	64	Paper is being fed with the paper FEED button.
7	Off	00	0	Fixed.

• Second byte (printer information)

Bit	Off/On	Hex	Decimal	Status
0 - 2	--	--	--	Reserved.
3	Off	00	0	No autocutter error.
	On	08	8	Autocutter error occurred.
4	Off	00	0	Fixed.
5	Off	00	0	No unrecoverable error.
	On	20	32	Unrecoverable error occurred.
6	Off	00	0	No automatically recoverable error.
	On	40	64	Automatically recoverable error occurred.
7	Off	00	0	Fixed.

• Third byte (paper sensor information)

Bit	Off/On	Hex	Decimal	Status
0, 1	Off	00	0	Roll paper near-end sensor: paper adequate.
	On	03	3	Roll paper near-end sensor: paper near end.
2, 3	Off	00	0	Roll paper end sensor (Paper sensor): paper present.
	On	0C	12	Roll paper end sensor (Paper sensor): paper not present.
4	Off	00	0	Fixed.
5, 6	--	--	--	Reserved.
7	Off	00	0	Fixed.

• Fourth byte (paper sensor information)

Bit	Off/On	Hex	Decimal	Status
0 - 3	--	--	--	Reserved.
4	Off	00	0	Fixed.
5, 6	--	--	--	Reserved.
7	Off	00	0	Fixed.

[Reference] APPENDIX J

GS f n

[Name] Select font for HRI characters

[Format] ASCII GS f n

Hex 1D 66 n

Decimal 29 102 n

[Range] n = 0, 1, 48, 49

[Default] n = 0

[Description] • Selects a font for the HRI characters when printing a bar code.

n	Font for the HRI characters
0, 48	Character font A (12 × 24)
1, 49	Character font B (9 × 17)

GS g 0 m nL n H

[Name] Initialize maintenance counter

[Format] ASCII GS g 0 m nL n H

Hex 1D 67 30 m nL n H

Decimal 29 103 48 m nL n H

[Range] m = 0

(n L + n H × 256) = 20, 21, 50, 70 (n L = 20, 21, 50, 70, n H = 0)

[Description] • Sets the resettable maintenance counter specified by (n L + n H × 256) to 0.

(nL + nH × 256)		Maintenance counter [Units]
Hex	Decimal	
14	20	Number of lines fed. [Lines]
15	21	Number of head energization. [Times]
32	50	Number of autocutter operations. [Times].
46	70	Duration of printer operation. [Hours].

[Notes] • Frequent write command executions by an NV memory write command may damage the NV memory. Therefore, it is recommended to limit writing the commands into the NV memory to less than 10 times a day.

- If the power is turned off or the printer is reset via an interface while this command is

being executed, the printer may go into an abnormal condition. Do not turn the power off or do not reset the printer via an interface while this command is being executed.

- While processing this command, the printer may become BUSY while writing the data to the NV memory and stops receiving data. Therefore, do not transmit data from the host computer while the printer is BUSY.

[Reference] APPENDIX G

GS g 2 m nL n H

[Name] Transmit maintenance counter

[Format] ASCII GS g 2 m nL n H

Hex 1D 67 32 m nL n H

Decimal 29 103 50 m nL n H

[Range] m = 0

(n L + n H × 256) = 20, 21, 50, 70, 148, 149, 178, 198

(n L = 20, 21, 50, 70, 148, 149, 178, 198, n H = 0)

[Description] • Transmits the value of the maintenance counter specified by (n L + n H × 256).

(nL + nH × 256)		Maintenance counter [Units]	Type of counter
Hex	Decimal		
14	20	Number of lines fed. [Lines]	Resettable (can be reset)
15	21	Number of head energization. [Times]	
32	50	Number of autocutter operations. [Times].	
46	70	Duration of printer operation. [Hours].	
94	148	Number of lines fed. [Lines]	Cumulative
95	149	Number of head energization. [Times]	
B2	178	Number of autocutter operations. [Times].	
C6	198	Duration of printer operation. [Hours].	

- [Notes] • The maintenance counter values are measurements; therefore, their values will be affected by the timing of errors and how and when the power is turned off.
- When this command is transmitted, do not transmit the subsequent data until the status is received.

[Reference] APPENDIX G

GS h n

[Name] Set bar code height

[Format] ASCII GS h n

Hex 1D 68 n

Decimal 29 104 n

[Range] $1 \leq n \leq 255$

[Default] $n = 162$

[Description] • Sets the height of the bar code to n dots.

<A> GS k m d1...dk NUL** GS k m n d1...dn**

[Name] Print bar code

[Format] <A> ASCII GS k m d1...dk NUL

Hex 1D 6B m d1...dk 00

Decimal 29 107 m d1...dk 0

 ASCII GS k m n d1...dn

Hex 1D 6B m n d1...dn

Decimal 29 107 m n d1...dn

[Range] <A> $0 \leq m \leq 6$ (For the range of k and d , see [Description].)

 $65 \leq m \leq 73$ (For the range of n and d , see [Description].)

[Description] • Prints the bar code using the bar code system specified by m .

For <Function A>

<i>m</i>	Bar code system	Range of <i>k</i>	Range of <i>d</i>
0	UPC-A	$k = 11, 12$	$48 \leq d \leq 57$
1	UPC-E	$k = 11, 12$	$48 \leq d \leq 57$ [where $d1 = 48$]
2	JAN13 / EAN13	$k = 12, 13$	$48 \leq d \leq 57$
3	JAN8 / EAN8	$k = 7, 8$	$48 \leq d \leq 57$
4	CODE39	$1 \leq k$	$48 \leq d \leq 57, 65 \leq d \leq 90,$ $d = 32, 36, 37, 42, 43, 45, 46, 47$
5	ITF	$2 \leq k$ (even number)	$48 \leq d \leq 57$
6	CODABAR (NW-7)	$2 \leq k$	$48 \leq d \leq 57, 65 \leq d \leq 68,$ $97 \leq d \leq 100,$ $d = 36, 43, 45, 46, 47, 58$ [where $65 \leq d1 \leq 68, 65 \leq dk \leq 68,$ $97 \leq d1 \leq 100, 97 \leq dk \leq 100$]

- *k* of <Function A> indicates the number of bytes of bar code data.
- *d* specifies the bar code data.

For <Function B>

<i>m</i>	Bar code system	Range of <i>n</i>	Range of <i>d</i>
65	UPC-A	$n = 11, 12$	$48 \leq d \leq 57$
66	UPC-E	$n = 11, 12$	$48 \leq d \leq 57$ [where $d1 = 48$]
67	JAN13 / EAN13	$n = 12, 13$	$48 \leq d \leq 57$
68	JAN8 / EAN8	$n = 7, 8$	$48 \leq d \leq 57$
69	CODE39	$1 \leq n \leq 255$	$48 \leq d \leq 57, 65 \leq d \leq 90,$ $d = 32, 36, 37, 42, 43, 45, 46, 47$
70	ITF	$2 \leq n \leq 254$ (even number)	$48 \leq d \leq 57$
71	CODABAR (NW-7)	$2 \leq n \leq 255$	$48 \leq d \leq 57, 65 \leq d \leq 68,$ $97 \leq d \leq 100,$ $d = 36, 43, 45, 46, 47, 58$ [where $65 \leq d1 \leq 68, 65 \leq dn \leq 68,$ $97 \leq d1 \leq 100, 97 \leq dn \leq 100$]
72	CODE93	$1 \leq n \leq 255$	$0 \leq d \leq 127$
73	CODE128	$2 \leq n \leq 255$	$0 \leq d \leq 127$ [where $d1 = 123, 65 \leq d2 \leq 67$]

- *n* of <Function B> specifies the number of bytes of bar code data.
- *d* specifies the bar code data.

[Note] • Users must secure the quiet zone (left or right side space area defined by the bar code standard) for bar code printing.

[Reference] APPENDIX H, APPENDIX I

GS r n

[Name] Transmit status

[Format] ASCII GS r n

Hex 1D 72 n

Decimal 29 114 n

[Range] n = 1, 2, 49, 50

[Description] • Transmits the status.

n	Function
1, 49	Transmits paper sensor status.
2, 50	Transmits drawer kick-out connector status.

- This printer transmits the following status.

- Paper sensor status (n = 1, 49)

Bit	Off/On	Hex	Decimal	Status
0, 1	Off	00	0	Roll paper near-end sensor: paper adequate.
	On	03	3	Roll paper near-end sensor: paper near end.
2, 3	Off	00	0	Roll paper end sensor (Paper sensor): paper present.
	On	0C	12	Roll paper end sensor (Paper sensor): paper not present.
4	Off	00	0	Fixed.
5, 6	--	--	--	Reserved.
7	Off	00	0	Fixed.

- Drawer kick-out connector status (n = 2, 50)

Bit	Off/On	Hex	Decimal	Status
0	Off	00	0	Drawer kick-out connector pin 3 is LOW.
	On	01	1	Drawer kick-out connector pin 3 is HIGH.
1 - 3	--	--	--	Reserved.
4	Off	00	0	Fixed.
5, 6	--	--	--	Reserved.
7	Off	00	0	Fixed.

[Note] • When this command is transmitted, do not transmit the subsequent data until this status is received.

GS w n

[Name] Set bar code width

[Format] ASCII GS w n

Hex 1D 77 n

Decimal 29 119 n

[Range] $2 \leq n \leq 6$

[Default] n = 3

[Description] • Sets the horizontal size of the bar code.

n	Multi-level bar code	Binary-level bar code	
	Module width(mm)	Thin element width(mm)	Thick element width(mm)
2	0.25	0.25	0.625
3	0.375	0.375	2.303
4	0.5	0.5	1.250
5	0.625	0.625	1.625
6	0.750	0.750	2

- Multi-level bar codes are as follows:

UPC-A, UPC-E, JAN13 / EAN13, JAN8 / EAN8, CODE93, and CODE128

- Binary-level bar codes are as follows:

CODE39, ITF, and CODABAR

ESC v

GS r, which is the upward-compatible command replacing ESC v, is recommended to use, since ESC v is an obsolete command in the ESC/POS command system.

[Name] Transmit paper sensor status

[Format] ASCII ESC v

Hex 1B 76

Decimal 27 118

[Description] • Transmits the status of paper sensor(s) as 1 byte of data, as follows:

Bit	Off/On	Hex	Decimal	Status
0, 1	Off	00	0	Roll paper near-end sensor: paper adequate.
	On	03	3	Roll paper near-end sensor: paper near end.
2, 3	Off	00	0	Roll paper end sensor: paper present.
	On	0C	12	Roll paper end sensor: paper not present.
4	Off	00	0	Fixed.
5, 6	--	--	--	Reserved.
7	Off	00	0	Fixed.

Bits 2 and 3: While the cover is open, this shows the state when the cover was still closed. (This command is not executed.)

[Note] • When this command is transmitted, do not transmit the subsequent data until the status is received.

FS p n m

[Name] Print NV bit image

[Format] ASCII FS p n m

Hex 1C 70 n m

Decimal 28 112 n m

[Range] $1 \leq n \leq 255$

$0 \leq m \leq 3, 48 \leq m \leq 51$

[Description] • Prints NV bit image n using the process of FS q and using the mode specified by m.

M	mode	Vertical direction	Horizontal direction
0,48	normal	203dip	203dip
1,49	double-width	203dip	101dip
2,50	double-height	101dip	203dip
3,51	quadruple	101dip	101dip

FS q n [x L x H y L y H d1...dk]1 ... [x L x H y L y H d1...dk]n

[Name] Define NV bit image

[Format] ASCII FS q n [x L x H y L y H d1...dk]1...[x L x H y L y H d1...dk]n

Hex 1C 71 n [x L x H y L y H d1...dk]1...[x L x H y L y H d1...dk]n

Decimal 28 113 n [xL xH yL yH d1...dk]1...[xL xH yL yH d1...dk]n

[Range] $1 \leq n \leq 255$

$$1 \leq (xL + xH \times 256) \leq 1023 \quad (0 \leq xL \leq 255, 0 \leq xH \leq 3)$$

$$1 \leq (yL + yH \times 256) \leq 288 \quad (0 \leq yL \leq 255, yH = 0,1)$$

$$0 \leq d \leq 255$$

$$k = (xL + xH \times 256) \times (yL + yH \times 256) \times 8$$

The entire capacity size = 256 KB.

[Description] • Defines the NV bit image in the NV graphics area.

- n specifies the number of defined NV bit images.
- xL, xH specify the number of bytes in the horizontal direction as $(xL + xH \times 256)$.
- yL, yH specify the number of bytes in the vertical direction as $(yL + yH \times 256)$.
- d specifies the defined data (column format).

- [Notes] • Frequent write command executions by an NV memory write command may damage the NV memory. Therefore, it is recommended to limit writing the commands into the NV memory to less than 10 times a day.
- If the power is turned off or the printer is reset via an interface while this command is being executed, the printer may go into an abnormal condition. Do not turn the power off or do not reset the printer via an interface while this command is being executed.
 - While processing this command, the printer may become BUSY while writing data to the NV memory and stops receiving data. Therefore, do not to transmit data from the host computer while the printer is BUSY.
 - The printer executes a software reset after processing this command.
 - Clears the receive and print buffers.
 - Resets all setting values in RAM (the print area, the character styles, user-defined

characters, and others) that were in effect at power on. (The data in the NV memory are not reset.)

- NV bit image and NV graphics (GS (L/ GS 8 L) cannot be defined simultaneously.

When this command is executed, all NV graphics are deleted.

GS v 0 m xL x H y L y H d1...dk

[Name] Print raster bit image

[Format] ASCII GS v 0 m xL x H y L y H d1...dk

Hex 1D 76 30 m xL x H y L y H d1...dk

Decimal 29 118 48 m xL x H y L y H d1...dk

[Range] $0 \leq m \leq 3$, $48 \leq m \leq 51$

$1 \leq (xL \times xH \times 256) \leq 65535$ ($0 \leq xL \leq 255$, $0 \leq xH \leq 255$)

$1 \leq (yL + yH \times 256) \leq 2303$ ($0 \leq yL \leq 255$, $0 \leq yH \leq 8$)

$0 \leq d \leq 255$

$k = (xL + xH \times 256) \times (yL + yH \times 256)$

[Description] • Prints a raster bit image using the mode specified by m.

M	mode	Vertical direction	Horizontal direction
0,48	normal	203dip	203dip
1,49	double-width	203dip	101dip
2,50	double-height	101dip	203dip
3,51	quadruple	101dip	101dip

- xL , xH specify the number of bytes in the horizontal direction as $(xL + xH \times 256)$.
- yL , yH specify the number of dots in the vertical direction as $(yL + yH \times 256)$.
- d specifies the defined data (raster format).

ESC (A p L p H fn n c t1 t2 < Function 97 >

[Name] Beep integrated beeper in TP801 (TP805/TP806) models

[Format] ASCII ESC (A p L p H fn n c t1 t2

Hex 1B 28 41 05 00 61 n c t1 t2

Decimal 27 40 65 5 097n c t1t2

[Range] (p L + pH × 256) = 5 (p L = 5, p H = 0)

fn = 97

n = 100

0 ≤ c ≤ 63

0 ≤ t1 ≤ 255

0 ≤ t2 ≤ 255

[Description] Beeps the integrated beeper.

- c specifies times of beeping.
- t1 specifies beeping time (t1 × 100 ms).
- t2 specifies time for stop beeping (t2 × 100 ms).

[Notes] • This function repeats integrated beeper control of [(t1 × 100 ms) beep/ (t2 × 100 ms) stop] c times.

- If this command is newly processed during beeping of the buzzer, the current process for beeping the buzzer is stopped and the new process for beeping the buzzer is started.
- Integrated beeper beeping by this function stops due to any of the following factors.
- Finish specification of (c).
- Reset or power off.

Appendix

Page 1 [Katakana]

HEX	8	9	A	B	C	D	E	F
0	— 128	⌈ 144	SP 160	— 176	々 192	ミ 208	= 224	× 240
1	— 129	〒 145	。○ 161	ア 177	チ 193	ム 209	ト 225	円 241
2	— 130	⌋ 146	「 162	イ 178	ツ 194	メ 210	≠ 226	年 242
3	■ 131	⌋ 147	」 163	ウ 179	テ 195	モ 211	≡ 227	月 243
4	■ 132	— 148	、 164	エ 180	ト 196	ヤ 212	▲ 228	日 244
5	■ 133	— 149	・ 165	オ 181	ナ 197	ユ 213	▲ 229	時 245
6	■ 134	⌋ 150	ヲ 166	カ 182	ニ 198	ヨ 214	▼ 230	分 246
7	■ 135	⌋ 151	ア 167	キ 183	ヌ 199	ラ 215	▼ 231	秒 247
8	⌋ 136	「 152	イ 168	ク 184	ネ 200	リ 216	▲ 232	〒 248
9	⌋ 137	「 153	ウ 169	ケ 185	ノ 201	ル 217	♥ 233	市 249
A	⌋ 138	「 154	エ 170	コ 186	ハ 202	レ 218	♦ 234	区 250
B	⌋ 139	「 155	オ 171	サ 187	ヒ 203	ロ 219	♣ 235	町 251
C	⌋ 140	「 156	ヤ 172	シ 188	フ 204	ワ 220	● 236	村 252
D	⌋ 141	「 157	ユ 173	ス 189	ヘ 205	ン 221	○ 237	人 253
E	⌋ 142	「 158	ヨ 174	セ 190	ホ 206	・ 222	/ 238	■ 254
F	⌋ 143	「 159	ツ 175	ソ 191	マ 207	・ 223	\ 239	SP 255

Page 2 [PC850: Multilingual]

HEX	8	9	A	B	C	D	E	F
0	Ç 128	É 144	á 160	 176	L 192	ø 208	Ó 224	- 240
1	ü 129	æ 145	í 161	 177	Ł 193	Ð 209	β 225	± 241
2	é 130	Æ 146	ó 162	 178	Τ 194	Ê 210	Ô 226	= 242
3	â 131	ô 147	ú 163	 179	† 195	Ë 211	Ò 227	¾ 243
4	ä 132	ö 148	ñ 164	‡ 180	— 196	È 212	õ 228	¶ 244
5	à 133	ò 149	Ñ 165	Á 181	‡ 197	ı 213	Õ 229	§ 245
6	á 134	û 150	ª 166	Â 182	ā 198	Í 214	μ 230	+ 246
7	ç 135	ù 151	º 167	À 183	Ä 199	Î 215	þ 231	· 247
8	ê 136	ÿ 152	¿ 168	© 184	Ł 200	Ï 216	ƒ 232	° 248
9	ë 137	Ö 153	® 169	¶ 185	ƒ 201	Ɔ 217	Ú 233	“ 249
A	è 138	Ü 154	¬ 170	 186	Ł 202	ŕ 218	Û 234	’ 250
B	ÿ 139	ø 155	½ 171	¶ 187	Ŧ 203	 219	Ü 235	¹ 251
C	î 140	£ 156	¼ 172	¶ 188	¶ 204	 220	ý 236	³ 252
D	ì 141	Ø 157	ı 173	¢ 189	= 205	ı 221	Ý 237	² 253
E	Ä 142	× 158	« 174	¥ 190	¶ 206	İ 222	— 238	■ 254
F	Å 143	f 159	» 175	ƒ 191	□ 207	 223	’ 239	SP 255

Page 3 [PC860: Portuguese]

HEX	8	9	A	B	C	D	E	F
0	Ç 128	É 144	á 160	 176	Ł 192	⌌ 208	α 224	≡ 240
1	Û 129	À 145	í 161	 177	⌐ 193	⌑ 209	β 225	± 241
2	é 130	È 146	ó 162	 178	Ƨ 194	⌒ 210	Γ 226	≥ 242
3	â 131	ô 147	ú 163	 179	Ƨ 195	⌌ 211	π 227	≤ 243
4	ã 132	õ 148	ñ 164	† 180	— 196	⌌ 212	Σ 228	 244
5	à 133	ò 149	Ñ 165	‡ 181	† 197	Ƨ 213	σ 229	 245
6	Á 134	Ú 150	ª 166	‡ 182	Ƨ 198	⌒ 214	μ 230	+ 246
7	ç 135	ù 151	º 167	‡ 183	‡ 199	‡ 215	τ 231	≈ 247
8	ê 136	î 152	¿ 168	‡ 184	⌌ 200	‡ 216	Φ 232	° 248
9	Ê 137	Ï 153	Ò 169	‡ 185	Ƨ 201	Ƨ 217	Θ 233	• 249
A	è 138	Ü 154	ˆ 170	‡ 186	⌌ 202	Ƨ 218	Ω 234	• 250
B	Í 139	¢ 155	½ 171	‡ 187	Ƨ 203	 219	δ 235	√ 251
C	Ô 140	£ 156	¼ 172	‡ 188	‡ 204	 220	∞ 236	ⁿ 252
D	ì 141	Ù 157	ì 173	‡ 189	= 205	 221	Φ 237	² 253
E	Ã 142	Ƨ 158	« 174	Ƨ 190	‡ 206	 222	ε 238	■ 254
F	Â 143	Ó 159	» 175	Ƨ 191	⌐ 207	 223	∩ 239	SP 255

Page 4 [PC863: Canadian-French]

HEX	8	9	A	B	C	D	E	F
0	Ç 128	É 144	Ì 160	⌘ 176	Ł 192	Ⓔ 208	α 224	≡ 240
1	Û 129	Ê 145	Í 161	⌙ 177	⌵ 193	Ⓕ 209	β 225	± 241
2	é 130	Ê 146	Ó 162	⌚ 178	Ŧ 194	Ⓖ 210	Γ 226	≥ 242
3	â 131	ô 147	ú 163	⌛ 179	⌶ 195	Ⓗ 211	π 227	≤ 243
4	Â 132	Ë 148	“ 164	⌜ 180	— 196	Ⓖ 212	Σ 228	∫ 244
5	à 133	Ï 149	• 165	⌟ 181	† 197	ƒ 213	σ 229	∫ 245
6	¶ 134	Ô 150	³ 166	⌠ 182	ƒ 198	Ⓖ 214	μ 230	÷ 246
7	ç 135	ù 151	— 167	⌡ 183	⌷ 199	Ⓗ 215	τ 231	≈ 247
8	ê 136	▣ 152	Î 168	⌢ 184	Ⓖ 200	≠ 216	Φ 232	° 248
9	ë 137	Ô 153	ƒ 169	⌣ 185	ƒ 201	Ⓖ 217	Θ 233	• 249
A	è 138	Û 154	ƒ 170	⌤ 186	Ⓔ 202	ƒ 218	Ω 234	• 250
B	ï 139	¢ 155	½ 171	⌥ 187	Ⓕ 203	■ 219	δ 235	√ 251
C	î 140	£ 156	¼ 172	⌦ 188	⌷ 204	■ 220	∞ 236	n 252
D	= 141	Û 157	¾ 173	⌧ 189	= 205	⌚ 221	Φ 237	² 253
E	À 142	Û 158	« 174	⌨ 190	⌷ 206	⌚ 222	ε 238	■ 254
F	§ 143	f 159	» 175	〈 191	⌵ 207	■ 223	∩ 239	SP 255

Page 5 [PC865: Nordic]

HEX	8	9	A	B	C	D	E	F
0	Ç 128	É 144	á 160	⌘ 176	Ł 192	ł 208	α 224	≡ 240
1	Ü 129	æ 145	í 161	⌘ 177	Ł 193	ŧ 209	β 225	± 241
2	é 130	Æ 146	ó 162	⌘ 178	ŧ 194	ŧ 210	Γ 226	≥ 242
3	â 131	ô 147	ú 163	 179	ŧ 195	ł 211	π 227	≤ 243
4	ä 132	ö 148	ñ 164	ŧ 180	— 196	Ł 212	Σ 228	 244
5	à 133	ò 149	Ñ 165	ŧ 181	ŧ 197	ŧ 213	σ 229	 245
6	á 134	û 150	ä 166	ŧ 182	ŧ 198	ŧ 214	μ 230	+ 246
7	ç 135	ù 151	å 167	ŧ 183	ŧ 199	ŧ 215	τ 231	≈ 247
8	ê 136	ÿ 152	ı 168	ŧ 184	Ł 200	ŧ 216	Φ 232	° 248
9	ë 137	Ö 153	ŗ 169	ŧ 185	ŧ 201	ŧ 217	Θ 233	• 249
A	è 138	Ü 154	ŧ 170	ŧ 186	Ł 202	ŧ 218	Ω 234	• 250
B	ï 139	ø 155	½ 171	ŧ 187	ŧ 203	ŧ 219	δ 235	√ 251
C	î 140	£ 156	¼ 172	ŧ 188	ŧ 204	ŧ 220	∞ 236	ⁿ 252
D	ì 141	Ø 157	ı 173	ŧ 189	= 205	ŧ 221	Φ 237	² 253
E	Ä 142	Pt 158	« 174	ŧ 190	ŧ 206	ŧ 222	ε 238	■ 254
F	Å 143	f 159	▣ 175	ŧ 191	ŧ 207	ŧ 223	∩ 239	SP 255

Page 13 [PC857: Turkish]

HEX	8	9	A	B	C	D	E	F
0	Ç 128	É 144	á 160	 176	L 192	² 208	Ó 224	- 240
1	Ü 129	æ 145	í 161	 177	⌋ 193	³ 209	β 225	± 241
2	é 130	Æ 146	ó 162	 178	T 194	Ê 210	Ô 226	SP 242
3	â 131	ô 147	ú 163	 179	† 195	Ë 211	Ö 227	¼ 243
4	ä 132	ö 148	ñ 164	‡ 180	- 196	È 212	õ 228	¶ 244
5	à 133	ò 149	Ñ 165	À 181	‡ 197	€ 213	Õ 229	§ 245
6	á 134	û 150	Ğ 166	Â 182	ã 198	Í 214	μ 230	+ 246
7	ç 135	ù 151	ğ 167	À 183	Ä 199	Î 215	SP 231	· 247
8	ê 136	ï 152	¿ 168	© 184	ℒ 200	Ï 216	× 232	° 248
9	ë 137	Ö 153	® 169	¶ 185	℞ 201	Ɔ 217	Ú 233	“ 249
A	è 138	Ü 154	¬ 170	 186	⌋ 202	ƒ 218	Û 234	· 250
B	ÿ 139	ø 155	½ 171	¶ 187	¶ 203	 219	Ü 235	¹ 251
C	î 140	£ 156	¼ 172	¶ 188	¶ 204	 220	ı 236	³ 252
D	ı 141	Ø 157	ı 173	¢ 189	= 205	ı 221	ÿ 237	² 253
E	Ă 142	Ş 158	« 174	¥ 190	¶ 206	İ 222	- 238	■ 254
F	Ă 143	Ş 159	» 175	¶ 191	¶ 207	 223	· 239	SP 255

Page 14 [PC737: Greek]

HEX	8	9	A	B	C	D	E	F
0	Α 128	Ρ 144	ι 160	⋈ 176	Λ 192	⋈ 208	ω 224	Ω 240
1	Β 129	Σ 145	κ 161	⋈ 177	⊥ 193	⊥ 209	ά 225	± 241
2	Γ 130	Τ 146	λ 162	⋈ 178	⊥ 194	⊥ 210	έ 226	≥ 242
3	Δ 131	Υ 147	μ 163	⋈ 179	⊥ 195	⊥ 211	ή 227	≤ 243
4	Ε 132	Φ 148	ν 164	⋈ 180	— 196	⋈ 212	ι 228	Ï 244
5	Ζ 133	Χ 149	ξ 165	⋈ 181	⊥ 197	⋈ 213	ι 229	ÿ 245
6	Η 134	Ψ 150	ο 166	⋈ 182	⋈ 198	⋈ 214	ό 230	+ 246
7	Θ 135	Ω 151	π 167	⋈ 183	⋈ 199	⋈ 215	ύ 231	≈ 247
8	Ι 136	α 152	ρ 168	⋈ 184	⋈ 200	⋈ 216	ü 232	° 248
9	Κ 137	β 153	σ 169	⋈ 185	⋈ 201	⋈ 217	ώ 233	• 249
A	Λ 138	γ 154	ς 170	⋈ 186	⋈ 202	⋈ 218	Α 234	· 250
B	Μ 139	δ 155	τ 171	⋈ 187	⋈ 203	⋈ 219	Έ 235	√ 251
C	Ν 140	ε 156	υ 172	⋈ 188	⋈ 204	⋈ 220	Η 236	ⁿ 252
D	Ξ 141	ζ 157	φ 173	⋈ 189	= 205	⋈ 221	Ι 237	² 253
E	Ο 142	η 158	χ 174	⋈ 190	⋈ 206	⋈ 222	Ο 238	■ 254
F	Π 143	θ 159	ψ 175	⋈ 191	⋈ 207	⋈ 223	Υ 239	SP 255

Page 15 [ISO8859-7: Greek]

HEX	8	9	A	B	C	D	E	F
0	SP 128	SP 144	SP 160	° 176	ı 192	Π 208	Ů 224	π 240
1	SP 129	SP 145	´ 161	± 177	Α 193	Ρ 209	α 225	ρ 241
2	SP 130	SP 146	´ 162	² 178	Β 194	SP 210	β 226	ς 242
3	SP 131	SP 147	£ 163	³ 179	Γ 195	Σ 211	γ 227	σ 243
4	SP 132	SP 148	€ 164	´ 180	Δ 196	Τ 212	δ 228	τ 244
5	SP 133	SP 149	Ɔp 165	ˆ 181	Ε 197	Υ 213	ε 229	υ 245
6	SP 134	SP 150	ı 166	Α 182	Ζ 198	Φ 214	ζ 230	φ 246
7	SP 135	SP 151	§ 167	• 183	Η 199	Χ 215	η 231	χ 247
8	SP 136	SP 152	ˆ 168	Ε 184	Θ 200	Ψ 216	θ 232	ψ 248
9	SP 137	SP 153	© 169	Η 185	Ι 201	Ω 217	ι 233	ω 249
A	SP 138	SP 154	ˆ 170	Ι 186	Κ 202	Ϊ 218	κ 234	ϊ 250
B	SP 139	SP 155	« 171	» 187	Λ 203	Ϋ 219	λ 235	ϋ 251
C	SP 140	SP 156	¬ 172	Ο 188	Μ 204	ά 220	μ 236	ό 252
D	SP 141	SP 157	- 173	½ 189	Ν 205	έ 221	ν 237	ύ 253
E	SP 142	SP 158	SP 174	Υ 190	Ξ 206	ή 222	ξ 238	ώ 254
F	SP 143	SP 159	— 175	Ω 191	Ο 207	ι 223	ο 239	SP 255

Page 16 [WPC1252]

HEX	8	9	A	B	C	D	E	F
0	€ 128	SP 144	SP 160	° 176	À 192	Đ 208	à 224	ô 240
1	SP 129	' 145	ı 161	± 177	Á 193	Ñ 209	á 225	ñ 241
2	, 130	' 146	¢ 162	² 178	Â 194	Ò 210	â 226	ò 242
3	f 131	" 147	£ 163	³ 179	Ã 195	Ó 211	ã 227	ó 243
4	" 132	" 148	¤ 164	´ 180	Ä 196	Ô 212	ä 228	ô 244
5	... 133	• 149	¥ 165	µ 181	Å 197	Ö 213	å 229	ö 245
6	† 134	— 150	 166	¶ 182	Æ 198	Ö 214	æ 230	ö 246
7	‡ 135	— 151	§ 167	· 183	Ç 199	× 215	ç 231	÷ 247
8	^ 136	" 152	¨ 168	˙ 184	È 200	Ø 216	è 232	ø 248
9	‰ 137	™ 153	© 169	¹ 185	É 201	Ù 217	é 233	ù 249
A	Š 138	š 154	ª 170	º 186	Ê 202	Ú 218	ê 234	ú 250
B	‹ 139	› 155	« 171	» 187	Ë 203	Û 219	ë 235	û 251
C	Œ 140	œ 156	¬ 172	¼ 188	Ì 204	Ü 220	ì 236	ü 252
D	SP 141	SP 157	- 173	½ 189	Í 205	Ý 221	í 237	ý 253
E	Ž 142	ž 158	® 174	¾ 190	Î 206	Þ 222	î 238	þ 254
F	SP 143	ÿ 159	— 175	¿ 191	Ï 207	ß 223	ï 239	ÿ 255

Page 17 [PC866: Cyrillic #2]

HEX	8	9	A	B	C	D	E	F
0	А 128	Р 144	а 160	 176	Л 192	л 208	р 224	ё 240
1	Б 129	С 145	б 161	 177	┘ 193	т 209	с 225	ё 241
2	В 130	Т 146	в 162	 178	т 194	т 210	т 226	ё 242
3	Г 131	У 147	г 163	 179	┘ 195	л 211	у 227	ё 243
4	Д 132	Ф 148	д 164	┘ 180	— 196	л 212	ф 228	й 244
5	Е 133	Х 149	е 165	┘ 181	┘ 197	р 213	х 229	й 245
6	Ж 134	Ц 150	ж 166	┘ 182	┘ 198	р 214	ц 230	й 246
7	З 135	Ч 151	з 167	┘ 183	┘ 199	┘ 215	ч 231	й 247
8	И 136	Ш 152	и 168	┘ 184	┘ 200	┘ 216	ш 232	° 248
9	Й 137	Щ 153	й 169	┘ 185	┘ 201	┘ 217	щ 233	° 249
A	К 138	Ъ 154	к 170	┘ 186	┘ 202	┘ 218	ъ 234	° 250
B	Л 139	Ы 155	л 171	┘ 187	┘ 203	 219	ы 235	√ 251
C	М 140	Ь 156	м 172	┘ 188	┘ 204	 220	ь 236	№ 252
D	Н 141	Э 157	н 173	┘ 189	= 205	 221	э 237	▣ 253
E	О 142	Ю 158	о 174	┘ 190	┘ 206	 222	ю 238	■ 254
F	П 143	Я 159	п 175	┘ 191	┘ 207	 223	я 239	SP 255

Page 18 [PC852: Latin2]

HEX	8	9	A	B	C	D	E	F
0	Ç 128	É 144	á 160	⌘ 176	Ł 192	đ 208	Ó 224	- 240
1	Û 129	Ì 145	í 161	⌘ 177	Ł 193	Đ 209	β 225	" 241
2	é 130	Í 146	ó 162	⌘ 178	Ŧ 194	Ď 210	Ô 226	ˆ 242
3	â 131	ô 147	ú 163	ı 179	ţ 195	Ě 211	Ň 227	˘ 243
4	ä 132	ö 148	À 164	ı 180	— 196	ď 212	ň 228	˘ 244
5	û 133	Ĭ 149	ą 165	Á 181	† 197	Ň 213	ñ 229	§ 245
6	ć 134	Ĳ 150	Ž 166	Â 182	Ǻ 198	Í 214	Š 230	+ 246
7	ç 135	Š 151	ž 167	Ě 183	ǻ 199	İ 215	š 231	* 247
8	ı 136	ś 152	Ę 168	Ş 184	Ł 200	ě 216	Ř 232	° 248
9	ë 137	Ö 153	ę 169	ı 185	Ŧ 201	Ĳ 217	Ú 233	ˆ 249
A	Ö 138	Ü 154	€ 170	ı 186	Ł 202	Ŧ 218	ŕ 234	• 250
B	õ 139	Ŧ 155	ž 171	ı 187	Ŧ 203	ı 219	Ü 235	ü 251
C	î 140	İ 156	Č 172	ı 188	ı 204	ı 220	ý 236	Ř 252
D	Ž 141	Ł 157	Ş 173	Ž 189	= 205	Ŧ 221	Ý 237	ř 253
E	Ǻ 142	× 158	« 174	ž 190	Ŧ 206	Ü 222	ı 238	■ 254
F	Ć 143	č 159	» 175	Ŧ 191	ı 207	ı 223	ˆ 239	SP 255

Page 19 [PC858: Euro]

HEX	8	9	A	B	C	D	E	F
0	Ç 128	É 144	á 160	 176	Ł 192	ð 208	Ó 224	- 240
1	Û 129	æ 145	í 161	 177	Ł 193	Ð 209	β 225	± 241
2	é 130	Æ 146	ó 162	 178	Ŧ 194	Ê 210	Ô 226	= 242
3	à 131	ô 147	ú 163	 179	† 195	Ë 211	Ö 227	¼ 243
4	ä 132	ö 148	ñ 164	‡ 180	— 196	È 212	ø 228	¶ 244
5	â 133	ò 149	Ñ 165	À 181	† 197	€ 213	Õ 229	§ 245
6	ä 134	û 150	ä 166	Â 182	ā 198	Í 214	μ 230	+ 246
7	ç 135	ù 151	æ 167	À 183	Ä 199	Î 215	þ 231	· 247
8	ê 136	ÿ 152	¿ 168	© 184	Ł 200	Ï 216	þ 232	° 248
9	ë 137	Ö 153	® 169	‡ 185	Ŧ 201	Ɔ 217	Ú 233	ˆ 249
A	è 138	Û 154	ˆ 170	 186	Ł 202	ŕ 218	Û 234	˙ 250
B	ÿ 139	ø 155	½ 171	¶ 187	Ŧ 203	 219	Ù 235	¹ 251
C	î 140	£ 156	¼ 172	¶ 188	Ł 204	 220	ý 236	³ 252
D	ì 141	Ø 157	ì 173	¢ 189	= 205	¡ 221	Ý 237	² 253
E	Ä 142	× 158	« 174	¥ 190	Ŧ 206	İ 222	— 238	■ 254
F	Å 143	f 159	» 175	Ŧ 191	□ 207	 223	ˆ 239	SP 255

Page 20 [KU42: Thai]

HEX	8	9	A	B	C	D	E	F
0	┐ 128	○ 144	SP 160	ฅ 176	ย 192	เ 208	' 224	๙ 240
1	┘ 129	๑ 145	ก 161	ฆ 177	ร 193	แ 209	" 225	๐ 241
2	└ 130	๒ 146	ข 162	ค 178	ฤ 194	โ 210	ฃ 226	๑ 242
3	┘ 131	๓ 147	ค 163	ด 179	ล 195	ใ 211	ฅ 227	๒ 243
4	┐ 132	๔ 148	ฅ 164	ฆ 180	ว 196	ใ 212	" 228	๓ 244
5	─ 133	๕ 149	ง 165	ท 181	ศ 197	ๆ 213	' 229	๔ 245
6	┘ 134	๖ 150	จ 166	ธ 182	ษ 198	ๆ 214	ฃ 230	๕ 246
7	┘ 135	๗ 151	ฉ 167	น 183	ส 199	' 215	ร 231	๖ 247
8	└ 136	๘ 152	ช 168	บ 184	ห 200	ฃ 216	ร 232	๗ 248
9	┘ 137	๙ 153	ซ 169	ป 185	ฬ 201	ฃ 217	ฃ 233	๘ 249
A	┘ 138	๐ 154	ฅ 170	ผ 186	อ 202	ฃ 218	๖ 234	๙ 250
B	█ 139	ค 155	ญ 171	ฝ 187	ฮ 203	ฃ 219	๖ 235	๐ 251
C	← 140	ร 156	ฎ 172	พ 188	ะ 204	ฃ 220	๖ 236	๑ 252
D	↑ 141	ร 157	ฏ 173	ฟ 189	ภ 205	ฃ 221	๖ 237	๒ 253
E	→ 142	ร 158	ฐ 174	ภ 190	า 206	' 222	๖ 238	๓ 254
F	↓ 143	เ 159	ท 175	ม 191	ำ 207	ฃ 223	๖ 239	SP 255

Page 21 [TIS11: Thai]

HEX	8	9	A	B	C	D	E	F
0	๐ 128	๑ 144	๒ 160	๓ 176	๔ 192	๕ 208	๖ 224	๗ 240
1	๘ 129	๙ 145	๑๐ 161	๑๑ 177	๑๒ 193	๑๓ 209	๑๔ 225	๑๕ 241
2	๑๖ 130	๑๗ 146	๑๘ 162	๑๙ 178	๒๐ 194	๒๑ 210	๒๒ 226	๒๓ 242
3	๒๔ 131	๒๕ 147	๒๖ 163	๒๗ 179	๒๘ 195	๒๙ 211	๓๐ 227	๓๑ 243
4	๓๒ 132	๓๓ 148	๓๔ 164	๓๕ 180	๓๖ 196	๓๗ 212	๓๘ 228	๓๙ 244
5	๔๐ 133	๔๑ 149	๔๒ 165	๔๓ 181	๔๔ 197	๔๕ 213	๔๖ 229	๔๗ 245
6	๔๘ 134	๔๙ 150	๕๐ 166	๕๑ 182	๕๒ 198	๕๓ 214	๕๔ 230	๕๕ 246
7	๕๖ 135	๕๗ 151	๕๘ 167	๕๙ 183	๖๐ 199	๖๑ 215	๖๒ 231	๖๓ 247
8	๖๔ 136	๖๕ 152	๖๖ 168	๖๗ 184	๖๘ 200	๖๙ 216	๗๐ 232	๗๑ 248
9	๗๒ 137	๗๓ 153	๗๔ 169	๗๕ 185	๗๖ 201	๗๗ 217	๗๘ 233	๗๙ 249
A	๘๐ 138	๘๑ 154	๘๒ 170	๘๓ 186	๘๔ 202	๘๕ 218	๘๖ 234	๘๗ 250
B	๘๘ 139	๘๙ 155	๙๐ 171	๙๑ 187	๙๒ 203	๙๓ 219	๙๔ 235	๙๕ 251
C	๙๖ 140	๙๗ 156	๙๘ 172	๙๙ 188	๑๐๐ 204	๑๐๑ 220	๑๐๒ 236	๑๐๓ 252
D	๑๐๔ 141	๑๐๕ 157	๑๐๖ 173	๑๐๗ 189	๑๐๘ 205	๑๐๙ 221	๑๑๐ 237	๑๑๑ 253
E	๑๑๒ 142	๑๑๓ 158	๑๑๔ 174	๑๑๕ 190	๑๑๖ 206	๑๑๗ 222	๑๑๘ 238	๑๑๙ 254
F	๑๒๐ 143	๑๒๑ 159	๑๒๒ 175	๑๒๓ 191	๑๒๔ 207	๑๒๕ 223	๑๒๖ 239	๑๒๗ 255

HEX	8	9	A	B	C	D	E	F
0	┐ 128	┐ 144	SP 160	ฐ 176	ภ 192	ะ 208	เ 224	อ 240
1	┐ 129	┐ 145	ก 161	ท 177	ม 193	ะ 209	แ 225	ด 241
2	┐ 130	ะ 146	ข 162	ณ 178	ย 194	า 210	โ 226	บ 242
3	┐ 131	ะ 147	ข 163	ณ 179	ร 195	า 211	โ 227	ต 243
4	┐ 132	ะ 148	ค 164	ด 180	ถ 196	ะ 212	ใ 228	ธ 244
5	┐ 133	ะ 149	ค 165	ด 181	ล 197	ะ 213	า 229	ธ 245
6	┐ 134	ะ 150	ท 166	ถ 182	ภ 198	ะ 214	า 230	อ 246
7	┐ 135	ะ 151	ง 167	ท 183	ว 199	ะ 215	ะ 231	ญ 247
8	┐ 136	ะ 152	จ 168	ธ 184	ศ 200	ะ 216	ะ 232	ธ 248
9	┐ 137	ะ 153	ฉ 169	น 185	ช 201	ะ 217	ะ 233	ศ 249
A	┐ 138	ะ 154	ข 170	บ 186	ส 202	ะ 218	ะ 234	ค 250
B	┐ 139	ะ 155	ข 171	ป 187	ท 203	ะ 219	ะ 235	ค 251
C	← 140	ะ 156	ณ 172	ผ 188	พ 204	ะ 220	ะ 236	ค 252
D	↑ 141	ะ 157	ณ 173	ผ 189	อ 205	ะ 221	ะ 237	ค 253
E	→ 142	ะ 158	ณ 174	พ 190	ฮ 206	ะ 222	ะ 238	ค 254
F	↓ 143	เ 159	ณ 175	พ 191	า 207	ธ 223	อ 239	SP 255

Page 32 [PC720: Arabic]

HEX	8	9	A	B	C	D	E	F
0	SP 128	SP 144	ب 160	 176	ل 192	ل 208	ض 224	≡ 240
1	SP 129	° 145	ة 161	 177	ل 193	ف 209	ط 225	° 241
2	é 130	° 146	ت 162	 178	ت 194	ط 210	ظ 226	° 242
3	â 131	ô 147	ث 163	 179	ـ 195	ل 211	ع 227	° 243
4	SP 132	□ 148	ج 164	ـ 180	ـ 196	ل 212	غ 228	° 244
5	à 133	- 149	ح 165	ـ 181	ـ 197	ف 213	ف 229	' 245
6	SP 134	û 150	خ 166	ـ 182	ـ 198	ر 214	م 230	- 246
7	ç 135	ù 151	د 167	ـ 183	ـ 199	ـ 215	ق 231	≈ 247
8	ê 136	ء 152	ذ 168	ـ 184	ل 200	ـ 216	ك 232	° 248
9	ë 137	آ 153	ر 169	ـ 185	ـ 201	ل 217	ل 233	° 249
A	è 138	أ 154	ز 170	ـ 186	ـ 202	ـ 218	م 234	° 250
B	ï 139	ؤ 155	س 171	ـ 187	ـ 203	 219	ن 235	√ 251
C	î 140	£ 156	ش 172	ـ 188	ـ 204	 220	ه 236	n 252
D	SP 141	إ 157	ص 173	ل 189	= 205	 221	و 237	² 253
E	SP 142	ئ 158	« 174	ـ 190	ـ 206	 222	ي 238	■ 254
F	SP 143	أ 159	» 175	ـ 191	ـ 207	 223	ي 239	SP 255

Page 33 [WPC775: Baltic Rim]

HEX	8	9	A	B	C	D	E	F
0	Ć 128	É 144	Ā 160	 176	Ł 192	ą 208	Ó 224	– 240
1	Ū 129	æ 145	Ī 161	 177	Ł 193	č 209	ß 225	± 241
2	é 130	Æ 146	ó 162	 178	Ŧ 194	ę 210	Ô 226	" 242
3	ā 131	ō 147	ž 163	 179	Ŧ 195	ė 211	Ń 227	¾ 243
4	ā 132	ō 148	ž 164	 180	– 196	į 212	ō 228	Ŧ 244
5	ġ 133	Ġ 149	ž 165	Ā 181	† 197	š 213	Ō 229	§ 245
6	ā 134	č 150	" 166	Č 182	Ū 198	ų 214	μ 230	÷ 246
7	ć 135	š 151	ı 167	Ē 183	Ū 199	ū 215	ń 231	" 247
8	ł 136	ś 152	© 168	Ē 184	Ł 200	ż 216	Ų 232	° 248
9	ē 137	Ö 153	® 169	Ŧ 185	Ŧ 201	Ų 217	ķ 233	· 249
A	Ŕ 138	Ū 154	Ŧ 170	 186	Ł 202	Ŧ 218	Ł 234	· 250
B	Ŧ 139	ø 155	½ 171	Ŧ 187	Ŧ 203	 219	ı 235	¹ 251
C	Ŧ 140	£ 156	¼ 172	Ŧ 188	Ŧ 204	 220	Ŧ 236	³ 252
D	Ž 141	Ø 157	Ł 173	ı 189	= 205	ı 221	Ē 237	² 253
E	Ā 142	× 158	« 174	Š 190	Ŧ 206	ı 222	Ŧ 238	■ 254
F	Ā 143	■ 159	» 175	Ŧ 191	Ž 207	■ 223	' 239	SP 255

Page 34 [PC855: Cyrillic]

HEX	8	9	A	B	C	D	E	F
0	ђ 128	љ 144	а 160	ѝ 176	Л 192	л 208	Я 224	– 240
1	Ђ 129	Љ 145	А 161	Ѧ 177	Љ 193	П 209	Р 225	Ы 241
2	ѓ 130	њ 146	б 162	ѧ 178	Т 194	М 210	Р 226	Ы 242
3	Ѓ 131	Њ 147	Б 163	Ѩ 179	Љ 195	М 211	С 227	З 243
4	ё 132	ћ 148	ц 164	ѩ 180	– 196	Н 212	С 228	З 244
5	Ё 133	Ћ 149	Ц 165	х 181	Ћ 197	Н 213	Т 229	Ш 245
6	е 134	ќ 150	Д 166	Х 182	К 198	О 214	Т 230	Ш 246
7	Е 135	Ќ 151	Д 167	И 183	К 199	О 215	У 231	Э 247
8	ѕ 136	ѣ 152	е 168	И 184	Љ 200	П 216	У 232	Э 248
9	Ѕ 137	Ѕ 153	Е 169	Ѫ 185	Ѓ 201	Ј 217	Ж 233	Щ 249
A	і 138	џ 154	Ф 170	ѫ 186	Љ 202	Г 218	Ж 234	Щ 250
B	І 139	Џ 155	Ф 171	Ѭ 187	Ѓ 203	■ 219	В 235	Ч 251
C	Ї 140	Ј 156	Г 172	ѭ 188	Ѓ 204	■ 220	В 236	Ч 252
D	Љ 141	Ю 157	Г 173	Й 189	= 205	П 221	Ь 237	§ 253
E	ј 142	Ѣ 158	« 174	Й 190	Ѯ 206	Я 222	Ь 238	■ 254
F	Ј 143	ѣ 159	» 175	Ј 191	■ 207	■ 223	№ 239	SP 255

Page 36 [PC862: Hebrew]

HEX	8	9	A	B	C	D	E	F
0	א 128	ב 144	ג 160	ד 176	ה 192	ו 208	ז 224	ח 240
1	ט 129	י 145	יא 161	יב 177	יג 193	יד 209	טו 225	טז 241
2	יז 130	יח 146	יט 162	כ 178	כא 194	כב 210	כג 226	כד 242
3	כה 131	כו 147	כז 163	כח 179	כט 195	ל 211	מ 227	מא 243
4	מב 132	מג 148	מד 164	מה 180	מו 196	מז 212	מח 228	מט 244
5	נ 133	נא 149	נב 165	נג 181	נד 197	נה 213	נו 229	נז 245
6	נח 134	נט 150	ס 166	סא 182	סב 198	סג 214	סד 230	סה 246
7	סז 135	סח 151	סט 167	ע 183	עא 199	עב 215	עג 231	עד 247
8	עז 136	עה 152	פ 168	פא 184	פב 200	פג 216	פד 232	פה 248
9	פו 137	פז 153	פח 169	פט 185	צ 201	צא 217	צב 233	צג 249
A	צד 138	צה 154	כ 170	כא 186	כב 202	כג 218	כד 234	כה 250
B	כו 139	כז 155	כח 171	כט 187	ל 203	לא 219	לב 235	לג 251
C	לד 140	לה 156	לו 172	לא 188	לב 204	לג 220	לד 236	לה 252
D	לז 141	לח 157	לט 173	לא 189	לב 205	לג 221	לד 237	לה 253
E	מ 142	מא 158	מב 174	מג 190	מד 206	מה 222	מו 238	מז 254
F	מח 143	מט 159	נ 175	נא 191	נב 207	נג 223	נד 239	נה 255

HEX	8	9	A	B	C	D	E	F
0	° 128	β 144	SP 160	• 176	¢ 192	ذ 208	- 224	 240
1	· 129	∞ 145	· 161	١ 177	ء 193	ر 209	ف 225	 241
2	· 130	φ 146	ل 162	٢ 178	أ 194	ز 210	ق 226	ن 242
3	√ 131	± 147	£ 163	٣ 179	إ 195	س 211	ك 227	ه 243
4	 132	½ 148	¤ 164	٤ 180	و 196	ش 212	ل 228	+ 244
5	— 133	¼ 149	ل 165	٥ 181	ع 197	ص 213	م 229	ي 245
6	 134	≈ 150	SP 166	٦ 182	ذ 198	ض 214	ن 230	ي 246
7	† 135	« 151	€ 167	٧ 183	ا 199	ط 215	ه 231	خ 247
8	‡ 136	» 152	ل 168	٨ 184	ب 200	ظ 216	و 232	ق 248
9	‡ 137	لا 153	ب 169	٩ 185	ة 201	ع 217	ي 233	لا 249
A	‡ 138	لا 154	ت 170	ف 186	ذ 202	غ 218	ي 234	لا 250
B	‡ 139	SP 155	ث 171	ة 187	ذ 203	ا 219	ض 235	ل 251
C	٦ 140	SP 156	• 172	س 188	ح 204	٦ 220	ع 236	ك 252
D	‡ 141	لا 157	ج 173	ش 189	ح 205	÷ 221	غ 237	ي 253
E	‡ 142	لا 158	ح 174	ص 190	خ 206	x 222	غ 238	■ 254
F	‡ 143	ء 159	خ 175	؟ 191	د 207	ع 223	م 239	SP 255

Page 39 [ISO8859-2: Latin2]

HEX	8	9	A	B	C	D	E	F
0	 128	L 144	SP 160	° 176	Ř 192	Đ 208	ř 224	đ 240
1	 129	Ł 145	Ą 161	ą 177	Á 193	Ñ 209	á 225	ñ 241
2	 130	T 146	˘ 162	˙ 178	Â 194	Ň 210	â 226	ň 242
3	131	† 147	Ł 163	ł 179	Ă 195	Ó 211	ă 227	ó 243
4	† 132	– 148	◻ 164	˙ 180	Ä 196	Ô 212	ä 228	ô 244
5	J 133	† 149	Ĺ 165	ĺ 181	Í 197	Ö 213	í 229	ö 245
6	ŕ 134	■ 150	Š 166	š 182	Č 198	Ö 214	č 230	ö 246
7	■ 135	■ 151	Š 167	˘ 183	Ç 199	× 215	ç 231	÷ 247
8	© 136	Ł 152	˘ 168	˙ 184	Č 200	Ř 216	č 232	ř 248
9	ŕ 137	ŕ 153	Š 169	š 185	É 201	Ú 217	é 233	ú 249
A	138	Ł 154	Š 170	š 186	Ę 202	Ú 218	ę 234	ú 250
B	ŕ 139	ŕ 155	Ť 171	ť 187	Ě 203	Ů 219	ě 235	ů 251
C	ŕ 140	ŕ 156	Ž 172	ž 188	Ě 204	Ü 220	ě 236	ü 252
D	¢ 141	= 157	- 173	˘ 189	İ 205	Ý 221	ı 237	ý 253
E	¥ 142	ŕ 158	Ž 174	ž 190	İ 206	Ť 222	ı 238	ť 254
F	ŕ 143	® 159	Ž 175	ž 191	Đ 207	ß 223	ď 239	· 255

Page 40 [ISO8859-15: Latin9]

HEX	8	9	A	B	C	D	E	F
0	SP 128	SP 144	SP 160	° 176	À 192	Ð 208	à 224	ð 240
1	SP 129	SP 145	í 161	± 177	Á 193	Ñ 209	á 225	ñ 241
2	SP 130	SP 146	¢ 162	² 178	Â 194	Ò 210	â 226	ò 242
3	SP 131	SP 147	£ 163	³ 179	Ã 195	Ó 211	ã 227	ó 243
4	SP 132	SP 148	€ 164	Ž 180	Ä 196	Ô 212	ä 228	ö 244
5	SP 133	SP 149	¥ 165	µ 181	Å 197	Ö 213	å 229	ö 245
6	SP 134	SP 150	Š 166	¶ 182	Æ 198	Ö 214	æ 230	ö 246
7	SP 135	SP 151	§ 167	· 183	Ç 199	× 215	ç 231	÷ 247
8	SP 136	SP 152	š 168	ž 184	È 200	Ø 216	è 232	ø 248
9	SP 137	SP 153	© 169	¹ 185	É 201	Ù 217	é 233	ù 249
A	SP 138	SP 154	ª 170	º 186	Ê 202	Ú 218	ê 234	ú 250
B	SP 139	SP 155	« 171	» 187	Ë 203	Û 219	ë 235	û 251
C	SP 140	SP 156	¬ 172	œ 188	Ì 204	Ü 220	ì 236	ü 252
D	SP 141	SP 157	- 173	œ 189	Í 205	Ý 221	í 237	ý 253
E	SP 142	SP 158	® 174	ÿ 190	Î 206	Þ 222	î 238	þ 254
F	SP 143	SP 159	— 175	¿ 191	Ï 207	ß 223	ï 239	ÿ 255

Page 45 [WPC1250: Latin 2]

HEX	8	9	A	B	C	D	E	F
0	€ 128	SP 144	SP 160	° 176	Ř 192	Đ 208	ř 224	đ 240
1	SP 129	' 145	ˆ 161	± 177	Á 193	Ñ 209	á 225	ñ 241
2	' 130	' 146	ˆ 162	ˆ 178	Â 194	Ň 210	â 226	ň 242
3	SP 131	“ 147	Ł 163	ı 179	Ă 195	Ó 211	ă 227	ó 243
4	” 132	” 148	□ 164	ˆ 180	Ä 196	Ô 212	ä 228	ô 244
5	... 133	• 149	À 165	μ 181	Í 197	Õ 213	í 229	õ 245
6	† 134	— 150	ı 166	¶ 182	Č 198	Ö 214	č 230	ö 246
7	‡ 135	— 151	§ 167	ˆ 183	Ç 199	× 215	ç 231	+ 247
8	SP 136	SP 152	” 168	ˆ 184	Ć 200	Ř 216	ć 232	ř 248
9	‰ 137	™ 153	© 169	ą 185	É 201	Ú 217	é 233	ú 249
A	Š 138	š 154	Ş 170	ş 186	Ę 202	Ú 218	ę 234	ú 250
B	‹ 139	› 155	« 171	» 187	Ě 203	Ů 219	ě 235	ů 251
C	Š 140	š 156	ˆ 172	Ĺ 188	Ě 204	Ü 220	ë 236	ü 252
D	† 141	‡ 157	- 173	ˆ 189	İ 205	Ý 221	ı 237	ý 253
E	Ž 142	ž 158	® 174	İ 190	Î 206	Ț 222	î 238	ț 254
F	Ž 143	ž 159	Ž 175	ž 191	Ǿ 207	ß 223	ď 239	· 255

Page 46 [WPC1251: Cyrillic]

HEX	8	9	A	B	C	D	E	F
0	Ѓ 128	ђ 144	SP 160	° 176	А 192	Р 208	а 224	р 240
1	ѓ 129	‘ 145	Ў 161	± 177	Б 193	С 209	б 225	с 241
2	‘ 130	’ 146	ў 162	І 178	В 194	Т 210	в 226	т 242
3	ђ 131	“ 147	Ј 163	і 179	Г 195	У 211	г 227	у 243
4	” 132	” 148	Ѡ 164	ѓ 180	Д 196	Ф 212	д 228	ф 244
5	... 133	• 149	Ѓ 165	μ 181	Е 197	Х 213	е 229	х 245
6	† 134	— 150	Ѓ 166	¶ 182	Ж 198	Ц 214	ж 230	ц 246
7	‡ 135	— 151	§ 167	· 183	З 199	Ч 215	з 231	ч 247
8	€ 136	SP 152	Ё 168	ё 184	И 200	Ш 216	и 232	ш 248
9	‰ 137	™ 153	© 169	№ 185	Й 201	Щ 217	й 233	щ 249
A	Љ 138	љ 154	Є 170	є 186	К 202	Ъ 218	к 234	ъ 250
B	‹ 139	› 155	« 171	» 187	Л 203	Ы 219	л 235	ы 251
C	Њ 140	њ 156	ѡ 172	ј 188	М 204	Ь 220	м 236	ь 252
D	Ќ 141	ќ 157	- 173	Ѕ 189	Н 205	Э 221	н 237	э 253
E	Ћ 142	ћ 158	® 174	ѕ 190	О 206	Ю 222	о 238	ю 254
F	Ќ 143	ѣ 159	Ї 175	ї 191	П 207	Я 223	п 239	я 255

Page 47 [WPC1253: Greek]

HEX	8	9	A	B	C	D	E	F
0	€ 128	SP 144	SP 160	° 176	ĩ 192	Π 208	Ů 224	π 240
1	SP 129	' 145	“ 161	± 177	Α 193	Ρ 209	α 225	ρ 241
2	' 130	' 146	Α 162	² 178	Β 194	SP 210	β 226	ς 242
3	f 131	“ 147	£ 163	³ 179	Γ 195	Σ 211	γ 227	σ 243
4	“ 132	” 148	□ 164	´ 180	Δ 196	Τ 212	δ 228	τ 244
5	... 133	• 149	¥ 165	μ 181	Ε 197	Υ 213	ε 229	υ 245
6	† 134	— 150	¡ 166	¶ 182	Ζ 198	Φ 214	ζ 230	φ 246
7	‡ 135	— 151	§ 167	· 183	Η 199	Χ 215	η 231	χ 247
8	SP 136	SP 152	” 168	Έ 184	Θ 200	Ψ 216	θ 232	ψ 248
9	‰ 137	™ 153	© 169	Ή 185	Ι 201	Ω 217	ι 233	ω 249
A	SP 138	SP 154	ª 170	Ί 186	Κ 202	Ϊ 218	κ 234	ϊ 250
B	‹ 139	› 155	« 171	» 187	Λ 203	Ϋ 219	λ 235	ϋ 251
C	SP 140	SP 156	¬ 172	Ό 188	Μ 204	ά 220	μ 236	ό 252
D	SP 141	SP 157	- 173	½ 189	Ν 205	έ 221	ν 237	ύ 253
E	SP 142	SP 158	® 174	Ύ 190	Ξ 206	ή 222	ξ 238	ώ 254
F	SP 143	SP 159	— 175	Ω 191	Ο 207	ι 223	ο 239	SP 255

Page 48 [WPC1254: Turkish]

HEX	8	9	A	B	C	D	E	F
0	€ 128	SP 144	SP 160	° 176	À 192	Ğ 208	à 224	ğ 240
1	SP 129	' 145	ı 161	± 177	Á 193	Ñ 209	á 225	ñ 241
2	, 130	' 146	¢ 162	² 178	Â 194	Ò 210	â 226	ò 242
3	f 131	" 147	£ 163	³ 179	Ã 195	Ó 211	ã 227	ó 243
4	" 132	" 148	¤ 164	´ 180	Ä 196	Ô 212	ä 228	ô 244
5	... 133	• 149	¥ 165	µ 181	Å 197	Ö 213	å 229	ö 245
6	† 134	— 150	ı 166	¶ 182	Æ 198	Ö 214	æ 230	ö 246
7	‡ 135	— 151	§ 167	· 183	Ç 199	× 215	ç 231	÷ 247
8	ˆ 136	ˆ 152	ˆ 168	ˆ 184	È 200	Ø 216	è 232	ø 248
9	‰ 137	™ 153	© 169	¹ 185	É 201	Ù 217	é 233	ù 249
A	Š 138	š 154	ª 170	º 186	Ê 202	Ú 218	ê 234	ú 250
B	‹ 139	› 155	« 171	» 187	Ë 203	Û 219	ë 235	û 251
C	Œ 140	œ 156	¬ 172	¼ 188	İ 204	Ü 220	ı 236	ü 252
D	SP 141	SP 157	- 173	½ 189	Í 205	İ 221	ı 237	ı 253
E	SP 142	SP 158	® 174	¾ 190	Î 206	Ş 222	î 238	ş 254
F	SP 143	ÿ 159	— 175	¿ 191	Ï 207	ß 223	ï 239	ÿ 255

Page 0 [PC437: USA, Standard Europe]

HEX	8	9	A	B	C	D	E	F
0	Ç 128	É 144	á 160	 176	L 192	ll 208	α 224	≡ 240
1	ü 129	æ 145	í 161	 177	⊥ 193	⌞ 209	β 225	± 241
2	é 130	Æ 146	ó 162	 178	τ 194	π 210	Γ 226	≥ 242
3	â 131	ô 147	ú 163	 179	† 195	ll 211	π 227	≤ 243
4	ä 132	ö 148	ñ 164	⌋ 180	— 196	ℓ 212	Σ 228	∫ 244
5	à 133	ò 149	Ñ 165	≡ 181	† 197	ƒ 213	σ 229	∫ 245
6	á 134	û 150	ä 166	ll 182	ƒ 198	π 214	μ 230	÷ 246
7	ç 135	ù 151	ø 167	π 183	ll 199	≡ 215	τ 231	≈ 247
8	ê 136	ÿ 152	¿ 168	ƒ 184	ll 200	≡ 216	Φ 232	° 248
9	ë 137	Ö 153	ƒ 169	ll 185	ƒ 201	∫ 217	Θ 233	• 249
A	è 138	Ü 154	ƒ 170	ll 186	ll 202	ƒ 218	Ω 234	• 250
B	ï 139	ø 155	½ 171	π 187	τ 203	 219	δ 235	√ 251
C	î 140	£ 156	¼ 172	ll 188	ll 204	 220	∞ 236	n 252
D	ì 141	¥ 157	ì 173	ll 189	= 205	ll 221	Φ 237	² 253
E	Ä 142	Pl 158	« 174	∫ 190	ll 206	ll 222	ε 238	■ 254
F	À 143	f 159	» 175	∫ 191	⊥ 207	 223	∩ 239	SP 255

Page 49 [WPC1255: Hebrew]

HEX	8	9	A	B	C	D	E	F
0	€ 128	SP 144	SP 160	° 176	‘ 192	ı 208	א 224	י 240
1	SP 129	‘ 145	ı 161	± 177	“ 193	’ 209	ב 225	ו 241
2	‘ 130	‘ 146	¢ 162	² 178	” 194	ˆ 210	ג 226	ע 242
3	f 131	” 147	£ 163	³ 179	” 195	˙ 211	ד 227	ף 243
4	” 132	” 148	₪ 164	ˆ 180	ˆ 196	ן 212	ה 228	פ 244
5	... 133	• 149	¥ 165	μ 181	” 197	ן 213	ו 229	ץ 245
6	† 134	— 150	ı 166	¶ 182	ˆ 198	” 214	ז 230	צ 246
7	‡ 135	— 151	§ 167	ˆ 183	— 199	ˆ 215	ח 231	ק 247
8	* 136	~ 152	” 168	ˆ 184	ˆ 200	” 216	ט 232	ר 248
9	‰ 137	™ 153	© 169	¹ 185	ˆ 201	SP 217	י 233	ש 249
A	SP 138	SP 154	x 170	÷ 186	SP 202	SP 218	ך 234	ת 250
B	‹ 139	› 155	« 171	» 187	ˆ 203	SP 219	כ 235	SP 251
C	SP 140	SP 156	¬ 172	¼ 188	ˆ 204	SP 220	ל 236	SP 252
D	SP 141	SP 157	- 173	½ 189	ˆ 205	SP 221	ם 237	SP 253
E	SP 142	SP 158	® 174	¾ 190	ˆ 206	SP 222	נ 238	SP 254
F	SP 143	SP 159	— 175	¿ 191	ˆ 207	SP 223	ן 239	SP 255

Page 50 [WPC1256: Arabic]

HEX	8	9	A	B	C	D	E	F
0	€ 128	گ 144	SP 160	° 176	ˆ 192	ذ 208	à 224	˙ 240
1	پ 129	‘ 145	، 161	± 177	ء 193	ر 209	ل 225	˘ 241
2	، 130	’ 146	¢ 162	² 178	آ 194	ز 210	â 226	˚ 242
3	f 131	“ 147	£ 163	³ 179	إ 195	س 211	م 227	˙ 243
4	” 132	” 148	¤ 164	´ 180	ذ 196	ش 212	ن 228	ô 244
5	... 133	• 149	¥ 165	µ 181	إ 197	ص 213	ه 229	˙ 245
6	† 134	– 150	¡ 166	¶ 182	ئ 198	ض 214	و 230	˙ 246
7	‡ 135	— 151	§ 167	· 183	ا 199	× 215	ç 231	+ 247
8	ˆ 136	ك 152	” 168	ˆ 184	ب 200	ط 216	è 232	˙ 248
9	‰ 137	™ 153	© 169	¹ 185	ة 201	ظ 217	é 233	ù 249
A	ث 138	ژ 154	ه 170	؛ 186	ت 202	ع 218	ê 234	˙ 250
B	‹ 139	› 155	« 171	» 187	ث 203	غ 219	ë 235	û 251
C	œ 140	œ 156	¬ 172	¼ 188	ج 204	- 220	ى 236	ü 252
D	چ 141	SP 157	- 173	½ 189	ح 205	ف 221	ي 237	SP 253
E	ژ 142	SP 158	® 174	¾ 190	خ 206	ق 222	î 238	SP 254
F	ذ 143	ن 159	– 175	؟ 191	د 207	ك 223	ï 239	ء 255

Page 51 [WPC1257: Baltic Rim]

HEX	8	9	A	B	C	D	E	F
0	€ 128	SP 144	SP 160	° 176	À 192	Š 208	ą 224	š 240
1	SP 129	' 145	SP 161	± 177	Í 193	Ń 209	ł 225	ń 241
2	' 130	' 146	¢ 162	² 178	Ā 194	Ŧ 210	ā 226	ŧ 242
3	SP 131	" 147	£ 163	³ 179	Ć 195	Ó 211	ć 227	ó 243
4	" 132	" 148	¤ 164	´ 180	Ä 196	Ö 212	ä 228	ö 244
5	... 133	• 149	SP 165	µ 181	Å 197	Õ 213	å 229	õ 245
6	† 134	— 150	ı 166	¶ 182	Ę 198	Ö 214	ę 230	ö 246
7	‡ 135	— 151	§ 167	· 183	Ė 199	× 215	ė 231	· 247
8	SP 136	SP 152	Ø 168	ø 184	Č 200	Ț 216	č 232	ț 248
9	‰ 137	™ 153	© 169	¹ 185	É 201	Ł 217	é 233	ł 249
A	SP 138	SP 154	Ŕ 170	ŗ 186	Ž 202	Ś 218	ż 234	ś 250
B	‹ 139	› 155	« 171	» 187	Ê 203	Û 219	ê 235	û 251
C	SP 140	SP 156	¬ 172	¼ 188	Ģ 204	Ü 220	ģ 236	ü 252
D	ˆ 141	ˆ 157	- 173	½ 189	ķ 205	Ž 221	ķ 237	ž 253
E	˘ 142	˘ 158	® 174	¾ 190	İ 206	Ž 222	ı 238	ž 254
F	˙ 143	SP 159	Æ 175	æ 191	Ĺ 207	ß 223	ı 239	· 255

HEX	8	9	A	B	C	D	E	F
0	€ 128	SP 144	SP 160	° 176	À 192	Đ 208	à 224	đ 240
1	SP 129	' 145	ì 161	± 177	Á 193	Ñ 209	á 225	ñ 241
2	' 130	' 146	¢ 162	² 178	Â 194	' 210	â 226	' 242
3	f 131	" 147	£ 163	³ 179	Ã 195	Ó 211	ã 227	ó 243
4	" 132	" 148	¤ 164	´ 180	Ä 196	Ô 212	ä 228	ô 244
5	... 133	• 149	¥ 165	µ 181	Å 197	Õ 213	å 229	σ 245
6	† 134	- 150	¡ 166	¶ 182	Æ 198	Ö 214	æ 230	ö 246
7	‡ 135	— 151	§ 167	· 183	Ç 199	× 215	ç 231	÷ 247
8	ˆ 136	ˆ 152	¨ 168	˘ 184	È 200	Ø 216	è 232	ø 248
9	‰ 137	™ 153	© 169	¹ 185	É 201	Ù 217	é 233	ù 249
A	SP 138	SP 154	ª 170	º 186	Ê 202	Ú 218	ê 234	ú 250
B	‹ 139	› 155	« 171	» 187	Ë 203	Û 219	ë 235	û 251
C	Œ 140	œ 156	¬ 172	¼ 188	´ 204	Ü 220	´ 236	ü 252
D	SP 141	SP 157	¯ 173	½ 189	í 205	U' 221	í 237	u' 253
E	SP 142	SP 158	® 174	¾ 190	î 206	ˆ 222	î 238	đ 254
F	SP 143	ÿ 159	— 175	¿ 191	Ï 207	ß 223	ï 239	ÿ 255