

MPrint (Western Language) ESC/P Command Reference

Version 3.12

Model Name: Mobile thermal printer (Western language models)

MW-120

MW-120 TypeF

MW-140BT TypeE

MW-140BT TypeF

MW-145BT

MW-260

Written by: Brother Industries, Ltd.

Machine Model: MW-120/MW-120 TypeF/MW-140BT TypeE/MW-140BT TypeF/

MW-145BT/MW-260

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Notes for using Bluetooth

When you are connecting the machine via Bluetooth, the printer may not start to receive the data immediately after the port is opened. We advise to wait for an interval of 500 msec before sending the print data to the machine.

If you normally close and re-open the Bluetooth port between prints, we would again advise to leave 500 msec between the port being closed and re-opened.

Also, once you have sent the print data, and the printing process has begun, do not close the port. Please ensure 32 bytes of data has been received by the printer, and then close the port.

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Chapter 1. General Information

1-1) About this Manual

This manual explains how to control the Brother MPrint series of mobile printers (hereafter referred to simply as “MPrint”) directly, and to use this command interface to customize the output from your programs. However, this manual should not be regarded as a programming tutorial. You should already have a basic knowledge and experience of programming.

These ESC/P commands have been adapted specifically for printers.

Target models and interfaces:

MW-120 / MW-120 TypeF

➔ IrDA Ver.1.2 and USB 2.0 Full Speed

MW-140BT TypeE / MW-140BT TypeF

➔ Bluetooth Ver.1.1 with serial port profile and USB 2.0 Full Speed

MW-145BT

➔ Bluetooth Ver.2.1+EDR with serial port profile and USB 2.0 Full Speed

MW-260

➔ IrDA Ver.1.3, Bluetooth Ver.1.1 with serial port profile and USB 2.0 Full Speed

Target language version:

➔ Western language versions

Target Host:

➔ Any host which has any one of the above interfaces, which can control data output from your program, and which can install and run your program, for example PCs, BlackBerrys, smart phones, PDAs and hand terminals.

Updated history:

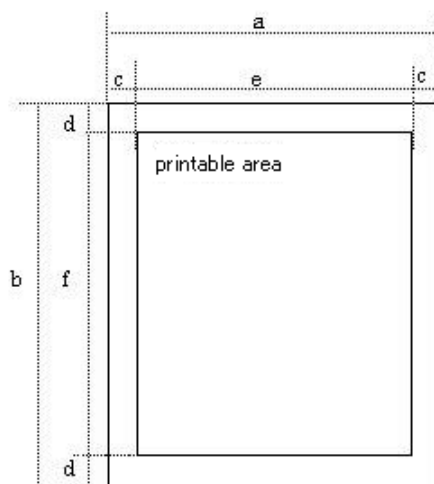
2010/02/26 Version 2.00 released.

Reference updated to apply to MW-120, MW-140BT, MW-145BT and MW-260.

1-2) Paper size and printable area information

Brother MPrint is able to output to A7 size or A6 size thermal paper. The MW-120, MW-140BT and MW-145BT use A7 size paper, MW-260 uses A6 size paper. We strongly recommend using Brother C-paper cassettes.

Standard thermal paper (C-11 / C-12 / C-211 / C-212)



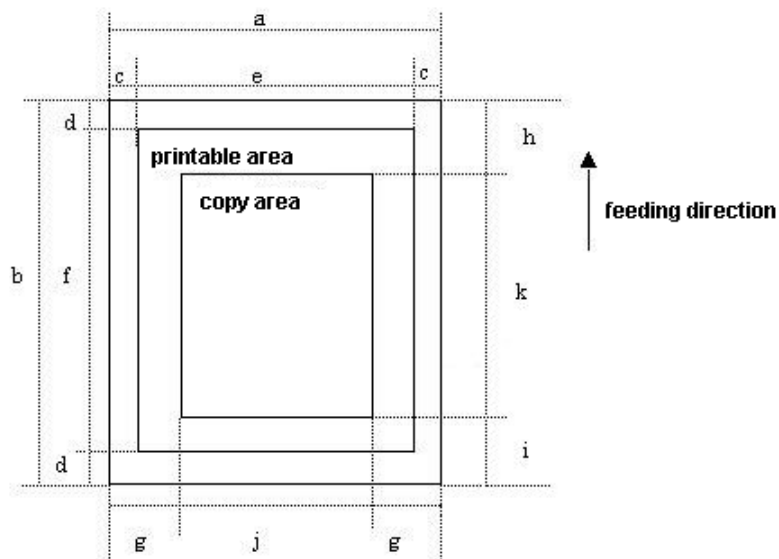
A7 size information (C-11 / C-12):

Position	Description	Size(mm)	Size(dots)
A	Paper width	74	874
B	Paper length	105	1,240
C	Paper margin left / right	2.5	29
D	Paper margin top / bottom	2.5	30
E	Printable area width	69.1	816
F	Printable area length	99.9	1,180

A6 size information (C-211 / C-212):

Position	Description	Size(mm)	Size(dots)
A	Paper width	105	1,240
B	Paper length	148	1,748
C	Paper margin left / right	3.75	44
D	Paper margin top / bottom	3.75	44
E	Printable area width	97.5	1,152
F	Printable area length	140.5	1,660

Carbon copy paper (C-51 / C-251)



A7 size information (C-51):

Position	Description	Size(mm)	Size(dots)
A	Paper width	74	874
B	Paper length	105	1,240
C	Paper margin left / right	2.5	29
D	Paper margin top / bottom	2.5	30
E	Printable area width	69.1	816
F	Printable area length	99.9	1,180
G	Total margin left / right by copy area	6.0	71
H	Total margin top by copy area	6.0	71
I	Total margin bottom by copy area	4.0	47
J	Copy area width	62.0	732
K	Copy area length	95.0	1,122

A6 size information (C-251):

Position	Description	Size(mm)	Size(dots)
A	Paper width	105	1,240
B	Paper length	148	1,748
C	Paper margin left / right	3.75	44
D	Paper margin top / bottom	3.75	44
E	Printable area width	97.5	1152
F	Printable area length	140.5	1,660
G	Total margin left / right by copy area	6.0	71
H	Total margin top by copy area	6.5	77
I	Total margin bottom by copy area	4.5	53
J	Copy area width	93.0	1,098
K	Copy area length	137.0	1,618

1-3) Character and text information

MPrint has 5 bitmap font styles, “Brougham”, “Letter Gothic Bold”, “Brussels”, “Helsinki” and “San Diego”, and 3 outline font styles, “Letter Gothic”, “Brussels” and “Helsinki” for MW-145BT and MW-260.

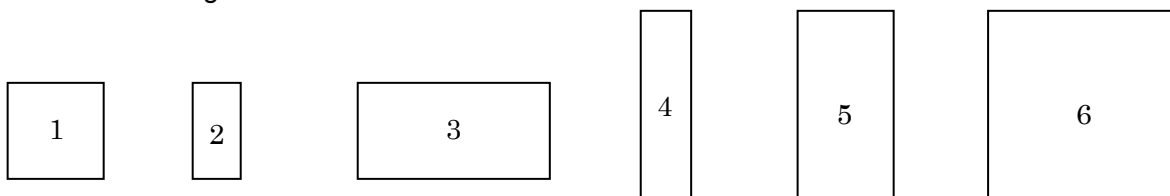
The Bitmap fonts are available with 3 sizes as standard, 24 dots, 32 dots and 48 dots. You can also use variations of each font size, such as double-width characters. For more details, please refer to the **“Detailed font size information”** section.

Each font can use either proportional or fixed-width settings. There are 2 types of font designed for fixed-width, “Brougham” and “Letter Gothic Bold”. There are 3 types of font designed for proportional width, “Brussels”, “Helsinki” and “San Diego”. For more details, please refer to the **“Detailed font width information”** section.

Detailed font size information

There are 6 types of size variations available for each font.

1. Regular size
2. Half-width size
3. Double-width size
4. Half-width and double-height size
5. Double height size
6. Double height and width size



The difference between the net font size and described font size is that the net font size is smaller than the described font size. The net font size depends on the currently selected font.

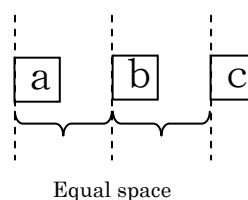
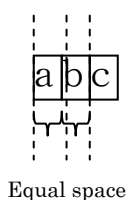
i.e. Brougham

Described font size (dots)	24	32	48
Net font height (dots)	21	28	44
Net font width (dots)	11	16	26

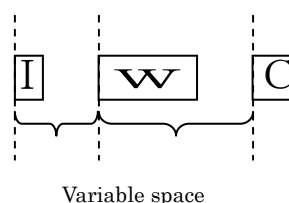
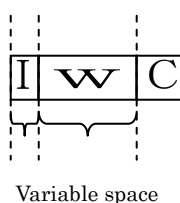
Special characters for rules (┌ ┐ └ ┘ ┐ ┌ └ ┘ ┐ ┌) and shaded characters are automatically set the same width as “Brougham”, overriding any custom proportional (PS pitch) or fixed-width settings.

Detailed font width information

With a “fixed-width” font each character is the same width as all other characters.



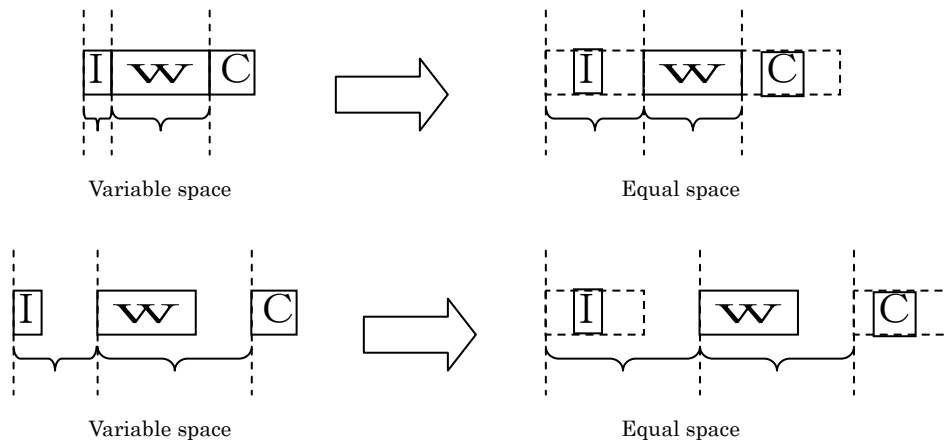
In a “Proportional” font, characters can occupy a different amount of space depending on the character. For example, “W” occupies a wider space than “I”..



If the fonts designed for proportional usage, “Brussels”, “Helsinki” and “San Diego” are set as fixed-width, all spaces are automatically set to equal the widest character in the table below.

Maximum character width each font

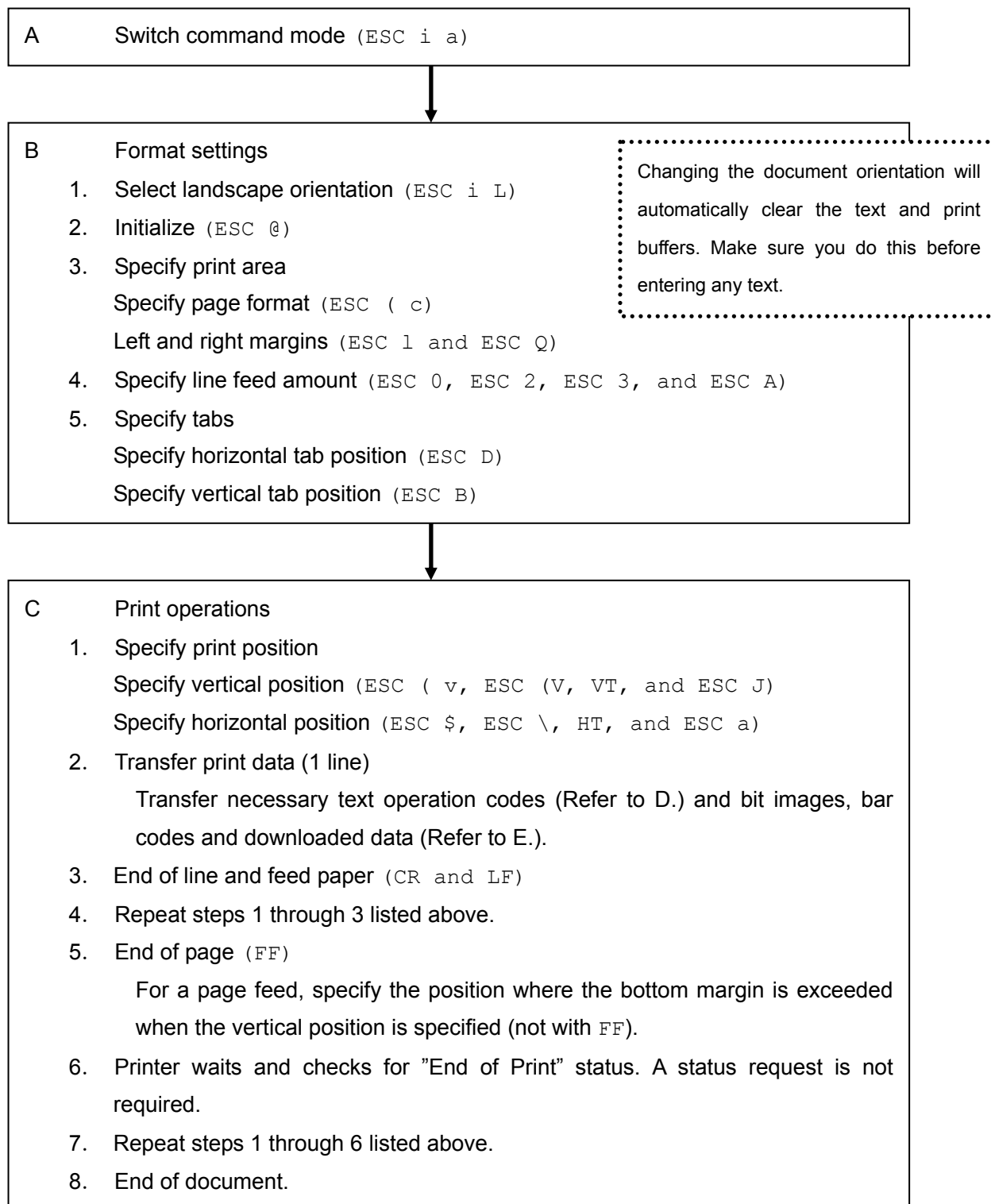
Font type	Font face	Font size 24 dots	Font size 32 dots	Font size 48 dots	Widest character code
Bitmap Font	Brussels	25	35	56	89h; “‰” (Western or Eastern)
	Helsinki	21	28	44	BDh; “FAX”, or DEh; “TEL” (Standard)
	San Diego	24	35	57	9Eh; “Pts” (Standard)
Outline Font	Brussels	Calculated (size/100 x 128)			89h ; “‰” (Western or Eastern)
	Helsinki	Calculated (size/100 x 102)			40h; “@”



You can set it so that each character is the same width even if you use a proportional font. However, using a fixed-width font with proportional settings will still have characters which are the same width.

1-3) Overview of document creation

A general overview of document creation is shown below.



D Text operations

1. Specify character set

Select font (ESC k)

Select character code (ESC t)

Select international character set (ESC R)

Specify character size (ESC X)

Character spacing (ESC P, ESC M, ESC g, and ESC SP)

2. Character style (ESC 4, ESC 5, ESC E, ESC F, ESC G, ESC H, ESC W, SO, ESC SO, SI, ESC SI, DC2, DC4, ESC -, and ESC !)

3. Character code

*Repeat steps 1 through 3, as necessary.

E Bitmap image (ESC *, ESC K, ESC L, ESC Y, and ESC Z)

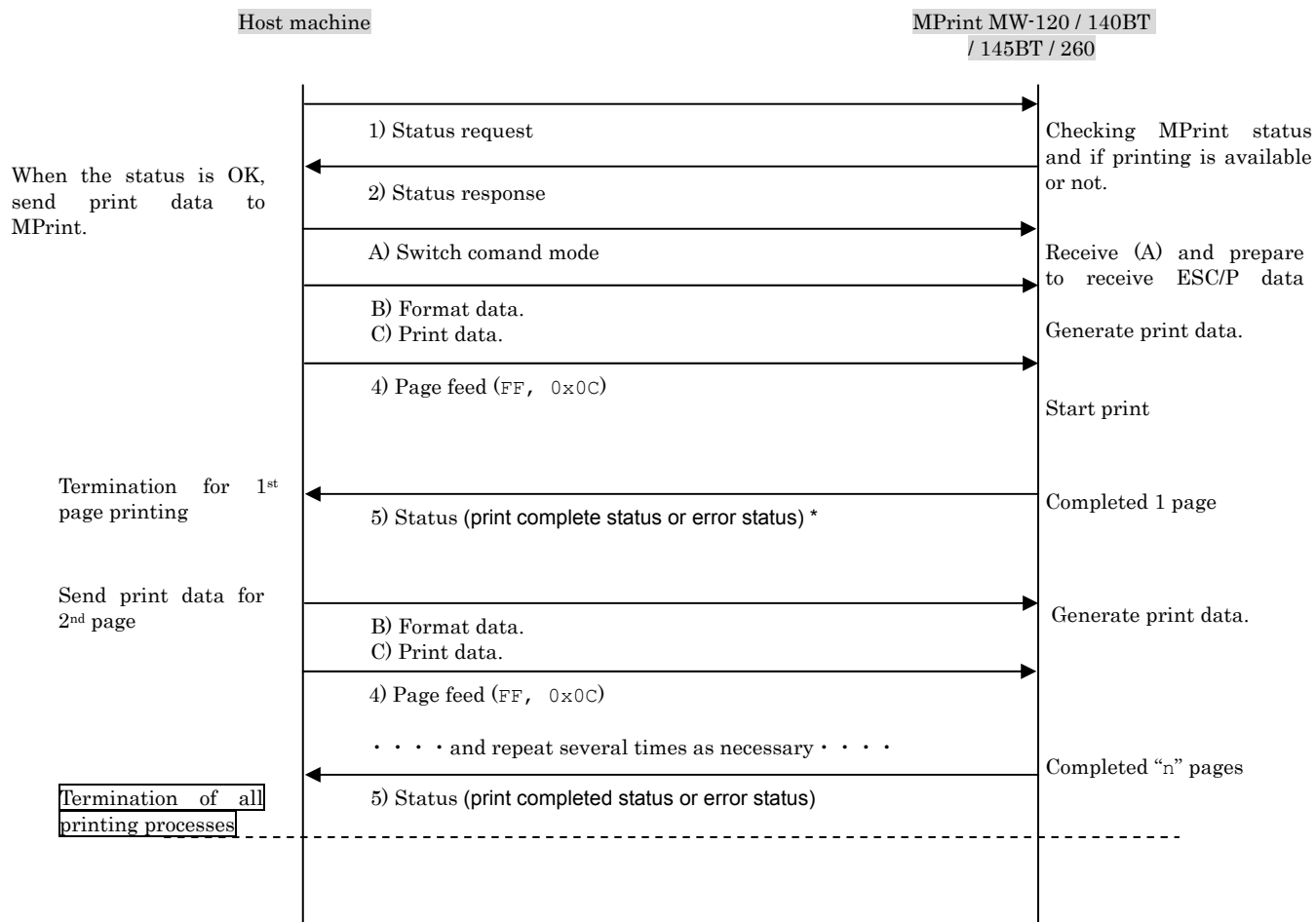
Bar code (ESC i B)

Downloaded data (ESC i F)

With downloaded data, the image data must be downloaded and saved on the main unit in advance.

1-4) Standard flow

Standard printing flow



[Description]

1) Status request

Send a status request (ESC + i + S)

2) Status response

There are 32 bytes of status such as header mark, size, "Brother" code, series code etc...

3) Print data

Sending print data with header, switch command mode (ESC + i + a + 0x00), initialize command (ESC + @), and actual print data.

4) Page feed (FF, 0x0C)

Receiving "Page feed command", the printer starts rendering the print image, and then prints.

5) Status (print completed status or error status)

This status shows "print completed".

* MW-120 does not reply "print completed" (using ESC/P commands).

1-4) Status and Error handling

1-4-1) Status information:

When your program issues the command "Status request", MPrint returns basic 32 bytes and additional status data. The command follows.

ESC i S Request printer status

[ASCII] ESC i S

[Decimal] 27 105 83

[Hexadecimal] 1B 69 53

[Parameters] None

[Description]

- Requests the printer status.

Status information table:

Index number	Offset	Data size	Description	Value
1	0	1	Head mark	80 Hex...fixed data
2	1	1	Size	20 Hex...fixed data
3	2	1	"Brother" code	'B' Char (42 Hex) ...fixed data
4	3	1	Series code	Describe afterward
5	4	1	Model code	Describe afterward
6	5	1	Country code	Describe afterward
7	6	1	Information on main unit	00 Hex...fixed data
8	7	1	N/A	00 Hex...fixed data
9	8	1	Error information 1	Describe afterward
10	9	1	Error information 2	Describe afterward
11	10	1	Media width	Describe afterward
12	11	1	Media kind	Describe afterward
13	12	1	Number of colours	Describe afterward
14	13	1	Font	00 Hex...fixed data
15	14	1	Japanese font	00 Hex...fixed data
16	15	1	Mode	Describe afterward
17	16	1	Density	Describe afterward
18	17	1	Media length	Describe afterward
19	18	1	Status kind	Describe afterward
20	19	1	Phase kind	Describe afterward
21	20	1	Phase number(upper byte)	Describe afterward
22	21	1	Phase number(lower byte)	Describe afterward
23	22	1	Notice number	Describe afterward
24	23	1	Number of bytes (expansion section)	00 Hex
25	24	8	Hardware setting	Describe afterward

Series code

Series	Value
General printer type	'2' Char (32 Hex)

Model code

Model	Value
MW-100	'1' Char (31 Hex)
MW-120 / MW-120 TypeF	'2' Char (32 Hex)
MW-140BT / MW-140BT TypeE / MW-140BT TypeF	'3' Char (33 Hex)
MW-145BT	'5' Char (35 Hex)
MW-260	'4' Char (34 Hex)

Country Code

Country	Value
USA or no country specified	'0' Char (30 Hex)

Media Width, Length

Name	Value
Width - MW-100 / 120 / 140BT / 145BT	74 mm
Height - MW-100 / 120 / 140BT / 145BT	105 mm
Width - MW-260	105 mm
Height - MW-260	148 mm
Width - MW-145BT / MW-260	0 mm = No paper *
Height - MW-145BT / MW-260	0 mm = No paper *

* MW-145BT and MW-260 check to see if the paper is present. If the paper is not present, the Width and Height are described as "0".

Media kind

Media kind	Value	Remarks	Memo
None (no paper cassette)	00 Hex	No paper cassette is present	
Thermal paper	01 Hex		
Reserved	02 Hex	Spare (currently not used)	
Label	03 Hex		
Cut label (split horizontally: 4 blocks)	04 Hex	Discontinue settings.	Do not use
Cut label (split horizontally: 2 blocks)	05 Hex	Discontinue settings.	Do not use

Reserved	06 Hex	Discontinue settings.	Do not use
Reserved	07 Hex	Discontinue settings.	Do not use
Carbon copy (2ply)	08 Hex		
Reserved	09 Hex	Spare (currently not used)	
Reserved	0E Hex	Spare (currently not used)	
Wrong paper cassette direction	0F Hex		

Status kind

Status kind	Value
Reply to status request	00 Hex
Print complete	01 Hex
Error occurrence	02 Hex
Not used (normally, IF mode exit)	03 Hex
Not used (normally, power off)	04 Hex
Notice	05 Hex
Phase change	06 Hex
(Not used)	07 Hex – 20 Hex
(Not allowed to use)	21 Hex – FF Hex

Phase kind and number *

Phase kind	Value
Edit (reception possible)	00 Hex
Normal printing	01 Hex

* “Phase kind and number” is not used in ESC/P Commands, it is used only for the raster graphic command mode.

Edit *

Phase number	Value(Dec)	Upper byte	Lower byte
Edit (reception possible)	0	00 Hex	00 Hex

* “Edit” is not used in ESC/P Commands, it is used only for the raster graphic command mode.

Normal printing *

Phase number	Value(Dec)	Upper byte	Lower byte
Printing	0	00 Hex	00 Hex

* “Normal printing” is not used in ESC/P Commands, it is used only for the raster graphic command mode.

Notice number

Name	Value
Invalid	00 Hex
Not used	01 Hex
Not used	02 Hex
Not used	03 Hex
Not used	04 Hex
Not used	05 Hex

1-4-2) Error information:

Error Information 1 table:

Data Flag	Mask	Description
Bit 0	0x01	Paper cassette empty error (or Paper cassette wrong distance error. It is not paper empty)
Bit 1	0x02	N/A
Bit 2	0x04	Paper Jam
Bit 3	0x08	Battery empty
Bit 4	0x10	N/A
Bit 5	0x20	N/A
Bit 6	0x40	Adapter overvoltage limit
Bit 7	0x80	N/A

Error Information 2 table:

Data Flag	Mask	Description
Bit 0	0x01	Paper cassette was changed during printing
Bit 1	0x02	N/A
Bit 2	0x04	Program error (communication error or buffer full error. ESC/P command data exceeded 64 KB limit.) MW-145BT and MW-260 are available the error. MW-120 and MW-140BT are not available.
Bit 3	0x08	N/A (communication error) MW-120 and MW-140BT are available the error. MW-145BT and MW-260 are not available (N/A).
Bit 4	0x10	N/A
Bit 5	0x20	Print head above high temperature limit
Bit 6	0x40	Feed error or paper empty
Bit 7	0x80	System error (EEPROM error and other fatal errors)

1-4-3) Error description

a. "Paper cassette empty error" / "Paper cassette wrong distance error"

An error status (setting bit 0 in the error information 1 table) is sent to the host device when a printer is detects an empty paper cassette or paper cassette wrong distance after a page feed command is received.

b. "Paper empty error"

An error status (setting bit 1 in the error information 1 table) is sent to the host device when a printer is aware of a paper empty or unable to feed error after a page feed command is received.

c. "Paper jam error"

An error status (setting bit 2 in the error information 1 table) is sent to the host device when a paper jam occurs. If the paper jam occurs during a print, the printer stops printing immediately. This error will remain until the jammed paper is removed. If the host device sends more print data while the printer is still jammed, the printer will not try printing and will return the same error.

d. "Battery empty error"

An error status (setting bit 3 in the error information 1 table) may be sent to the host device when the printer detects the battery is empty while idle or printing. After the error is sent, the printer is shut down. If the "battery empty error" occurs while printing, the printer tries printing the current page. After the page is printed, an error status may be sent. The printer will shut down even if the host does not receive the error. If the printer does not have enough power to finish printing the page, the printer is shut down immediately and no error status is sent to the device.

e. "Paper cassette change during printing error"

An error status (setting bit 0 in the error information 2 table) is sent to the host device when the printer detects a paper cassette change during printing action, and stops printing immediately. It is not kept error data in the printer.

f. "Program error"

An error status (setting bit 2 in the error information 2 table) is sent to the host device when the printer detects a "program error". This "program error" occurs in 2 cases. One is that ESC/P data has exceeded the 64KB buffer, and the other is that the printer received corrupted print data. This error only applies to MW-145BT and MW-260.

g. "Communication error"

An error status (setting bit 3 in the error information 2 table) is sent to the host device when the printer detects a "communication error". This error only applies to MW-120 and MW-140BT.

h. "High-temperature error"

An error status (setting bit 5 in the error information 2 table) is sent to the host device when the printer detects high-temperature on the thermal print head after receiving a page feed command, or detects it during printing. The printer will immediately stop printing until the head is cool enough to continue, and should continue printing the current page. Subsequent pages may need to be re-sent by the host device or control software.

i. “No paper at start point error / Feed error”

An error status (setting bit 6 in the error information 2 table) is sent to the host device when the printer cannot detect the paper edge after feeding action. It is not kept error data in the printer. If a host device sends print data, a printer will try printing it.

j. “System error”

An error status (setting bit 7 in the error information 2 table) is sent to the host device when the printer detects a system error. The error will remain until it is resolved.

Chapter 2. Command information

The MPrint range of printers can be updated through firmware updates. These updates can include new commands.

Commands or parameters marked with “*” are supported by MW-120 TypeF, MW-140BT TypeF and MW-260.

Commands or parameters marked with “**” are supported by MW-260 and MW-145BT.

2-1) Character/style selection commands

ESC R Select international character set

[ASCII] ESC R n

[Decimal] 27 82 n

[Hexadecimal] 1B 52 n

[Parameters] $0 \leq n \leq 13$, 64

[Description]

- Selects the character code section of the code table corresponding to the value of n.
- The default setting is n=0 (United States).

-> Refer to “*International character set*” on page 44.

ESC q Select character style

[ASCII] ESC q n

[Decimal] 27 113 n

[Hexadecimal] 1B 71 n

[Parameters] $0 \leq n \leq 3$

[Description]

- Selects the character style.
- n=0: Cancel (normal characters)
n=1: Outline
n=2: Shadow
n=3: Shadow and outline

ESC k Select font

[ASCII] ESC k n

[Decimal] 27 107 n

[Hexadecimal] 1B 6B n

MW-120 / MW-120 TypeF / MW-140BT TypeE / MW-140BT TypeF

[Parameters] $0 \leq n \leq 4$

[Description]

- Selects the font.

n=0 Brougham (better for fixed-width)

n=1 Letter Gothic Bold (better for fixed-width)

n=2 Brussels (better for proportional)

n=3 Helsinki (better for proportional)

n=4 San Diego (better for proportional)

- The default setting is n=0 Brougham (better for fixed-width).

**** These parameters are supported by MW-145BT and MW-260.**

[Parameters] 00h ≤ n ≤ 04h (bitmap fonts)

[Parameters] 09h ≤ n ≤ 0Bh (outline fonts)

[Description]

- Selects the font.

n=0 Brougham (better for fixed-width)

n=1 Letter Gothic Bold (better for fixed-width)

n=2 Brussels (better for proportional)

n=3 Helsinki (better for proportional)

n=4 San Diego (better for proportional)

n=9 Letter Gothic (better for fixed-width)

n=10 Brussels (better for proportional)

n=11 Helsinki (better for proportional)

- The default setting is n=0 Brougham (better for fixed-width).

ESC t Select character code table
--

[ASCII] ESC t n

[Decimal] 27 116 n

[Hexadecimal] 1B 74 n

[Parameters] n=0, 1, 2

[Description]

- From the two built-in character code tables, selects the character code table to be used.
- n=0: Code table for regular characters
- n=1: Code table for Eastern European characters
- n=2: Code table for Western European characters
- n=3: (Spare)
- The default setting is n=0.

2-2) Text printing commands

ESC 4 Apply italic style

[ASCII] ESC 4

[Decimal] 27 52

[Hexadecimal] 1B 34

[Parameters] None

[Description]

- Applies the italic character style.

ESC 5 Cancel italic style

[ASCII] ESC 5

[Decimal] 27 53

[Hexadecimal] 1B 35

[Parameters] None

[Description]

- Cancels the italic character style.

ESC E Apply bold style

[ASCII] ESC E

[Decimal] 27 69

[Hexadecimal] 1B 45

[Parameters] None

[Description]

- Prints subsequent print data in bold.

ESC F Cancel bold style

[ASCII] ESC F

[Decimal] 27 70

[Hexadecimal] 1B 46

[Parameters] None

[Description]

- Cancels the bold style.

ESC G Specify double printing

[ASCII] ESC G

[Decimal] 27 71

[Hexadecimal] 1B 47

[Parameters] None

[Description]

- Applies the bold style.

ESC H Cancel double printing

[ASCII] ESC H

[Decimal] 27 72

[Hexadecimal] 1B 48

[Parameters] None

[Description]

- Cancels the bold style.

ESC P Specify pica pitch

[ASCII] ESC P

[Decimal] 27 80

[Hexadecimal] 1B 50

[Parameters] None

[Description]

- Prints the following data (ANK characters) with the pica pitch (10 characters/inch).

ESC M Specify elite pitch

[ASCII] ESC M

[Decimal] 27 77

[Hexadecimal] 1B 4D

[Parameters] None

[Description]

- Prints the following data (ANK characters) with the elite pitch (12 characters/inch).

ESC g Specify micron pitch

[ASCII] ESC g

[Decimal] 27 103

[Hexadecimal] 1B 67

[Parameters] None

[Description]

- Prints the following data (ANK characters) using micron pitch (15 characters/inch).

ESC p Specify proportional characters

[ASCII] ESC p n

[Decimal] 27 112 n

[Hexadecimal] 1B 70 n

[Parameters] n=0, 1 or 30h, 31h

[Description]

- Specifies proportional characters.
- If n=1 or 31h, proportional characters are applied.
- If n=0 or 30h, proportional characters are cancelled.

ESC W Specify double-width characters

[ASCII] ESC W n

[Decimal] 20 87 n

[Hexadecimal] 1B 57 n

[Parameters] n=0 and 1 or 30h and 31h

[Description]

- Specifies double-width characters.
- If n=1 or 31h ("1"), double width is applied.
- If n=0 or 30h ("0"), double width is cancelled.

SO Specify auto-cancelling enlarged characters

[ASCII] SO

[Decimal] 14

[Hexadecimal] 0E

[Parameters] None

[Description]

- Prints the following data in double-width characters.
- This mode is cancelled using DC4, LF, VT, FF, or an automatic line feed.

- This mode is cancelled using CR, ESC \$, ESC \, ESC (V, ESC (v.

ESC SO Specify auto-cancelling enlarged characters

[ASCII] ESC SO

[Decimal] 27 14

[Hexadecimal] 1B 0E

[Parameters] None

[Description]

- Same as SO

SI Specify half-width characters

[ASCII] SI

[Decimal] 15

[Hexadecimal] 0F

[Parameters] None

[Description]

- Prints the following data in half-width characters.

ESC SI Specify half-width characters

[ASCII] ESC SI

[Decimal] 27 15

[Hexadecimal] 1B 0F

[Parameters] None

[Description]

- Same as SI

DC2 Cancel half-width characters

[ASCII] DC2

[Decimal] 18

[Hexadecimal] 12

[Parameters] None

[Description]

- Cancels the half-width characters specified using SI.

DC4 Cancel auto-cancelling double-width characters

[ASCII] DC4

[Decimal] 20

[Hexadecimal] 14

[Parameters] None

[Description]

- Cancels the double-width characters specified using ESC SO or SO.

ESC - Apply/cancel underlining

[ASCII] ESC - n

[Decimal] 27 45 n

[Hexadecimal] 1B 2D n

[Parameters] n=0, 1, 2, 3, 4

[Description]

- Applies and cancels underlining.
- If n=4, underlining with a width of 4 dots is applied. **
- If n=3, underlining with a width of 3 dots is applied. **
- If n=2, underlining with a width of 2 dots is applied. **
- If n=1, underlining with a width of 1 dots is applied.
- If n=0, underlining is cancelled.
- Available at any point in the text line.

ESC ! Global formatting

[ASCII] ESC ! n

[Decimal] 27 33 n

[Hexadecimal] 1B 21 n

[Parameters] 0≤n≤255

[Description]

- Specifies a combination of the various print modes.

Bit	7	6	5	4	3	2	1	0
If "1"	Underline	Italics	Doublewidth	Doubleheight	Bold	Reduced	Proportional	12 cpi
If "0"	Cancel	Cancel	Cancel	Cancel	Cancel	Cancel	Cancel	10 cpi

Setting Bit 5 comes before setting Bit 2.

The setting of "Bit 0" is available only when "Bit 1" is set with a parameter "0".

ESC SP Select character spacing for ANK characters

[ASCII] ESC SP n

[Decimal] 27 32 n

[Hexadecimal] 1B 20 n

[Parameters] $0 \leq n \leq 127$

[Description]

- Specifies the character spacing.
- The default setting is $n=0$.

ESC X Select alphanumeric/kana character size

[ASCII] ESC X m nL nH

[Decimal] 27 88 m nL nH

[Hexadecimal] 1C 58 m nL nH

Bitmap fonts (MW-120 / MW-120 TypeF / MW-140BT / MW-140BT TypeF / MW-145BT / MW-260)

[Parameters] Character width: The value of m is irrelevant.

Character size: $nL = 24, 32, \text{ or } 48$ dots

Available only when $nH=0$.

[Description]

- This command is only used to change the size.
- Underlining must not be specified.
- Character width cannot be specified.
- The character size is set to $n=nL+nH*256$ dots.
- The width and the height is the same size.
- Only $n=24, 32, \text{ or } 48$ are available.

**** These parameters are supported by MW-145BT / MW-260.**

Outline fonts (MW-145BT / MW-260)**

[Parameters] Character width: The value of m is irrelevant.

Character size:

$nL = 33, 38, 42, 46, 50, 58, 67, 75, 83, 92, 100, 117, 133, 150, 167,$
 $200 \text{ or } 233$ dots

$nH=0$.

$nL = 11 (267), 44 (300), 77 (333), 111 (367) \text{ or } 144 (400)$ dots

$nH=1$.

[Description]

- This command is only used to change the size.
- Underlining must not be specified.
- Character width cannot be specified.
- The character size is set to $n=nL+nH*256$ dots.
- The width and the height is the same size.
- Default values are the following:
 - MW-120 / MW-140BT: Bitmap font is Brougham 24 dots
 - MW-145BT: Bitmap font is Brougham 32dots and Outline font selects Brougham 42 dots.
 - MW-260: Bitmap font is Brougham 32 dots and Outline font selects Brougham 42 dots.
- If you input a wrong value, it will be ignored. In case of selected bitmap font, it is also wrong value with the font size for Outline font.

2-3) Line feed amount commands

ESC 0 Specify line feed of 1/8"

[ASCII] ESC 0

[Decimal] 27 48

[Hexadecimal] 1B 30

[Parameters] None

[Description]

- Specifies a line feed amount of 1/8" (approximately 0.32 cm).
- A line feed sets 38 dots (38 dots / 300 dpi).

ESC 2 Specify line feed of 1/6"

[ASCII] ESC 2

[Decimal] 27 50

[Hexadecimal] 1B 32

[Parameters] None

[Description]

- Specifies a line feed amount of 1/6" (approximately 0.42 cm).
- A line feed sets 50 dots (50 dots / 300 dpi).

ESC 3 Specify line feed amount in minimum units

[ASCII] ESC 3 n

[Decimal] 27 51 n

[Hexadecimal] 1B 33 n

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

[Description]

- Specifies a line feed amount of $n/300$ " each text line.

ESC A Specify line feed amount of n/60"

[ASCII] ESC A n

[Decimal] 27 65 n

[Hexadecimal] 1B 41 n

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

[Description]

- Specifies a line feed amount of $n/60$ ".
- Therefore, $n=1$ will feed 5 dots ($n=1 = 5 \text{ dots} / 300 \text{ dpi}$).

2-4) Horizontal movement commands

ESC I Specify left margin

[ASCII] ESC I n

[Decimal] 27 108 n

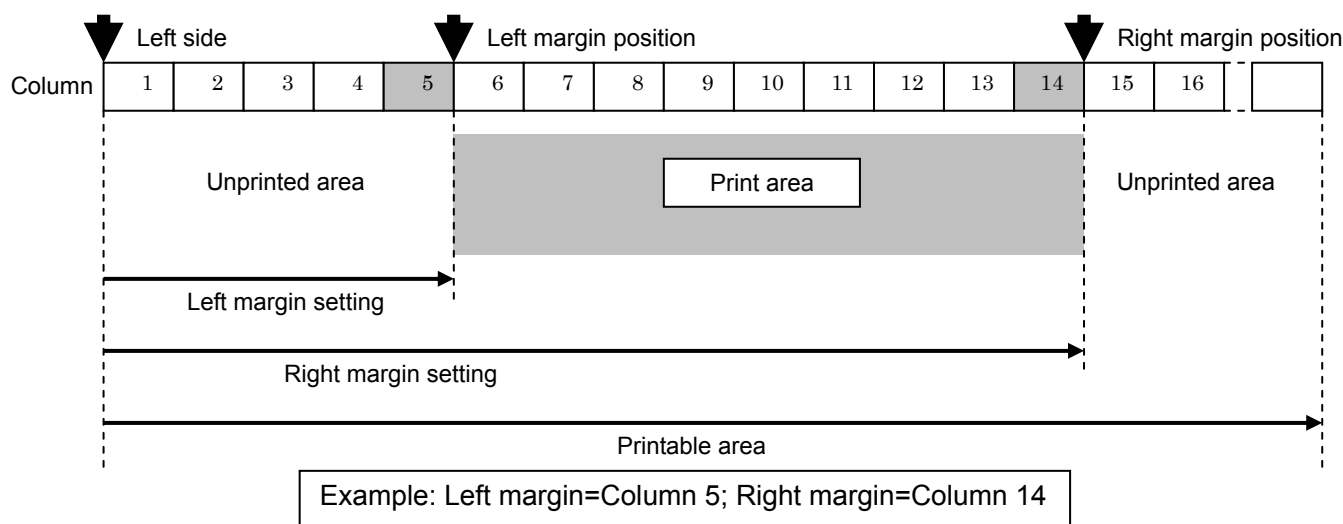
[Hexadecimal] 1B 6C n

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

$0 \leq \text{Left margin} < \text{Right margin}$

[Description]

- The position of the character width when the left margin is specified *n from the left side is the left margin position.



ESC Q Specify right margin

[ASCII] ESC Q n

[Decimal] 27 81 n

[Hexadecimal] 1B 51 n

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

Left margin < Character width when right margin is specified *n ≤ Printable area

[Description]

- The position of the character width when the right margin is specified *n from the left side is the right margin position.

CR Carriage return

[ASCII] CR

[Decimal] 13

[Hexadecimal] 0D

[Parameters] None

[Description]

- Concludes the input of one line, and waits for input of the second line.
- A “Line Feed” command after “Carriage return” command is ignored.

ESC D Specify horizontal tab position

[ASCII] ESC D [n] _k NUL

[Decimal] 27 68 [n] _k 0

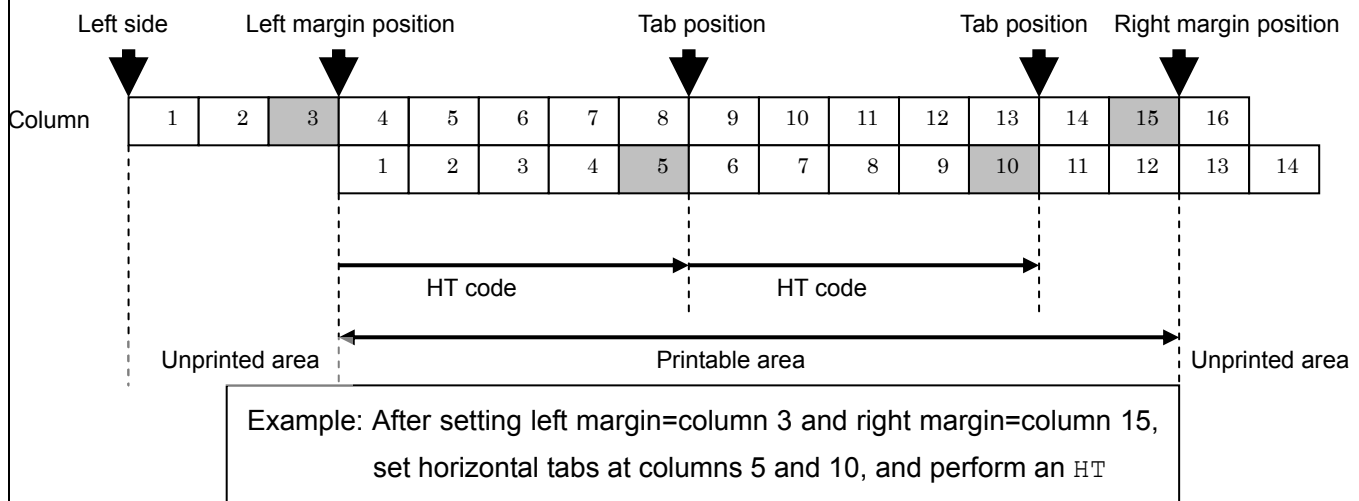
[Hexadecimal] 1B 44 [n] _k 00h

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

$0 \leq k \leq 32$

[Description]

- The horizontal tab position is set at the position of the character width when the horizontal tab is specified *_n from the left margin position.
- Enter _n in ascending order, and end the setting with NUL.
- If any _n value is smaller than the value before it, the tab setting is finished.



HT Apply horizontal tab

[ASCII] HT

[Decimal] 9

[Hexadecimal] 09

[Parameters] None

[Description]

- Moves the horizontal print position from the position where HT was entered to the next nearest horizontal tab position to the right.

ESC \$ Specify absolute horizontal position

[ASCII] ESC \$ n1 n2

[Decimal] 27 36 n1 n2

[Hexadecimal] 1B 24 n1 n2

[Parameters] $0 \leq n1 \leq 255$, $0 \leq n2 \leq 255$

[Description]

- Specifies an absolute position in dots for the print position for the next data.
- n1 and n2 represent the number of dots from the left margin. (No. of dots = $n1 + 256 * n2$)

ESC \ Specify relative horizontal position

[ASCII] ESC \ n1 n2

[Decimal] 27 92 n1 n2

[Hexadecimal] 1B 5C n1 n2

[Parameters] $0 \leq n1 \leq 255$, $0 \leq n2 \leq 255$

[Description]

- Specifies the horizontal print position as a relative position in dots from the current position.
- n1 and n2 represent the number of dots from the current position. (No. of dots = $n1 + 256 * n2$)
- The specified value for moving to the left is represented as a 2's complement, and is basically determined by the following equation.

$$n1 + n2 * 256 = 65536 - \text{Actual amount moved}$$

ESC a Specify alignment

[ASCII] ESC a n

[Decimal] 27 97 n

[Hexadecimal] 1B 61 n

[Parameters] $0 \leq n \leq 3$ or "0" $\leq n \leq$ "3"

[Description]

- Aligns and prints the following data according to the value of n as described below.

If $n=0$, specifies a left alignment.

If $n=1$, specifies a center alignment.

If $n=2$, specifies a right alignment.

If $n=3$, nothing is applied.

- The default setting is $n=0$.

2-5) Vertical movement commands

LF Line feed

[ASCII] LF

[Decimal] 10

[Hexadecimal] 0A

[Parameters] None

[Description]

- The print position is at the beginning of the next line.
- A "Carriage return" command after an LF command will be ignored.

FF Page feed

[ASCII] FF

[Decimal] 12

[Hexadecimal] 0C

[Parameters] None

[Description]

- Begins printing.
- After printing based on commands and characters previously entered, all text is cleared.
(Same as ESC @.)

ESC J Forward paper feed

[ASCII] ESC J n

[Decimal] 27 74 n

[Hexadecimal] 1B 4A n

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

[Description]

- Ends input of the current line, and moves the vertical print position forward $n/300$ inch (1 dot).

ESC B Specify vertical tab position

[ASCII] ESC B [n] _k NUL

[Decimal] 27 66 [n] _k 0

[Hexadecimal] 1B 42 [n] _k 00h

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

$0 \leq k \leq 16$

[Description]

- The vertical tab position is set at the position of the line feed amount when the vertical tab is specified *n from the top margin position.
- Enter n in ascending order, and end the setting with NUL.
- If any n value is smaller than the value before it, the tab setting is finished.

VT Apply vertical tab

[ASCII] VT

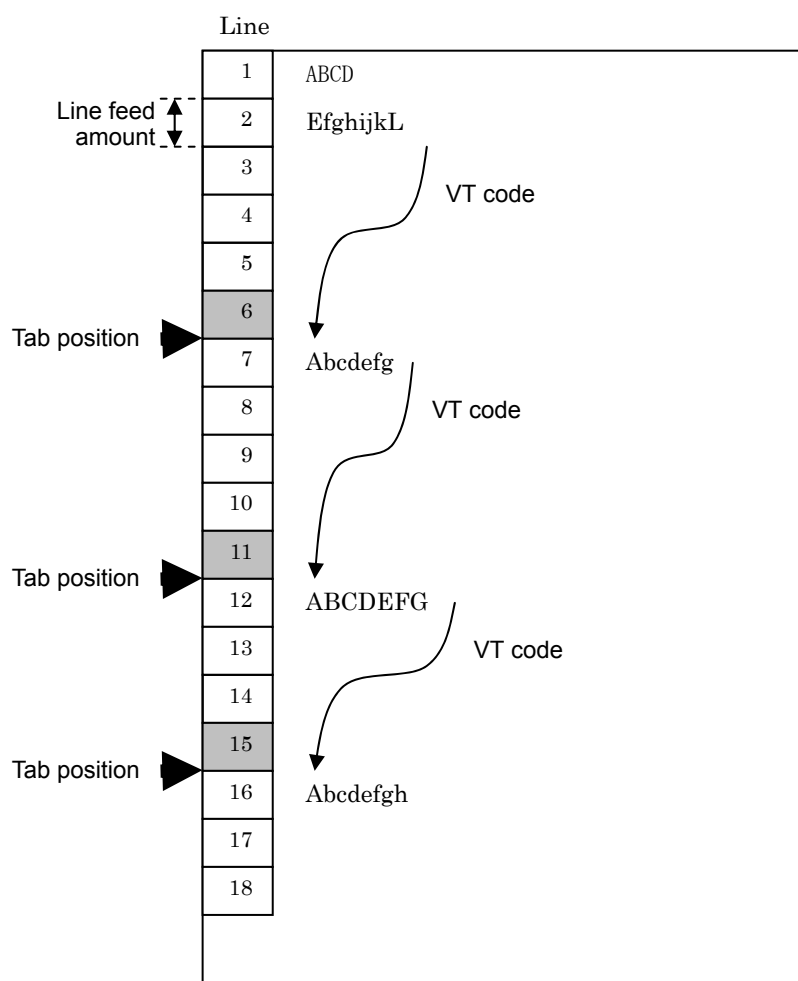
[Decimal] 11

[Hexadecimal] 0B

[Parameters] None

[Description]

- Moves the print position from the position where VT was entered to the next nearest vertical tab position below.



Example: If vertical tabs are set at lines 6, 11 and 15, and text is entered while VT is performed

ESC (V Specify absolute vertical position

[ASCII] ESC (V nL nH mL mH

[Decimal] 27 40 86 nL nH mL mH

[Hexadecimal] 1B 28 56 nL nH mL mH

[Parameters] nL=2

nH=0

$0 \leq mL \leq 255$

$0 \leq mH \leq 127$

[Description]

- Specifies the vertical print position as an absolute position from the top margin position.

Vertical position = $mL + mH * 256 + \text{Top margin}$

ESC (v Specify relative vertical position

[ASCII] ESC (v nL nH mL mH

[Decimal] 27 40 118 nL nH mL mH

[Hexadecimal] 1B 28 76 nL nH mL mH

[Parameters] nL=2

nH=0

$0 \leq mL \leq 255$

$0 \leq mH \leq 127$

$-16384 \leq (mL + mH * 256) \leq 16383$

[Description]

- Specifies the vertical print position as a relative position from the current position.

Vertical position after movement = $mL + mH * 256 + \text{Current position}$

- The specified value for moving up is represented as a 2's complement, and is basically determined by the following equation.

$mL + mH * 256 = 65536 - \text{Actual amount moved}$

2-6) Paper formatting

ESC (c Specify page format

[ASCII] ESC (c nL nH tL tH bL bH

[Decimal] 27 40 99 nL nH tL tH bL bH

[Hexadecimal] 1B 28 63 nL nH tL tH bL bH

[Parameters] nL=4, nH=0

(tL+tH*256) < (bL+bH*256)

Top margin < Bottom margin

[Description]

- Specifies settings for the top and bottom margins.
- This printer is designed specifically for A7-size or A6-size paper. As for A7-size, the physical printable area is 1,180 dots (height) * 816 dots (width) with the portrait orientation, or 816 dots (height) * 1,180 dots (width) with the landscape orientation. As for A6-size, the physical printable area is 1,660 dots (height) * 1,152 dots (width) with the portrait orientation, or 1,152 dots (height) * 1,660 dots (width) with the landscape orientation.

The top margin and bottom margin are specified in units of 1/300 inch (1 dot), based on the top edge of the physical printable area.

(The left margin and right margin are based on the left side of the physical printable area.)

Top margin = tL + tH * 256

Bottom margin = bL + bH * 256

2-7) Printer control commands

ESC @ Initialize

[ASCII] ESC @

[Decimal] 27 64

[Hexadecimal] 1B 40

[Parameters] None

[Description]

- Resets all commands to their default settings.
- Clears the data from the print buffer.

2-8) Graphics commands

ESC * Select bitmap image

[ASCII] ESC * m n1 n2 data

[Decimal] 27 42 m n1 n2 data

[Hexadecimal] 1B 2A m n1 n2 data

[Parameters] m=0, 1, 2, 3, 4, 6, 32, 33, 38, 39, 40

$0 \leq n1 \leq 255$, $0 \leq n2 \leq 11$

In data,

if m=0, 1, 2, 3, 4 or 6,

the image data is $n1 + n2 * 256$ bytes,

and if m=32, 33, 38, 39 or 40,

the image data is $(n1 + n2 * 256) * 3$ bytes.

*The settings below is available for MW-120 TypeF, MW-140BT TypeF and MW-260.

if m=71, 72 or 73,

the image data is $(n1 + n2 * 256) * 6$ bytes.

[Description]

- Selects the bitmap image according to the value of m, and outputs it.
- n1 and n2 indicate the number of dot positions.

n1: The remainder from dividing the number of dot positions by 256

n2: The quotient from dividing the number of dot positions by 256

m	Dot density of width	Dot density of height	Resolution of width dots	Resolution of height dots
0	60 dpi	60 dpi	6 / 300 inch	6 / 300 inch
1	120 dpi	60 dpi	3 / 300 inch	6 / 300 inch
2	120 dpi	60 dpi	3 / 300 inch	6 / 300 inch
3	240 dpi	60 dpi	2 / 300 inch	6 / 300 inch
4	80 dpi	60 dpi	4 / 300 inch	6 / 300 inch
6	90 dpi	60 dpi	4 / 300 inch	6 / 300 inch
32	60 dpi	180 dpi	6 / 300 inch	2 / 300 inch
33	120 dpi	180 dpi	3 / 300 inch	2 / 300 inch
38	90 dpi	180 dpi	4 / 300 inch	2 / 300 inch
39	180 dpi	180 dpi	2 / 300 inch	2 / 300 inch
40	360 dpi	180 dpi	1 / 300 inch	2 / 300 inch

*The settings below are available for MW-120 TypeF, MW-140BT TypeF and MW-260.

71	180 dpi	360 dpi	2 / 300 inch	1 / 300 inch
72	360 dpi	360 dpi	1 / 300 inch	1 / 300 inch
73	360 dpi	360 dpi	1 / 300 inch	1 / 300 inch

ESC K 8-dot bitmap image (standard density)

[ASCII] ESC K n1 n2 data

[Decimal] 27 75 n1 n2 data

[Hexadecimal] 1B 4B n1 n2 data

[Parameters] $0 \leq n1 \leq 255$, $0 \leq n2 \leq 3$

In data, the image data is $n1 + n2 * 256$ bytes.

[Description]

Specifies that an 8-dot bitmap image (standard density) will be printed with the number of dot positions defined by $n1$ and $n2$.

- $n1$ and $n2$ indicate the number of dot positions. Specify their values as shown below.

$n1$: The remainder from dividing the number of dot positions by 256

$n2$: The quotient from dividing the number of dot positions by 256

ESC L 8-dot bitmap image (double density)

[ASCII] ESC L n1 n2 data

[Decimal] 27 76 n1 n2 data

[Hexadecimal] 1B 4C n1 n2 data

[Parameters] $0 \leq n1 \leq 255$, $0 \leq n2 \leq 3$

In data, the image data is $n1 + n2 * 256$ bytes.

[Description]

Specifies that an 8-dot bitmap image (double density) will be printed with the number of dot positions defined by $n1$ and $n2$.

- Specify $n1$ and $n2$ in the same way as with ESC K.

ESC Y 8-dot bitmap image (double speed, double density)

[ASCII] ESC Y n1 n2 data

[Decimal] 27 89 n1 n2 data

[Hexadecimal] 1B 59 n1 n2 data

[Parameters] $0 \leq n1 \leq 255$, $0 \leq n2 \leq 3$

In data, the image data is $n1 + n2 * 256$ bytes.

[Description]

- Same as 8-dot bitmap image (double density).

ESC Z 8-dot bitmap image (quadruple density)

[ASCII] ESC Z n1 n2 data

[Decimal] 27 90 n1 n2 data

[Hexadecimal] 1B 5A n1 n2 data

[Parameters] $0 \leq n1 \leq 255$, $0 \leq n2 \leq 7$

In data, the image data is $n1 + n2 * 256$ bytes.

[Description]

Specifies that an 8-dot bitmap image (quadruple density) will be printed with the number of dot positions defined by $n1$ and $n2$.

- Specify $n1$ and $n2$ in the same way as with ESC K.

2-9) Advanced commands

ESC i B Bar code

[ASCII] ESC i [parameter] B or b [bar code data] backslash

[Decimal] 27 105 [parameter] 66 or 98 [bar code data] 92

[Hexadecimal] 1B 69 [parameter] 42 or 62 [bar code data] 5C

[Parameters]

 T or t (type)

 t0: CODE39

 t1: INTERLEAVED 2 OF 5

 t5: EAN-8, EAN-13, UPC-A

 t6: UPC-E

 t9: CODABAR

 ta: CODE128 *

 tb: GS1-128 (UCC / EAN128) *

 * MW-120 TypeF, MW-140BT TypeF, MW-145BT and MW-260 support these settings.

 s (style) Ignored

 p (number of passes) Ignored

 R or r (Characters below bar code)

 r0: OFF

 r1: ON

 u (units of measurement) Ignored

 x (horizontal position) Ignored

 y (vertical offset) Ignored

 h (size of height)

 h n1 n2

 Height=n1 + n2 *256 (dots)

 48 ≤ Height ≤ 480

 If height<48, height=48

 If height>480, height=480

 w (size of width)

 w0: extra small

 w1: small

 w2: medium

 w3: large

 w4: extra extra small **

B or b: Beginning of bar code data

? (generate check digit)

Generates a check digit when “?” is in the bar code data

The position of “?” is irrelevant as long as it is within the bar code data.

E or e (deleting brackets on GS1-128)

e0: ON (deleted)

e1: OFF (not deleted)

Backslash: End of bar code data

Both 00H through 09H and 30H through 39H are recognized as the parameter numbers 0 through 9.

If there is no type command or if the type command is invalid, Code 39 is used.

The number of characters that can be entered for each type is as follows:

MW-120 and MW-140BT TypeE:

t0: 2 to 20 characters

t1: 3 to 22 characters

t5: 7 characters (for EAN-8)
12 characters (for EAN-13)
11 characters (for UPC-A)

t6: 6 characters

t9: 4 to 22 characters

*MW-120 TypeF, MW-140BT TypeF, MW-145BT and MW-260:

t0: 2 to 50 characters

t1: 3 to 64 characters

t5: 7 characters (for EAN-8)
12 characters (for EAN-13)
11 characters (for UPC-A)

t6: 6 characters

t9: 4 to 64 characters

ta: 1 to 64 characters

tb: 1 to 64 characters

[Description]

- Specifies a bar code image.

*The following 2D codes are available for MW-120 TypeF, MW-140BT TypeF, MW-145BT and MW-260.

ESC i Q Print QR Code *

[ASCII] ESC i Q **or** q [parameter] [bar code data] \\ \\

[Decimal] 27 105 81 **or** 113 [parameter] [bar code data] 92 92 92

[Hexadecimal] 1B 69 51 **or** 71 [parameter] [bar code data] 5C 5C 5C

[Parameters]

All parameters must be set in the correct order. If there is an irregular parameter, then the default value is automatically used instead.

1. Cell size [Decimal 1byte] 3 [Decimal 1byte] 4 [Decimal 1byte] 5 [Decimal 1byte] 6 [Decimal 1byte] 8 [Decimal 1byte] 10	Setting a dot size on each cell Printing a 3 dots x 3 dots-sized cell (Default value) Printing a 4 dots x 4 dots-sized cell. Printing a 5 dots x 5 dots-sized cell. Printing a 6 dots x 6 dots-sized cell. Printing an 8 dots x 8 dots-sized cell. Printing a 10 dots x 10 dots-sized cell.
2. Model type [Decimal 1byte] 1 [Decimal 1byte] 2 [Decimal 1byte] 3	Choose MODEL 1 Choose MODEL 2 (Default value) Choose MicroQR Code
3. Structured append [Decimal 1byte] 0 [Decimal 1byte] 1	No structured append (Default value) Structured append available
4. Order number of code [Decimal 1byte] 1~16	Describing a position of the data, if "structured append" is available.
5. Division number of code [Decimal 1byte] 2~16	Describing the total counts of data parts, if "structured append" is available.
6. Parity data [Hexadecimal 1byte] 00~FF	Setting a parity value of EX-OR data from all of printing data each byte before dividing.
7. Error correction level [Decimal 1byte] 1 [Decimal 1byte] 2 [Decimal 1byte] 3 [Decimal 1byte] 4	L 7% High dense level M 15% Regular(Default value) Q 25% High quality level H 30% Super high quality level
8. Input data method [Decimal 1byte] 0 [Decimal 1byte] 1	Setting a number symbol, ASCII or binary. Automatically input method (Default value) Manual input method

[Description]

- What is "QR Code Structured append"?

QR Code can use the divided and combined feature called "Structured append".

This feature enables you to split long text data into 2 to 16 QR code blocks. It is necessary to input as many commands as splits. For example, if you split the text data into 3 datasets, the commands will be as below.

```
ESC i Q or q [First parameter] [First bar code data] \\ \\
ESC i Q or q [Second parameter] [Second bar code data] \\ \\
ESC i Q or q [Third parameter] [Third bar code data] \\ \\
```

3. Structured append defines if you have split the data into sets or not. Please input "0" if you have not split and "1" if you have split the data. 4. Order number of code, 5. Division number of code, and 6. Parity data will be ignored if "0" is set for Structured append. Please also input "0" for them as a dummy data.

4. Order number of code defines the order of the ESC/P command for the QR Code. For example, the data is split into 4 datasets. If the number is "2", the data is the second dataset, and if it is "4", then it is the fourth dataset.

5. Division number of code defines the number of datasets.

6. Parity data is data which is checked with the original print data (not divided) by byte. (EX-OR by byte) It shows that codes are combined together by inputting the data to the divided QR Code ESC/P command.

*** EX-OR by byte**

It means to take XOR by byte.

For example, "1234" is 0x31, 0x32, 0x33, 0x34 in hex.

XOR of 0x31 and 0x32 0011 0001 ^= 0011 0010 result 0000 0011 (0x03)

XOR of 0x03 and 0x33 0000 0011 ^= 0011 0011 result 0011 0000 (0x30)

XOR of 0x30 and 0x34 0011 0000 ^= 0011 0100 result 0000 0100 (0x04)

Therefore, the parity is 0x04.

*The QR code will not be created if the parity data is not correct.

Conclusion

Condition – text data: "123456789"

cell size: 4 dot

MODEL2

Error correction level: standard

Input data method: automatically input method

Print (no combination)

**ESC i Q 0x04 0x02 0x00 0x00 0x00 0x00 0x02 0x00 "123456789" **

Print (with combination – divide into 3 data) parity for 123456789 will be 0x31.

**ESC i Q 0x04 0x02 0x01 0x01 0x03 0x31 0x02 0x00 "123" **

**ESC i Q 0x04 0x02 0x01 0x02 0x03 0x31 0x02 0x00 "456" **

**ESC i Q 0x04 0x02 0x01 0x03 0x03 0x31 0x02 0x00 "789" **

[Bar code data]

The following half-width alphabet character is necessary when you choose data input method - "manual input method".

Numeric – N or n

Alphanumeric – A or a

2-byte code (Kanji characters) – K or k

Binary input – B or b + 4 digit numbers

The 4 digit numbers shows the actual numbers of binary characters.

For example, if you input 12 binary characters; B 0012 (0x30,0x30,0x31,0x32)

<Examples>

1. Kanji characters

```
ESC i Q [other parameter] 1 K[kanji characters]\\
```

2. Alphanumeric

```
ESC i Q [other parameter] 1 A012345678abcde\\
```

3. Binary input

```
ESC i Q [other parameter] 1 B0005####\\
```

The number of possible bar code data amount is different from model types or input method.

MODEL1: Alphanumeric 707 characters, numeric 1,167 characters, binary 486 byte, Kanji 299 characters

MODEL2: Alphanumeric 4,296 characters, numeric 7,089 characters, binary 2,953 byte, Kanji 1,817 characters

MicroQR: Alphanumeric 21 characters, numeric 35 characters, binary 15 byte, Kanji 9 characters

* Above is for the error correction level – “L7% high dense level”. It may be decreased if you set it for higher level. Even though you set the level “L 7% high dense level”, the number of the characters may be decreased because of the data compression.

[Data end sign]

For 2D bar codes, 3 backslashes “\\” should be required at end of the data.

ESC i V Print PDF417 code*

[ASCII] ESC i V or v [Parameters] [2D bar code data] \\

[Decimal] 27 105 86 or 118 [Parameters] [2D bar code data] 92 92 92

[Hexadecimal] 1B 69 56 or 76 [Parameters] [2D bar code data] 5C 5C 5C

[Parameters]

All parameters must be set in the correct order. If there is an irregular parameter, the default value is automatically used instead of the parameter number.

1. Cell size [Decimal 1 byte] 3 [Decimal 1 byte] 4 [Decimal 1 byte] 5 [Decimal 1 byte] 6 [Decimal 1 byte] 8 [Decimal 1 byte] 10	Setting a dot size on each cell Printing a 3 dots x 3 dots-sized cell (Default value) Printing a 4 dots x 4 dots-sized cell. Printing a 5 dots x 5 dots-sized cell. Printing a 6 dots x 6 dots-sized cell. Printing an 8 dots x 8 dots-sized cell. Printing a 10 dots x 10 dots-sized cell.
2. Symbol type [Decimal 1 byte] 0 [Decimal 1 byte] 1	Choose Standard (Default value) Choose Truncate
3. Input data method [Decimal 1 byte] 0 [Decimal 1 byte] 1	Automatically input (Default value) Binary data
4. Error correction type [Decimal 1 byte] 0 [Decimal 1 byte] 1	Input a level value (Default value) Input a percentage value
5. Error correction level: [Decimal 2 byte] 0~8 Percentage: [Decimal 2 byte] 0~400	Input value for level (Default value: 0) Input value for percentage (Default value: 10)
6. Symbol size X(Width) [Decimal 1 byte] 0 [Decimal 1 byte] 1~30	Set a size Automatically (Default value) Set a Manually
7. Symbol size Y(Height) [Decimal 1 byte] 0 [Decimal 1 byte] 3~90	Set a size Automatically (Default value) Set a Manually
8. Aspect valuable [Decimal 2 byte] 1~1,000	Setting an aspect value Automatically input method (Default value is 50) In nature the value should be from 0.01 to 10. But, it is integer. Thus, it should be 100 times to float point. Default 50 described 0.5 in nature.

[Description]

- The printer ignores "Aspect valuable" when Symbol size X and Symbol size Y are input manually.
- The bar code (2D code) generating error or un-scanned bar code may occur if you manually input wrong values for Symbol size X and Symbol size Y.
- The bar code generating error may occur with an internal buffer overflow error if you set a large size of cell size settings and a high level of error correction level settings.

[Bar code data]: maximum bar code data size:

It is 1,850 characters of alphanumeric, 2,710 characters of numeric or 1,108 bytes of binary to input the data for bar code. The characters of 2 byte-code are handled as a binary data.

Note: Above “maximum characters” is applied when the lowest level of error correction is set. It may be decreased by higher levels of error correction and lower levels of compression.

Data end sign.

For 2D bar codes, 3 backslashes “\\ ” should be inserted at the end of the data.

** The 2D code below is supported by MW-145BT and MW-260.

ESC i D Print DataMatrix code**

[ASCII] ESC i D or d [Parameters] [2D code data] \\

[Decimal] 27 105 68 or 100 [Parameters] [2D code data] 92 92 92

[Hexadecimal] 1B 69 44 or 64 [Parameters] [2D code data] 5C 5C 5C

[Parameters]

All parameters must be set in the correct order. If irregular parameters are detected, default values will automatically be used.

1. Cell size [Decimal 1 byte] 3 [Decimal 1 byte] 4 [Decimal 1 byte] 5 [Decimal 1 byte] 6 [Decimal 1 byte] 8 [Decimal 1 byte] 10	Setting a dot size on each cell Printing a 3 dots x 3 dots sized cell (Default value) Printing a 4 dots x 4 dots sized cell. Printing a 5 dots x 5 dots sized cell. Printing a 6 dots x 6 dots sized cell. Printing an 8 dots x 8 dots sized cell. Printing a 10 dots x 10 dots sized cell.
2. Symbol type [Decimal 1 byte] 0 [Decimal 1 byte] 1	ECC200 Square (Default value) ECC200 Rectangle
3. Height size [Decimal 1 byte] 0 [Decimal 1 byte] 10 [Decimal 1 byte] 12 [Decimal 1 byte] 14 [Decimal 1 byte] 16 [Decimal 1 byte] 18 [Decimal 1 byte] 20 [Decimal 1 byte] 22 [Decimal 1 byte] 24 [Decimal 1 byte] 26 [Decimal 1 byte] 32 [Decimal 1 byte] 36 [Decimal 1 byte] 40 [Decimal 1 byte] 44 [Decimal 1 byte] 48 [Decimal 1 byte] 52 [Decimal 1 byte] 64 [Decimal 1 byte] 72 [Decimal 1 byte] 80 [Decimal 1 byte] 88 [Decimal 1 byte] 96 [Decimal 1 byte] 104 [Decimal 1 byte] 120 [Decimal 1 byte] 132 [Decimal 1 byte] 144 [Decimal 1 byte] 0 [Decimal 1 byte] 8 [Decimal 1 byte] 12 [Decimal 1 byte] 16	-ECC200 Square: Height count of cells Automatically (Default value) Height count of 10 cells Height count of 12 cells Height count of 14 cells Height count of 16 cells Height count of 18 cells Height count of 20 cells Height count of 22 cells Height count of 24 cells Height count of 26 cells Height count of 32 cells Height count of 36 cells Height count of 40 cells Height count of 44 cells Height count of 48 cells Height count of 52 cells Height count of 64 cells Height count of 72 cells Height count of 80 cells Height count of 88 cells Height count of 96 cells Height count of 104 cells Height count of 120 cells Height count of 132 cells Height count of 144 cells - ECC200 Rectangle: Height count of cells Automatically (Default value) Height count of 8 cells Height count of 12 cells Height count of 16 cells
4. Width size [Decimal 1byte] X	-ECC200 Square: Width count of cells equal to height count

[Decimal 1 byte] 0	-ECC200 Rectangle: In case of height count of cells is automatically; Width count of cells automatically
[Decimal 1 byte] 18 [Decimal 1 byte] 32	In case of height count of 8 cells; Width count of 18 cells Width count of 32 cells
[Decimal 1 byte] 26 [Decimal 1 byte] 36	In case of height count of 12 cells; Width count of cells 26 Width count of cells 36
[Decimal 1 byte] 36 [Decimal 1 byte] 48	In case of height count of 16 cells; Width count of cells 36 Width count of cells 48
5. System Reserved [Decimal 1 byte] * 5 0	5 bytes of Dummy data "0" are sent.

[Description]

The height cell size is changed to "auto setting" automatically when the incorrect height cell size value is set for the ECC200 Square symbol. If you input different values of width and height cell size when specifying the ECC200 Square, the height cell size is changed to the same value as the width cell size since width size is the priority value.

Incorrect values are changed to "auto setting" automatically when either the height or width cell size are wrong.

[Bar code data]: maximum bar code data size:

The maximum is 2,335 characters of alphanumeric, 3,116 characters of numeric or 1,556 bytes of binary to input bar code data.

Note: Above "maximum data size" is applied under settings with maximum cell size (144 cells x 144 cells). According to cell size settings, "maximum data size" may be decreased.

Data end sign.

For 2D code, 3 backslashes "\\\\" should be required at the end of the data.

[Input sample]

You would input the following conditions, please refer to the sample code below.

Cell size: 3 dots

Symbol type: ECC Square 40 x 40

Data: "12345"

ESC iD 03h 00h 28h(40d) 28h 00h 00h 00h 00h 00h "12345" \\\\"

ESC i F Print downloaded data

[ASCII] ESC i F P n

[Decimal] 27 105 70 80 n

[Hexadecimal] 1B 69 46 50 n

[Parameters]

MW-120, MW-120 TypeF, MW-140BT TypeE and MW-140BT TypeF:

n: Index of file header
 $0 \leq n \leq 7$

MW-145BT and MW-260**:

n: Index of file header
 $0 \leq n \leq 98$

[Description]

- Expands downloaded data as image data in the print buffer.

ESC i a Switch command mode

[ASCII] ESC i a n

[Decimal] 27 105 97 n

[Hexadecimal] 1B 69 61 n

[Parameters]

MW-120, MW-120 TypeF, MW-140BT TypeE and MW-140BT TypeF:

n: Command mode
0=ESC/P
Other than 0 = Raster graphics

MW-145BT and MW-260**:

n: Command mode
0 = ESC/P
1 = Raster graphics
3 = P-touch template

[Description]

- Sets to the command mode to ESC/P, PTCBP (raster graphics), or P-touch template (MW-145BT and MW-260 can set templates).

ESC i S Request printer status

[ASCII] ESC i S

[Decimal] 27 105 83

[Hexadecimal] 1B 69 53

[Parameters] None

[Description]

- Requests the printer status.

ESC i L Select landscape orientation

[ASCII] ESC i L n

[Decimal] 27 105 76 n

[Hexadecimal] 1B 69 4C n

[Parameters] n=0 and 1 or 48 and 49

[Description]

- Specifies and cancels the landscape orientation.
- If n=1 or 49 ("1"), the landscape orientation is specified.
- If n=0 or 48 ("0"), the landscape orientation is cancelled.
- If this command is executed, since the landscape setting remains applied after initialization, all text is cleared.

Chapter 3. Appendix

3-1) Control code Lists

Character/style selection

ESC R	1B 52	Select international character set
ESC q	1B 71	Select character style
ESC k	1B 6B	Select alphanumeric/kana character font
ESC t	1B 74	Select character code table

Text printing

ESC 4	1B 34	Apply italic style
ESC 5	1B 35	Cancel italic style
ESC E	1B 45	Apply bold style
ESC F	1B 46	Cancel bold style
ESC G	1B 47	Specify double printing
ESC H	1B 48	Cancel double printing
ESC P	1B 50	Specify pica pitch (10 cpi)
ESC M	1B 4D	Specify elite pitch (12 cpi)
ESC g	1B 67	Specify micron pitch
ESC p	1B 70	Specify proportional characters
ESC W	1B 57	Specify double-width characters
SO	0E	Specify auto-cancelling enlarged characters
ESC SO	1B 0E	Specify auto-cancelling enlarged characters
SI	0F	Specify reduced characters
ESC SI	1B 0F	Specify reduced characters
DC2	12	Cancel reduced characters
DC4	14	Cancel auto-cancelling double-width characters
ESC -	1B 2D	Apply/cancel underlining
ESC !	1B 21	Global formatting
ESC SP	1B 20	Select character spacing
ESC X	1B 58	Select alphanumeric/kana character size

Line feeds

ESC 0	1B 30	Specify line feed of 1/8"
ESC 2	1B 32	Specify line feed of 1/6"
ESC 3	1B 33	Specify line feed amount in minimum units
ESC A	1B 41	Specify line feed amount of n/60"

Horizontal movement

ESC I	1B 6C	Specify left margin
ESC Q	1B 51	Specify right margin
CR	0D	Carriage return
ESC D	1B 44	Specify horizontal tab position
HT	09	Apply horizontal tab
ESC \$	1B 24	Specify absolute horizontal position
ESC ¥	1B 5C	Specify relative horizontal position
ESC a	1B 61	Specify alignment

Vertical movement

LF	0A	Line feed
FF	0C	Page feed
ESC J	1B 4A	Forward paper feed
ESC B	1B 42	Specify vertical tab position
VT	0B	Apply vertical tab
ESC (V	1B 28 56	Specify absolute vertical position
ESC (v	1B 28 76	Specify relative vertical position

Paper formatting

ESC (c	1B 28 63	Specify page format
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Printer control

ESC @	1B 40	Initialize
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Graphics commands

ESC *	1B 2A	Select bitmap image
ESC K	1B 4B	8-dot bitmap image (standard density)
ESC L	1B 4C	8-dot bitmap image (double density)
ESC Y	1B 59	8-dot bitmap image (double speed, double density)
ESC Z	1B 5A	8-dot bitmap image (quadruple density)

Advanced commands

ESC i B	1B 69 42	Bar code
ESC i Q	1B 69 51	2D bar code (QR code) *
ESC i V	1B 69 56	2D bar code (PDF417) *
ESC i D	1B 69 44	2D bar code (DataMatrix) **
ESC i F	1B 69 46	Print downloaded data
ESC i a	1B 69 61	Switch command mode
ESC i S	1B 69 53	Request printer status
ESC i L	1B 69 4C	Specify landscape orientation

* Settings supported by MW-120 TypeF, MW-140BT TypeF MW-145BT or MW-260.

** Settings supported by MW-145BT and MW-260..

3-2) Character table

Standard character code table for ESC/P codes

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0			SP	0	@	P	`	p	Ç	É	á	⋈	L		α	
1			!	1	A	Q	a	q	Ü	Æ	í	⋈	⊥		β	±
2			”	2	B	R	b	r	É	Æ	ó	⋈	⊥			
3			#	3	C	S	c	s	Â	Ô	ú		⊥			¾
4			\$	4	D	T	d	t	Ä	Ö	ñ	⊥	—			
5			%	5	E	U	e	u	À	Ò	Ñ		⊥			§
6			&	6	F	V	f	v	Å	Û	ä				μ	÷
7			,	7	G	W	g	w	Ç	Ù	ø					
8			(	8	H	X	h	x	Ê	ÿ	¿	©	ℒ			°
9			)	9	I	Y	i	y	Ë	Ö	®	⋈	ℒ	⊥		.
A			*	:	J	Z	j	z	È	Ü	€	⋈	ℒ	⊥	Ω	
B			+	;	K	[	k	{	Ï	ø	½	⋈	⋈	✓	δ	
C			,	<	L	\	l		Î	£	¼	⋈	⋈	☑		³
D			—	=	M	]	m	}	Ì	¥	¡	TEL	=		ø	²
E			.	>	N	^	n	~	Ä	Pts	«	FAX	⋈			
F			/	?	O	_	o	DEL	Å	f	»	⊥		□		

“■” indicates that a space is printed.

“■” indicates that the character will change if the international character set is switched.

Eastern European character code table (Windows-1250)

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0			SP	0	@	P	`	p	€	t̃		°	Ř	Đ	í	ď
1			!	1	A	Q	a	q	À	‘	˘	±	Á	Ň	á	ň
2			"	2	B	R	b	r	,	’	˘	˘	Â	Ň	â	ň
3			#	3	C	S	c	s	Ł	“	Ł	Ł	Ă	Ó	ă	ó
4			\$	4	D	T	d	t	„	”	¤	’	Ä	Ô	ä	ô
5			%	5	E	U	e	u	...	•	Å	μ	Í	Õ	í	õ
6			&	6	F	V	f	v	†	–		¶	Ć	Ö	ć	ö
7			’	7	G	W	g	w	‡	—	§	·	Ç	×	ç	÷
8			(	8	H	X	h	x	İ		”	˘	Č	Ř	č	ř
9			)	9	I	Y	i	y	‰	™	©	ą	É	Û	é	ű
A			*	:	J	Z	j	z	Š	Š	Ş	ş	Ę	Ú	ę	ú
B			+	;	K	[	k	{	<	>	«	»	Ě	Ů	ě	ů
C			,	<	L	\	l		Ś	Ś	¬	Ł	Ě	Ü	ě	ü
D			–	=	M	]	m	}	Ť	Ť	–	”	Í	Ý	í	ý
E			.	>	N	^	n	~	Ž	Ž	®	İ	Î	Ț	î	ț
F			/	?	O	_	o	DEL	Ž	Ž	Ž	ž	Ď	ß	ď	·

“■” indicates that a space is printed.

“■” indicates that the character will change if the international character set is switched.

Western European character code table (Windows 1252)

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0			SP	0	@	P	`	p	€			°	À	Đ	à	đ
1			!	1	A	Q	a	q	~	‘	ı	±	Á	Ñ	á	ñ
2			”	2	B	R	b	r	,	’	ç	²	Â	Ò	â	ò
3			#	3	C	S	c	s	f	“	£	³	Ã	Ó	ã	ó
4			\$	4	D	T	d	t	„	”	¤	´	Ä	Ô	ä	ô
5			%	5	E	U	e	u	...	•	¥	µ	Å	Õ	å	õ
6			&	6	F	V	f	v	†	-		¶	Æ	Ö	æ	ö
7			’	7	G	W	g	w	‡	·	§	·	Ç	×	ç	÷
8			(	8	H	X	h	x	^	~	¨	¸	È	Ø	è	ø
9			)	9	I	Y	i	y	‰	™	©	¹	É	Ù	é	ù
A			*	:	J	Z	j	z	Š	Š	ª	º	Ê	Ú	ê	ú
B			+	;	K	[	k	{	<	>	«	»	Ë	Û	ë	û
C			,	<	L	\	l		Œ	Œ	¬	¼	Ì	Ü	ì	ü
D			–	=	M	]	m	}			-	½	Í	Ý	í	ý
E			.	>	N	^	n	~	Ž	Ž	®	¾	Î	Þ	î	þ
F			/	?	O	_	o	DEL		ÿ	–	¿	Ï	ß	ï	ÿ

“■” indicates that a space is printed.

“■” indicates that the character will change if the international character set is switched.

International character set

Compatible characters in each language when the international character set is switched

n		23	24	40	5B	5C	5D	5E	60	7B	7C	7D	7E
0	United States	#	\$	@	[	\	]	^	`	{		}	~
1	France	#	\$	à	°	Ç	§	^	`	É	ù	è	¨
2	Germany	#	\$	§	Ä	Ö	Ü	^	`	Ä	ö	ü	ß
3	Britain	£	\$	@	[	\	]	^	`	{		}	~
4	Denmark I	#	\$	@	Æ	Ø	Å	^	`	Æ	ø	å	~
5	Sweden	#	¤	É	Ä	Ö	Å	Ü	é	Ä	ö	å	ü
6	Italy	#	\$	@	°	\	É	^	ù	À	ò	è	ì
7	Spain I	Pt	\$	@	í	Ñ	¿	^	`	¨	ñ	}	~
8	Japan	#	\$	@	[	¥	]	^	`	{		}	~
9	Norway	#	¤	É	Æ	Ø	Å	Ü	é	Æ	ø	å	ü
10	Denmark II	#	\$	É	Æ	Ø	Å	Ü	é	Æ	ø	å	ü
11	Spain II	#	\$	á	í	Ñ	¿	é	`	Í	ñ	ó	ú
12	Latin America	#	\$	á	í	Ñ	¿	é	ü	Í	ñ	ó	ú
13	Korea	#	\$	@	[	₩	]	^	`	{		}	~
64	Legal	#	\$	§	°	'	"	¶	`	©	®	†	™