Line Thermal Printer

STAR Page Mode
Command Specifications

Rev 1.17

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Special Products Division

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This specifications document describes the command specifications for the STAR PAGE MODE on line thermal printers.
Information contained herein applies to models with the following conditions.

- Line Thermal Printers
- Interface
  - Parallel
  - RS-232C
  - USB
    (TSP800 USB is supported by ROM version 5.0 later.)
  - Ethernet (Not supported on TSP800, TSP828L)
  - Wireless LAN (Not supported on TSP800, TSP828L)

  <Applicable Models>
- TSP800
- TUP900
- TSP1000
- TSP828L
- TUP500
- TSP800II

1. INTERFACE CONFIGURATION

1-1 RS-232 Serial Interface

1-1-1 Specifications (Conforming to RS-232)

Rating: RS-232C
Synch method: Start-Stop synchronization method
Handshake: DTR mode
Baud rates: 4800, 9600, 19200, 38400 bps   (Set by DIP switches)
Bit length: 7, 8 bits   (Set by DIP switches)
Parity: Yes/No   (Set by DIP switches)
Parity bit: Odd/even   (Set by DIP switches)
Stop bit: 1 bit (Fixed)
Signal polarity: Mark = logic 1 (-3 V to -15 V)
                   Space = logic 0 (+3 V to +15 V)

1-1-2 Signal Array and Explanations According to Interface Connector Pin

<Signal array and functions>

Pin No.	Signal Name	Signal Direction	Function
1	FG	-	Frame ground
2	TXD	OUT	Transmission Data
3	RXD	IN	Reception Data
4	RTS	OUT	Same as DTR
5	N.C	-	Not Used
6	DSR	IN	Not Used (Can also be used as an external reset signal by the DIP SW setting. The printer is reset by mark status over a pulse width of 1 msec.)
7	SG	-	Signal ground
8-19	N.C	-	Not Used
20	DTR	OUT	Data terminal ready signal (SPACE: Printer ready to receive) 1) For DTR Mode SPACE when printer is ready to receive. 2) For XON/XOFF Mode Always a space excluding the following conditions. 1. Time until communications are ready and after reset. 2. When test printing
21-24	N.C		Not Used
25	/INIT	IN	Not Used (Can also be used as an external reset signal by the DIP SW setting. The printer is reset by mark status over a pulse width of 1 msec.)

1-1-3 Communication Protocol

1) General description of operations in the DTR mode
This mode abides by the DIP switch settings. (Ex-factory settings)
This mode performs communication while handshaking with the DTR signals. In the operations to receive printer data, this mode controls the DTR signals by confirming the BUSY signal. A SPACE indicates that the printer is ready to receive data; conversely, a "mark" indicates that the printer cannot receive data.

<When ONLINE>

| RXD | DATA | DATA | DATA |

DTR

Printing operation

Power ON   Buffer Full   Buffer Empty

<When Paper is Out>

RXD   OFFLINE →   ← ONLINE

DTR   ← Recover to ONLINE

Printing operation   Paper out →

Paper out signal

Power ON
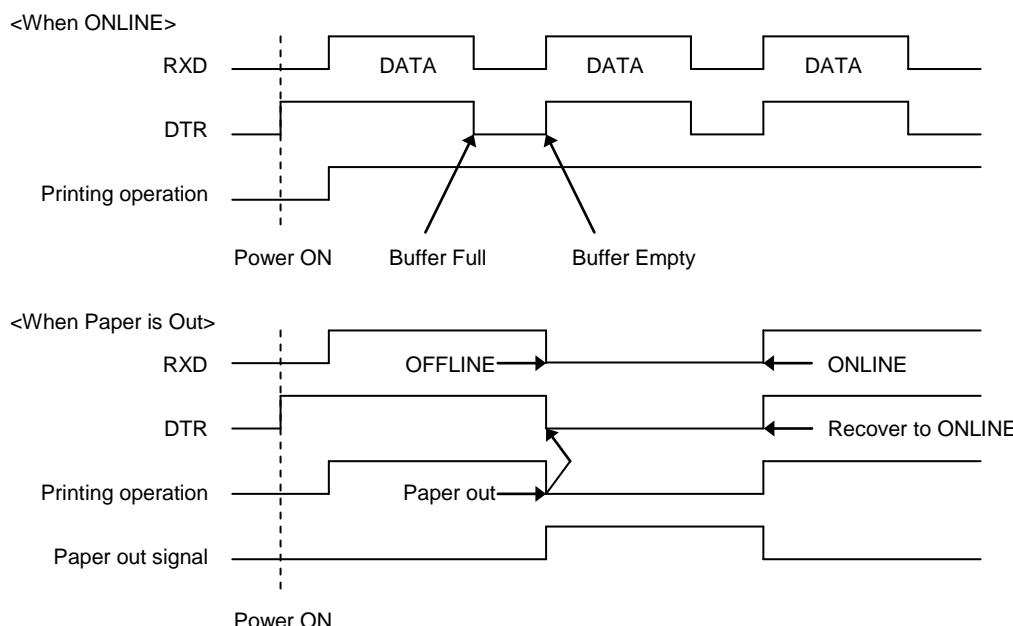
If there is no printer error after turning ON the power, the DTR signal line is set to a SPACE. When the host computer confirms that the DTR signal line is a SPACE, it sends the data text to the RXD signal line. The printer sets the DTR signal line to a "Mark" after the empty area of the data buffer reaches a maximum of 256 bytes. When the host computer confirms that the DTR signal line is a Mark, it stops the transmission of data text to the printer buffer, but at this point as well, the printer is still capable of receiving data, up to the amount of empty space in the data buffer. If the host computer ignores the DTR signal and transmits data, all data exceeding the amount of space in the data buffer is simply discarded. The printer sets the DTR signal line to SPACE again when the amount of empty space in the data buffer increased because of the printing and the data in the buffer is a maximum of 256 bytes. As the empty area in the data
buffer increases because of printing, the printer sets the DTR signal line to "SPACE."

2) Buffer full/Buffer full cancel in the DTR mode

Full   Near Full   Near Empty   Empty

Buffer
Empty area 512 bytes
Empty area 256 bytes
DTR "Mark" ←   → DTR "Space"
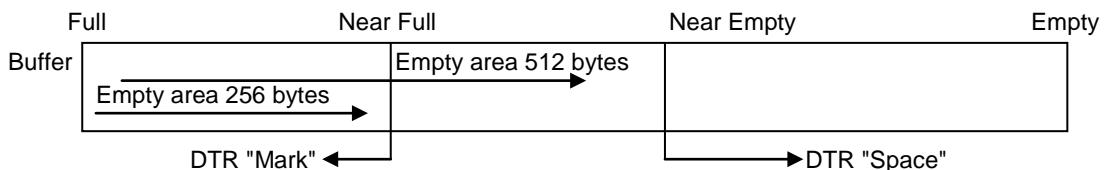
3) General description of operations in the XON/XOFF mode

This mode is set when DIPSW #1 to #3 are turned OFF. This mode notifies the host of the XON (DC1) data when the printer can receive data and the XOFF (DC3) data when the printer cannot receive data, using the TXD signals.

If memory switch B-4 is set to 0 (factory default), this function acts so that when the printer status changes from OFFLINE (printer busy) to ONLINE (printer ready), only one byte of XON signal is output. When the printer status changes from ONLINE (printer ready) to OFFLINE (printer busy), only one byte of XOFF signal is output.

If memory switch B-4 is set to 1 (the conventional STAR compatible protocol), this function outputs the XON signal every 3 seconds. This function outputs a single byte of XOFF signal when the printer status changes from ONLINE (printer ready) to OFFLINE (printer busy). Then, it outputs the XOFF signal each time data is received in Offline mode.
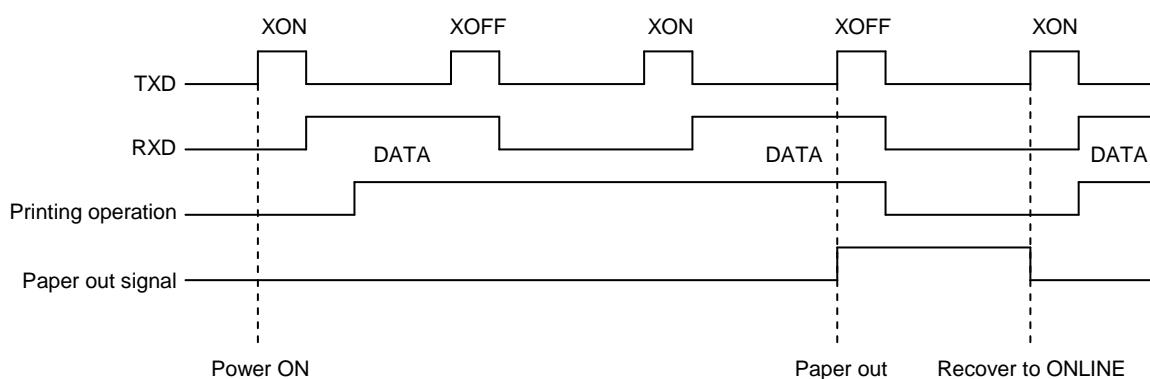
If there is no error after turning the power ON, XON (control code name: DC1; Hexadecimal name: 11H) is output by the TXD signal line. After the host computer receives the XON, it sends the data text to the RXD signal line. XOFF (DC3; 13H) is output when the empty space in the data buffer is a maximum of 256 bytes.Also, if memory switch B-4 is set to 1, the XOFF signal is output every time one byte of data is received.

The host computer stops sending data text when it receives the XOFF, however, the printer is capable of receiving data at that time for the amount of empty space in the data buffer. Data exceeding the amount of empty space is discarded. As the empty space in the data buffer increases through printing, XON is output when the data in the buffer is a maximum of 256 bytes. When the empty area of the data buffer increases because of printing, the printer outputs XON. When the empty area of the data buffer increases because of printing, the printer outputs XON.

4) Buffer full/Buffer full cancel in the XON/XOFF mode
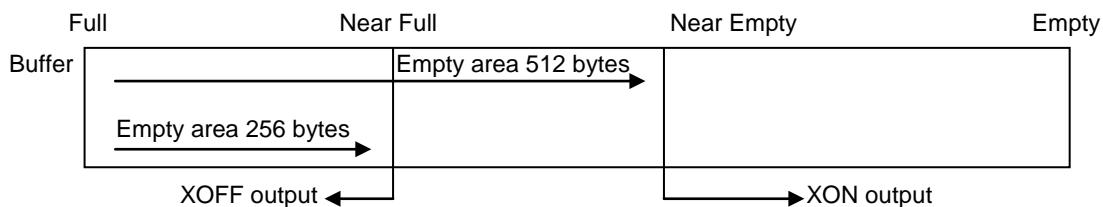
Printer Setting Conditions	Explanation of Operations
If memory switch B-4 is 0	If the size of the empty area becomes 256 bytes or less, only one byte of XOFF signal is output. If the size of the empty area becomes 512 bytes or less, only one byte of XON signal is output
If memory switch B-4 is 1	If the size of the empty area becomes 256 bytes or less, the XOFF signal is output each time one byte of data is received. If the size of the empty area becomes 512 bytes or less, the XON signal is output.

1-2 Parallel Interfaces (Amphenol 36 Pins)

1-2-1 Specifications (Conforming to IEEE 1284)

Rating:	Conforms to IEEE 1284
Mode:	Compatibility Mode/Nibble Mode/Byte Mode
Data transfer speed:	1000 to 6000 CPS
Synch method:	According to externally supplied strobe pulse
Handshake:	According to ACK and BUSY signals
Logic level:	Compatible to TTL

1-2-2 Signal Array and Explanations According to Interface Connector Pin

<Signal array and functions>

Pin No.	Compatibility Mode Signal Name	Nibble Mode Signal Name	Byte Mode Signal Name
1	nStrobe	HostClk	HostClk
2 to 9	Data 0 to 7	Data 0 to 7	Data 0 to 7
10	nAck	PtrClk	PtrClk
11	Busy	PtrBusy/Data 3, 7	PtrBusy
12	PError	AckDataReq/Data 2, 6	AckDataReq
13	Select	Xflag/Data 1, 5	Xflag
14	N/C	HostBusy	HostBusy
15	N/C	-	-
16	Signal GND	Signal GND	Signal GND
17	Frame GND	Frame GND	Frame GND
18	+5V	+5V	+5V
19 to 30	Twisted Pair Return	Twisted Pair Return	Twisted Pair Return
31	nInit	nInit	nInit
32	nFault	nDataAvail/Data 0, 4	nDataAvail
33	External GND	-	-
34	N/C	-	-
35	N/C	-	-
36	nSelectIn	1284Active	1284Active

1-2-3 Signal Output Timing

1) Compatibility mode
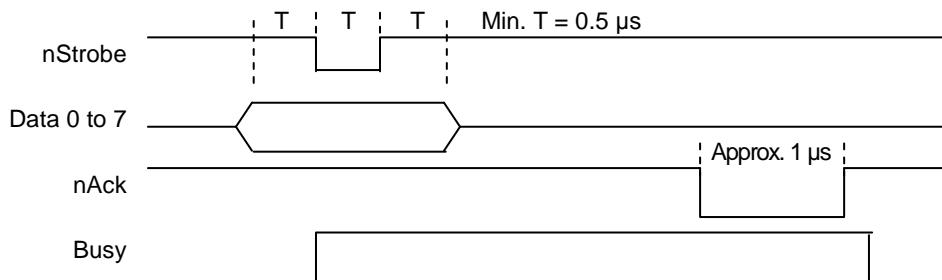
2) Nibble mode/Byte mode
   Conforms to IEEE 1284 standard

1-2-4 Status Specification
See Appendix 2 for details.

1-3 USB Interface

Specifications: Conforms to USB 2.0 Full Speed
                     Supports printer class and vendor class (Refer to each printer specifications manual for
                     selections.)
Connector: Type B

1-4 Ethernet Interface

Specifications: Conforms to IEEE 802.3
Cable: 10BASE-T/10BASE-TX
Connector: RJ45

1-5 Wireless LAN Interface

Specifications: Conforms to IEEE 802.11b

2. COMMAND FUNCTION LIST

● Standard Commands

Class	Command	Names
Format settings	ESC C	Format initialization
	ESC D	Set print area
	ESC L	Define line formats
	ESC E	Clear line formats
	ESC P C	Define character string formats
	ESC Y	Define character pitch
	ESC P B	Define bar code format
	ESC B	Cutter control
Set data	ESC X	Clear image memory
	ESC R C	Define character string data
	ESC G	Call up external character
	ESC R B	Define bar code data
	ESC Q	Define dot graphics data
	ESC H	Define dot graphics data (For BMP files)
Other settings	ESC F	Register external character
	ESC N	Select international characters
	ESC Z	Set zero style
	ESC GS =	Write blank code page data
	ESC GS t	Code page specification
	ESC RS d	Set print density
	ESC RS r	Set printing speed
Register flash memory	ESC w	Register format to flash memory
	ESC r	Load format from flash memory
	ESC q	Register dot graphics data to flash memory
	ESC h	Register dot graphics data to flash memory (for BMP files)
	ESC k	Define dot graphics data
	ESC FS q	Register logo data
	ESC K	Define logo data
Control commands	ESC I	Issue paper
	ESC W	Issue paper (Specify print range)
	ESC GS #	Set memory switch
	ESC ?	Reset printer
	ESC GS BEL	Ring buzzer
	ESC GS SUB DC1	Specify snout operation mode
	ESC GS SUB DC2	Specify snout LED ON/OFF time
	ESC GS SUB DC3	Execute snout LED operation
Status	ESC RS a	Set status transmission conditions
	ESC ACK SOH	Inquire status
	ENQ	Status send request
	EOT	Status send request
	ESC ACK CAN	Real-time printer reset
	ETB	Update ETB status
	ESC RS E	Initialize ASB ETB counter and ETB status
	ESC GS ETX	Send and initialize printing end counter

● Presenter Related Commands

Class	Command	Names
Presenter related commands	ESC ¥ 0	Execute presenter paper recovery
	ESC ¥ 1	Set presenter automatic recovery function and recovery time
	ESC ¥ 3	Acquire presenter paper counter
	ESC ¥ 4	Initialize presenter paper counter

● PDF 417 Commands

Class	Commands	Name
PDF417 commands	ESC GS x S0	Set PDF417 bar code size
	ESC GS x S1	Set PDF417 ECC (security level)
	ESC GS x S2	Set PDF417 module X direction size
	ESC GS x S3	Set PDF417 module aspect ratio
	ESC GS x D	Set PDF417 bar code data
	ESC GS x T	Set PDF417 Star page mode
	ESC GS x P	Print PDF417 bar code
	ESC GS x I	Get PDF417 bar code expansion information

● QR Code Commands

Class	Commands	Name
QR commands	ESC GS y S0	Set QR code model
	ESC GS y S1	Set QR code error correction level
	ESC GS y S2	Set QR code cell size
	ESC GS y D1	Set QR code data (auto)
	ESC GS y D 2	Set QR code data (manual)
	ESC GS y T	Set for QR code STAR page mode
	ESC GS y P	Expand QR code bar code data
	ESC GS y I	Get QR code bar code expansion information

● Two-color Printing Commands

Class	Commands	Name
Two-color commands	ESC RS C n	Select/cancel two-color print mode

3. COMMAND DETAILS

3-1 Explanation of Terms

- Reception buffer
  The buffer for storing data (reception data) received from the host, as it is called the reception buffer.
  Reception data is temporarily stored in the reception buffer, then processed sequentially.

- Printable region
  This is the maximum printable area with the printer's specifications.

- Print region
  This is the printing area specified by a command. (Print region ≦ printable region)

- Reference position
  Both characters and bar codes use the top left as the reference position. Rotation occurs clockwise with the reference position as center.
  This is also true for character strings that are rotated.
  (The character reference position does not change even for expanded characters.)

Reference position
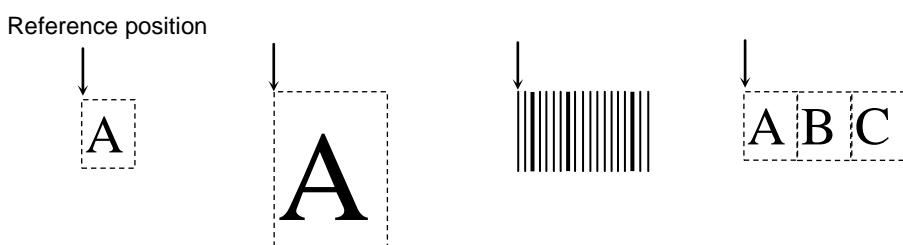
(Ex.) Rotating characters and character strings

1.   When only characters, not character strings, are rotated:

<Character: 0°>   <Character: 90°>   <Character: 180°>   <Character: 270°>
<Character String: 0°>   <Character String: 0°>   <Character String: 0°>   <Character String: 0°>
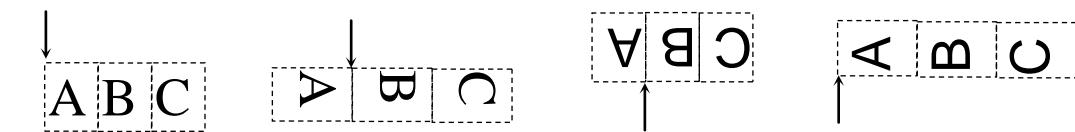
2. When only character strings, not characters, are rotated:

| <Character: 0°> | <Character: 0°> | <Character: 0°> | <Character: 0°> |
| <Character String: 0°> | <Character String: 90°> | <Character String: 180°> | <Character String: 270°> |
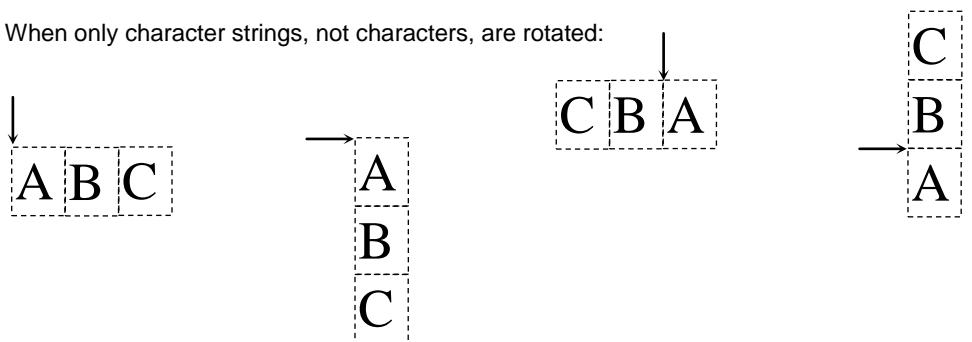
3. When both characters and character strings are rotated:

| <Character: 0°> | <Character: 90°> | <Character: 180°> | <Character: 270°> |
| <Character String: 0°> | <Character String: 90°> | <Character String: 180°> | <Character String: 270°> |
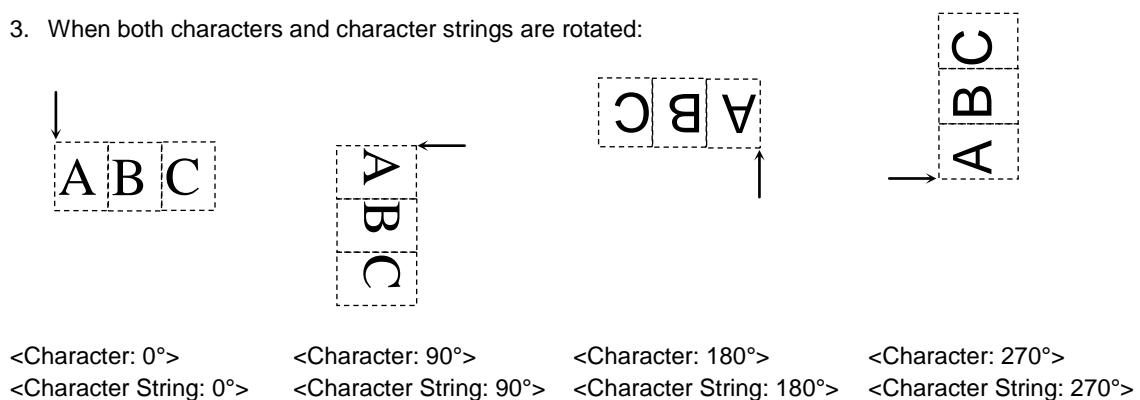
(Ex.) Rotating bar codes

| <0°> | <90°> | <180°> | <270°> |
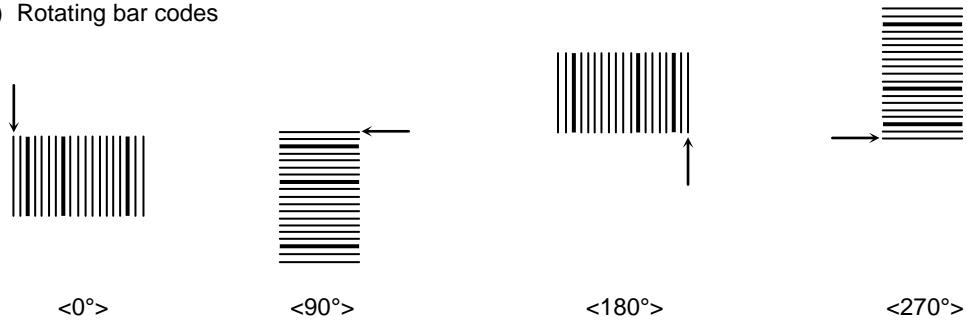
* Other bar codes and rotation specifications are different for PDF417.

| 0º | 90º | 180º | 270º |
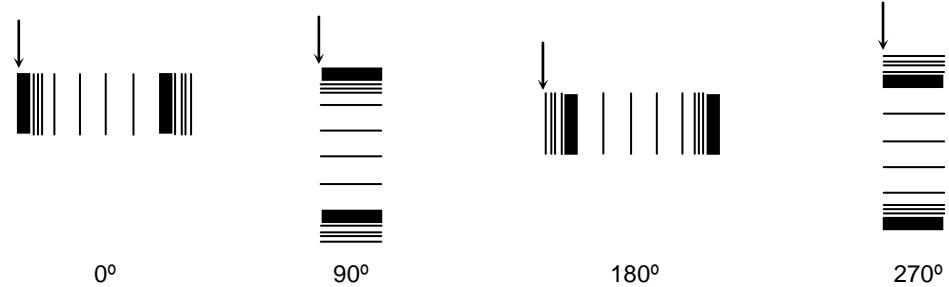
- ASB function
  This function sends the printer's status to the host when the status has changed.

- NSB function
  When a parallel interface or USB interface is used, this function sends the automatic status when the printer enters the reverse transfer mode.
  When an Ethernet interface or wireless LAN interface is used, this function sends the automatic status when the printing port (TCP port 9100) is connected.
  The status formats are the same for the ASB and NSB functions.

3-2 Exception Processing

There are two possible page mode analyses: Code analysis and ESC command analysis that follows.

1) Code analysis
   Code that analyzes all codes from <00>H to <FF>H and defines reception data as commands.
   Discards the code when anything other than (<04>H, <05>H, <17>H, <1B>H) is received.
   When the reception data is an ESC code (<1B>H), processing shifts to ESC command analysis.
   (Ex.) If processing the data string of <30>H<1B>H<43>H<0A>H<00>H, the printer will discard <30>H as an
          undefined code and will enable subsequent commands of <1B>H<43>H<0A>H<00>H.

2) ESC command analysis
   If the data analyzed using code analysis is an ESC code, it analyzes reception data following that ESC code.
   When the reception data following an ESC command applies to one of the following ESC command analysis stops
   immediately and maintains that reception data, then shifts to code analysis again. Data received before that is read
   and discarded.

   • When data following an ESC code is a code that is not defined as a command:
     (Ex.) When the data of <1B>H<41>H<1B>H<43>H<0A>H<00>H is received, the printer analyzes <41>H
            following the ESC code. Because this is not a code defined as a command, the printer stops ESC
            command analysis, maintains the reception data <41>H and begins analysis from the <41>H code.
            The result is <41>H is an undefined code, so it is discarded and the subsequent
            <1B>H<43>H<0A>H<00>H command is enabled.

   • When processing numerical values outside of the definition in commands that accompany arguments:
     (Ex.) If the data string of <1B>H<44>H<40>H<30>H<30>H<30>H<0A>H<00>H is received, the printer will start
            processing the ESC D (<1B>H<44>H) command. However, because the following argument <40>H is data
            outside of the definition, ESC command analysis is stopped, the reception data <40>H maintained and
            processing starts from code analysis of <40>H.
     (Ex.) This is the same as for commands the specify the position as an argument, and that position is outside of
     the print region.
          When a data string below is received.
     <1B>H<50>H<43>H<30>H<30>H<3B>H<39>H<38>H<37>H<36>H<2C>H…
     The printer begins processing the command (ESC P C (<1B>H<50>H<43>H)) but the X coordinate is out of the
      print region, so the ESC command is interpreted and the final <36>H of the 4-byte parameter that indicates this
      position is held as it is, and the analysis of the <36>H code is begun.

   • When the command that ends at the last data string of LF NUL (<0A>H<00>H) and the code does not end there:
     (Ex.) When the data string of <1B>H<43>H<0A>H<FF>H<1B>H<43>H<0A>H<00>H is received, the printer
            starts processing ESC C (<1B>H<43>H), but because the last is not an LF NUL data string, the data
            received to then is read and discarded, but it maintains the reception data <FF>H and begins analysis from
            the <FF>H code analysis.
            The result is <FF>H is an undefined code, so it is discarded and the subsequent <1B>H<43>H<0A>H
            <00>H command is enabled.

3-3 Standard Command Details

Length and position specifications in page mode are made in 0.1 mm increments. However, because the printer resolution is 0.125 mm, those specifications are actually set with values raised to 0.125 mm. Be aware that maximum print area varies according to printer model, and print region settings made by the memory switch. (See Appendix 4) There are three general classes, according to functions, that the page mode commands can be placed. They are those that define formats, that specify print data and those that control the printer. See Appendix 1 for the flow of program generation and sample programs.

3-3-1 Setting Formats

ESC C LF NUL

[Name]	Format initialization			
[Code]	ASCII	**ESC**	**C**	**LF**	**NUL**
	Hexadecimal	1B	43	0A	00
	Decimal	27	67	10	0

[Defined Area]   - - -
[Initial Value]   - - -

[Function]   Clears all format memory and image memory data.

Specification As

Registered Region	Data Type	Commands
Format memory	Print area	ESC D
	Line formats	ESC L
	Character formats	ESC P C, ESC Y
	Bar code format	ESC P B
	Mechanism control	ESC B
Image memory	Character data	ESC R C
	Bar code data	ESC R B
	Graphics data	ESC Q, ESC H, ESC K, ESC k

Specification Bs

Registered Region	Data Type	Commands
Format memory	Print area	ESC D
	Line formats	ESC L
	Character formats	ESC P C, ESC Y
	Bar code format	ESC P B
	Mechanism control	ESC B
Image memory	Character data	ESC R C
	Bar code data	ESC R B
	Graphics data	ESC Q, ESC H, ESC K, ESC k
	Two-dimensional code data	ESC GS x, ESC GS y

ESC D n1n2n3n4 LF NUL

[Name]   Set print area

[Code]

	ESC	D	n1	n2	n3	n4	LF	NUL
ASCII	**ESC**	**D**	**n1**	**n2**	**n3**	**n4**	**LF**	**NUL**
Hex.	1B	44	n1	n2	n3	n4	0A	00
Decimal	27	68	n1	n2	n3	n4	10	0

[Defined Area] $48 \leq n1 \leq 57$ ("0" $\leq$ n1 $\leq$ "9"), $48 \leq n2 \leq 57$ ("0" $\leq$ n2 $\leq$ "9"), $48 \leq n3 \leq 57$ ("0" $\leq$ n3 $\leq$ "9"), $48 \leq n4 \leq 57$ ("0" $\leq$ n4 $\leq$ "9")

                See Appendix 4 because the n1 n2 n3 n4 values are different for each printer model.

[Initial Value]   - - -

[Function]   Defines the print area (the image memory vertical size (in units 0.1 mm) targeted for printing).
When the TOF function is enabled, this specifies a value smaller than the paper pitch. In this case, having an approximately 5 mm margin is preferred. (This is because when set to a value larger than the paper pitch, print data is printed to two sheets if there is variation in the black mark printing position or detection.)
Settings using this command are cleared by the format initialization command (ESC C).

When switching the reception mode of the 2-color print setting/cancel command (ESC RS C), the settings made by this command are cleared.

ESC L n1n2 ; x1x2x3x4 , y1y2y3y4 , x5x6x7x8 , y5y6y7y8 , d ,w LF NUL

[Name]	Define line formats (Specifications A, B)															
[Code]	ASCII	ESC	L	n1	n2	;	x1	x2	x3	x4	,	y1	y2	y3	y4	,
	Hex.	1B	4C	n1	n2	3B	x1	x2	x3	x4	2C	y1	y2	y3	y4	2C
	Decimal	27	76	n1	n2	59	x1	x2	x3	x4	44	y1	y2	y3	y4	44

	ASCII	x5	x6	x7	x8	,	y5	y6	y7	y8	,	d	,	w	LF	NUL
	Hex.	x5	x6	x7	x8	2C	y5	y6	y7	y8	2C	d	2C	w	0A	00
	Decimal	x5	x6	x7	x8	44	y5	y6	y7	y8	44	d	44	w	10	0

[Defined Area] $48 \leq n1 \leq 57$ ("0" $\leq n1 \leq$ "9"), $48 \leq n2 \leq 57$ ("0" $\leq n2 \leq$ "9")

"00" $\leq n1\ n2 \leq$ "63"

$49 \leq w \leq 57$ ("1" $\leq w \leq$ "9")

$48 \leq x1 \leq 57$ ("0" $\leq x1 \leq$ "9"), $48 \leq x2 \leq 57$ ("0" $\leq x2 \leq$ "9"), $48 \leq x3 \leq 57$ ("0" $\leq x3 \leq$ "9"), $48 \leq x4 \leq 57$ ("0" $\leq x4 \leq$ "9")

$48 \leq y1 \leq 57$ ("0" $\leq y1 \leq$ "9"), $48 \leq y2 \leq 57$ ("0" $\leq y2 \leq$ "9"), $48 \leq y3 \leq 57$ ("0" $\leq y3 \leq$ "9"), $48 \leq y4 \leq 57$ ("0" $\leq y4 \leq$ "9")

$48 \leq x5 \leq 57$ ("0" $\leq x5 \leq$ "9"), $48 \leq x6 \leq 57$ ("0" $\leq x6 \leq$ "9"), $48 \leq x7 \leq 57$ ("0" $\leq x7 \leq$ "9"), $48 \leq x8 \leq 57$ ("0" $\leq x8 \leq$ "9")

$48 \leq y5 \leq 57$ ("0" $\leq y5 \leq$ "9"), $48 \leq y6 \leq 57$ ("0" $\leq y6 \leq$ "9"), $48 \leq y7 \leq 57$ ("0" $\leq y7 \leq$ "9"), $48 \leq y8 \leq 57$ ("0" $\leq y8 \leq$ "9")

See Appendix 4 and the example here because the x1 x2 x3 x4, y1 y2 y3 y4, x5 x6 x7 x8, y5 y6 y7 y8 values are different for each printer model and print region.

See the following parameter details of d.

[Initial Value] - - -

[Function] Parameter details

- n1 n2:   Line number
- x1 x2 x3 x4:   X direction position unit of the starting point   Unit 0.1 mm
- y1 y2 y3 y4:   Y direction position unit of the starting point   Unit 0.1 mm
- x5 x6 x7 x8:   X direction position unit of the ending point   Unit 0.1 mm
- y5 y6 y7 y8:   Y direction position unit of the ending point   Unit 0.1 mm
- d: Line direction (See the information below because this varies according to printer model.)

Specification A

d	
48 ("0")	Horizontal line
49 ("1")	Vertical line

Specification B

d	
48 ("0")	Horizontal line
49 ("1")	Vertical line
50 ("2")	Frame

- w: Line width Dot count (1 dot = 0.125 mm)

This command defines the line format.
Line formats are defined only by this command. They are expanded also to the image memory.
Therefore, lines are not cleared by executing the image memory clear command (ESC X). To clear
lines, execute the format initialization command (ESC C) or the line clear command (ESC E).
This command cannot print oblique lines.
For horizontal lines (d = "0"), specify a constant (y1 y2 y3 y4 = y5 y6 y7 y8) value for the y direction,
and for the vertical direction (d = "1") a constant (x1 x2 x3 x4 = x5 x6 x7 x8) value for the x direction.
See Appendix 4 and the example here for effective range of the print position specification parameter
(x1 x2 x3 x4, y1 y2 y3 y4, x5 x6 x7 x8, y5 y6 y7 y8).

<Ex.> When the print region is 104 mm in the horizontal direction (X direction) and 300 mm in the
vertical direction (Y direction):

	X direction (x1 x2 x3 x4, x5 x6 x7 x8)	Y direction (y1 y2 y3 y4, y5 y6 y7 y8)
Horizontal line	"0000" to "1040"	"0000" to "2999"
Vertical line	"0000" to "1039"	"0000" to "3000"
Framed	"0000" to "1040"	"0000" to "3000"

<Relationship of print position specification and the actual printed line>

A: Print starting position (x1 x2 x3 x4, y1 y2 y3 y4)
B: Print ending position (x5 x6 x7 x8, y5 y6 y7 y8)
W: Line width

(1) For horizontal line (d = "0") → Always set to y1 y2 y3 y4 = y5 y6 y7 y8.

(2) For vertical line (d = "1") → Always set to x1 x2 x3 x4 = x5 x6 x7 x8.

(3) For frame (d = "2")

ESC L n1n2 ; x1x2x3x4 , y1y2y3y4 , x5x6x7x8 , y5y6y7y8 , d ,w a LF NUL

[Name]	Define line formats (Specifications C, D)

[Code]																
ASCII	ESC	L	n1	n2	;	x1	x2	x3	x4	,	y1	y2	y3	y4	,	
Hex.	1B	4C	n1	n2	3B	x1	x2	x3	x4	2C	y1	y2	y3	y4	2C	
Decimal	27	76	n1	n2	59	x1	x2	x3	x4	44	y1	y2	y3	y4	44	

ASCII	x5	x6	x7	x8	,	y5	y6	y7	y8	,	d	,	w	,	a	LF	NUL
Hex.	x5	x6	x7	x8	2C	y5	y6	y7	y8	2C	d	2C	w	2C	a	0A	00
Decimal	x5	x6	x7	x8	44	y5	y6	y7	y8	44	d	44	w	44	a	10	0

[Defined Area] $48 \leq n1 \leq 57$ ("0" $\leq n1 \leq$ "9"), $48 \leq n2 \leq 57$ ("0" $\leq n2 \leq$ "9")

"00" $\leq n1\ n2 \leq$ "63"

$49 \leq w \leq 57$ ("1" $\leq w \leq$ "9")

$48 \leq x1 \leq 57$ ("0" $\leq x1 \leq$ "9"), $48 \leq x2 \leq 57$ ("0" $\leq x2 \leq$ "9"), $48 \leq x3 \leq 57$ ("0" $\leq x3 \leq$ "9"), $48 \leq x4 \leq 57$ ("0" $\leq x4 \leq$ "9")

$48 \leq y1 \leq 57$ ("0" $\leq y1 \leq$ "9"), $48 \leq y2 \leq 57$ ("0" $\leq y2 \leq$ "9"), $48 \leq y3 \leq 57$ ("0" $\leq y3 \leq$ "9"), $48 \leq y4 \leq 57$ ("0" $\leq y4 \leq$ "9")

$48 \leq x5 \leq 57$ ("0" $\leq x5 \leq$ "9"), $48 \leq x6 \leq 57$ ("0" $\leq x6 \leq$ "9"), $48 \leq x7 \leq 57$ ("0" $\leq x7 \leq$ "9"), $48 \leq x8 \leq 57$ ("0" $\leq x8 \leq$ "9")

$48 \leq y5 \leq 57$ ("0" $\leq y5 \leq$ "9"), $48 \leq y6 \leq 57$ ("0" $\leq y6 \leq$ "9"), $48 \leq y7 \leq 57$ ("0" $\leq y7 \leq$ "9"), $48 \leq y8 \leq 57$ ("0" $\leq y8 \leq$ "9")

See Appendix 4 and the example here because the x1 x2 x3 x4, y1 y2 y3 y4, x5 x6 x7 x8, y5 y6 y7 y8 values are different for each printer model and print region.

See the following parameter details of d.

$48 \leq a \leq 49$ ("0" $\leq a \leq$ "1") (Specifications C, D)

[Initial Value]	- - -

[Function]   Parameter details

- n1 n2:   Line number
- x1 x2 x3 x4:   X direction position unit of the starting point   Unit 0.1 mm
- y1 y2 y3 y4:   Y direction position unit of the starting point   Unit 0.1 mm
- x5 x6 x7 x8:   X direction position unit of the ending point   Unit 0.1 mm
- y5 y6 y7 y8:   Y direction position unit of the ending point   Unit 0.1 mm
- d: Line direction (See the information below because this varies according to printer model.)

Specifications C

d	
48 ("0")	Horizontal line
49 ("1")	Vertical line
50 ("2")	Frame

Specifications D

d	
48 ("0")	Horizontal line
49 ("1")	Vertical line
50 ("2")	Frame
51 ("3")	Slanted line

- w: Line width Dot count (1 dot = 0.125 mm)

- a (Specifications C,D): Color specification (The settings by this parameter are valid only when set to two color printing.)

         ",a" can be omitted. (Black if omitted.)

a	
48 ("0")	Black
49 ("1")	Red

This command defines the line format.
Line formats are defined only by this command. They are expanded also to the image memory.
Therefore, lines are not cleared by executing the image memory clear command (ESC X). To clear lines, execute the format initialization command (ESC C) or the line clear command (ESC E).
This command cannot print oblique lines.
For horizontal lines (d = "0"), specify a constant (y1 y2 y3 y4 = y5 y6 y7 y8) value for the y direction, and for the vertical direction (d = "1") a constant (x1 x2 x3 x4 = x5 x6 x7 x8) value for the x direction.
See Appendix 4 and the example here for effective range of the print position specification parameter (x1 x2 x3 x4, y1 y2 y3 y4, x5 x6 x7 x8, y5 y6 y7 y8).

<Ex.>   When the print region is 104 mm in the horizontal direction (X direction) and 300 mm in the vertical direction (Y direction):

	X direction (x1 x2 x3 x4, x5 x6 x7 x8)	Y direction (y1 y2 y3 y4, y5 y6 y7 y8)
Horizontal line	"0000" to "1040"	"0000" to "2999"
Vertical line	"0000" to "1039"	"0000" to "3000"
Framed	"0000" to "1040"	"0000" to "3000"
Slanted line	"0000" to "1039"	"0000" to "3000"

<Relationship of print position specification and the actual printed line>

A: Print starting position (x1 x2 x3 x4, y1 y2 y3 y4)
B: Print ending position (x5 x6 x7 x8, y5 y6 y7 y8)
W: Line width

(1) For horizontal line (d = "0") $\rightarrow$ Always set to y1 y2 y3 y4 = y5 y6 y7 y8.

(2) For vertical line (d = "1") $\rightarrow$ Always set to x1 x2 x3 x4 = x5 x6 x7 x8.

(3) For frame (d = "2")

(4) For slanted line (d = "3") (Specification D)
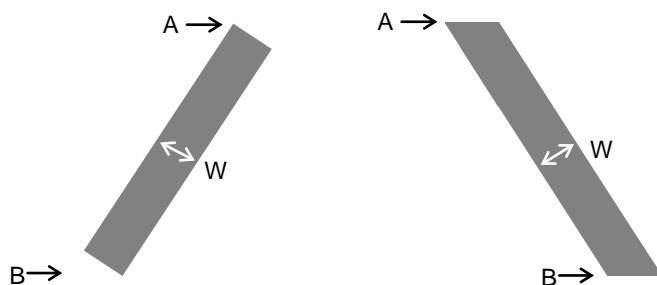
ESC E n1n2 LF NUL

[Name]   Clear lines
[Code]   ASCII   ESC   E   n1   n2   LF   NUL
                Hex.   1B   45   n1   n2   0A   00
                Decimal   27   69   n1   n2   10   0

[Defined Area] 48 ≦ n1 ≦ 57 ("0" ≦ n1 ≦ "9"), 48 ≦ n2 ≦ 57 ("0" ≦ n2 ≦ "9")
                "00" ≦ n1 n2 ≦ "63"
[Initial Value] - - -

[Function]   Clears the specified line format and image.

ESC P C n1n2 ; x1x2x3x4 , y1y2y3y4 , w , h , c , r1r2 , d1d2 LF NUL

[Name]	Define character string formats (Specifications A and B)

[Code]

ASCII	ESC	P	C	n1	n2	;	x1	x2	x3	x4		,	y1	y2	y3	y4	,
Hex.	1B	50	43	n1	n2	3B	x1	x2	x3	x4	2C		y1	y2	y3	y4	2C
Decimal	27	80	67	n1	n2	59	x1	x2	x3	x4	44		y1	y2	y3	y4	44

ASCII	w	,	h	,	c	,	r1	r2	,	d1	d2	LF	NUL
Hex.	w	2C	h	2C	c	2C	r1	r2	2C	d1	d2	0A	00
Decimal	w	44	h	44	c	44	r1	r2	44	d1	d2	10	0

[Defined Area] $48 \leq n1 \leq 57$ ("0" $\leq n1 \leq$ "9"), $48 \leq n2 \leq 57$ ("0" $\leq n2 \leq$ "9")

"00" $\leq$ n1 n2 $\leq$ "99"

$49 \leq w \leq 54$ ("1" $\leq w \leq$ "6")

$49 \leq h \leq 54$ ("1" $\leq h \leq$ "6")

$49 \leq c \leq 53$ ("1" $\leq c \leq$ "5")

$48 \leq r1 \leq 51$ ("0" $\leq r1 \leq$ "3")

$48 \leq r2 \leq 51$ ("0" $\leq r2 \leq$ "3")

$48 \leq d1 \leq 57$ ("0" $\leq d1 \leq$ "9"), $48 \leq d2 \leq 57$ ("0" $\leq d2 \leq$ "9")

"00" $\leq$ d1 d2 $\leq$ "63"

$48 \leq x1 \leq 57$ ("0" $\leq x1 \leq$ "9"), $48 \leq x2 \leq 57$ ("0" $\leq x2 \leq$ "9"), $48 \leq x3 \leq 57$ ("0" $\leq x3 \leq$ "9"), $48 \leq x4 \leq 57$ ("0" $\leq x4 \leq$ "9")

$48 \leq y1 \leq 57$ ("0" $\leq y1 \leq$ "9"), $48 \leq y2 \leq 57$ ("0" $\leq y2 \leq$ "9"), $48 \leq y3 \leq 57$ ("0" $\leq y3 \leq$ "9"), $48 \leq y4 \leq 57$ ("0" $\leq y4 \leq$ "9")

See Appendix 4 because the x1 x2 x3 x4, y1 y2 y3 y4 values are different for each printer model.

[Initial Value] d1 d2 = "00"

[Function] Parameter details

- n1 n2: Character string number
- x1 x2 x3 x4: Print starting X direction position Unit 0.1 mm
- y1 y2 y3 y4: Print starting Y direction position Unit 0.1 mm
- w: Character width magnification (1, 2, 3, 4, 5, 6 magnifications)
- h: Character height magnification (1, 2, 3, 4, 5, 6 magnifications)
- c: Character type (dot unit character size)

  (1: Small characters (8 * 16) / 2: Standard characters (16 * 24) /

  3: Chinese characters (12 * 24/24 * 24) / 4: Bold characters (24 * 32))
- r1: Direction of character rotation

  (0:0°, 1:90°, 2:180°, 3: 270°
- r2: Direction of character string rotation

  (0:0°, 1:90°, 2:180°, 3: 270°
- d1 d2: Character pitch units Unit Dots

  The previous "," may be omitted.

  ", d1 d2" may be omitted. (If omitted, the setting value of "ESC Y" is used.)

Defines character string format (print position, size, character type and direction of rotation).

The upper left of the character face is the reference position for expansion, which does not change even when expanded.

Rotation is done clockwise around the reference point.

Character pitch does not expand when characters are expanded.

Settings using this command are cleared by the format initialization command (ESC C).

When Chinese characters or OCR characters are specified, international characters are invalidated.

When OCR or bold characters are specified, ASCII Katakana characters are invalidated.

The handling of character data differs according to printer model when Chinese characters are selected for the character type.

Specification A
    This always handles character data according to double-byte Chinese character code system.

Specification B
    Characters are handled in the following manner according to the memory switch settings and the first byte data that is sent.
    Be aware that when using Japanese characters the system can switch between the Shift JIS mode and the JIS/Shift JIS Chinese characters mixed mode, depending on the memory switch setting. (Refer to each product specification manual.)
    In these specifications, the settings for single-byte characters are reflected as they are for character pitch, but for double-byte characters, a double character pitch setting is applied.
    Also, international and zero style settings are invalidated for single-byte characters in these specifications.

(1) Chinese characters other than Japanese characters

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0	Command error		*	Single-byte Characters (ASCII)					Chinese Characters (Space when Outside of Standard)							
1																
2																
3																
4																
5																
6																
7																
8																
9																
A																
B																
C																
D																
E																
F								*								

    *: Single-byte space

    → Enabled for printer models equipped with Chinese characters functions other than Japanese characters.
      If the first byte of data is 0x20-0x7f, it is processed as 1 byte of ASCII code and expands the single-byte character data.
      If the code for the first byte of data is 0x80 or higher (0xA1 or higher for Chinese characters used in Korea) and the code corresponds to the Chinese characters for the printer, the printer processes the first and second bytes of data together to print the Chinese character data.

(2) Japanese character Shift JIS mode (specified by memory switch)

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0			*								*					
1																
2																
3																
4																
5																
6	Command				Single-byte Characters (ASCII)				Shift JIS			Single-byte Kana			Shift JIS	Command error
7																
8	error															
9																
A																
B																
C																
D																
E																
F								*								

*: Single-byte space

→ Enabled only on printer models equipped with Japanese character functions.
  If the first byte of data is 0x20-0x7f, 0xa0-0xdf, it is processed as 1 byte of ASCII code and expands the single-byte character data.
  If the first byte of data is 0x81-0x9f, 0xe0-0xef, it is processed as shift JIS Chinese characters, and processes according to double-byte data and expands the Chinese character data.

(3) Japanese characters and JIS/shift JIS mixed mode (specified by memory switch)

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0																
1																
2																
3																
4																
5																
6	Command					JIS			Shift JIS			Command error			Shift JIS	Command error
7																
8	error															
9																
A																
B																
C																
D																
E																
F																

→ Enabled only on printer models equipped with Japanese character functions.
  If the first byte of data is 0x21-0x7e, it is processed as JIS Chinese characters. With 0x81-0x9f, 0xe0-0xef, it is processed as shift JIS Chinese character and always processes double-bytes and expands Chinese character data.

ESC P C n1n2 ; x1x2x3x4 , y1y2y3y4 , w , h , c , r1r2, d1d2, s1s2, a LF NUL

[Name]   Define character string format (Specification C)

[Code]

	ASCII	ESC	P	C	n1	n2	;	x1	x2	x3	x4	,	y1	y2	y3	y4	,
	Hex.	1B	50	43	n1	n2	3B	x1	x2	x3	x4	2C	y1	y2	y3	y4	2C
	Decimal	27	80	67	n1	n2	59	x1	x2	x3	x4	44	y1	y2	y3	y4	44

	ASCII	w	,	h	,	c	,	r1	r2	,	d1	d2	,	s1	s2	,	a	LF	NUL
	Hex.	w	2C	h	2C	c	2C	r1	r2	2C	d1	d2	2C	s1	s2	2C	a	0A	00
	Decimal	w	44	h	44	c	44	h1	h2	44	d1	d2	44	s1	s2	44	a	10	0

[Defined Area] $48 \leq n1 \leq 57$ ("0" $\leq n1 \leq$ "9"), $48 \leq n2 \leq 57$ ("0" $\leq n2 \leq$ "9")

"00" $\leq n1\, n2 \leq$ "99"

$49 \leq w \leq 56$ ("1" $\leq w \leq$ "8") (w = "7", "8": Specification C)

$49 \leq h \leq 56$ ("1" $\leq h \leq$ "8") (h = "7", "8": Specification C)

$49 \leq c \leq 53$ ("1" $\leq c \leq$ "5")

$48 \leq r1 \leq 51$ ("0" $\leq r1 \leq$ "3")

$48 \leq r2 \leq 51$ ("0" $\leq r2 \leq$ "3")

$48 \leq d1 \leq 57$ ("0" $\leq d1 \leq$ "9") $48 \leq d2 \leq 57$ ("0" $\leq d2 \leq$ "9")

"00" $\leq d1\, d2 \leq$ "63"

$48 \leq s1 \leq 49$ ("0" $\leq s1 \leq$ "1"), $48 \leq s2 \leq 50$ ("0" $\leq s2 \leq$ "2") (Specification C)

$48 \leq a \leq 49$ ("0" $\leq a \leq$ "1") (Specification C)

$48 \leq x1 \leq 57$ ("0" $\leq x1 \leq$ "9"), $48 \leq x2 \leq 57$ ("0" $\leq x2 \leq$ "9"), $48 \leq x3 \leq 57$ ("0" $\leq x3 \leq$ "9"), $48 \leq x4 \leq 57$ ("0" $\leq x4 \leq$ "9")

$48 \leq y1 \leq 57$ ("0" $\leq y1 \leq$ "9"), $48 \leq y2 \leq 57$ ("0" $\leq y2 \leq$ "9"), $48 \leq y3 \leq 57$ ("0" $\leq y3 \leq$ "9"), $48 \leq y4 \leq 57$ ("0" $\leq y4 \leq$ "9")

See Appendix 4 because the x1 x2 x3 x4, y1 y2 y3 y4 values are different for each printer model.

[Initial Value]   d1d2 = "00"

[Function]   Parameter details

• n1 n2:   Character string number

• x1 x2 x3 x4:   Print starting X direction position   Unit 0.1 mm

• y1 y2 y3 y4:   Print starting Y direction position   Unit 0.1 mm

• w: Character width magnification (Mags. of 1, 2, 3, 4, 5, 6, 7 and 8) (Mags. 7 and 8: Specification C)

• h: Character height magnification   (Mags. of 1, 2, 3, 4, 5, 6, 7 and 8) (Mags. 7 and 8: Specification C)

• c: Character type (Data in parentheses show character size in dot increments.)
(1: Small characters (8 x 16)/2: Standard characters (16 x 24)/3: Chinese characters (12 x 24/24 x 24)/4: Bold characters (24 x 32)

• r1:   Character rotation direction
(0: 0˚; 1: 90˚; 2: 180˚; 3: 270˚)

• r2:   Character rotation direction
(0: 0˚; 1: 90˚; 2: 180˚; 3: 270˚)

• d1d2:   Character pitch

• s1s2 (Specification C): Character modification

		s1	
		48 ("0")	49 ("1")
s2	48 ("0")	No character modification	Character modification
	49 ("1")	Underline	Enhance + underline
	50 ("2")	Black/white inversion	Enhance + black/white inversion

• a (Specification C):   Color specification (The setting made by this parameter is valid only when two-color printing is set.)

a	
48 ("0")	Black
49 ("1")	Red

The parameters ", d1d2, s1s2, a" or ", s2s2, a" can be omitted. (When omitted, Character pitch: value set by ESC Y; Character modification: None; Color: Black)

Defines character string format (print position, size, character type and direction of rotation).
The upper left of the character face is the reference position for expansion, which does not change even when expanded.
Rotation is done clockwise around the reference point.
Character pitch does not expand when characters are expanded.
Settings using this command are cleared by the format initialization command (ESC C).

When Chinese characters or OCR characters are specified, international characters are invalidated.
When OCR or bold characters are specified, ASCII Katakana characters are invalidated.

2 byte code specifications
   Characters are handled in the following manner according to the memory switch settings and the first byte data that is sent.
   Be aware that when using Japanese characters the system can switch between the Shift JIS mode and the JIS/Shift JIS Chinese characters mixed mode, depending on the memory switch setting. (Refer to each product specification manual.)
   In these specifications, the settings for single-byte characters are reflected as they are for character pitch, but for double-byte characters, a double character pitch setting is applied.
   Also, international and zero style settings are invalidated for single-byte characters in these specifications.

   (1) Chinese characters other than Japanese characters

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0			*													
1																
2																
3																
4																
5																
6																
7	Command error		Single-byte Characters (ASCII)						Chinese Characters (Space when Outside of Standard)							
8																
9																
A																
B																
C																
D																
E																
F								*								

      *: Single-byte space

   → Enabled for printer models equipped with Chinese characters functions other than Japanese characters.
      If the first byte of data is 0x20-0x7f, it is processed as 1 byte of ASCII code and expands the single-byte character data.

If the code for the first byte of data is 0x80 or higher (0xA1 or higher for Chinese characters used in Korea) and the code corresponds to the Chinese characters for the printer, the printer processes the first and second bytes of data together to print the Chinese character data.

(2) Japanese character shift JIS mode (specified by memory switch)

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0			*								*					
1																
2																
3																
4	Command error		Single-byte Characters (ASCII)						Shift JIS		Single-byte Kana				Shift JIS	Command error
5																
6																
7																
8																
9																
A																
B																
C																
D																
E																
F								*								

*: Single-byte space

→ Enabled only on printer models equipped with Japanese character functions.
If the first byte of data is 0x20-0x7f, 0xa0-0xdf, it is processed as 1 byte of ASCII code and expands the single-byte character data.
If the first byte of data is 0x81-0x9f, 0xe0-0xef, it is processed as shift JIS Chinese characters, and processes according to double-byte data and expands the Chinese character data.

(3) Japanese characters and JIS/shift JIS mixed mode (specified by memory switch)

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0																
1																
2																
3																
4	Command error		JIS						Shift JIS		Command error				Shift JIS	Command error
5																
6																
7																
8																
9																
A																
B																
C																
D																
E																
F																

→ Enabled only on printer models equipped with Japanese character functions.
If the first byte of data is 0x21-0x7e, it is processed as JIS Chinese characters. With 0x81-0x9f, 0xe0-0xef, it is processed as shift JIS Chinese character and always processes double-bytes and expands Chinese character data.

ESC P C n1n2 ; x1x2x3x4 , y1y2y3y4 , w , h , c , r1r2 , d1d2 , s1s2 , a LF NUL

[Name] Define character string formats (Spec. D)

[Code]

ASCII	ESC	P	C	n1	n2	:	x1	x2	x3	x4	,	y1	y2	y3	y4	,
Hexadecimal	1B	50	43	n1	n2	3B	x1	x2	x3	x4	2C	y1	y2	y3	y4	2C
Decimal	27	80	67	n1	n2	59	x1	x2	x3	x4	44	y1	y2	y3	y4	44

ASCII	w	,	h	,	c	,	r1	r2	,	d1	d2	,	s1	s2	,	a	LF	NUL
Hexadecimal	w	2C	h	2C	c	2C	r1	r2	2C	d1	d2	2C	s1	s2	2C	a	0A	00
Decimal	w	44	h	44	c	44	r1	r2	44	d1	d2	44	s1	s2	44	a	10	0

[Defined Area] 48≦n1≦57 ("0"≦n1≦"9"), 48≦n2≦57 ("0"≦n2≦"9")

"00" ≦ n1n2≦"99"

49≦w≦56 ("1"≦w≦"8")

49≦h≦56 ("1"≦h≦"8")

49≦c≦53 ("1"≦c≦"5")

48≦r1≦51 ("0"≦r1≦"3")

48≦r2≦51 ("0"≦r2≦"3")

48≦d1≦57 ("0"≦d1≦"9"), 48≦d2≦57 ("0"≦d2≦"9")

"00"≦d1d2≦"63"

48≦s1≦49 ("0"≦s1≦"1"), 48≦s2≦50 ("0"≦s2≦"2")

48≦a≦49 ("0"≦a≦"1")

48≦x1≦57("0"≦x1≦"9"), 48≦x2≦57("0"≦x2≦"9"), 48≦x3≦57("0"≦x3≦"9"), 48≦x4≦57("0"≦x4≦"9")

48≦y1≦57("0"≦y1≦"9"), 48≦y2≦57("0"≦y2≦"9"), 48≦y3≦57("0"≦y3≦"9"), 48≦y4≦57("0"≦y4≦"9")

See Appendix 4 because the x1 x2 x3 x4, y1 y2 y3 y4 values are different for each printer model.

[Initial Value] d1 d2 = "00"

[Function] Parameter details

- n1 n2:   Character string number
- x1 x2 x3 x4:   Print starting X direction position   Unit 0.1 mm
- y1 y2 y3 y4:   Print starting Y direction position   Unit 0.1 mm
- w: Character width magnification (1, 2, 3, 4, 5, 6, 7, 8 magnifications)
- h: Character height magnification (1, 2, 3, 4, 5, 6, 7, 8 magnifications)
- c: Character type ((•) dot unit character size)

  1: Small characters (8 * 16)/2: Standard characters (16 * 24)/

  3: Chinese characters (12 * 24/24 * 24)/

  4: Bold characters (24 * 32)

- r1:   Direction of character rotation

  (0° (0), 90° (1), 180° (2), 270° (3))

- r2:   Direction of character rotation

  (0° (0), 90° (1), 180° (2), 270° (3))

- d1 d2:   Character Pitch   Unit Dots
- s1 s2:   Character Adornment:

		s1	
		48 ("0")	49 ("1")
s2	48 ("0")	No adornment	Emphasized
	49 ("1")	Underline	Emphasized + Underline
	50 ("2")	White/black Inversion	Emphasized + White/black Inversion

- a: Color specification (Settings using this parameter valid only when 2-color printing is specified.)

a	
48 ("0")	Black
49 ("1")	Red

The parameter can omit ",d1 d2, a" or "s1 s2 a."

(If omitted, the character pitch is: Setting value of ESC Y; character adornment: None; Color: Black)

Defines character string format (print position, size, character type and direction of rotation).
The upper left of the character face is the reference position for expansion, which does not change even when expanded.
Rotation is done clockwise around the reference point.
Character pitch does not expand when characters are expanded.
Settings using this command are cleared by the format initialization command (ESC C).

When Chinese characters or OCR characters are specified, international characters are invalidated. When OCR or bold characters are specified, ASCII Katakana characters are invalidated.

2-Byte Specification

Characters are handled in the following manner according to the memory switch settings and the first byte data that is sent.
Be aware that when using Japanese characters the system can switch between the Shift JIS mode and the JIS/Shift JIS Chinese characters mixed mode, depending on the memory switch setting.(Refer to each product specification manual.)
In these specifications, the settings for single-byte characters are reflected as they are for character pitch, but for double-byte characters, a double character pitch setting is applied.
Also, international and zero style settings are invalidated for single-byte characters in these specifications.

(1)   Chinese characters other than Japanese characters

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0			*													
1																
2																
3																
4																
5																
6																
7	Commands		Single-byte Characters (ASCII)						Chinese Character (SPACE for Outside for Specification)							
8	Error															
9																
A																
B																
C																
D																
E																
F								*								

* Single-byte space

→   Enabled for printer models equipped with Chinese characters functions other than Japanese characters.
If the first byte of data is 0x20-0x7f, it is processed as 1 byte of ASCII code and expands the single-byte character data.
If the code for the first byte of data is 0x80 or higher (0xA1 or higher for Chinese characters used in Korea) and the code corresponds to the Chinese characters for the printer, the printer processes the first and second bytes of data together to print the Chinese character data.

(2)   Japanese character SHIFT-JIS mode (specified by memory switch)

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0			*								*					
1																
2																Command Errors
3																
4			Single-byte Characters (ASCII)						Shift JIS		Single-byte Kana				Shift JIS	
5																
6		Commands Error														
7																
8																-
9																
A																
B																
C																
D																
E																
F								*								

* Single-byte space

→   Enabled only on printer models equipped with Japanese character functions.

If the first byte of data is 0x20-0x7f, 0xa0-0xdf, it is processed as 1 byte of ASCII code and expands the single-byte character data.

If the first byte of data is 0x81-0x9f, 0xe0-0xef, it is processed as shift JIS Chinese characters, and processes according to double-byte data and expands the Chinese character data.

Portions enclosed by double-lines are IBM expanded Chinese characters.

(3)   Japanese character JIS mode (specified by memory switch)
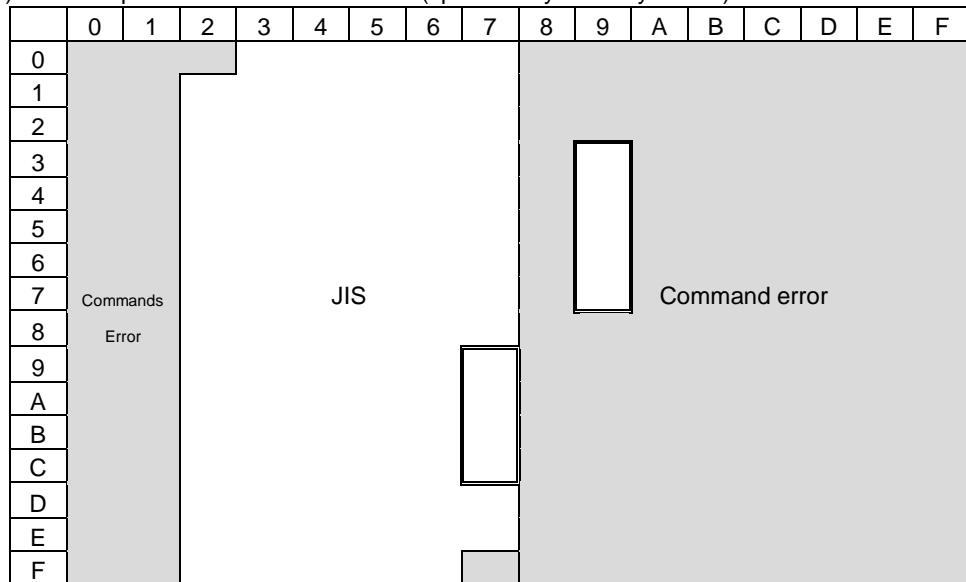
	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0																
1																
2																
3																
4																
5																
6																
7	Commands			JIS						Command error						
8	Error															
9																
A																
B																
C																
D																
E																
F																

→   Enabled only on printer models equipped with Japanese character functions.
If the first byte of data is 0x20-0x7f, this expands the Chinese character data as JIS Chinese characters.
Portions enclosed by double-lines are IBM expanded Chinese characters.

(4)   Japanese characters and JIS/shift JIS mixed mode (specified by memory switch)

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0																
1																
2																
3																
4	Commands			JIS					Shift JIS	Command error					Shift JIS	Command Errors
5																
6																
7																
8	Error															
9																
A																
B																
C																
D																
E																
F																

→   Enabled only on printer models equipped with Japanese character functions.
If the first byte of data is 0x21-0x7e, it is processed as JIS Chinese characters. With 0x81-0x9f, 0xe0-0xef, it is processed as shift JIS Chinese character and always processes double-bytes and expands Chinese character data. IBM expanded Chinese characters are not printed in this mode.

ESC Y d1d2 LF NUL

[Name]	Define character pitch

[Code]

	ASCII	ESC	Y	d1	d2	LF	NUL
	Hex.	1B	59	d1	d2	0A	00
	Decimal	27	89	d1	d2	10	0

[Defined Area] $48 \leq d1 \leq 57$ ("0" $\leq$ d1 $\leq$ "9"), $48 \leq d2 \leq 57$ ("0" $\leq$ d2 $\leq$ "9")

"00" $\leq$ d1 d2 $\leq$ "63"

[Initial Value] d1 d2 = "00"

[Function] Defines the character pitch.

To change character pitch, specify before the character string format definition command (ESC P C).

The setting value is applied as is for single byte characters, but for double-byte characters, the pitch is doubled.

This command is enabled only by the character string format definition command (ESC P C) and when character pitch (d1 d2) is omitted.

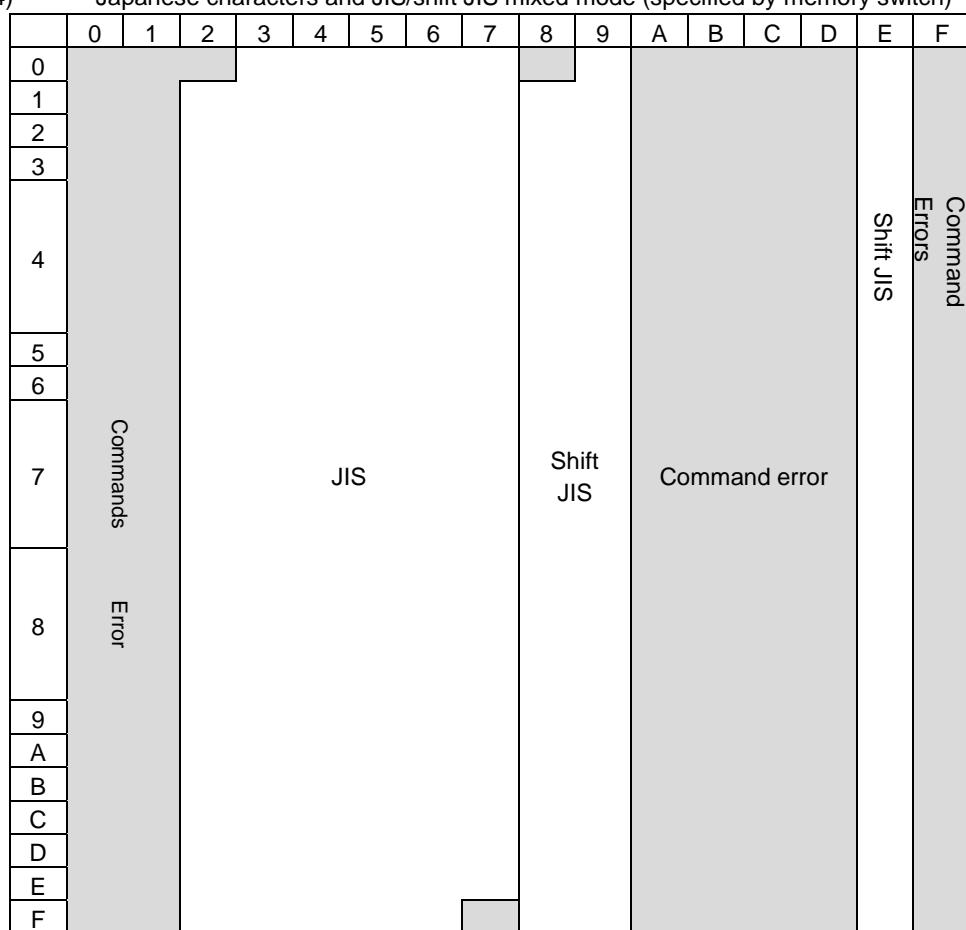Settings using this command are cancelled by the format initialization command (ESC C).

ESC P B n1n2 ; x1x2x3x4 , y1y2y3y4 , w , b , m , h1h2h3h4 LF NUL

[Name]	Define bar code format (Specification A)

[Code]

ASCII	ESC	P	B	n1	n2	;	x1	x2	x3	x4	,	y1	y2	y3	y4	,
Hex.	1B	50	42	n1	n2	3B	x1	x2	x3	x4	2C	y1	y2	y3	y4	2C
Decimal	27	80	66	n1	n2	59	x1	x2	x3	x4	44	y1	y2	y3	y4	44

ASCII	w	,	b	,	m	,	h1	h2	h3	h4	LF	NUL
Hex.	w	2C	b	2C	m	2C	h1	h2	h3	h4	0A	00
Decimal	w	44	b	44	m	44	h1	h2	h3	h4	10	0

[Defined Area] $48 \leq n1 \leq 57$ ("0" $\leq$ n1 $\leq$ "9"), $48 \leq n2 \leq 57$ ("0" $\leq$ n2 $\leq$ "9")

"00" $\leq$ n1 n2 $\leq$ "31"

$49 \leq w \leq 57$ (Varies according to "1" $\leq$ w $\leq$ "9" and bar code types. See Appendix 2 for details.)

$49 \leq b \leq 57$ ("1" $\leq$ b $\leq$ "9")

$48 \leq m \leq 51$ ("0" $\leq$ m $\leq$ "3")

$48 \leq x1 \leq 57$ ("0" $\leq$ x1 $\leq$ "9"), $48 \leq x2 \leq 57$ ("0" $\leq$ x2 $\leq$ "9"), $48 \leq x3 \leq 57$ ("0" $\leq$ x3 $\leq$ "9"), $48 \leq x4 \leq 57$ ("0" $\leq$ x4 $\leq$ "9")

$48 \leq y1 \leq 57$ ("0" $\leq$ y1 $\leq$ "9"), $48 \leq y2 \leq 57$ ("0" $\leq$ y2 $\leq$ "9"), $48 \leq y3 \leq 57$ ("0" $\leq$ y3 $\leq$ "9"), $48 \leq y4 \leq 57$ ("0" $\leq$ y4 $\leq$ "9")

$48 \leq h1 \leq 57$ ("0" $\leq$ h1 $\leq$ "9"), $48 \leq h2 \leq 57$ ("0" $\leq$ h2 $\leq$ "9"), $48 \leq h3 \leq 57$ ("0" $\leq$ h3 $\leq$ "9"), $48 \leq h4 \leq 57$ ("0" $\leq$ h4 $\leq$ "9")

See Appendix 4 because the x1 x2 x3 x4, y1 y2 y3 y4, h1 h2 h3 h4 values are different for each printer model.

[Initial Value] - - -

[Function] Parameter details

- n1 n2: Bar code number
- x1 x2 x3 x4: Print starting X direction position   Unit 0.1 mm
- y1 y2 y3 y4: Print starting Y direction position   Unit 0.1 mm
- w: Bar code mode selection
- b: Bar code type
  (1:Code39 / 2:ITF / 3:Code93 / 4:UPC-A / 5:JAN/EAN-8 / 6:JAN/EAN-13 / 7:Code128 / 8:NW-7 / 9:UPC-E)
- m: Direction of bar code rotation
  (0:0°, 1:90°, 2:180°, 3: 270°)
- h1 h2 h3 h4: Bar code height   Unit 0.1 mm

Defines bar code format (print position, size, type, direction of rotation, and height).

Rotation is done clockwise around the reference point, using the upper left of the bar code as a reference position.
The bar codes that are printed do not conform to each standard, so you should confirm before actual use.
Settings using this command are cleared by the format initialization command (ESC C).

ESC P B n1n2 ; x1x2x3x4 , y1y2y3y4 , w , b , m , h1h2h3h4 a LF NUL

| [Name] | Define bar code format (Specifications B, C) |

[Code]	ASCII	ESC	P	B	n1	n2	;	x1	x2	x3	x4	,	y1	y2	y3	y4	,
	Hex.	1B	50	42	n1	n2	3B	x1	x2	x3	x4	2C	y1	y2	y3	y4	2C
	Decimal	27	80	66	n1	n2	59	x1	x2	x3	x4	44	y1	y2	y3	y4	44

	ASCII	w	,	b	,	m	,	h1	h2	h3	h4	,	a	LF	NUL
	Hex.	w	2C	b	2C	m	2C	h1	h2	h3	h4	2C	a	0A	00
	Decimal	w	44	b	44	m	44	h1	h2	h3	h4	44	a	10	0

[Defined Area] $48 \leq n1 \leq 57$ ("0" $\leq n1 \leq$ "9"), $48 \leq n2 \leq 57$ ("0" $\leq n2 \leq$ "9")

"00" $\leq$ n1 n2 $\leq$ "31"

$49 \leq w \leq 57$ (Varies according to "1" $\leq w \leq$ "9" and bar code types. See Appendix 2 for details.)

$49 \leq b \leq 57$ ("1" $\leq b \leq$ "9")

$48 \leq m \leq 51$ ("0" $\leq m \leq$ "3")

$48 \leq a \leq 49$ ("0" $\leq a \leq$ "1") (Specification B)

$48 \leq x1 \leq 57$ ("0" $\leq x1 \leq$ "9"), $48 \leq x2 \leq 57$ ("0" $\leq x2 \leq$ "9"), $48 \leq x3 \leq 57$ ("0" $\leq x3 \leq$ "9"), $48 \leq x4 \leq 57$ ("0" $\leq x4 \leq$ "9")

$48 \leq y1 \leq 57$ ("0" $\leq y1 \leq$ "9"), $48 \leq y2 \leq 57$ ("0" $\leq y2 \leq$ "9"), $48 \leq y3 \leq 57$ ("0" $\leq y3 \leq$ "9"), $48 \leq y4 \leq 57$ ("0" $\leq y4 \leq$ "9")

$48 \leq h1 \leq 57$ ("0" $\leq h1 \leq$ "9"), $48 \leq h2 \leq 57$ ("0" $\leq h2 \leq$ "9"), $48 \leq h3 \leq 57$ ("0" $\leq h3 \leq$ "9"), $48 \leq h4 \leq 57$ ("0" $\leq h4 \leq$ "9")

See Appendix 4 because the x1 x2 x3 x4, y1 y2 y3 y4, h1 h2 h3 h4 values are different for each printer model.

[Initial Value] - - -

[Function] Parameter details
- n1 n2: Bar code number
- x1 x2 x3 x4: Print starting X direction position   Unit 0.1 mm
- y1 y2 y3 y4: Print starting Y direction position   Unit 0.1 mm
- w: Bar code mode selection
- b: Bar code type
  (1:Code39 / 2:ITF / 3:Code93 / 4:UPC-A / 5:JAN/EAN-8 / 6:JAN/EAN-13 / 7:Code128 / 8:NW-7 / 9:UPC-E)
- m: Direction of bar code rotation
  (0:0°, 1:90°, 2:180°, 3: 270°)
- h1 h2 h3 h4: Bar code height   Unit 0.1 mm
- a (Specification B): Color specification (The setting made by this parameter is valid only when two-color printing is set.) ",a" can be omitted. (Black when omitted.)

a	
48 ("0")	Black
49 ("1")	Red

Defines bar code format (print position, size, type, direction of rotation, and height).

Rotation is done clockwise around the reference point, using the upper left of the bar code as a reference position.

The bar codes that are printed do not conform to each standard, so you should confirm before actual use.

Settings using this command are cleared by the format initialization command (ESC C).

(Spec. C)

If the bar code type selected by b whose specification value of the mode follows, by w, the command analysis is ended and a command error is generated.

ESC B n d1d2 LF NUL

[Name]   Cutter control

[Code]

ASCII	ESC	B	n	d1	d2	LF	NUL
Hex.	1B	42	n	d1	d2	0A	00
Decimal	27	66	n	d1	d2	10	0

[Defined Area]   n = 42, 43, 44, 47, 64   (n = "*", "+", "-", "/", "@")

                 $48 \leq d1 \leq 57$ ("0" $\leq$ d1 $\leq$ "9"), $48 \leq d2 \leq 57$ ("0" $\leq$ d2 $\leq$ "9")

                 "00" $\leq$ d1 d2 $\leq$ "50"

[Initial Value]   - - -

[Function]   Parameter details

- n: Direction of offset

   "+": Offsets in the plus direction according to a standard feed value and performs a full cut.

   "-": Offsets in the minus direction according to a standard feed value and performs a full cut.

   "*": Offsets in the plus direction according to a standard feed value and performs a partial cut.

   "/": Offsets in the minus direction according to a standard feed value and performs a partial cut.

   "@": Cutter drive invalidated except for next issue.

   (Use this when cutting several sheets of paper. In that case, do not specify d1 d2.)

- d1 d2:   Offset amount   Unit 0.1 mm

Note: The parameters (n d1 d2) can be omitted together. When doing so, a full cut on a standard paper feed is set.

Drive of the auto cutter is enabled.
When a presenter is equipped, a full cut is used for the paper cut.
For cutters that leave on uncut portion, it does not return paper after the cut.
The cutter is driven after paper is issued only by setting this command.
This command is valid when performing a TOF using the black mark function.

Settings using this command are cleared by the format initialization command (ESC C).

See APPENDIX 6 for operations of this command on the label printer TSP828L.

ESC T n d1d2 LF NUL

[Name]   Tear bar feeding control
[Code]   ASCII   ESC   T   n   d1   d2   LF   NUL
              Hex.   1B   54   n   d1   d2   0A   00
              Decimal   27   84   n   d1   d2   10   0

[Defined Area]   n = 43, 44, 64   (n = "+", "-", "@")
                 48 ≤ d1 ≤ 57 ("0" ≤ d1 ≤ "9"), 48 ≤ d2 ≤ 57 ("0" ≤ d2 ≤ "9")
                 "00" ≤ d1 d2 ≤ "50"
[Initial Value] - - -

[Function]   Parameter details
              • n: Direction of offset
                    "+": Offsets in the plus direction according to a standard feed value.
                    "-":   Offsets in the minus direction according to a standard feed value.
                    "@": Tear Bar Feeding is made invalid for the next issue.
                     (Use this command for continuous issue etc. In such a case, do not specify "d1"
                     or"d2".)

              • d1 d2:   Offset amount   Unit 0.1 mm
              Note: The parameters (n, d1, d2) can be omitted together. If omitted, the standard paper feed is set.

              Paper feeding to the tear bar is made valid.
              Cutter and correction feed settings are made invalid.
              This command only specifies the settings, and paper is fed after the paper is issued.
              This command is valid when performing a TOF using the black mark function.

              Settings using this command are cleared by the format initialization command (ESC C).

              See APPENDIX 6 for operations of this command on the label printer TSP828L.

ESC J n d1d2 LF NUL

[Name]   Control correction feed

[Code]

	ESC	J	n	d1	d2	LF	NUL
ASCII	ESC	J	n	d1	d2	LF	NUL
Hex.	1B	4A	n	d1	d2	0A	00
Decimal	27	74	n	d1	d2	10	0

[Defined Area]   n = 43, 44, 64   (n = "+", "-", "@")

$48 \leq d1 \leq 57$ ("0" $\leq d1 \leq$ "9"), $48 \leq d2 \leq 57$ ("0" $\leq d2 \leq$ "9")

"00" $\leq$ d1 d2 $\leq$ "99"

[Initial Value]   - - -

[Function]   Parameter details

• n: Direction of offset

"+": Offsets in the positive direction from the current stop position.

"-":   Invalid (Offset 0)

"@": Offsets (cutter and tear bar feeding) are made invalid for the next issue.
(Use this command for continuous issue etc. In such a case, do not specify "d1" or"d2".)

• d1 d2:   Offset amount   Unit 0.1 mm

Note: The parameters (n, d1, d2) can be omitted together. If omitted, the standard paper feed is set.

Offset from the stop position is made valid.

Cutter and tear bar feedings are made invalid.

This command only specifies the settings, and paper is fed after the paper is issued.

This command is valid when performing a TOF using the black mark function.

Settings using this command are cleared by the format initialization command (ESC C).

See APPENDIX 6 for operations of this command on the label printer TSP828L.

ESC U n ; x1x2x3 , y1y2y3 LF NUL

[Name]	Control peripheral devices												
[Code]	ASCII	ESC	U	n	;	x1	x2	x3	,	y1	y2	y3	LF NUL
	Hex.	1B	56	n	3B	x1	x2	x3	2C	y1	y2	y3	0A 00
	Decimal	27	85	n	59	x1	x2	x3	44	y1	y2	y3	10 0

[Defined Area]   n = 49, 50, 64   (n = "1", "2", "@")
48≦x1≦57 ("0"≦x1≦"9"), 48≦x2≦57 ("0"≦x2≦"9"), 48≦x3≦57 ("0"≦x3≦"9")
"000"≦x1x2x3≦"127"
48≦y1≦57 ("0"≦y1≦"9"), 48≦y2≦57 ("0"≦y2≦"9"), 48≦y3≦57 ("0"≦y3≦"9")
"000"≦y1y2y3≦"127"

[Initial Value]   - - -

[Function]   Parameter details

- n: Selects a peripheral device.
("1": Peripheral device 1; "2": Peripheral device 2)

"@": Peripheral device driving is made invalid only for the next issue.
(Use this command to drive peripheral devices for multiple sheets. In such a case, do not specify the parameters until <LF> and <NUL> parameters.)

- x1 x2 x3:   Energizing Time   Unit 10msec
- y1 y2 y3:   Delay Time   Unit 10msec

Note: The parameters (";" "x1x2x3", "y1y2y3") can be omitted together. If omitted, the standard driving conditions are set.

Peripheral device driving is made valid.
This command only specifies the settings, and paper is fed after the paper is issued.
Settings using this command are cleared by the format initialization command (ESC C).

3-3-2 Data Settings

ESC X LF NUL

[Name]   Clear image memory
[Code]   ASCII   ESC   X   LF   NUL
                Hex.   1B   58 0A   00
                Decimal   27   88 10   0

[Defined Area]   - - -
[Initial Value]   - - -

[Function]   Clears the image memory.
                This does not clear the format memory.

                Items Registered in the Image Memory

	Command
Character data	ESC R C
Bar code data	ESC R B, ESC GS x (equipped models only), ESC GS y (equipped models only)
Graphics data	ESC Q, ESC H, ESC K, ESC k

ESC R C n1n2 ; a1a2 . . . an LF NUL

[Name]	Define character string data										
[Code]	ASCII	ESC	R	C	n1	n2	;	a1	a2	..	ak	LF	NUL
	Hex.	1B	52	43	n1	n2	3B	a1	a2	..	ak	0A	00
	Decimal	27	82	67	n1	n2	59	a1	a2	..	ak	10	0

[Defined Area] $48 \leq n1 \leq 57$ ("0" $\leq n1 \leq$ "9"), $48 \leq n2 \leq 57$ ("0" $\leq n2 \leq$ "9")
"00" $\leq$ n1 n2 $\leq$ "99"
$1 \leq n \leq 100$

[Initial Value]   - - -

[Function]   Parameter details
• n1 n2:   Character string number
• a1 a2 … ak: Print data (Maximum 100 characters)

Defines character string data defined by the format setting command.
Character string data is overwritten in the image memory.
It is possible to redefine character data only without changing the format. In that case, old character strings are deleted before expanding the new character string.
When k = 0 (when the data following n1, n2 was LF NUL), it is out of range of the defined area, but considering ease of use, there is no command error generated.
This data is cleared by the format initialization command (ESC C) or the image memory clear command (ESC X).

![star logo]

ESC G n1n2 . . . ESC 0

[Name]   Call up external character
[Code]   ASCII   ESC   G   n1   n2 . .   ESC   0
              Hex.   1B   47 n1   n2 . .   1B   30
              Decimal   27   71 n1   n2 . .   27   48

[Defined Area]   48 ≤ n1 ≤ 57 ("0" ≤ n1 ≤ "9"), 48 ≤ n2 ≤ 57 ("0" ≤ n2 ≤ "9")
                 "00" ≤ n1 n2 ≤ "31"
[Initial Value] - - -

[Function]   Parameter details
              • n1 n2:   External character register number

              Calls up the external characters registered by the external character register command (ESC F).
              External characters are enabled only for standard characters.

              External register numbers are called up by "ESC G" and "ESC 0." They are called up from among the
              character string data definition command (ESC R C).
              To continue calling up external characters, separate by "," (commas) to specify them.
              An empty space is printed if there is no defined data for a specified external character register
              number.
              This data is cleared by the format initialization command (ESC C) or the image memory clear
              command (ESC X).

              Example of Use)
              ESC "R C 00 ;" "**GAIJI**" ESC "G 00 , 01" ESC "0" "**SAMPLE**" LF NUL
              → The external character registered to 00 and 01 between "**GAIJI**" and "**SAMPLE**" is printed.

ESC R B n1n2 ; a1a2 . . . an LF NUL

[Name]	Define bar code data										
[Code]	ASCII	ESC	R	B	n1	n2	;	a1	a2	.. an	LF	NUL
	Hex.	1B	52	42	n1	n2	3B	a1	a2	.. an	0A	00
	Decimal	27	82	66	n1	n2	59	a1	a2	.. an	10	0

[Defined Area] $48 \leq n1 \leq 57$ ("0" $\leq n1 \leq$ "9"), $48 \leq n2 \leq 57$ ("0" $\leq n2 \leq$ "9")
"00" $\leq n1 \; n2 \leq$ "31"

[Initial Value] - - -

[Function]   Parameter details
- n1 n2:   Bar code string number
- a1 a2 … an: Bar code data

Code 39: (Data count = Any)
Start/stop characters ("*") are automatically inserted.

ITF: (Data count = Any)
Start/stop codes are automatically applied.
When the data count is odd, a 0 is automatically applied to the header of the data.

Code 93: (Data count = Any)
Start/stop check characters (C, K) are automatically applied.

UPC-A: (Data count = 11, 12)
The 12th check digit is automatically inserted, so it is ignored even if specified.
When there is insufficient data, that data is ignored.

JAN/EAN-8: (Data count = 7, 8)
The 8th check digit is automatically inserted, so it is ignored even if specified.
When there is insufficient data, that data is ignored.

JAN/EAN-13: (Data count = 12, 13)
The 13th check digit is automatically inserted, so it is ignored even if specified.
When there is insufficient data, that data is ignored.

Code 128: (Data count = Any)
Conforms to EAN -128.
Start/stop codes and check characters are automatically applied.

NW-7: (Data count = Any)
Both start/stop codes are not automatically applied, so it is included in the data.

UPC-E: (Data count = 11, 12)
The 12th check digit is automatically inserted, so it is ignored even if specified.
Data conversion to abbreviated forms is automatically performed. The command is ignored for data that cannot be abbreviated.

Defines bar code data defined by the format setting command (ESC P B).
Bar codes are overwritten in the image memory.
It is possible to redefine character data only without changing the format. In that case, expand the new bar code after deleting the old one.
The bar codes that are printed do not conform to each standard, so you should confirm before actual use.
This data is cleared by the format initialization command (ESC C) or the image memory clear command (ESC X).

ESC Q n x1x2x3x4 , y1y2y3y4 , h1h2h3h4 , w1w2w3 , n11n12...n1m LF n21n22...n2m LF...LF NUL

[Name] Define dot graphics data (Specification A)

[Code]

		ESC	Q	n	x1	x2	x3	x4	,	y1	y2	y3	y4	,	h1	h2	h3	h4
ASCII		ESC	Q	n	x1	x2	x3	x4	,	y1	y2	y3	y4	,	h1	h2	h3	h4
Hex.		1B	51	n	x1	x2	x3	x4	2C	y1	y2	y3	y4	2C	h1	h2	h3	h4
Decimal		27	81	n	x1	x2	x3	x4	44	y1	y2	y3	y4	44	h1	h2	h3	h4

	,	w1	w2	w3	,	n11	n12	..	n1m	LF	n21	..	n2m	LF	..	LF	NUL
ASCII	,	w1	w2	w3	,	n11	n12	..	n1m	LF	n21	..	n2m	LF	..	LF	NUL
Hex.	2C	w1	w2	w3	2C	n11	n12	..	n1m	0A	n21	..	n2m	0A	..	0A	00
Decimal	44	w1	w2	w3	44	n11	n12	..	n1m	10	n21	..	n2m	10	..	10	0

[Defined Area]   n = 58, 59   (n = ":", ";")

$48 \leq x1 \leq 57$ ("0" $\leq x1 \leq$ "9"), $48 \leq x2 \leq 57$ ("0" $\leq x2 \leq$ "9"), $48 \leq x3 \leq 57$ ("0" $\leq x3 \leq$ "9"), $48 \leq x4 \leq 57$ ("0" $\leq x4 \leq$ "9")

$48 \leq y1 \leq 57$ ("0" $\leq y1 \leq$ "9"), $48 \leq y2 \leq 57$ ("0" $\leq y2 \leq$ "9"), $48 \leq y3 \leq 57$ ("0" $\leq y3 \leq$ "9"), $48 \leq y4 \leq 57$ ("0" $\leq y4 \leq$ "9")

$48 \leq h1 \leq 57$ ("0" $\leq h1 \leq$ "9"), $48 \leq h2 \leq 57$ ("0" $\leq h2 \leq$ "9"), $48 \leq h3 \leq 57$ ("0" $\leq h3 \leq$ "9"), $48 \leq h4 \leq 57$ ("0" $\leq h4 \leq$ "9")

$48 \leq w1 \leq 57$ ("0" $\leq w1 \leq$ "9"), $48 \leq w2 \leq 57$ ("0" $\leq w2 \leq$ "9"), $48 \leq w3 \leq 57$ ("0" $\leq w3 \leq$ "9")

Appendix 4 because the x1 x2 x3 x4, y1 y2 y3 y4, h1 h2 h3 h4, w1 w2 w3 values are different for each printer model.

[Initial Value]   - - -

[Function]   Parameter details

- n: Print specifications
                    (":" Overwrite / ";" Duplicate)
- x1 x2 x3 x4:   Graphics data X axis direction starting address   Unit 0.1 mm
- y1 y2 y3 y4:   Graphics data Y axis direction starting address   Unit 0.1 mm
- h1 h2 h3 h4:   Graphics area Y axis direction length   Unit Dots
- w1 w2 w3:   Graphics area X axis direction width   Unit Bytes
- n11 n12… n1m: mth data of the first line
  n21… n2m: mth data of the second line (The same applies below.)
                    Data display method is the same as download.

Writes dot graphics data to the image memory.
This data is cleared by the format initialization command (ESC C) or the image memory clear command (ESC X).

The following describes the relationship between data and graphics.

```
                    MSB        LSB
n11, n12, …         □□□□□□□□,□□□□□□□□,…
n21, n22, …         □□□□□□□□,□□□□□□□□,…
    :                      :              :
n…                  □□□□□□□□,□□□□□□□□,…
```

ESC Q n x1x2x3x4 , y1y2y3y4 , a, h1h2h3h4 , w1w2w3 , n11n12...n1m LF n21n22...n2m LF...LF NUL

[Name] Define dot graphics data (Specification B)

[Code]

ASCII	ESC	Q	n	x1	x2	x3	x4	,	y1	y2	y3	y4	,	a	,	h1	h2
Hex.	1B	51	n	x1	x2	x3	x4	2C	y1	y2	y3	y4	2C	a	2C	h1	h2
Decimal	27	81	n	x1	x2	x3	x4	44	y1	y2	y3	y4	44	a	44	h1	h2

ASCII	h3	h4	,	w1	w2	w3	,	n11	n12	…	n1m	LF	n21	…	n2m	LF	…
Hex.	h3	h4	2C	w1	w2	w3	2C	n11	n12	…	n1m	0A	n21	…	n2m	0A	..
Decimal	h3	h4	44	w1	w2	w3	44	n11	n12	…	n1m	0A	n21	…	n2m	10	..

ASCII	LF	NUL
Hex.	0A	00
Decimal	10	0

[Defined Area] n = 58, 59   (n = ":", ";")

48 ≤ a ≤ 49 ("0" ≤ a ≤ "1") (Specification B)

48 ≤ x1 ≤ 57 ("0" ≤ x1 ≤ "9"), 48 ≤ x2 ≤ 57 ("0" ≤ x2 ≤ "9"), 48 ≤ x3 ≤ 57 ("0" ≤ x3 ≤ "9"), 48 ≤ x4 ≤ 57 ("0" ≤ x4 ≤ "9")

48 ≤ y1 ≤ 57 ("0" ≤ y1 ≤ "9"), 48 ≤ y2 ≤ 57 ("0" ≤ y2 ≤ "9"), 48 ≤ y3 ≤ 57 ("0" ≤ y3 ≤ "9"), 48 ≤ y4 ≤ 57 ("0" ≤ y4 ≤ "9")

48 ≤ h1 ≤ 57 ("0" ≤ h1 ≤ "9"), 48 ≤ h2 ≤ 57 ("0" ≤ h2 ≤ "9"), 48 ≤ h3 ≤ 57 ("0" ≤ h3 ≤ "9"), 48 ≤ h4 ≤ 57 ("0" ≤ h4 ≤ "9")

48 ≤ w1 ≤ 57 ("0" ≤ w1 ≤ "9"), 48 ≤ w2 ≤ 57 ("0" ≤ w2 ≤ "9"), 48 ≤ w3 ≤ 57 ("0" ≤ w3 ≤ "9")

Appendix 4 because the x1 x2 x3 x4, y1 y2 y3 y4, h1 h2 h3 h4, w1 w2 w3 values are different for each printer model.

[Initial Value] - - -

[Function] Parameter details

- n: Print specifications
                      (":" Overwrite / ";" Duplicate)
- x1 x2 x3 x4:   Graphics data X axis direction starting address   Unit 0.1 mm
- y1 y2 y3 y4:   Graphics data Y axis direction starting address   Unit 0.1 mm
- a (Specification B) Color specification (The setting made by this parameter is valid only when two-color printing is set.) ",a" can be omitted. (Black when omitted.)

a	
48 ("0")	Black
49 ("1")	Red

- h1 h2 h3 h4:   Graphics area Y axis direction length   Unit Dots
- w1 w2 w3:   Graphics area X axis direction width   Unit Bytes
- n11 n12… n1m: mth data of the first line
  n21… n2m: mth data of the second line (The same applies below.)
                      Data display method is the same as download.

Writes dot graphics data to the image memory.

This data is cleared by the format initialization command (ESC C) or the image memory clear command (ESC X).

The following describes the relationship between data and graphics.

```
                 MSB        LSB
n11, n12, …      □□□□□□□□,□□□□□□□□,...
n21, n22, …      □□□□□□□□,□□□□□□□□,...
    :                 :            :
n…               □□□□□□□□,□□□□□□□□,...
```

ESC H n x1x2x3x4, y1y2y3y4, (for BMP Files), LF NUL

[Name]   Define dot graphics data (For BMP files) (Specification A)

[Code]

	ESC	H	n	x1	x2	x3	x4	,	y1	y2	y3	y4	,
ASCII	ESC	H	n	x1	x2	x3	x4	,	y1	y2	y3	y4	,
Hex.	1B	48	n	x1	x2	x3	x4	2C	y1	y2	y3	y4	2C
Decimal	27	72	n	x1	x2	x3	x4	44	y1	y2	y3	y4	44

	(BMP File)	,	LF	NUL
ASCII	(BMP File)	,	LF	NUL
Hex.	(BMP File)	2C	0A	00
Decimal	(BMP File)	44	10	0

[Defined Area]   n = 58, 59   (n = ": ", ";")

$48 \leq x1 \leq 57$ ("0" $\leq x1 \leq$ "9"), $48 \leq x2 \leq 57$ ("0" $\leq x2 \leq$ "9"), $48 \leq x3 \leq 57$ ("0" $\leq x3 \leq$ "9"), $48 \leq x4 \leq 57$ ("0" $\leq x4 \leq$ "9")

$48 \leq y1 \leq 57$ ("0" $\leq y1 \leq$ "9"), $48 \leq y2 \leq 57$ ("0" $\leq y2 \leq$ "9"), $48 \leq y3 \leq 57$ ("0" $\leq y3 \leq$ "9"), $48 \leq y4 \leq 57$ ("0" $\leq y4 \leq$ "9")

See Appendix 4 because the x1 x2 x3 x4, y1 y2 y3 y4 values are different for each printer model.

[Initial Value]   - - -

[Function]   Parameter details

- n: Print specifications
                         (":" Overwrite / ";" Duplicate)
- x1 x2 x3 x4:   Graphics data X axis direction starting address   Unit 0.1 mm
- y1 y2 y3 y4:   Graphics data Y axis direction starting address   Unit 0.1 mm
- (BMP File):   Sends the contents of a BMP file as it is.
                         This is limited to when the format of a BMP file is black and white and not
                         compressed. This means that the user should be aware that not all BMP files
                         are handled.

Writes dot graphics data (BMP Files) to the image memory.
This data is cleared by the format initialization command (ESC C) or the image memory clear command (ESC X).

ESC H n x1x2x3x4, y1y2y3y4, a, (for BMP Files), LF NUL

[Name]	Define dot graphics data (For BMP files) (Specification B)

[Code]

	ASCII	ESC	H	n	x1	x2	x3	x4	,	y1	y2	y3	y4	,	a	,
	Hex.	1B	48	n	x1	x2	x3	x4	2C	y1	y2	y3	y4	2C	a	2C
	Decimal	27	72	n	x1	x2	x3	x4	44	y1	y2	y3	y4	44	a	44

	ASCII	(BMP File)	,	LF	NUL
	Hex.	(BMP File)	2C	0A	00
	Decimal	(BMP File)	44	10	0

[Defined Area]   n = 58, 59   (n = ": ", ";")

48 $\leq$ a $\leq$ 49 ("0" $\leq$ a $\leq$ "1") (Specification B)

48 $\leq$ x1 $\leq$ 57 ("0" $\leq$ x1 $\leq$ "9"), 48 $\leq$ x2 $\leq$ 57 ("0" $\leq$ x2 $\leq$ "9"), 48 $\leq$ x3 $\leq$ 57 ("0" $\leq$ x3 $\leq$ "9"), 48 $\leq$ x4 $\leq$ 57 ("0" $\leq$ x4 $\leq$ "9")

48 $\leq$ y1 $\leq$ 57 ("0" $\leq$ y1 $\leq$ "9"), 48 $\leq$ y2 $\leq$ 57 ("0" $\leq$ y2 $\leq$ "9"), 48 $\leq$ y3 $\leq$ 57 ("0" $\leq$ y3 $\leq$ "9"), 48 $\leq$ y4 $\leq$ 57 ("0" $\leq$ y4 $\leq$ "9")

See Appendix 4 because the x1 x2 x3 x4, y1 y2 y3 y4 values are different for each printer model.

[Initial Value]   - - -

[Function]   Parameter details

- n: Print specifications
  (":" Overwrite / ";" Duplicate)
- x1 x2 x3 x4:   Graphics data X axis direction starting address   Unit 0.1 mm
- y1 y2 y3 y4:   Graphics data Y axis direction starting address   Unit 0.1 mm
- a (Specification B)   Color specification (The setting made by this parameter is valid only when two-color printing is set.) ",a" can be omitted. (Black when omitted.)

a	
48 ("0")	Black
49 ("1")	Red

- (BMP File):   Sends the contents of a BMP file as it is.
  This is limited to when the format of a BMP file is black and white and not compressed. This means that the user should be aware that not all BMP files are handled.

Writes dot graphics data (BMP Files) to the image memory.
This data is cleared by the format initialization command (ESC C) or the image memory clear command (ESC X).

3-3-3 Other Settings

ESC F n1n2 ; d1d2 . . . d48 LF NUL

[Name]	Register external character									
[Code]	ASCII	ESC	F	n1	n2	;	d1	d2	..	d48	LF	NUL
	Hex.	1B	46	n1	n2	3B	d1	d2	..	d48	0A	00
	Decimal	27	70	n1	n2	59	d1	d2	..	d48	10	0

[Defined Area] $48 \leq n1 \leq 57$ ("0" $\leq$ n1 $\leq$ "9"), $48 \leq n2 \leq 57$ ("0" $\leq$ n2 $\leq$ "9")
"00" $\leq$ n1 n2 $\leq$ "31"

[Initial Value] - - -

[Function] Parameter details
- n1 n2: External character register number
- d1 d2 … d48: External character registered character data

Registers user created characters on the printer.
Only standard characters can be registered for external character registration. Character size is 16 (W) $\times$ 24 (H) dots.

The following describes the relationship between data and external characters.

```
        MSB          LSB
d1      □□□□□□□□ □□□□□□□□ d2
d3      □□□□□□□□ □□□□□□□□ d4
  :          :            :
d47     □□□□□□□□ □□□□□□□□ d48
```

ESC N n1n2 LF NUL

[Name]   Select international characters
[Code]   ASCII   ESC   N   n1   n2   LF   NUL
               Hex.   1B   4E   n1   n2   0A   00
               Decimal   27   78   n1   n2   10   0

[Defined Area]   48 ≤ n1 ≤ 57 ("0" ≤ n1 ≤ "9"), 48 ≤ n2 ≤ 57 ("0" ≤ n2 ≤ "9")
                 "00" ≤ n1 n2 ≤ "15"
[Initial Value] Memory switch setting

[Function]   Selects international characters when defining characters.

n1 n2	
00	U.S.A
01	France
02	Germany
03	UK
04	Denmark
05	Sweden
06	Italy
07	Spain
08	Japan
09	Norway
10	Denmark II
11	Spain II
12	Latin America
13	Korea
14	(Reserved)
15	(Reserved)

Settings using this command are invalid when using OCR characters and when Chinese characters are specified.

ESC Z n LF NUL

[Name]	Set zero style				
[Code]	ASCII	ESC	Z	n	LF	NUL
	Hex.	1B	5A	n	0A	00
	Decimal	27	90	n	10	0

[Defined Area]   n = 48, 49 (n = "0", "1")
[Initial Value]   Memory switch setting

[Function]   Sets character zero to "0" style.

n	
48	Cancels slash zero (specifies a normal zero.)
49	Specifies slash zero

Settings using this command are invalid when using OCR characters and when Chinese characters are specified.

ESC GS = nL nH dat1…datk

[Name] Write blank code page data
[Code] ASCII ESC GS = nL nH dat1 … datk
　　　 Hexadecimal 1B 1D 3D nL nH dat1 … datk
　　　 Decimal 27 29 61 nL nH dat1 … datk

[Defined Area] nL = 0
　　　　　　　 nH = 80
　　　　　　　 k = nL + nH * 256

[Initial Value] ---
[Function] A blank code page indicates a character code table where character codes from 80h to FFh are all blank.
A blank code page can be selected using the ESC GS t n command n = 255.
The printer is reset when writing with this command is completed.
k = (Small characters D1 to D16) * 128) + (Standard characters D1 to D48) * 128) + ((Bold characters D1 to D96) * 128) = 20,480

[Small character data Format Vertical 16 dots x Horizontal 8 dots]

	MSB							LSB
D1	•	•	•	•	•	•	•	•
D2	•	•	•	•	•	•	•	•
D3	•	•	•	•	•	•	•	•
D4	•	•	•	•	•	•	•	•
D5	•	•	•	•	•	•	•	•
D6	•	•	•	•	•	•	•	•
D7	•	•	•	•	•	•	•	•
D8	•	•	•	•	•	•	•	•
D9	•	•	•	•	•	•	•	•
D10	•	•	•	•	•	•	•	•
D11	•	•	•	•	•	•	•	•
D12	•	•	•	•	•	•	•	•
D13	•	•	•	•	•	•	•	•
D14	•	•	•	•	•	•	•	•
D15	•	•	•	•	•	•	•	•
D16	•	•	•	•	•	•	•	•

[Standard character data format Vertical 24 dots x Horizontal 16 dots]

	MSB							LSB		MSB							LSB
D1	•	•	•	•	•	•	•	•	D2	•	•	•	•	•	•	•	•
D3	•	•	•	•	•	•	•	•	D4	•	•	•	•	•	•	•	•
D5	•	•	•	•	•	•	•	•	D6	•	•	•	•	•	•	•	•
D7	•	•	•	•	•	•	•	•	D8	•	•	•	•	•	•	•	•
D9	•	•	•	•	•	•	•	•	D10	•	•	•	•	•	•	•	•
D11	•	•	•	•	•	•	•	•	D12	•	•	•	•	•	•	•	•
D13	•	•	•	•	•	•	•	•	D14	•	•	•	•	•	•	•	•
D15	•	•	•	•	•	•	•	•	D16	•	•	•	•	•	•	•	•
D17	•	•	•	•	•	•	•	•	D18	•	•	•	•	•	•	•	•
D19	•	•	•	•	•	•	•	•	D20	•	•	•	•	•	•	•	•
D21	•	•	•	•	•	•	•	•	D22	•	•	•	•	•	•	•	•
D23	•	•	•	•	•	•	•	•	D24	•	•	•	•	•	•	•	•
D25	•	•	•	•	•	•	•	•	D26	•	•	•	•	•	•	•	•
D27	•	•	•	•	•	•	•	•	D28	•	•	•	•	•	•	•	•
D29	•	•	•	•	•	•	•	•	D30	•	•	•	•	•	•	•	•
D31	•	•	•	•	•	•	•	•	D32	•	•	•	•	•	•	•	•
D33	•	•	•	•	•	•	•	•	D34	•	•	•	•	•	•	•	•
D35	•	•	•	•	•	•	•	•	D36	•	•	•	•	•	•	•	•
D37	•	•	•	•	•	•	•	•	D38	•	•	•	•	•	•	•	•
D39	•	•	•	•	•	•	•	•	D40	•	•	•	•	•	•	•	•
D41	•	•	•	•	•	•	•	•	D42	•	•	•	•	•	•	•	•
D43	•	•	•	•	•	•	•	•	D44	•	•	•	•	•	•	•	•
D45	•	•	•	•	•	•	•	•	D46	•	•	•	•	•	•	•	•
D47	•	•	•	•	•	•	•	•	D48	•	•	•	•	•	•	•	•

[Bold character data format Vertical 32 dots x Horizontal 24 dots]

MSB							LSB	MSB							LSB	MSB							LSB
D1 •	•	•	•	•	•	•	•	D2 •	•	•	•	•	•	•	•	D3 •	•	•	•	•	•	•	•
D4 •	•	•	•	•	•	•	•	D5 •	•	•	•	•	•	•	•	D6 •	•	•	•	•	•	•	•
D7 •	•	•	•	•	•	•	•	D8 •	•	•	•	•	•	•	•	D9 •	•	•	•	•	•	•	•
D10 •	•	•	•	•	•	•	•	D11 •	•	•	•	•	•	•	•	D12 •	•	•	•	•	•	•	•
D13 •	•	•	•	•	•	•	•	D14 •	•	•	•	•	•	•	•	D15 •	•	•	•	•	•	•	•
D16 •	•	•	•	•	•	•	•	D17 •	•	•	•	•	•	•	•	D18 •	•	•	•	•	•	•	•
D19 •	•	•	•	•	•	•	•	D20 •	•	•	•	•	•	•	•	D21 •	•	•	•	•	•	•	•
D22 •	•	•	•	•	•	•	•	D23 •	•	•	•	•	•	•	•	D24 •	•	•	•	•	•	•	•
D25 •	•	•	•	•	•	•	•	D26 •	•	•	•	•	•	•	•	D27 •	•	•	•	•	•	•	•
D28 •	•	•	•	•	•	•	•	D29 •	•	•	•	•	•	•	•	D30 •	•	•	•	•	•	•	•
D31 •	•	•	•	•	•	•	•	D32 •	•	•	•	•	•	•	•	D33 •	•	•	•	•	•	•	•
D34 •	•	•	•	•	•	•	•	D35 •	•	•	•	•	•	•	•	D36 •	•	•	•	•	•	•	•
D37 •	•	•	•	•	•	•	•	D38 •	•	•	•	•	•	•	•	D39 •	•	•	•	•	•	•	•
D40 •	•	•	•	•	•	•	•	D41 •	•	•	•	•	•	•	•	D42 •	•	•	•	•	•	•	•
D43 •	•	•	•	•	•	•	•	D44 •	•	•	•	•	•	•	•	D45 •	•	•	•	•	•	•	•
D46 •	•	•	•	•	•	•	•	D47 •	•	•	•	•	•	•	•	D48 •	•	•	•	•	•	•	•
D49 •	•	•	•	•	•	•	•	D50 •	•	•	•	•	•	•	•	D51 •	•	•	•	•	•	•	•
D52 •	•	•	•	•	•	•	•	D53 •	•	•	•	•	•	•	•	D54 •	•	•	•	•	•	•	•
D55 •	•	•	•	•	•	•	•	D56 •	•	•	•	•	•	•	•	D57 •	•	•	•	•	•	•	•
D58 •	•	•	•	•	•	•	•	D59 •	•	•	•	•	•	•	•	D60 •	•	•	•	•	•	•	•
D61 •	•	•	•	•	•	•	•	D62 •	•	•	•	•	•	•	•	D63 •	•	•	•	•	•	•	•
D64 •	•	•	•	•	•	•	•	D65 •	•	•	•	•	•	•	•	D66 •	•	•	•	•	•	•	•
D67 •	•	•	•	•	•	•	•	D68 •	•	•	•	•	•	•	•	D69 •	•	•	•	•	•	•	•
D70 •	•	•	•	•	•	•	•	D71 •	•	•	•	•	•	•	•	D72 •	•	•	•	•	•	•	•
D73 •	•	•	•	•	•	•	•	D74 •	•	•	•	•	•	•	•	D75 •	•	•	•	•	•	•	•
D76 •	•	•	•	•	•	•	•	D77 •	•	•	•	•	•	•	•	D78 •	•	•	•	•	•	•	•
D79 •	•	•	•	•	•	•	•	D74 •	•	•	•	•	•	•	•	D81 •	•	•	•	•	•	•	•
D82 •	•	•	•	•	•	•	•	D76 •	•	•	•	•	•	•	•	D84 •	•	•	•	•	•	•	•
D85 •	•	•	•	•	•	•	•	D78 •	•	•	•	•	•	•	•	D87 •	•	•	•	•	•	•	•
D88 •	•	•	•	•	•	•	•	D89 •	•	•	•	•	•	•	•	D90 •	•	•	•	•	•	•	•
D91 •	•	•	•	•	•	•	•	D92 •	•	•	•	•	•	•	•	D93 •	•	•	•	•	•	•	•
D94 •	•	•	•	•	•	•	•	D95 •	•	•	•	•	•	•	•	D96 •	•	•	•	•	•	•	•

• = Data region/0=Zero data

ESC GS t n

[Name] Select code page
[Code] ASCII   ESC   GS   t   n
        Hexadecimal 1B 1D   74   n
        Decimal   27   29 116   n

[Defined Area]   0=0,10,255
[Initial Value]   Memory switch setting
                    When in SBCS mode, selects the code page of the memory switch. (If the memory switch is set outside of the defined area, normal is used.)
                    When the DBCS and Chinese characters used in Japan are installed, this is fixed to Katakana.
 [Function]   Specifies code page
                    When installed with Japanese, Chinese, Taiwan and Hangeul language characters and DBCS setting, this command is invalid.

n	Code Page		n	Code Page
0	Normal(IBM Characters)		32	Reserved*
1	Reserved*		33	Reserved*
2	Reserved*		34	Reserved*
3	Reserved*		64	Reserved*
4	Reserved*		65	Reserved*
5	Reserved*		66	Reserved*
6	Reserved*		67	Reserved*
7	Reserved*		68	Reserved*
8	Reserved*		69	Reserved*
9	Reserved*		70	Reserved*
10	Codepage 866 (Cyrillic Russian)		71	Reserved*
11	Reserved*		72	Reserved*
12	Reserved*		73	Reserved*
13	Reserved*		74	Reserved*
14	Reserved*		75	Reserved*
15	Reserved*		76	Reserved*
16	Reserved*		77	Reserved*
17	Reserved*		78	Reserved*
18	Reserved*		79	Reserved*
19	Reserved*		255	User Setting　（Blank Code Page）
20	Reserved*			
21	Reserved*			

* If the value of n is outside the defined area, the current code page setting is not changed.
 Settings using this command are invalid when using OCR characters and single-byte characters, which were used when specifying Chinese characters.

ESC RS d n

[Name]   Set print density
[Code]   ASCII   ESC   RS   d   n
               Hex.   1B   1E   64   n
               Decimal   27   30   100   n

[Defined Area] $0 \leq n \leq 15$
                      Specs. A and B $48 \leq n \leq 57$ （"0" $\leq n \leq$ "9"）, $65 \leq n \leq 70$ （"A" $\leq n \leq$ "F"）
                      Spec. C $48 \leq n \leq 54$ ("0" $\leq n \leq$ "6")
[Initial Value]   Memory switch setting

[Function]   Sets print density.
              This command stops printing to be executed.
              When in two-color print mode, this can set only the print density of red print.
              When in low peak current mode, the print density setting is ignored.

n	Spec. A	Spec. B	
		Single Color Printing Mode	Two Color Printing Mode Red Print Density Double Resolution Mode (*) Installed print mode depends on the model.
0, 48	Print density 1.3	Print density 1.3	Print density 1.2
1, 49	Print density 1.2	Print density 1.2	Print density 1.2
2, 50	Print density 1.1	Print density 1.1	Print density 1.0
3, 51	Print density 1.0	Print density 1.0	Print density 1.0
4, 52	Print density 0.9	Print density 0.9	Print density 1.0
5, 53	Print density 0.8	Print density 0.8	Print density 0.8
6, 54	Print density 0.7	Print density 0.7	Print density 0.8
7, 55	(Reserved)	(Reserved)	(Reserved)
8, 56	(Reserved)	(Reserved)	(Reserved)
9, 57	(Reserved)	(Reserved)	(Reserved)
10, 65	(Reserved)	(Reserved)	(Reserved)
11, 66	(Reserved)	(Reserved)	(Reserved)
12, 67	(Reserved)	(Reserved)	(Reserved)
13, 68	(Reserved)	(Reserved)	(Reserved)
14, 69	(Reserved)	(Reserved)	(Reserved)
15, 70	(Reserved)	(Reserved)	(Reserved)

n	Spec. C	
	Single Color Printing Mode	Two Color Printing Mode Red Print Density Double Resolution Mode (*) Installed print mode depends on the model.
0, 48	Print density 1.3	Print density 1.2
1, 49	Print density 1.2	Print density 1.2
2, 50	Print density 1.1	Print density 1.0
3, 51	Print density 1.0	Print density 1.0
4, 52	Print density 0.9	Print density 1.0
5, 53	Print density 0.8	Print density 0.8
6, 54	Print density 0.7	Print density 0.8

n	Spe. D	
	Single Color Printing Mode	Two Color Printing Mode Red Print Density Double Resolution Mode *1
0, 48	Print density: +3	Print density: +1
1, 49	Print density: +2	Print density: +1
2, 50	Print density: +1	Print density: Standard
3, 51	Print density: Standard	Print density: Standard
4, 52	Print density: −1	Print density: Standard
5, 53	Print density: −2	Print density: −1
6, 54	Print density: −3	Print density: −1

*1) For the installed print modes, check the product specifications manual for each printer.

ESC RS r n

[Name]   Set printing speed
[Code]   ASCII   ESC   RS   r   n
              Hex.   1B   1E   72   n
              Decimal   27   30   114   n

[Defined Area] $0 \leq n \leq 3$
                 $48 \leq n \leq 51$ ("0" $\leq n \leq$ "3")
[Initial Value] Memory switch setting

[Function]   Sets print speed.
              This command stops printing to be executed.
              Because two-color print mode, low peak current mode, and double resolution mode print in one speed, the speed settings with this command are invalid.
              This command setting becomes valid when returned from the two-color print mode, low peak current mode, and double resolution mode to the single color print mode.

Spec. A

n	Print Speed
0, 48	High speed
1, 49	Mid-speed
2, 50	Slow speed
3, 51	Option-speed (This speed varies according to the model.)

Spec. B

n	Print Speed	
	Single Color Printing Mode	Two-Color Printing Mode
0, 48	High speed	Two-color print mode speed
1, 49	Mid-speed	Two-color print mode speed
2, 50	Slow speed	Two-color print mode speed
3, 51	Option-speed (This speed varies according to the model.)	Two-color print mode speed

There is one print speed in two-color print mode, so the speed set by this command is invalid.
This command is valid when recovering from two-color print mode to single-color print mode.

Spec. C

n	Print Speed	
	Single Color Printing Mode	Two-Color Printing Mode Low Peak Current Mode Double Resolution Mode (*) Installed print mode depends on the model.
0, 48	Standard	Each print mode speed
1, 49	Mid-speed	Each print mode speed
2, 50	Slow speed	Each print mode speed
3, 51	High speed	Each print mode speed

3-3-4 Flash Memory Registration

ESC w n LF NUL

[Name]   Register format to flash memory
[Code]   ASCII   ESC   w   n   LF   NUL
              Hex.   1B   77   n   0A   00
              Decimal   27   119   n   10   0

[Defined Area]   n = 48, 49 (n = "0", "1")
[Initial Value]   ---

[Function]   Parameter details
              • n: Format Number Specification
                          ("0": Format 1; "1" Format 2)
                          n may be omitted. When omitted, the printer automatically registers to format 1.

              Registers format to flash memory.
              Registered formats can be loaded after turning on the power and resetting by registering using this
              function and specify using the memory switch. Refer to the product specifications manual for details
              on how to make the settings.

              The data that is registered as the format is shown below.
              Specification A

Registered Region	Data Type	Commands
Format Memory	Print area	ESC D
	Line formats	ESC L
	Character formats	ESC P C, ESC Y
	Bar code format	ESC P B
	Mechanism control	ESC B
	Control peripheral devices	ESC U
	External character data	ESC F
	Select international characters	ESC N
	Set zero style	ESC Z
Image Memory	Character data	ESC R C
	Bar code data	ESC R B
	Graphics data	ESC k

Specification B

Registered Region	Data Type	Commands
Format Memory	Print area	ESC D
	Line formats	ESC L
	Character formats	ESC P C, ESC Y, ESC S
	Bar code format	ESC P B
	Mechanism control	ESC B, ESC T
	External device control	ESC U
	External character data	ESC F
	Select international characters	ESC N
	Set zero style	ESC Z
	Two-color printing	ESC RS C
Image Memory	Character data	ESC R C
	Bar code data	ESC R B
	Graphics data	ESC k

Initialize the printer after registering the format.

Spec. C

Registered region	Data type	Commands
Format Memory	Print area	ESC D
	Line formats	ESC L
	Character formats	ESC P C, ESC Y
	Bar code format	ESC P B
	Mechanism control	ESC B, ESC T, ESC J
	External Device Control	ESC U
	External character data	ESC F
	Select international characters	ESC N
	Set zero style	ESC Z
	Code Page Setting	ESC GS t
	Print Mode Setting	ESC RS C
Image memory	Character data	ESC R C
	Bar code data	ESC R B
	Graphics data	ESC k

ESC r n LF NUL

[Name]   Load format from flash memory

[Code]

	ASCII	ESC	r	n	LF	NUL
Hex.	1B	72	n	0A	00	
Decimal	27	114	n	10	0	

[Defined Area]   n = 48, 49 (n = "0", "1")

[Initial Value]   ---

[Function]   Parameter details

• n: Format Number Specification

("0": Format 1; "1" Format 2)

n may be omitted. When omitted, the printer automatically loads format 1.

Loads formats registered in the flash memory.

When there is print data in the read format, it is expanded to the ijmage memory.

ESC q h1h2h3h4 , w1w2w3 , n11n12...n1mLF n21...n2mLF...LF NUL

[Name] Register dot graphics data to flash memory

[Code]

	ASCII	ESC	q	h1	h2	h3	h4	,	w1	w2	w3	,	n11	n12	..	n1m	LF
	Hex.	1B	71	h1	h2	h3	h4	2C	w1	w2	w3	2C	n11	n12	..	n1m	0A
	Decimal	27	113	h1	h2	h3	h4	44	w1	w2	w3	44	n11	n12	..	n1m	10

	ASCII	n21	n22	..	n2m	LF	..	LF	NUL
	Hex.	n21	n22	..	n2m	0A	..	0A	00
	Decimal	n21	n22	..	n2m	10	..	10	0

[Defined Area] $48 \leq h1 \leq 57$ ("0" $\leq h1 \leq$ "9"), $48 \leq h2 \leq 57$ ("0" $\leq h2 \leq$ "9"), $48 \leq h3 \leq 57$ ("0" $\leq h3 \leq$ "9"), $48 \leq h4 \leq 57$ ("0" $\leq h4 \leq$ "9")

$48 \leq w1 \leq 57$ ("0" $\leq w1 \leq$ "9"), $48 \leq w2 \leq 57$ ("0" $\leq w2 \leq$ "9"), $48 \leq w3 \leq 57$ ("0" $\leq w3 \leq$ "9")

See Appendix 4 because the h1 h2 h3 h4, w1 w2 w3 values are different for each printer model.

[Initial Value] - - -

[Function] Parameter details

- h1 h2 h3 h4: Graphics area Y axis direction length Unit Dots
- w1 w2 w3: Graphics area X axis direction width Unit Bytes
- n11 n12… n1m: mth data of the first line
  n21… n2m: mth data of the second line (The same applies below.)
  Data display method is the same as download.
  (Maximum number of possible registrations: 65530 bytes)

The following describes the relationship between data and graphics.

```
              MSB          LSB
n11, n12, …   □□□□□□□□,□□□□□□□□,…
n21, n22, …   □□□□□□□□,□□□□□□□□,…
    :
```

Registers dot graphics data to flash memory.

Because the registration area for this function is shared with the dot graphics data registration ((ESC h for BMP files) the registered data is updated each time either command is executed. Therefore, only 1 piece of data of either is registered.

Specification B
Initialize the printer after registering the graphic data format.

ESC h (for BMP Files) , LF NUL

[Name]	Register dot graphics data to flash memory (for BMP files)						
[Code]	ASCII	ESC	h	(BMP File)	,	LF	NUL
	Hex.	1B	68	(BMP File)	2C	0A	00
	Decimal	27	104	(BMP File)	44	10	0

[Defined Area]   - - -
[Initial Value]   - - -

[Function]   Parameter details
- (BMP File):   Sends the contents of a BMP file as it is.
                 This is limited to when the format of a BMP file is black and white and not
                 compressed. This means that the user should be aware that not all BMP files are
                 handled.
                 (Maximum data size that can be registered: 65530 bytes)

Registers dot graphics data (for BMP files) to flash memory.

Because the registration area for this function is shared with the dot graphics data registration ((ESC q) the registered data is updated each time either command is executed. Therefore, only 1 piece of data of either is registered.

Specification B
Initialize the printer after registering the graphic data format.

ESC k n x1x2x3x4 , y1y2y3y4 LF NUL

[Name]	Define dot graphics data (Specification A)

[Code]	ASCII	ESC	k	n	x1	x2	x3	x4	,	y1	y2	y3	y4	LF	NUL
	Hex.	1B	6B	n	x1	x2	x3	x4	2C	y1	y2	y3	y4	0A	00
	Decimal	27	107	n	x1	x2	x3	x4	44	y1	y2	y3	y4	10	0

[Defined Area]   n = 58, 59 (n = ":" , ";")

$48 \leq x1 \leq 57$ ("0" $\leq x1 \leq$ "9"), $48 \leq x2 \leq 57$ ("0" $\leq x2 \leq$ "9"), $48 \leq x3 \leq 57$ ("0" $\leq x3 \leq$ "9"), $48 \leq x4 \leq 57$ ("0" $\leq x4 \leq$ "9")

$48 \leq y1 \leq 57$ ("0" $\leq y1 \leq$ "9"), $48 \leq y2 \leq 57$ ("0" $\leq y2 \leq$ "9"), $48 \leq y3 \leq 57$ ("0" $\leq y3 \leq$ "9"), $48 \leq y4 \leq 57$ ("0" $\leq y4 \leq$ "9")

See Appendix 4 because the x1 x2 x3 x4, y1 y2 y3 y4 values are different for each printer model.

[Initial Value]   - - -

[Function]   Parameter details

- n: Print specifications

                        (";" Duplicate/":" Overwrite)

- x1 x2 x3 x4:   Graphics data X axis direction starting address   Unit 0.1 mm
- y1 y2 y3 y4:   Graphics data Y axis direction starting address   Unit 0.1 mm

Writes the dot graphics data registered by the dot graphics data registration command (ESC q or ESC h) to the flash memory to the image memory.

To register definitions according to this command to the flash memory as formats, execute the format registration command (ESC w) after executing this command. However, only definitions according to this command (graphics data expansion information) is registered as a format. The graphics data registered to the flash memory at that point is expanded each time the format is loaded.

This graphics data expanded to the image memory by this command is cleared by the format initialization command (ESC C) or the image memory clear command (ESC X).

![star]

ESC k n x1x2x3x4 , y1y2y3y4, a LF NUL

[Name]	Define dot graphics data (Specification B)													
[Code]	ASCII	ESC	k	n	x1	X2	x3	x4	,	y1	y2	y3	y4	,	a	LF	NUL
	Hex.	1B	6B	n	x1	X2	x3	x4	2C	y1	y2	y3	y4	2C	a	0A	00
	Decimal	27	107	n	x1	X2	x3	x4	44	y1	y2	y3	y4	44	a	10	0

[Defined Area]   n = 58, 59 (n = ":" , ";")

$48 \leq a \leq 49$ ("0" $\leq a \leq$ "1") (Specification B)

$48 \leq x1 \leq 57$ ("0" $\leq x1 \leq$ "9"), $48 \leq x2 \leq 57$ ("0" $\leq x2 \leq$ "9"), $48 \leq x3 \leq 57$ ("0" $\leq x3 \leq$ "9"), $48 \leq x4 \leq 57$ ("0" $\leq x4 \leq$ "9")

$48 \leq y1 \leq 57$ ("0" $\leq y1 \leq$ "9"), $48 \leq y2 \leq 57$ ("0" $\leq y2 \leq$ "9"), $48 \leq y3 \leq 57$ ("0" $\leq y3 \leq$ "9"), $48 \leq y4 \leq 57$ ("0" $\leq y4 \leq$ "9")

See Appendix 4 because the x1 x2 x3 x4, y1 y2 y3 y4 values are different for each printer model.

[Initial Value]   - - -

[Function]   Parameter details

- n: Print specifications
  (";" Duplicate/":" Overwrite)
- x1 x2 x3 x4: Graphics data X axis direction starting address   Unit 0.1 mm
- y1 y2 y3 y4: Graphics data Y axis direction starting address   Unit 0.1 mm
- a (Specification B: Color specification (The setting made by this parameter is valid only when two-color printing is set.) ",a" can be omitted. (Black when omitted.)

a	
48 ("0")	Black
49 ("1")	Red

Writes the dot graphics data registered by the dot graphics data registration command (ESC q or ESC h) to the flash memory to the image memory.

To register definitions according to this command to the flash memory as formats, execute the format registration command (ESC w) after executing this command. However, only definitions according to this command (graphics data expansion information) is registered as a format. The graphics data registered to the flash memory at that point is expanded each time the format is loaded.

This graphics data expanded to the image memory by this command is cleared by the format initialization command (ESC C) or the image memory clear command (ESC X).

ESC FS q n [x11 x12 y11 y12 d1 . . . dk]1 . . . [xn1 xn2 yn1 yn2 d1 . . . dk]n

[Name] Register logo

[Code]

		ESC	FS	q	n	[x11	x12	y11	y12	d1	..	dk]1	..	[xn1	xn2	yn1	yn2	d1	..	dk]n
ASCII		ESC	FS	q	n	[x11	x12	y11	y12	d1	..	dk]1	..	[xn1	xn2	yn1	yn2	d1	..	dk]n
Hex.		1B	1C	71	n	[x11	x12	y11	y12	d1	..	dk]1	..	[xn1	xn2	yn1	yn2	d1	..	dk]n
Decimal		27	28	113	n	[x11	x12	y11	y12	d1	..	dk]1	..	[xn1	xn2	yn1	yn2	d1	..	dk]n

[Defined Area] $1 \leq n \leq 255$

$0 \leq xn1 \leq 255, 0 \leq xn2 \leq 3$

$1 \leq (xn1 + xn2 \times 256) \leq 1023$

$0 \leq yn1 \leq 255, 0 \leq yn2 \leq 1$

$1 \leq (yn1 + yn2 \times 256) \leq 288$

$0 \leq d \leq 255$

$k = \{(xn1 + xn2 \times 256) \times (yn1 + yn2 \times 256) \times 8\}$

[Initial Value] - - -

[Function] Parameter details

- n: Specifies registered logo count
- xn1, xn2: Horizontal size of registered logo {(xn1 + xn2 x 256) x 8} dots
- yn1, yn2: Vertical size of registered logo {(yn1 + yn2 x 256) x 8} dots
- d: Registered logo data
- k: Logo data count

When the first parameter is determined to be free of error, the printer starts processing this command.
When logo register processing starts, all previously defined data is deleted.
(It is not possible to reregister a portion of a plurality of defined logo data.)
Logo registration numbers are defined in rising order from 1.
If the defined area specified by the parameter is not empty, or if there is an error in the parameter specification, register processing is aborted. (The pre-registered and complete data is effective.)
The printer should be initialized if logo registration is completed.
If an error occurs while performing register processing (the time from when the first parameter is OK until the printer initialization is completed after registering a logo), error processing, mechanical operation and status processing cannot be performed.
The relationships between input data and the actual print are shown on the next page.

Relationship of logo and registered data

$xn = xn1 + xn2 \times 256, \quad yn = yn1 + yn2 \times 256$

$\{(xn1 + xn2 \times 256) \times 8\}$ dots

Data

MSB

LSB

(yn1 + yn2 x 256) bytes

(yn1 + yn2 x 256) x 8 dots

d[11]　d[21]　　　　　d[n1]

d[12]　d[22]　　　　　d[n2]

d[x1]　d[x2]　　　　　d[xn]
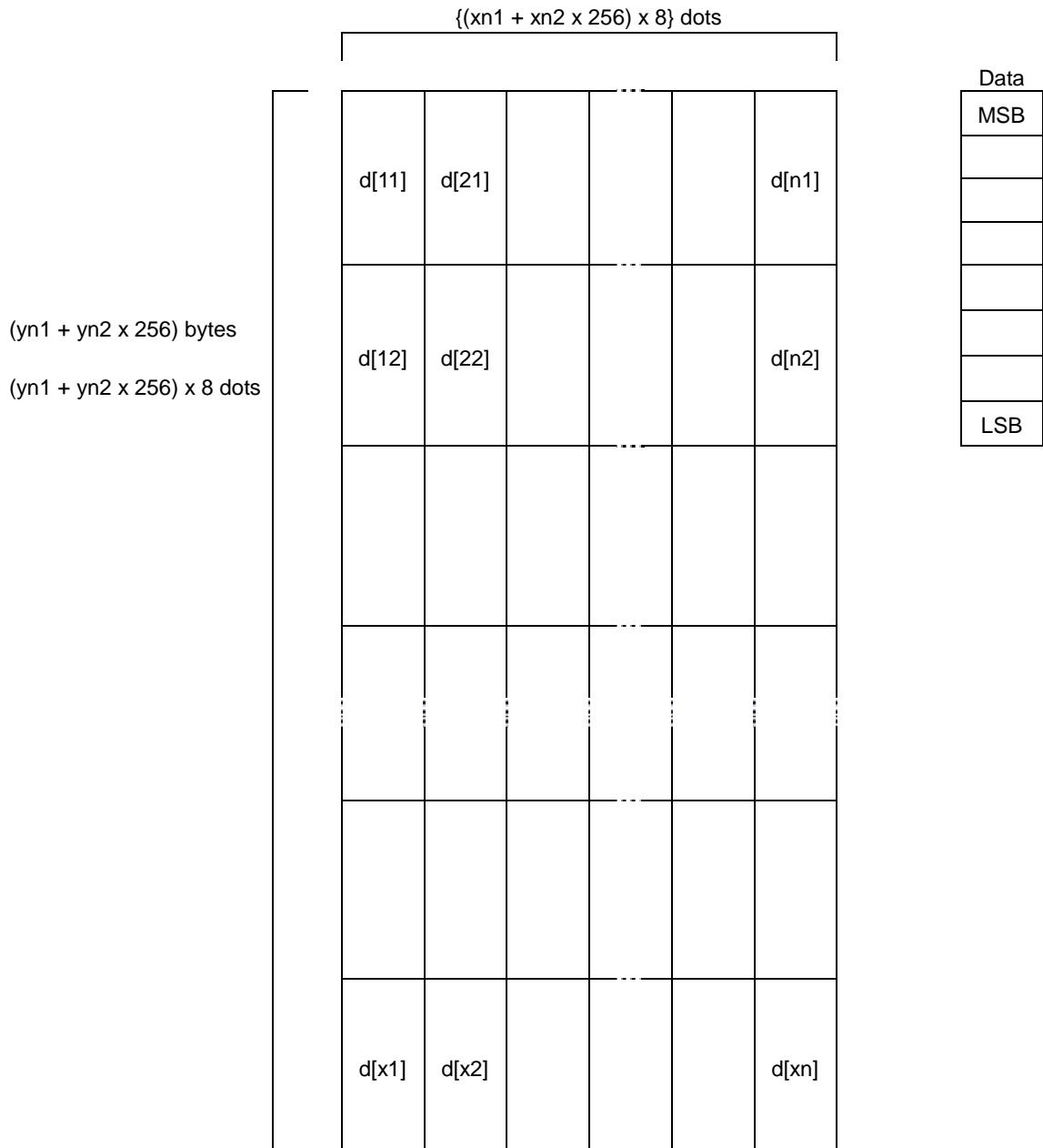
ESC K n x1x2x3x4 , y1y2y3y4 , d1d2d3 LF NUL

[Name]	Define logo data (Specification A

[Code]	ASCII	ESC	K	n	x1	x2	x3	x4	,	y1	y2	y3	y4	,
	Hex.	1B	4B	n	x1	x2	x3	x4	2C	y1	y2	y3	y4	2C
	Decimal	27	75	n	x1	x2	x3	x4	44	y1	y2	y3	y4	44

	ASCII	d1	d2	d3	LF	NUL
	Hex.	d1	d2	d3	0A	00
	Decimal	d1	d2	d3	10	0

[Defined Area] n = 58, 59 (n = ":", ";")

$48 \leq d1 \leq 57$ ("0" $\leq d1 \leq$ "9"), $48 \leq d2 \leq 57$ ("0" $\leq d2 \leq$ "9"), $48 \leq d3 \leq 57$ ("0" $\leq d3 \leq$ "9")

"001" $\leq$ d1 d2 d3 $\leq$ "255"

$48 \leq x1 \leq 57$ ("0" $\leq x1 \leq$ "9"), $48 \leq x2 \leq 57$ ("0" $\leq x2 \leq$ "9"), $48 \leq x3 \leq 57$ ("0" $\leq x3 \leq$ "9"), $48 \leq x4 \leq 57$ ("0" $\leq x4 \leq$ "9")

$48 \leq y1 \leq 57$ ("0" $\leq y1 \leq$ "9"), $48 \leq y2 \leq 57$ ("0" $\leq y2 \leq$ "9"), $48 \leq y3 \leq 57$ ("0" $\leq y3 \leq$ "9"), $48 \leq y4 \leq 57$ ("0" $\leq y4 \leq$ "9")

See Appendix 4 because the x1 x2 x3 x4, y1 y2 y3 y4 values are different for each printer model.

[Initial Value] - - -

[Function] Parameter details

- n: Print specifications
  (";" Duplicate/":" Overwrite)
- x1 x2 x3 x4: Graphics data X axis direction starting address Unit 0.1 mm
- y1 y2 y3 y4: Graphics data Y axis direction starting address Unit 0.1 mm
- d1 d2 d3: Logo registration number

Writes logo data to the image memory.

This data is cleared by the format initialization command (ESC C) or the image memory clear command (ESC X).

If there is no registration for the logo registration number specified by d1d2d3, there is no command error generated.

Logo registration is performed by the STAR Line Mode on printer models not equipped with the logo registration command (ESC FS q).

(See the "Special Appendix" for commands per model" for details.)

ESC K n x1x2x3x4 , y1y2y3y4 , d1d2d3, a LF NUL

[Name]	Define logo data (Specification B

[Code]	ASCII	ESC	K	n	x1	x2	x3	x4	,	y1	y2	y3	y4	,	d1	d2	d3
	Hex.	1B	4B	n	x1	x2	x3	x4	2C	y1	y2	y3	y4	2C	d1	d2	d3
	Decimal	27	75	n	x1	x2	x3	x4	44	y1	y2	y3	y4	44	d1	d2	d3

	ASCII	,	a	LF	NUL
	Hex.	2C	a	0A	00
	Decimal	44	a	10	0

[Defined Area]   n = 58, 59 (n = ":", ";")

$48 \leq d1 \leq 57$ ("0" $\leq d1 \leq$ "9"), $48 \leq d2 \leq 57$ ("0" $\leq d2 \leq$ "9"), $48 \leq d3 \leq 57$ ("0" $\leq d3 \leq$ "9")

"001" $\leq d1\ d2\ d3 \leq$ "255"

$48 \leq a \leq 49$ ("0" $\leq a \leq$ "1") (Specification B)

$48 \leq x1 \leq 57$ ("0" $\leq x1 \leq$ "9"), $48 \leq x2 \leq 57$ ("0" $\leq x2 \leq$ "9"), $48 \leq x3 \leq 57$ ("0" $\leq x3 \leq$ "9"), $48 \leq x4 \leq 57$ ("0" $\leq x4 \leq$ "9")

$48 \leq y1 \leq 57$ ("0" $\leq y1 \leq$ "9"), $48 \leq y2 \leq 57$ ("0" $\leq y2 \leq$ "9"), $48 \leq y3 \leq 57$ ("0" $\leq y3 \leq$ "9"), $48 \leq y4 \leq 57$ ("0" $\leq y4 \leq$ "9")

See Appendix 4 because the x1 x2 x3 x4, y1 y2 y3 y4 values are different for each printer model.

[Initial Value]   - - -

[Function]   Parameter details

- n: Print specifications
                        (";" Duplicate/":" Overwrite)
- x1 x2 x3 x4:   Graphics data X axis direction starting address   Unit 0.1 mm
- y1 y2 y3 y4:   Graphics data Y axis direction starting address   Unit 0.1 mm
- d1 d2 d3:   Logo registration number
- a (Specification B)   Color specification (The setting made by this parameter is valid only when
                        two-color printing is set.) ",a" can be omitted. (Black when omitted.)

a	
48 ("0")	Black
49 ("1")	Red

Writes logo data to the image memory.

This data is cleared by the format initialization command (ESC C) or the image memory clear command (ESC X).

If there is no registration for the logo registration number specified by d1d2d3, there is no command error generated

Logo registration is performed by the STAR Line Mode on printer models not equipped with the logo registration command (ESC FS q).

(See the "Special Appendix" for commands per model" for details.)

ESC RS L m

[Name]	Logo batch control				
[Code]	ASCII	ESC	RS	L	m
	Hex.	1B	1E	4C	m
	Decimal	27	30	76	m

[Defined Area]   0 ≤ m ≤ 3
48 ≤ m ≤ 51 ("0" ≤ m ≤ "3")
m=255

[Initial Value]   - - -

[Function]   Performs a control specified by parameter m for the logo.
If batch printing is selected, all of the current settings including page format settings (page length, and character and line definitions) are cleared and the logos are printed.
If the black mark is valid, a single logo is considered to be a single page. The sheet is fed for the top of the form, and the next logo is printed (after the next black mark is detected).
After batch printing, the printer is reset.

m	Logo Control Mode
0, 48	Batch Printing
255	Batch delete logos

3-3-5 Control Commands

ESC I LF NUL

[Name]	Issue paper			
[Code]	ASCII	ESC	I	LF	NUL
	Hex.	1B	49	0A	00
	Decimal	27	73	10	0

[Defined Area]   - - -
[Initial Value]   - - -

[Function]   Prints one page according to the print area setting command (ESC D).
If there is a control command registered in the format memory, that too is executed.
When the TOF function is enabled, this executes the next TOF after quitting printing.
Error recovery operations that occur for recoverable errors while printing differ according to the printer
model. Check the product specifications manual for each model.

ESC W s1s2s3s4 , h1h2h3h4 LF NUL

[Name]	Issue paper

[Code]

		ESC	W	s1	s2	s3	s4	,	h1	h2	h3	h4	LF	NUL
	ASCII	ESC	W	s1	s2	s3	s4	,	h1	h2	h3	h4	LF	NUL
	Hex.	1B	57	s1	s2	s3	s4	2C	h1	h2	h3	h4	0A	00
	Decimal	27	87	s1	s2	s3	s4	44	h1	h2	h3	h4	10	0

[Defined Area] $48 \leq s1 \leq 57$ ("0" $\leq s1 \leq$ "9"), $48 \leq s2 \leq 57$ ("0" $\leq s2 \leq$ "9"), $48 \leq s3 \leq 57$ ("0" $\leq s3 \leq$ "9"), $48 \leq s4 \leq 57$ ("0" $\leq s4 \leq$ "9")

$48 \leq h1 \leq 57$ ("0" $\leq h1 \leq$ "9"), $48 \leq h2 \leq 57$ ("0" $\leq h2 \leq$ "9"), $48 \leq h3 \leq 57$ ("0" $\leq h3 \leq$ "9"), $48 \leq h4 \leq 57$ ("0" $\leq h4 \leq$ "9")

See Appendix 4 because the s1 s2 s3 s4, h1 h2 h3 h4 values are different for each printer model.

[Initial Value]   - - -

[Function]   Parameter details
* s1 s2 s3 s4:   Y axis direction printing starting position   Unit 0.1 mm
* h1 h2 h3 h4:   Length of print from starting position   Unit 0.1 mm

Prints on specified area.
Settings by the print area setting command (ESC D) are temporarily invalidated.
If there is a control command registered in the format memory, that too is executed.
When the TOF function is enabled, this executes the next TOF after quitting printing.
Error recovery operations that occur for recoverable errors while printing differ according to the printer model. Check the product specifications manual for each model.

ESC GS # m N n1 n2 n3 n4 LF NUL

[Name]	Set memory switch											
[Code]	ASCII	ESC	GS	#	m	N	n1	n2	n3	n4	LF	NUL
	Hex.	1B	1D	23	m	N	n1	n2	n3	n4	0A	00
	Decimal	27	29	35	m	N	n1	n2	n3	n4	10	0

[Defined Area] m = 87, 84, 44, 43, 45, 64 (m = "W", "T", ",", "+", "-", "@")

$48 \le n1 \le 57$ ("0" $\le n1 \le$ "9"), $65 \le n1 \le 70$ ("A" $\le n1 \le$ "F"), $97 \le n1 \le 102$ ("a" $\le n1 \le$ "f")

$48 \le n2 \le 57$ ("0" $\le n2 \le$ "9"), $65 \le n2 \le 70$ ("A" $\le n2 \le$ "F"), $97 \le n2 \le 102$ ("a" $\le n2 \le$ "f")

$48 \le n3 \le 57$ ("0" $\le n3 \le$ "9"), $65 \le n3 \le 70$ ("A" $\le n3 \le$ "F"), $97 \le n3 \le 102$ ("a" $\le n3 \le$ "f")

$48 \le n4 \le 57$ ("0" $\le n4 \le$ "9"), $65 \le n4 \le 70$ ("A" $\le n4 \le$ "F"), $97 \le n4 \le 102$ ("a" $\le n4 \le$ "f")

Spec. A

$48 \le N \le 57$ ("0" $\le N \le$ "9"), $65 \le N \le (*)70$ ("A" $\le N \le (*)$"F"), $97 \le N \le (*) 102$, ("a" $\le N \le (*)$ "f")

Spec. B

$48 \le N \le 57$ ("0" $\le N \le$ "9"), $65 \le N \le (*)70$ ("A" $\le N \le (*)$"F"), $97 \le N \le (*) 102$, ("a" $\le N \le (*)$ "f")

N = 85 (N = "U") User defined region

(*) The memory switch defined area differs according to the model.

[Initial Value] - - -

[Function] Sends command to write after defining memory switch using the definition command specified by the following classes.

Memory switch information defined by the command to write is written to the volatile memory.

When writing to the volatile memory by the command to write, the printer executes a reset.

This command exists in models that have the specifications of A and B as indicated in the above defined areas.

Models having Specifications B can register any 16 bit data by specifying N = 85 ("U"). (See the "Special Appendix, Command Table per Model" for details per model.)

Consider the life of the non - volatile memory and avoid over - sue of this command.

Function	Class	m	N	n1 n2 n3 n4
Definition data write and reset	Write	"W"	Fixed at "0"	Fixed at "0000"
Definition data write and reset and self print	Write	"T"	Fixed at "0"	Fixed at "0000"
Data definition (Data Specification)	Definition	", "	N	n1 n2 n3 n4
Data definition (set specified bit)	Definition	"+"	N	n1 n2 n3 n4
Data definition (clear specified bit)	Definition	"-"	N	n1 n2 n3 n4
Data definition (initialize all data)	Definition	"@"	Fixed at "0"	Fixed at "0000"

- m: Mode Selection
- N :   Memory switch number to specify
- n1 n2 n3 n4: Specified Data   m = "," $\to$ Specified Data

m = "+" $\to$ Bit number to set

m = "-" $\to$ Bit number to clear

ESC ? LF NUL

[Name]	Reset printer (execute self print)				
[Code]	ASCII	ESC	?	LF	NUL
	Hex.	1B	3F	0A	00
	Decimal	27	63	10	0

[Defined Area] - - -
[Initial Value] - - -

[Function]   Hardware resets the printer and executes on self print.
After sending this command, the next data is not sent until the printer is online (in a state wherein it can receive data).
When resetting the printer, the following processes are performed.

I/F	Mode	Process
Parallel	- - -	BUSY output
RS-232C	DTR mode	DTR mark output
	Xon/Xoff mode	Xoff output

ESC GS BEL m t1 t2

[Name]　Ring buzzer

[Code]　ASCII　　　ESC　GS　BEL　m　t1　t2

　　　　Hex.　　　　1B　1D　07　m　t1　t2

　　　　Decimal　　27　29　7　m　t1　t2

[Defined Area]　　1≦m≦2, 49≦m≦50 ("1"≦m≦"2")

　　　　　　　　　1≦t1≦255

　　　　　　　　　1≦t2≦255

[Initial Value]　　- - -

[Function]　　　　Rings the buzzer.

　　　　　　　　　m specifies the drive terminal of the buzzer.

m	Buzzer Drive Terminal
1, 49	Buzzer Drive Terminal 1
2, 50	Buzzer Drive Terminal 2

　　　　　　　　　t1 specifies energizing time; t2 specifies the delay time.

　　　　　　　　　• Energizing time = 20 msec x t1

　　　　　　　　　• Delay time = 20 msec x t2

　　　　　　　　　The buzzer will not ring while printing.

　　　　　　　　　Use of this command other than for ringing the buzzer is prohibited.

　　　　　　　　　(There is the possibility of damage if using this command for driving the drawer on models that support external device terminals.)

```
             ON  ┌──────────────────┐
Drive Pulse      │                  │
             OFF ─┘                  └─────────────────

                 │  20 × t1 (msec)  │  20 × t2 (msec)  │
                 │←───────────────→│←───────────────→│
                 │ (Energizing Time)│   (Delay Time)   │

Print Operation  ┌──────────────────────────────────┐
                 │ Printing and Paper Feed Prohibited │
                 └──────────────────────────────────┘
```
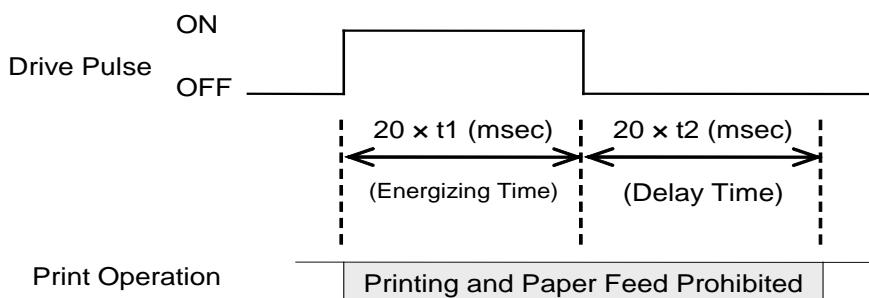
3-3-6 Status

ESC RS a n

[Name]   Set status transmission conditions
[Code]   ASCII   ESC   RS   a   n
                Hex.   1B   1E   61   n
                Decimal   27   30   97   n

[Defined Area] Specs. A, B
                $0 \leq n \leq 3$, $48 \leq n \leq 51$ ("0"$\leq n \leq$"3")
                Spec. C
                $0 \leq n \leq 3$, $48 \leq n \leq 51$ ("0" $\leq n \leq$ "3")
                n=16,n=255

[Initial Value] DIP Switch / Memory switch setting

[Function]   Sets the status transmission conditions.
                See Appendix 3 for details regarding ASB status.

1. Specification A

n	Status Transmission Conditions
0, 48	ASB invalid and NSB invalid
1, 49	ASB valid and NSB invalid
2, 50	ASB invalid and NSB valid
3, 51	ASB valid and NSB valid

2. Specification B
The command functions can be selected using the memory switch.
Therefore, the command specifications vary depending on the memory switch setting as follows.

n	Command function selection by memory switches	
	Status Transmission Condition Settings	Status transmission
0, 48	ASB invalid and NSB invalid	Status transmission
1, 49	ASB valid and NSB invalid	
2, 50	ASB invalid and NSB valid	
3, 51	ASB valid and NSB valid	

3. Specification C
The command functions can be selected using the memory switch.
Therefore, the command specifications vary depending on the memory switch setting as follows.

n	Command function selection by memory switches	
	Status Transmission Condition Settings	Status transmission
0, 48	ASB invalid and NSB invalid	Status transmission
1, 49	ASB valid and NSB invalid	
2, 50	ASB invalid and NSB valid	
3, 51	ASB valid and NSB valid	
16	Returns the ASB and NSB settings to the initial state previously set by the DIP SW or MSW.	
255	Sends the ASB status information.	

ESC ACK SOH

[Name]	Real-time printer status (ASB Status)			
[Code]	ASCII	ESC	ACK	SOH
	Hex.	1B	06	01
	Decimal	27	6	1

[Defined Area]   - - -
[Initial Value]   - - -

[Function]   Sends ASB status information to the host.
             This command is not used when ASB is valid.
             See Appendix 3 Automatic Status for details regarding ASB status.

ENQ

[Name]	Real-time printer status (1)	
[Code]	ASCII	ENQ
	Hexadecimal	05
	Decimal	5

[Defined Area]   - - -
[Initial Value]   - - -

[Function]   Sends 1 byte of the following the printer status
             This command is not used when ASB is valid.
             See Appendix 3 ENQ Command Status for details regarding status.

EOT

[Name]	Real-time printer status (2)	
[Code]	ASCII	EOT
	Hex.	04
	Decimal	4

[Defined Area]   - - -
[Initial Value]   - - -

[Function]   Sends 1 byte of the following the printer status
             This command is not used when ASB is valid.
             See Appendix 3 EOT Command Status for details regarding status.

ESC ACK CAN

[Name] Execute real-time printer reset
[Code] ASCII   ESC   ACK   CAN
        Hexadecimal 1B   06   18
        Decimal   27   6   24

[Defined Area]   ---
[Initial Value]   ---
[Function]   Execute real-time printer reset.

ETB

[Name]   Update ASB ETB status
[Code]   ASCII   ETB
           Hexadecimal   17
           Decimal   23

[Defined Area]   - - -
[Initial Value] - - -

[Function]   Specification A
                 Sets the ASB ETB status and sends ASB when this command is read from the reception buffer.
                 See Appendix 3 ASB Status for details.

                 Specification B
                 Sets the ASB ETB status and updates the ASB ETB counter, then sends the ASB when this
                 command is read from the reception buffer.
                 See Appendix 3 ASB Status for details.
                 The following outlines the details of the processes of this command.
                 (1) Reads ETB command from reception buffer.
                 (2) Wait for printing of print data before ETB command to end.
                 (3) After printing ends, ASB ETB counter is incremented 1 count and the ASB ETB status is set.
                 (4) Send ASB (only when ASB is enabled)

                 ・Cautions When Using an Ethernet
                 When the multi-session setting is valid, the ASB (ETB counter) that is sent according to the <ETB>
                 command is sent to all of the connected hosts. As a result, the ETB counter will be misidentified if the
                 ETB is sent from multiple sessions.
                 Therefore, it is recommended to use the <ESC><GS><ETX> command to check the printing end
                 counter.
                 →See the SPECIAL APPENDIX: COMMAND LIST SUPPORTED BY MODEL.

ESC RS E n

[Name]   Initialize ASB ETB counter and ETB status
[Code]   ASCII   ESC   RS   E   n
           Hex.   1B   1E   45   n
           Decimal   27   30   69   n

[Defined Area]   n = 0
                 n = 48 (n = "0")
[Initial Value] ASB ETB counter = 0

[Function]   Clears the ASB ETB counter to 0 (zero) and clears the ETB status.

ESC GS ETX s n1 n2

[Name] Send and initialize printing end counter

[Code]

ASCII	ESC	GS	ETX	s	n1	n2
Hex.	1B	1D	03	s	n1	n2
Decimal	27	30	3	s	n1	n2

[Defined Area] 0 ≦ s ≦ 2

0 ≦ n1 ≦ 255, 0 ≦ n2 ≦ 255

[Function] This command is executed when it is read from the reception buffer, and the processing related to the printing end counter is carried out according to the s parameter.

s	Name	Function
0	Printing end counter check	The current printing end counter is sent to the host. (The function does not wait for printing to end. Also, the counter is not counted up.)
1	Printing end counter update	The following operations are executed. ① If data is in the line buffer, the data is printed and cleared from the buffer. ② The function waits until the printing ends (motor stops). ③ The printing end counter is updated (+1). ④ The printing end counter is sent to the host.
2	Printing end counter clear	The printing end counter is cleared to 0 (zero). (The function does not wait for printing to end. Also, the counter is not returned to the host.)

When s = 0 or s = 1 is specified, the format of the data returned to the host is as follows.

<Returned Data Format>

[Code]								
	ASCII	ESC	GS	ETX	s	n1	n2	[Printing end counter] NUL
	Hex.	1B	1D	03	s	n1	n2	[Printing end counter] 00
	Decimal	27	30	3	s	n1	n2	[Printing end counter] 0

* The specified contents from the host up to ESC GS ETX s n1 n2 are echoed back, and are followed by the printing end counter value and NUL.

The [Printing end counter] has a single-byte length and the initial value is 0x00.

When s = 1, the counter is increased by +1 each time this command is processed. After 0xFF, the counter returns to 0x00.

The [Printing end counter] is not related to the n1, n2 values, and there is only one counter in the printer. (The n1, n2 values do not require corresponding counters.)

(Reference Information) Differences between ETB Command and This Command

Item	ESC GS ETX s n1 n2	ETB
Effect on ASB (ETB status)	No	Yes
ASB generated	No	Yes
Effect on ASB valid/invalid setting	No	Yes
Effect on ESC RS E n command	No	Yes
Transmission destination of status using Ethernet (When multi-session setting is valid)	Sent only to applicable printing session (host) that is connected	ASB is sent to all sessions (hosts) that are connected

* This printing end counter and the ETB counter, which is sent according to the ETB command, are different and do not have any effect on each other.

(Cautions on Ethernet interfacing)

When using the Ethernet interface, be sure to use the same communication socket for transmission of this command by the host device and for reception of print end counter data (between #9100 port connection and disconnection). After the command has been transmitted, if the socket is disconnected before the print end counter data is received (#9100 port is disconnected), the print end counter data is returned to the next connected socket (#9100 port).

Examples of communication using this command are provided on the following page.

Communication Example 1

Host transmission data		Printer returned data	
ESC GS ETX **0x00** 0x00 0x00	→		
	←	ESC GS ETX **0x00** 0x00 0x00 0x00 0x00	(Counter check)
Printing data ＋ ESC GS ETX **0x01** 0x00 0x00	→		(Counter update)
	←	ESC GS ETX **0x01** 0x00 0x00 0x01 0x00	
Printing data ＋ ESC GS ETX **0x01** 0x00 0x00	→		(Counter update)
	←	ESC GS ETX **0x01** 0x00 0x00 0x02 0x00	

Communication Example 2

Host transmission data		Printer returned data	
ESC GS ETX **0x02** 0x02 0x00			
ESC GS ETX **0x00** 0x02 0x00	→		(Counter clear)
	←	ESC GS ETX **0x00** 0x02 0x00 0x00 0x00	(Counter check)
Printing data ＋ ESC GS ETX **0x01** 0x02 0x11	→		(Counter update)
	←	ESC GS ETX **0x01** 0x02 0x11 0x01 0x00	
Printing data ＋ ESC GS ETX **0x01** 0x02 0x12	→		(Counter update)
	←	ESC GS ETX **0x01** 0x02 0x12 0x02 0x00	
Printing data ＋ ESC GS ETX **0x01** 0x02 0x13	→		(Counter update)
	←	ESC GS ETX **0x01** 0x02 0x13 0x03 0x00	
Printing data ＋ ESC GS ETX **0x01** 0x02 0x14	→		(Counter update)
	←	ESC GS ETX **0x01** 0x02 0x14 0x04 0x00	

<Example of Using n1, n2>

・When using an Ethernet: n1 = host ID and n2 = document number are specified. When the returned printing end counter is acquired, the information from the transmission source and the returned information are checked to make sure that the host ID and document ID are the same.

・When not using an Ethernet: $n1+ n2*256$ is specified for the document ID. The document ID is checked at the same time to make sure that it is the same.

・When not confirming that the information from the transmission source and the returned information are the same: The values are fixed at n1 = 0 and n2 = 0.

3-4 Presenter Command Details

The following outlines the commands relating to the presenter. These commands are valid only on machines connected to a presenter.

ESC ¥ 0 n, ESC ¥ NUL n

[Name]	Execute presenter paper recovery								
[Code]	ASCII	ESC	¥	0	n	,	ESC	¥	NUL	n
	Hex.	1B	5C	30	n	,	1B	5C	00	n
	Decimal	27	92	48	n	,	27	92	0	n

[Defined Area]   n = 0
                 n = 48 (n ="0")
[Initial Value] - - -

[Function]   Executes presenter paper recovery.
             This command is ignored when a presenter is not connected.
             Also, this command is executed when paper is supplied by the presenter, exists in the presenter and the paper has been cut. This command is ignored with under all other conditions. (Ignored when paper is being recovered.)

ESC ¥ 1 n

[Name]	Set presenter paper automatic recovery function and automatic recovery time				
[Code]	ASCII	ESC	¥	1	n
	Hex.	1B	5C	31	n
	Decimal	27	92	49	n

[Defined Area] $0 \leq n \leq 255$
[Initial Value] Memory switch setting

[Function]   Sets presenter paper automatic recovery function and automatic recovery time.
             This command is ignored when a presenter is not connected.
             Settings using this command are effective from the next sheet when the printer processes this command and paper has already been supplied to the presenter.

n	Function
n = 0	Paper automatic recovery function invalid.
$1 \leq n \leq 255$	Paper automatic recovery function valid. Automatic recovery time: n x 0.5 sec (0.5 sec to 127.5 sec)

ESC ¥ 3 n

[Name]   Acquire presenter paper counter

[Code]
ASCII	ESC	¥	3	n
Hex.	1B	5C	33	n
Decimal	27	92	51	n

[Defined Area]   n = 0, 1

                   n = 48, 49 (n ="0", "1")

[Initial Value]   - - -

[Function]   Acquires presenter paper counter.

This command is ignored when a presenter is not connected.

Counter can count to 0xFFFFFFFF sheets.

Counter is cleared to zero when the following conditions are met.

- At a printer reset
- At the <ESC> ¥ 4 n command

The paper counter using this command sends the counter value at the time this command is processed.

The counter is counted up when paper is completely recovered or when pulled out.

The counter counts from when the power is turned ON, excluding the following.

- When paper is discharged because of an error
- When printing using self-print
- When paper in the presenter is discharged when the power is turned ON

n	Counter
n = 0, 48	Acquires paper reel counter
n = 1, 49	Acquires paper recovery counter

<Counter transmission format from printer: When using the paper reel counter>

Printer transmission: ESC SYN 3 n c1 c2 c3 c4

Ticket counter: $c4 + (c3 \times 256) + (c2 \times 256 \times 256) + (c1 \times 256 \times 256 \times 256)$

![star logo]

ESC ¥ 4 n

[Name]	Initialize presenter paper counter			
[Code]	ASCII	ESC	¥	4	n
	Hex.	1B	5C	34	n
	Decimal	27	92	52	n

[Defined Area]   n = 0
                       n = 48 (n ="0")
[Initial Value]   - - -

[Function]   Initializes the presenter paper counter (paper reel counter/paper recovery counter).
                Initialization of the paper counter using this command is executed when this command is processed.

ESC GS SUB DC1 m t1 t2

[Name]	Specify snout operation mode						
[Code]	ASCII	ESC	GS	SUB	DC1	m	t1	t2
	Hexadecimal	1B	1D	1A	11	m	t1	t2
	Decimal	27	29	26	17	m	t1	t2

[Defined Area]   0 ≤ m ≤ 3, 48 ≤ m ≤ 51 ("0" ≤ m ≤ "3")
                     t1 = 0, t2 =0
[Initial Value]   MSW Setting
[Function]   Specify the snout operation mode using the m parameter.

m	Snout Operating Mode
0、48	Snout LED operation OFF
1、49	Snout LED operation ON (while printing, or during presenter operation)
2、50	Snout LED operation ON (during an error)
3、51	Snout LED operation ON (while printing, or during presenter operation or an error)

This command is valid when a presenter is connected.

When the snout is not connected, this command is prohibited from use.

ESC GS SUB DC2 m t1 t2

[Name] Specify Snout LED ON/OFF

[Code]

	ASCII	ESC	GS	SUB	DC2	m	t1	t2
	Hexadecimal	1B	1D	1A	12	m	t1	t2
	Decimal	27	29	26	18	m	t1	t2

[Defined Area] 0≤m≤02, 49≤m≤50, ("1"≤m≤"2")

0≤t1≤255, 0≤t2≤255

[Initial Value] t1 = 2, t2 = 2

[Function] Specify Snout LED ON/OFF times.

m specifies the snout operation mode.

m	Snout Operating Mode
1、49	This command specifies the LED ON/OFF times while the presenter is operating. (LED lights in orange while the printer is printing.)
2、50	This command specifies the LED ON/OFF times for recoverable and non-recoverable errors.

t1 specifies the snout LED ON time.

When 1 ≤ t1 ≤ 255: ON time = t1 x 50 msec

When t1 = 0: When ON time is default value (Default =2 x 50 msec)

T2 specifies the snout LED OFF time.

When 1 ≤ t2 ≤ 255: OFF time = t2 x 50 msec

When t2 = 0: When OFF time is default value (Default =2 x 50 msec)

This command is valid when a presenter is connected.

When the snout is not connected, this command is prohibited from use.

ESC GS SUB DC3 m t1 t2

[Name] Execute snout LED operation

[Code]

	ASCII	ESC	GS	SUB	DC3	m	t1	t2
	Hexadecimal	1B	1D	1A	13	m	t1	t2
	Decimal	27	29	26	19	m	t1	t2

[Defined Area] 0≤m≤2, 49≤m≤50, ("1"≤m≤"2")

0≤t1≤255, 0≤t2≤255

[Initial Value] ---

[Function] Operate the snout LED.

m specifies the snout LED output terminal.

m	LED output terminal
1、49	External output terminal 1
2、50	External output terminal 2

t1 specifies the ON time for the snout LED operation.

When 1 ≤ t1 ≤ 255: ON time = t1 x 50 msec

When t1 = 0 When ON time is default value (Default =2 x 50 msec)

t2 specifies the OFF time for the snout LED operation.

When 1 ≤ t2 ≤ 255: OFF time = t2 x 50 msec

When t2 = 0: When OFF time is default value (Default =2 x 50 msec)

This command is valid when a presenter is connected.

When the snout is not connected, this command is prohibited from use.

This command has priority if received while operating the snout LED in the operation mode specified by the <ESC><GS><SUB><DC1> m t1 t2 command.

3-5 Two-dimensional Code PDF417 Command Details

This command prints two-dimensional code PDF417.
There are four types of commands, according to functions, for two-dimensional code PDF417.

(1) Bar code type setting   (<ESC> <GS> "x" "S")
(2) Bar code data setting   (<ESC> <GS> "x" "D")
(3) Star page mode setting   (<ESC> <GS> "x" "T")
(4) Bar code printing   (<ESC> <GS> "x" "P")
(5) Bar code expanded information acquisition   (<ESC> <GS> "x" "I")

The following describes the functions in detail.

(1) Bar code type setting
These commands set the bar code type. Because these are all set with default values, they should be used only when it is necessary to change. (Refer to section below for details on each setting.)
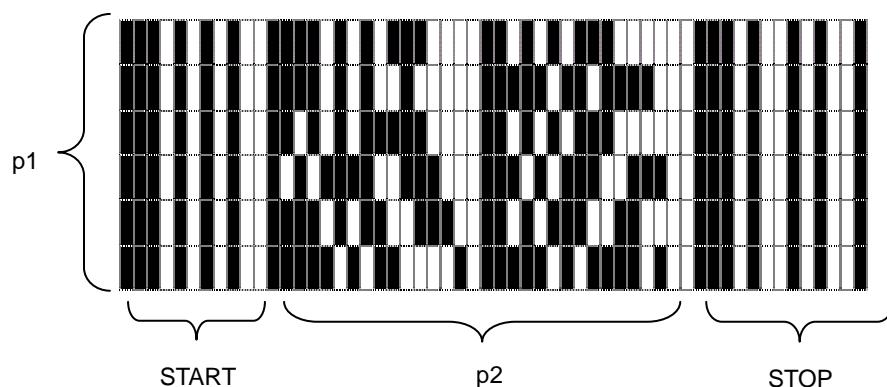
PDF417 is configured by a fixed bar pattern for starting and stopping, and a bar pattern called a code word.
Code words are configured by 17 modules.
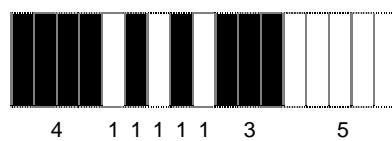
Code Word

<ESC> <GS> "x" "S" "0" specifies values of p1 and p2.
USE_LIMITS mode specify the ratio of p1 and p2. USE_FIXED mode specifies p1 (line count) and p2 (code word count per line).

<ESC> <GS> "x" "S" "1" specifies values of error correction levels.
PDF417 can read information even if a portion of the data is corrupted by using the error correction.
By increasing this level, the bar code size increases because there is more preparatory information.

<ESC> <GS> "x" "S" "2" and <ESC> <GS> "x" "S" "3" specify the size of the module that configures the code word.
The X direction size (in dot increments) is determined by <ESC> <GS> "x" "S" "2" for the module, and <ESC> <GS> "x" "S" "3" specifies the Y direction size from the aspect.
Module size setting is the basis for the bar code image that is generated, so the resulting print will vary according to that setting.

Printable size of bar code

Vertical Size [dots]	Horizontal Size [dots]
640	640

The settings above are set individually, so the errors described below may be generated even if there is no particular problem in those settings. In such case, if the bar code is generated the (4) expanded print command (<ESC> <GS> "x" "P") is ignored.
• Error is generated when generating a bar code, due to the combination of the bar code setting commands.
• The bar code data that is generated exceeds the printable size of PDF417.

It is recommended to use (5) Bar code expanded information acquisition (<ESC> <GS> "x" "I") as a means for checking these errors prior to printing.

(2) Bar code data setting command
This command sets the print data of the bar code.

(3) STAR page mode setting command
This command sets the expansion starting position and rotation information for expanding bar code data.

(4) Bar code print command
This command prints the bar code according to the settings of (1) to (3).

(5) Bar code expanded information acquisition
This command checks whether it is possible to print the bar code according to the settings of (1) to (3).

- Precautions for use of commands -
   • Unless the following operations are performed, the setting values are maintained for (1) to (3).
        • Sending of new setting commands
        • Sending a format clear command (<ESC> C)
        • The power is turned off
   • Sending (4) and (5) when needed
   • When a bar code is printed, always verify it by actual use.

Send the command transmission example last.

1. Page setting
     <ESC> "C" <LF> <NUL>:   Clears format
     <ESC> "D" "1000" <LF> <NUL>:   Sets print area to 100.0 mm

2. Bar code type setting
     <ESC> <GS> "x" "S" "0" 0 2 3:   Sets the bar code size to USE_LIMITS = 2:3
     <ESC> <GS> "x" "S" "1" 3:   Sets ECC level to 3
     <ESC> <GS> "x" "S" "2" 3:   Sets the module X direction size to 3 dots
     <ESC> <GS> "x" "S" "3" 3:   Sets module aspect ratio to 3

3. Bar code data setting
     <ESC> <GS> "x" "D" 10 0 "0123456789":   Sets the bar code data

4. Page mode setting
     <ESC> <GS> "x" "T" "0000" "," "0000" "," "0" <LF> <NUL>: Sets the expansion information

5. Printing bar code
To verify whether printing is possible with the current settings, check the bar code expansion information
     <ESC> <GS> "x" "I":   Bar code expansion information check
     <ESC> <GS> "x" "P":   Expands bar code
     <ESC> "I" <LF> <NUL>:   Print

ESC GS x S 0 n p1 p2

[Name]   Set bar code size
[Code]   ASCII   ESC GS   x   S   0   n   p1   p2
             Hex.   1B 1D   78   53   30   n   p1   p2
             Decimal 27 29   120 83   48   n   p1   p2

[Defined Area]   n = 0, 1
                        When n = 0: $1 \le p1 \le 99$, $1 \le p2 \le 99$
                        When n = 1:   p1 = 0 or $3 \le p1 \le 90$, p2 = 0 or $1 \le p2 \le 30$ (However, this excludes p1 = p2 = 0)
[Initial Value]   n = 0, p1 = 1, p2 = 2
[Function]   Parameter details

n (Specify Method to Specify Bar Code Size)		p1, p2 (Size Specification)
0	USE_LIMITS (Specify ratio of bar code horizontally and vertically)	p1: p2: Proportions of Vertical (p1) and Horizontal (p2) However, p1: p2 = 1: 99 to 10 : 1 (p1/p2 = 0.01 to 10)
1	USE_FIXED (Specifies number of lines and number of columns of bar code.)	p1: Number of lines (0, 3 to 90), p2: Number of columns (0, 1 to 30) However, p1 * p2 $\le$ 928 When either p1 or p2 specifies 0, it indicates that that setting value is variable.

Setting the bar code size using this command specifies the general size of the bar code. The size will automatically be corrected according to the other settings.

ESC GS x S 1 n

[Name]   Set ECC (security level)
[Code]   ASCII   ESC GS   x   S   1   n
             Hex.   1B 1D   78   53   31   n
             Decimal 27 29   120 83   49   n

[Defined Area] $0 \le n \le 8$
[Initial Value]   n = 1
[Function]   Parameter details
                        • n: ECC level (0 to 8)

ESC GS x S 2 n

[Name]   Set module X direction size
[Code]   ASCII   ESC GS   x   S   2   n
             Hex.   1B 1D   78   53   32   n
             Decimal 27 29   120 83   50   n

[Defined Area] $1 \le n \le 10$
[Initial Value]   n = 2
[Function]   Parameter details
                        • n: Sets the module X direction size (x-dim). Units: Dots
                        It is recommended that $2 \le n$ when specifying using this command.
                        When using with n = 1, check by actual use.

ESC GS x S 3 n

[Name] Set module aspect ratio
[Code] ASCII   ESC   GS   x   S   3   n
        Hex.   1B   1D   78   53   33   n
        Decimal 27   29   120 83   51   n

[Defined Area]   1 ≤ n ≤ 10
[Initial Value]   n = 3
[Function]   Parameter details
                 • n: Sets the module aspect ratio (asp).
                 The module Y direction size (x-dim x asp) is set using this command.

                 It is recommended that 2 ≤ n when specifying using this command.
                 When using with n = 1, check by actual use.

ESC GS x D nL nH d1 d2 … dk

[Name]   Set bar code data
[Code]   ASCII   ESC   GS   x   D   nL   nH   d1   d2   …   dk
         Hex.   1B   1D   78   44   nL   nH   d1   d2   …   dk
         Decimal 27   29   120 68   nL   nH   d1   d2   …   dk

[Defined Area]   0 ≤ nL ≤ 255, 0 ≤ nH ≤ 255
                 1 ≤ nL + nH x 256 ≤ 1024
                 0 ≤ d ≤ 255
                 1 ≤ k ≤ 1024
[Initial Value]   ---
[Function]   Parameter details
                 • nL + nH x 256:   Bar code data count
                 • dk: Bar code data (Maximum 1024 data)
                 When [nL + nH x 256] is outside of the definition, data of [nL + nH x 256] bytes is discarded.

ESC GS x T x1 x2 x3 x4, y1 y2 y3 y4, r LF NUL

[Name]	PDF417 set STAR page mode (Specification A)																	
[Code]	ASCII	ESC	GS	x	T	x1	x2	x3	x4	,	y1	y2	Y3	y4	,	r	LF	NUL
	Hex.	1B	1D	78	54	x1	x2	x3	x4	2C	y1	y2	Y3	y4	2C	r	0A	00
	Decimal	27	29	120	84	x1	x2	x3	x4	44	y1	y2	Y3	y4	44	r	10	0

[Defined Area] $48 \leq x1 \leq 57$ ("0" $\leq x1 \leq$ "9"), $48 \leq x2 \leq 57$ ("0" $\leq x2 \leq$ "9")

$48 \leq x3 \leq 57$ ("0" $\leq x3 \leq$ "9"), $48 \leq x4 \leq 57$ ("0" $\leq x4 \leq$ "9")

$48 \leq y1 \leq 57$ ("0" $\leq y1 \leq$ "9"), $48 \leq y2 \leq 57$ ("0" $\leq y2 \leq$ "9")

$48 \leq y3 \leq 57$ ("0" $\leq y3 \leq$ "9"), $48 \leq y4 \leq 57$ ("0" $\leq y4 \leq$ "9")

The x1x2x3x4 and y1y2y3y4 values differ according to the model. See Appendix 4.

$48 \leq r \leq 51$ ("0" $\leq r \leq$ "3")

[Initial Value]   ---

[Function]   Parameter details

• x1 x2 x3 x4:   Print start X direction position   Units: 0.1 mm

• y1 y2 y3 y4:   Print start Y direction position   Units: 0.1 mm

• r: Rotation direction

"0": 0˚

"1": 90˚

"2": 180˚

"3": 270˚

ESC GS x T x1 x2 x3 x4, y1 y2 y3 y4, r, a LF NUL

[Name]	PDF417 Set STAR page mode (Specification B)															
[Code]	ASCII	ESC	GS	x	T	X1	x2	x3	x4	,	y1	y2	Y3	y4	,	r
	Hex.	1B	1D	78	54	X1	x2	x3	x4	2C	y1	y2	Y3	y4	2C	r
	Decimal	27	29	120	84	X1	x2	x3	x4	44	y1	y2	Y3	y4	44	r

	ASCII	,	a	LF	NUL
	Hex.	2C	a	0A	00
	Decimal	44	a	10	0

[Defined Area] $48 \leq x1 \leq 57$ ("0" $\leq x1 \leq$ "9"), $48 \leq x2 \leq 57$ ("0" $\leq x2 \leq$ "9")

$48 \leq x3 \leq 57$ ("0" $\leq x3 \leq$ "9"), $48 \leq x4 \leq 57$ ("0" $\leq x4 \leq$ "9")

$48 \leq y1 \leq 57$ ("0" $\leq y1 \leq$ "9"), $48 \leq y2 \leq 57$ ("0" $\leq y2 \leq$ "9")

$48 \leq y3 \leq 57$ ("0" $\leq y3 \leq$ "9"), $48 \leq y4 \leq 57$ ("0" $\leq y4 \leq$ "9")

The x1x2x3x4 and y1y2y3y4 values differ according to the model. See Appendix 4.

$48 \leq r \leq 51$ ("0" $\leq r \leq$ "3")

$48 \leq a \leq 49$ ("0" $\leq a \leq$ "1") (Specification B)

[Initial Value]   ---

[Function]   Parameter details

• x1 x2 x3 x4:   Print start X direction position   Units: 0.1 mm

• y1 y2 y3 y4:   Print start Y direction position   Units: 0.1 mm

• r: Rotation direction

"0": 0˚

"1": 90˚

"2": 180˚

"3": 270˚

• a (Specification B)   Color specification (The setting made by this parameter is valid only when two-color printing is set.) ",a" can be omitted. (Black if omitted.)

a	
48 ("0")	Black
49 ("1")	Red

ESC GS x P

[Name]   Bar code data expansion

[Code]

	ASCII	ESC	GS	x	P
	Hex.	1B	1D	78	50
	Decimal	27	29	120	80

[Defined Area]   ---

[Initial Value]   ---

[Function]   Expands to image buffer of the bar code data.

This command is ignored if the following errors occur.

• Error when creating a bar code because of the combination of each bar code setting command

• The bar code data that was created exceeds the printable size of PDF417.

Always check the actual bar code when printed.

ESC GS x I

[Name]   Get PDF417 bar code expansion information

[Code]

	ASCII	ESC	GS	x	I
	Hex.	1B	1D	78	49
	Decimal	27	29	120	73

[Defined Area]   ---

[Initial Value]   ---

[Function]   When printing a bar code with the current settings and at the print starting position using this command, error information is sent to the printer. Therefore, it is possible to check whether it is possible to print before actually printing, by using this command.

If an error occurs, this command is discarded even if the print command (<ESC> <GS> "x" "P") is sent.

If the following errors occur, "Error" information is sent to the printer.

• When an error is generated when generating a bar code, due to the combination of the bar code setting commands.

• When the bar code data that is generated exceeds the printable size of PDF417.

Transmission format: <ESC> <GS> "x" "I" n

n	
0	No Error
1	Error

![star logo]

3-6 Two-dimensional Code QR Code Command Details

* Note that QR code is a registered trademark of DENSO WAVE.
This command is for printing 2-dimensional code QR codes. There are five functions of the commands relating to the two-dimensional code QR codes, shown below.

(1) Set bar code type   (<ESC> <GS> "y" "S")
(2) Set bar code data   (<ESC> <GS> "y" "D")
(3) Set Star page mode   (<ESC> <GS> "y" "T")
(4) Print bar code   (<ESC> <GS> "y" "P")
(5) Get bar code print information   (<ESC> <GS> "y" "I")

The details of each function are described below.

<u>(1) Set bar code type</u>
These commands set the bar code type. Because all initial values are set, use these only to make changes. (See the details for each setting below.)

← Cell

← Alignment Pattern
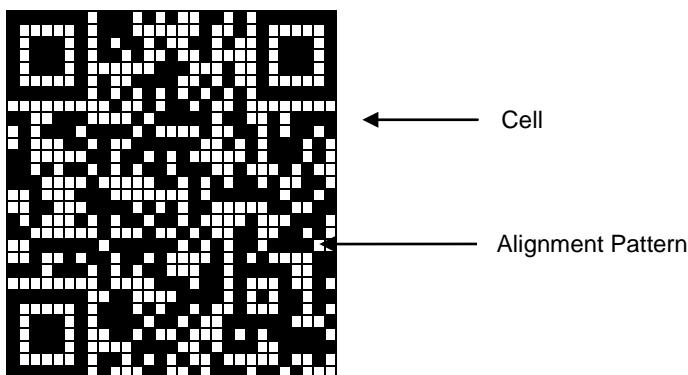
<ESC> <GS> "y" "S" "0" Sets the model
Currently supported models are model 1 and model 2. Model 2 has a configuration including an alignment bar to improve its support of weight to handle skewing when codes are large.

<ESC> <GS> "y" "S" "1" Sets the error correction level
QR codes can be read even if a part of the data is corrupted, by using error correction. Raising this level increases the size of the bar code because there is an increase in preparatory information.

<ESC> <GS> "y" "S" "2" Specifies the size of the cell (One four squared region configuring the QR code)
The QR code is formed into a square of an equivalent size in the vertical and horizontal directions, but the size of the bar code image that is generated depends on the cell size setting. The actual QR code that is printed is [number of cells on one side x cell size]. See Appendix 5 for details on the actual printed size of the QR code.

These settings are individual settings. Therefore, even though there may not be any particular problem in each of them, there is the potential for an error to be generated. (See the descriptions below.) In such cases, the bar code will not be generated and the (4) Print command (<ESC> <GS> "y" "P") is ignored. With the (5) Get bar code expansion information command, an error code is returned.

• Error is generated when generating a bar code by the combination of each setting command.
• Print data exceeds the currently set print region

Therefore, it is recommended to use (5) Get bar code expansion information command (<ESC> <GS> "y" "I") as a means for checking for these errors prior to printing.
(2) Set bar code data

This command sets the bar code print data. There are four types of data that can be set using QR codes. They are: numbers; English characters; binary; and Kanji. Furthermore, there are two types of data setting methods. One is to specify these along with the bar code data (data manual analysis), and the other is to specify only the bar code data (data automatic analysis).

(3) Set Star page mode
This command sets the expansion starting position and rotation information for bar code data expansion.

(4) Print Bar code
This command prints bar codes based on the settings of (1) to (3).

(5) Get bar code print information
This command confirms whether to print bar codes based on the settings of (1) to (3).

= Precautions on using these commands =
• The setting values for (1) to (3) are held unless any of the following operations are performed.

> • Sending a new setting command
> • Sending a format clear command (<ESC> C)
> • Turning the power OFF

• When there is an error in sending a command with (2), the set data is cleared and the command itself is disabled.

• (4) and (5) are sent when necessary.

• Printed bar codes should always be checked in an actual use.

The following is an example showing the sending of the commands.

(1)   Set page
    \<ESC\> "C" \<LF\> \<NUL\>   Clears the format.
    \<ESC\> "D" "1000 "\<LF\> \<NUL\>   Sets print area to 100.0 mm.

(2)   Set bar code type
    \<ESC\> \<GS\> "y" "S" "0" 1   Sets to model 1.
    \<ESC\> \<GS\> "y" "S" "1" 0   Sets the error correction level to L.
    \<ESC\> \<GS\> "y" "S" "2" 3   Sets the cell size to 3 dots.

(3)   Set bar code data
    • Automatic data analysis
     \<ESC\> \<GS\> "y" "D" "1" 0 20 0 "January 1, 2005 (Saturday)"
                                          Sets the bar code data.

    • Manual data analysis
    \<ESC\> \<GS\> "y" "D" "2" 9 1 4 0   "2005"   Sets the bar code data.
                               4 2 0   "Year"
                               1 1 0   "1"
                               4 2 0   "Month"
                               1 1 0   "1"
                               4 2 0   "Day"
                               4 2 0   "("
                               2 3 0   "SAT"
                               4 2 0   ")"

(4)   Set page mode
    \<ESC\> \<GS\> "y" "T" "0000" "," "0000" "," "0" \<LF\> \<NUL\>
                                          Sets the print information.

(5) Print bar code
To verify whether to print with the current settings, check the bar code expansion information.
    \<ESC\> \<GS\> "y" "I"   Check bar code expansion information
    \<ESC\> \<GS\> "y" "P"   Expand
    \<ESC\> "I: \<LF\> \<NUL\>   Print

ESC GS y S 0 n

[Name]　Set QR code model
[Code]　ASCII　　ESC　GS　y　S　0　n
　　　　Hex.　　 1B　1D　79　53　30　n
　　　　Decimal　27　29　121　83　48　n

[Defined Area]　　n = 1, 2
[Initial Value]　　n = 2
[Function]　　　　Parameter details

n	
1	Model 1
2	Model 2

ESC GS y S 1 n

[Name]　Set QR code error correction level
[Code]　ASCII　　ESC　GS　y　S　1　n
　　　　Hex.　　 1B　1D　79　53　31　n
　　　　Decimal　27　29　121　83　49　n

[Defined Area]　　$0 \leq n \leq 3$
[Initial Value]　　n = 0
[Function]　　　　Parameter details

n	Error Correction Level	Error Correction Rate (%)
0	L	7
1	M	15
2	Q	25
3	H	30

ESC GS y S 2 n

[Name]　Set QR code cell size
[Code]　ASCII　　ESC　GS　y　S　2　n
　　　　Hex.　　 1B　1D　79　53　32　n
　　　　Decimal　27　29　121　83　50　n

[Defined Area]　　$1 \leq n \leq 8$
[Initial Value]　　n = 3
[Function]　　　　Parameter details
　　　　　　　　　• n: Cell size (Units: Dots)
　　　　　　　　　It is recommended that the specification using this command be $3 \leq n$.
　　　　　　　　　If n = 1 or 2, check by actually using.

ESC GS y D 1 m nL nH d1 d2 … dk

[Name]   Set QR code cell size (Auto Setting)

[Code]
	ASCII	ESC	GS	y	D	1	m	nL	nH	d1	d2	…	dk
	Hex.	1B	1D	79	44	31	m	nL	nH	d1	d2	…	dk
	Decimal	27	29	121	68	49	m	nL	nH	d1	d2	…	dk

[Defined Area] $m = 0$

$0 \leq nL \leq 255$, $0 \leq nH \leq 255$

$1 \leq nL + nH \times 256 \leq 7089$ (k = nL + nH × 256)

$0 \leq d \leq 255$

[Initial Value]   ---

[Function]   Automatically expands the data type of the bar code and sets the data.

• Parameter details

• nL + nH x 256: Byte count of bar code data

• dk: Bar code data (Max. 7089 bytes)

• When using this command, the printer receives data for the number of bytes (k) specified by nL and nH. The data automatically expands to be set as the bar code data.

• Indicates the number bytes of data specified by the nL and nH.

When processing Chinese character (Kanji) codes, two bytes is one character.

• Command analysis is terminated if the command is outside of the defined area.

Bar code data is cleared at this time.

• The data storage region of this command is shared with the manual setting command so data is updated each time either command is executed.

ESC GS y D 2 a m1 n1L n1H d11 d12 • • • d1k m2 n2L n2H d21 d22 • • • d2k ml • • • dlk

[Name]   Set QR code cell size (Manual setting)

[Code]

ASCII	ESC	GS	y	D	2	a	m1	n1L	n1H	d11	d12	...	d1k
Hex.	1B	1D	79	44	32	a	m1	n1L	n1H	d11	d12	...	d1k
Decimal	27	29	121	68	50	a	m1	n1L	n1H	d11	d12	...	d1k

ASCII	m2	n2L	n2H	D21	d22	...	d2k	ml	...	dlk
Hex.	m2	n2L	n2H	D21	d22	...	d2k	ml	...	dlk
Decimal	m2	n2L	n2H	D21	d22	...	d2k	ml	...	dlk

[Defined Area] $1 \leq a \leq 255$

                $1 \leq m \leq 4$

                $0 \leq nL \leq 255$, $0 \leq nH \leq 255$

                $1 \leq nL + nH \times 256 \leq 7089$ ($k = nL + nH \times 256$)

                $0 \leq d \leq 255$

                $1 \leq l \leq 255$

[Initial Value]   ---

[Function]   Specifies the bar code data type and sets the data.

• Parameter details

• a: Block count

• m: Input data type

• nL + nH x 256: Bar code data byte count

• dk: Bar code data (Max. 7089 bytes)

m	Data Type	Data Definition Region (d)
1	Numbers	"0" to "9"
2	English Characters	"", "$", "%" "*", "+", "-", ".", "/", ":", "0" to "9", "A" to "Z", "a" to "z"
3	Binary	0x00 to 0xFF
4	Kanji (Shift JIS)	0x8140 to 0x9FFC, 0xE040 to 0xEBBF However, the lower 8 bits are 0x40 to 0x7E, and 0x80 to 0xFC

• The printer receives the data type specified by m, and the data of the number of bytes (k) specified by nL and nH, based on the block count specified by a.

• 1 block specified by a indicates m1, n1L, n1H, d11 • • • d1k (data type + data count + bar code data), and by continuously sending these a multiple of times, one bar code data can mix data types.

• It is possible to set a maximum of 255 blocks with one command transmission.

• nL and nH specify the number of bytes of the data, so when using Kanji, calculate that 1 character has 2 bytes.

• If this command is outside of the definition region, immediately stop the command analysis process.

When doing so, the bar code data is cleared.

• This command data storage region is shared with the automatic setting command, so data is updated each time either command is executed.

• When data type is set to alphanumeric (m=2) and data of alphabet characters "a" to "z" is sent, they are converted into uppercase alphabet characters "A" to "Z" and their barcode data is generated.

ESC GS y T x1 x2 x3 x4 , y1 y2 y3 y4 , r LF NUL

[Name]	Set QR code STAR page mode (Specification A)

[Code]	ASCII	ESC	GS	y	T	x1	x2	x3	x4	,	y1	y2	y3	y4	,	r	LF	NUL
	Hex.	1B	1D	78	54	x1	x2	x3	x4	2C	y1	y2	y3	y4	2C	r	0A	00
	Decimal	27	29	120	84	x1	x2	x3	x4	44	y1	y2	y3	y4	44	r	10	0

[Defined Area]	$48 \leq x1 \leq 57$ ("0" $\leq x1 \leq$ "9"), $48 \leq x2 \leq 57$ ("0" $\leq x2 \leq$ "9")
	$48 \leq x3 \leq 57$ ("0" $\leq x3 \leq$ "9"), $48 \leq x4 \leq 57$ ("0" $\leq x4 \leq$ "9")
	$48 \leq y1 \leq 57$ ("0" $\leq y1 \leq$ "9"), $48 \leq y2 \leq 57$ ("0" $\leq y2 \leq$ "9")
	$48 \leq y3 \leq 57$ ("0" $\leq y3 \leq$ "9"), $48 \leq y4 \leq 57$ ("0" $\leq y4 \leq$ "9")
	The x1x2x3x4 and y1y2y3y4 values differ according to the model. See Appendix 4.
	$48 \leq r \leq 51$ ("0" $\leq r \leq$ "3")

[Initial Value]	---

[Function] Parameter details
- x1 x2 x3 x4   Print starting X direction position   Units of 0.1 mm
- y1 y2 y3 y4   Print starting Y direction position   Units of 0.1 mm
- r   Rotating direction
                 "0" is 0°
                 "1" is 90°
                 "2" is 180°
                 "3" is 270°

ESC GS y T x1 x2 x3 x4 , y1 y2 y3 y4 , r, a LF NUL

[Name]	Set QR code STAR page mode (Specification B)

[Code]	ASCII	ESC	GS	y	T	x1	x2	x3	x4	,	y1	y2	y3	y4	,	r
	Hex.	1B	1D	78	54	x1	x2	x3	x4	2C	y1	y2	y3	y4	2C	r
	Decimal	27	29	120	84	x1	x2	x3	x4	44	y1	y2	y3	y4	44	r

	ASCII	,	a	LF	NUL
	Hex.	2C	a	0A	00
	Decimal	44	a	10	0

[Defined Area]	$48 \leq x1 \leq 57$ ("0" $\leq x1 \leq$ "9"), $48 \leq x2 \leq 57$ ("0" $\leq x2 \leq$ "9")
	$48 \leq x3 \leq 57$ ("0" $\leq x3 \leq$ "9"), $48 \leq x4 \leq 57$ ("0" $\leq x4 \leq$ "9")
	$48 \leq y1 \leq 57$ ("0" $\leq y1 \leq$ "9"), $48 \leq y2 \leq 57$ ("0" $\leq y2 \leq$ "9")
	$48 \leq y3 \leq 57$ ("0" $\leq y3 \leq$ "9"), $48 \leq y4 \leq 57$ ("0" $\leq y4 \leq$ "9")
	The x1x2x3x4 and y1y2y3y4 values differ according to the model. See Appendix 4.
	$48 \leq r \leq 51$ ("0" $\leq r \leq$ "3")
	$48 \leq a \leq 49$ ("0" $\leq a \leq$ "1") (Specification B)

[Initial Value]	---

[Function] Parameter details
- x1 x2 x3 x4   Print starting X direction position   Units of 0.1 mm
- y1 y2 y3 y4   Print starting Y direction position   Units of 0.1 mm
- r   Rotating direction
                 "0" is 0°
                 "1" is 90°
                 "2" is 180°
                 "3" is 270°
- a (Specification B) Color specification (The setting made by this parameter is valid only when two-color printing is set.) ",a" can be omitted. (Black when omitted.)

a	
48 ("0")	Black
49 ("1")	Red

ESC GS y P

[Name]   Print QR code
[Code]   ASCII   ESC GS   y   P
            Hex.   1B 1D 79 50
            Decimal 27 29 121 80

[Defined Area]   ---
[Initial Value]   ---
[Function]   This command expands to the bar code data image buffer.
A margin of more than 4 cells is required around the QR code. The user should ensure that space.
Always check printed bar codes in actual use.

ESC GS y I

[Name]   Get QR code expansion information
[Code]   ASCII   ESC GS   y   I
            Hex.   1B 1D 79 49
            Decimal 27 29 121 73

[Defined Area]   ---
[Initial Value]   ---
[Function]   Sends information on generated image sizes and errors in bar code expansion using the current settings. Therefore, it is possible to check whether printing is possible prior to actual printing. If there is an error in the expanded bar code, this command is ignored even if the expand command (<ESC> <GS> "y" "P") is sent.

In the even that errors like the ones below occurs, "Error" information is sent to the printer.
• When there is an error in generating a bar code by the combination of bar code setting commands.
• When the generated bar code data exceeds the printable size

Sending Format: <ESC> <GS> "y" "I" n1 n2

n1 n2	
0000	Error
0x0001 to 0xffff	Size around generated bar code (Units: Dots)

Specification A

Specification B
If the starting position is in the printable area, an error is not generated even if the size of the bar code exceeds the printable area.

3-7 Print Mode Command Details

In Page Mode, this specifies the print data color when switching single/two-color printing using <ESC><RS>C. Settable page lengths differ according to the model.

When switching, the image buffer and set format data are all cleared.

ESC RS C n

[Name]	Select/cancel printing mode			
[Code]	ASCII	ESC	RS	C	n
	Hexadecimal	1B	1E	43	n
	Decimal	27	30	67	n

[Defined Area]   Spec. A 0≤n≤1, 48≤n≤49 ("0"≤n≤"1")

Spec. B 0≤n≤1, 48≤n≤49 ("0"≤n≤"1"), n = 16, 32

[Initial Value]   Memory switch setting

[Function] Spec. A

n	Select/cancel 2-color printing mode

0, 48	Cancel 2-color printing mode
	When in two-color print mode, this command cancels 2-color printing mode.
	This command is ignored when the 2-color print mode is already cancelled.
	The specification of this command is not cleared by ESC C.
	The following processes are executed by canceling the 2-color print mode using this command.
	  • Clears image memory (All expanded print data is cleared.)
	  • Clears page length setting
	  • Waits to stop printing when printing in 2-color print mode.
	  • Recovers print speed to single color mode.

1, 49	Select 2-color printing mode
	This command selects 2-color print mode, when in single color print mode.
	This command is ignored already in the 2-color print mode.
	The specification of this command is not cleared by ESC C.
	The following processes are executed by selecting the 2-color print mode using this command.
	  • Clears image memory (All expanded print data is cleared.)
	  • Clears page length setting
	  • Waits to stop printing when printing in single-color print mode.
	  • Initializes print color setting (2-color print mode setting)

Spec. B

n	Print Mode Specification
0, 48	Single-color Mode
1, 49	2-color Mode
16	Low Peak Current Mode
32	Double Resolution Mode

• This command is ignored when the specified mode is already selected.

• This command is ignored when the low-peak current mode is selected by the DIP switches.

• The specification of this command is not cleared by ESC C.

4. CHARACTER CODE TABLES

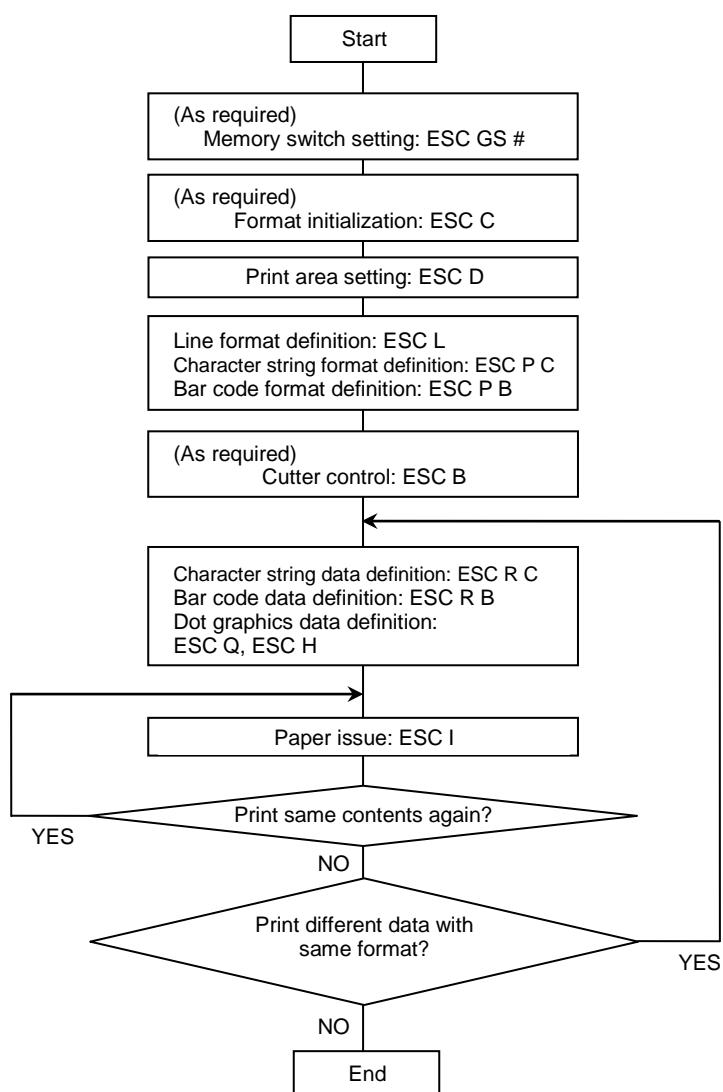See the character code specifications manual.

5. APPENDIX

5-1 Appendix 1 Page Mode Specification Details

Page mode commands can be placed in three general classes, according to functions. They are those that define formats, that specify print data and those that control the printer.
The printer has a format memory region that records formats, and an image memory region that records image data for printing. The image memory has a region that is the size of the print area. Print patterns are loaded based on the data of the format memory region and the print data.
Printing is executed by sending a print start command which is one of the control commands, to the printer.

5-1-1 Program Generation Procedures

```
                    ┌─────────────┐
                    │    Start    │
                    └─────────────┘
                           │
        ┌──────────────────────────────────────┐
        │ (As required)                         │
        │     Memory switch setting: ESC GS #   │
        └──────────────────────────────────────┘
                           │
        ┌──────────────────────────────────────┐
        │ (As required)                         │
        │     Format initialization: ESC C      │
        └──────────────────────────────────────┘
                           │
        ┌──────────────────────────────────────┐
        │     Print area setting: ESC D         │
        └──────────────────────────────────────┘
                           │
        ┌──────────────────────────────────────┐
        │ Line format definition: ESC L         │
        │ Character string format definition: ESC P C │
        │ Bar code format definition: ESC P B   │
        └──────────────────────────────────────┘
                           │
        ┌──────────────────────────────────────┐
        │ (As required)                         │
        │     Cutter control: ESC B             │
        └──────────────────────────────────────┘
                           │
        ┌──────────────────────────────────────┐ ◄─────────┐
        │ Character string data definition: ESC R C │       │
        │ Bar code data definition: ESC R B     │           │
        │ Dot graphics data definition:         │           │
        │ ESC Q, ESC H                          │           │
        └──────────────────────────────────────┘           │
                           │                                │
        ┌──────────────────────────────────────┐           │
   ┌──► │     Paper issue: ESC I                │           │
   │    └──────────────────────────────────────┘           │
   │                       │                                │
   │               ◇ Print same contents again? ◇           │
   │   YES ─────────┘              │ NO                      │
   │                                │                        │
   │                   ◇ Print different data with ◇ ── YES ─┘
   │                     same format?
   │                                │ NO
   │                       ┌─────────────┐
   │                       │     End     │
   │                       └─────────────┘
```

5-1-2 Sample Program

This shows an example of creating a program.
The following program is by BASIC. It is already able to be sent to the printer as file #1 by an open statement.

1. SAMPLE 1

```
'----------<< SAMPLE1.BAS >>----------------------------
ESC$ = CHR$(27): LN$ = CHR$(10) + CHR$(0)
'----------<< FORMAT SETTINGS >>-----------------------
PRINT #1, ESC$; "C"; LN$;                                    ;'Clear format
PRINT #1, ESC$; "D1500"; LN$;                                ;'Set print area
PRINT #1, ESC$; "L00;0050,0050,0750,0050,0,4"; LN$;          ;'Define ruled line format
PRINT #1, ESC$; "L01;0150,0300,0230,0300,0,2"; LN$;
PRINT #1, ESC$; "L02;0150,0400,0310,0400,0,2"; LN$;
PRINT #1, ESC$; "L03;0050,0800,0310,0800,0,2"; LN$;
PRINT #1, ESC$; "L04;0590,0800,0750,0800,0,2"; LN$;
PRINT #1, ESC$; "L05;0050,0945,0750,0945,0,4"; LN$;
PRINT #1, ESC$; "L06;0050,0050,0050,0950,1,4"; LN$;
PRINT #1, ESC$; "L07;0150,0050,0150,0950,1,2"; LN$;
PRINT #1, ESC$; "L08;0230,0050,0230,0950,1,2"; LN$;
PRINT #1, ESC$; "L09;0260,0050,0260,0400,1,2"; LN$;
PRINT #1, ESC$; "L10;0310,0050,0310,0950,1,2"; LN$;
PRINT #1, ESC$; "L11;0590,0050,0590,0950,1,2"; LN$;
PRINT #1, ESC$; "L12;0670,0050,0670,0950,1,2"; LN$;
PRINT #1, ESC$; "L13;0745,0050,0745,0950,1,4"; LN$;
PRINT #1, ESC$; "PC00;0070,0930,1,1,1,33,02"; LN$;           ;'Define character string position and type
PRINT #1, ESC$; "PC01;0060,0780,2,3,2,33,02"; LN$;
PRINT #1, ESC$; "PC02;0170,0930,1,1,1,33,02"; LN$;
PRINT #1, ESC$; "PC03;0160,0780,1,2,4,33,02"; LN$;
PRINT #1, ESC$; "PC04;0170,0380,1,1,1,33,02"; LN$;
PRINT #1, ESC$; "PC05;0180,0280,1,1,4,33,02"; LN$;
PRINT #1, ESC$; "PC06;0250,0930,1,1,1,33,02"; LN$;
PRINT #1, ESC$; "PC07;0260,0780,1,1,2,33,02"; LN$;
PRINT #1, ESC$; "PC08;0240,0380,1,1,1,33,02"; LN$;
PRINT #1, ESC$; "PC09;0275,0380,1,1,2,33,02"; LN$;
PRINT #1, ESC$; "PC10;0610,0930,1,1,1,33,02"; LN$;
PRINT #1, ESC$; "PC11;0620,0780,1,1,2,33,02"; LN$;
PRINT #1, ESC$; "PC12;0690,0930,1,1,1,33,02"; LN$;
PRINT #1, ESC$; "PC13;0695,0780,1,1,2,33,02"; LN$;
PRINT #1, ESC$; "PB00;0330,0850,1,1,3,0120"; LN$;            ;'Define barcode position and type
PRINT #1, ESC$; "PB01;0470,0850,1,2,3,0100"; LN$;
PRINT #1, ESC$; "PB02;0470,0450,1,2,3,0100"; LN$;
PRINT #1, ESC$; "B"; LN$;                                    ;'Enable cutter
'----------<< PRINT DATA >>-----------------------------
PRINT #1, ESC$; "RC00;TYPE-No."; LN$;                        ;'Set character data
PRINT #1, ESC$; "RC01;ABC0123456789"; LN$;
PRINT #1, ESC$; "RC02;LOT"; LN$;
PRINT #1, ESC$; "RC03;5X6789"; LN$;
PRINT #1, ESC$; "RC04;QTY"; LN$;
PRINT #1, ESC$; "RC05;10000"; LN$;
PRINT #1, ESC$; "RC06;DATE"; LN$;
PRINT #1, ESC$; "RC07;"; DATE$; LN$;
PRINT #1, ESC$; "RC08;COMMENT"; LN$;
```

```
PRINT #1, ESC$; "RC09;054-263-1115"; LN$;
PRINT #1, ESC$; "RC10;COSTOMER"; LN$;
PRINT #1, ESC$; "RC11;STAR MICRONICS CO.,LTD"; LN$;
PRINT #1, ESC$; "RC12;ADDRESS"; LN$;
PRINT #1, ESC$; "RC13;20-10 NAKAYOSHIDA, JAPAN"; LN$;
PRINT #1, ESC$; "RB00;ABC0123456789"; LN$;                      ;'Define barcode data
PRINT #1, ESC$; "RB01;10000"; LN$;
PRINT #1, ESC$; "RB02;940517"; LN$;
'----------<< PRINT >>--------------------------------
PRINT #1, ESC$; "I"; LN$;                                       ;'Print Label
END
```

Print Out Sample

TYPE-No.	ABC0123456789		
LOT	5X6789	QTY	10000
DATE	06-21-1995	COMMENT	054-263-1115

CUSTOMER	STAR MICRONICS CO.,LTD
ADDRESS	20-10 NAKAYOSHIDA, JAPAN

2. SAMPLE 2

```
'----------<< SAMPLE2.BAS >>-----------------------------
ESC$ = CHR$(27): LN$ = CHR$(10) + CHR$(0)
'----------<< FORMAT SETTINGS >>------------------------
PRINT #1, ESC$; "C"; LN$;                               ;'Clrar format
PRINT #1, ESC$; "D0800"; LN$;                           ;'Set print area
PRINT #1, ESC$; "PC00;0300,0222,1,1,1,00,01"; LN$;      ;'Define character string position and type
PRINT #1, ESC$; "PC01;0300,0249,1,1,1,00,01"; LN$;
PRINT #1, ESC$; "PC02;0300,0276,1,1,1,00,01"; LN$;
PRINT #1, ESC$; "PB00;0300,0330,4,1,0,0040"; LN$;       ;'Define barcode position and type
PRINT #1, ESC$; "B"; LN$;                               ;'Enable cutter
'----------<< PRINT DATA >>-----------------------------
PRINT #1, ESC$; "RC00;Part#: 08210116"; LN$;            ;'Set character data
PRINT #1, ESC$; "RC01;Name : TTL IC 74LS06(FLAT TYPE)"; LN$;
PRINT #1, ESC$; "RC02;Qty. : 50 pcs"; LN$;
PRINT #1, ESC$; "RB00;08210116"; LN$;                   ;'Set barcode data
'
PRINT #1, ESC$; "H;0135,0255,";                         ;'Copy BMP file to image buffer
OPEN "TTLIC.BMP" FOR BINARY AS #2
 FOR I = 1 TO LOF(2):D$ = INPUT$(1,#2):PRINT #1,D$;:NEXT I
CLOSE #2
PRINT #1, ","; LN$;
'----------<< PRINT >>----------------------------------
PRINT #1, ESC$; "I"; LN$;                               ;'Print Label
END
```

Print Out Sample
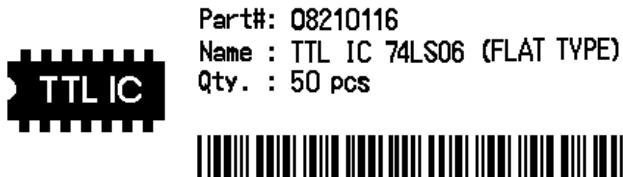
5-2 Appendix 2 Bar Code Specification Details

Refer to the dedicated manuals for characteristics and methods of use for each bar code symbol.
This section describes precautions and methods for setting when printing with the printer.

Bar code widths are set for each bar code according to the mode. The following describes each mode and the dot counts.
The user must ensure the specified printing position and quiet zone at the position where the bar code begins.

5-2-1 Code 39
Code 39 represents numbers 0 to 9 and the letters of the alphabet from A to Z. These are the symbols most frequently used today in industry.

1. Length of characters in each mode

Item	Mode 1	Mode 2	Mode 3	Mode 4	Mode 5	Mode 6	Mode 7	Mode 8	Mode 9
Narrow Element Width	2 Dots	3 Dots	4 Dots	2 Dots	3 Dots	4 Dots	2 Dots	3 Dots	4 Dots
Wide Element Width	6 Dots	9 Dots	12 Dots	5 Dots	8 Dots	10 Dots	4 Dots	6 Dots	8 Dots
Ratio	1:3	1:3	1:3	1:2.5	1:2.7	1:2.5	1:2	1:2	1:2
Character Space	2 Dots	3 Dots	4 Dots	2 Dots	3 Dots	4 Dots	2 Dots	3 Dots	4 Dots
Length of 1 Character	4 mm	6 mm	8 mm	3.625 mm	5.625 mm	7.25 mm	3.25 mm	4.875 mm	6.5 mm

 (*) The length of 1 character includes the character spacing.

2. Regulations
   Code 39 Start/stop characters bar codes ("*") are automatically inserted.

5-2-2 Interleaved 2 of 5
Interleaved 2 of 5 represents numbers 0 to 9. Higher density of characters is possible and with JIS and EAN, and priting to cardboard for distribution has been standardized.

1. Narrow element width and length of symbols per 2 characters

Item	Mode 1	Mode 2	Mode 3	Mode 4	Mode 5	Mode 6	Mode 7	Mode 8	Mode 9
Narrow Element Width	2 Dots	4 Dots	6 Dots	2 Dots	4 Dots	6 Dots	2 Dots	3 Dots	4 Dots
Wide Element Width	5 Dots	10 Dots	15 Dots	4 Dots	8 Dots	12 Dots	6 Dots	9 Dots	12 Dots
Ratio	1:2.5	1:2.5	1:2.5	1:2	1:2	1:2	1:3	1:3	1:3
Length of 1 Character	4 mm	8 mm	12 mm	3.5 mm	7 mm	10.5 mm	4.5 mm	6.75 mm	9 mm

2. Regulations
   • By selecting interleaved 2 of 5 bar code symbols, start and stop patterns are automatically inserted.
   • When the bar code data digit count is odd, a zero is added to the highest value digit.
   • Details conform to standards for AIM, USS-12/5, ANSI and JIS x 0502.

5-2-3 JAN/EAN/UPC

Used numbers, not only the bar code symbols, are controlled using JAN, EAN and UPC as shared common commercial codes. Mainly, they are used for supermarkets such as shops and grocery stores.

1. Each mode and bar code widths

Items		Mode 1	Mode 2	Mode 3
Module Width		2 Dots	3 Dots	4 Dots
Bar code width (*)	JAN/EAN-8	16.75 mm	25.125 mm	33.5 mm
	JAN/EAN-13	23.75 mm	35.625 mm	47.5 mm
	UPC-A	23.75 mm	35.625 mm	47.5 mm
	UPC-E	12.75 mm	19.125 mm	25.5 mm

(*) Includes the guard bar (left/right/center) but not the white space.

2. Regulations
- JAN/EAN-8:
  Data is in 7 or 8 digits. The command is ignored for others.
  The check digit uses a modulus weight of 10/3 and is automatically applied.
  When the calculated value and the numerical value of the 8th digit differ, the calculated value has priority.
- JAN/EAN-13:
  Data is in 12 or 13 digits. The command is ignored for others.
  The check digit uses a modulus weight of 10/3 and is automatically applied.
  When the calculated value and the numerical value of the 13th digit differ, the calculated value has priority.
- UPC – A:
  Data is in 11 or 12 digits. The command is ignored for others.
  The check digit uses a modulus weight of 10/3 and is automatically applied.
  When the calculated value and the numerical value of the 12th digit differ, the calculated value has priority.
- UPC – E:
  Data is in 11 or 12 digits. The command is ignored for others.
  The check digit uses a modulus weight of 10/3 and is automatically applied.
  When the calculated value and the numerical value of the 12th digit differ, the calculated value has priority.
  Data conversion to rectangles is automatic.
  Data that cannot be shortened is processed as invalid data.

5-2-4 Code 128

These are bar code symbols that can print ASCII 128 characters. For that reason, use thereof is increasing.

1. Each module and module widths

Item	Mode 1	Mode 2	Mode 3
Module Width	2 Dots	3 Dots	4 Dots
Length of 1 Character (*)	2.75 mm	4.125 mm	5.5 mm

(*) Start and stop bars not included.

2. Regulations

When using <LF> with the command, control codes are not sent by the host PC, so the control codes are sent as data, as shown below.

- When sending the following data, it represents a 2 character set.

  % (25H) represents %0 (25H 30H).

  Control codes (00H to 1FH) represent 40H to 5FH applied behind %.

  Control code (7FH) represents %5 (25H 35H).

  Function codes represent 1 to 4 (31H to 34H) applied behind %.

  Start codes represent 6 to 8 (36H to 38H) applied behind %.

- Stop code (SC)/Check character (CK) are automatically applied.

- When the start code is omitted:

  Uses START C when more than 4 digits continue after header.

  Uses START A when initial data other than numbers are the control code.

  Uses START B for other cases.

3. 2 character set code table

<Control Codes>

<Control Codes>

Code	Format
NUL 00H	%@ 25H 40H
SOH 01H	%A 25H 41H
STX 02H	%B 25H 42H
ETX 03H	%C 25H 43H
EOT 04H	%D 25H 44H
ENQ 05H	%E 25H 45H
ACK 06H	%F 25H 46H
BEL 07H	%G 25H 47H
BS 08H	%H 25H 48H
HT 09H	%I 25H 49H
LF 0AH	%J 25H 4AH
VT 0BH	%K 25H 4BH
FF 0CH	%L 25H 4CH
CR 0DH	%M 25H 4DH
SO 0EH	%N 25H 4EH
SI 0FH	%O 25H 4FH
DLE 10H	%P 25H 50H
DC1 11H	%Q 25H 51H
DC2 12H	%R 25H 52H
DC3 13H	%S 25H 53H
DC4 14H	%T 25H 54H
NAK 15H	%U 25H 55H
SYN 16H	%V 25H 56H
ETB 17H	%W 25H 57H
CAN 18H	%X 25H 58H
EM 19H	%Y 25H 59H
SUB 1AH	%Z 25H 5AH
ESC 1BH	%[25H 5BH
FS 1CH	%¥ 25H 5CH
GS 1DH	%] 25H 5DH
RS 1EH	%^ 25H 5EH
US 1FH	%_ 25H 5FH
DEL 7FH	%5 25H 35H

Code	Format
% 25H	%0 25H 30H

<Function Codes>

Code	Format	
FNC1	%1 25H 31H	☆
FNC2	%2 25H 32H	☆
FNC3	%3 25H 33H	☆
FNC4	%4 25H 34H	☆

<Start Code>

Code	Format	
START A	%6 25H 36H	☆
START B	%7 25H 37H	☆
START C	%8 25H 38H	☆

5-2-5 Code 93

1. Each mode and module widths

Item	Mode 1	Mode 2	Mode 3
Module Width	2 Dots	3 Dots	4 Dots
Length of 1 Character (*)	2.25 mm	3.375 mm	4.5 mm

   (*) Start and stop bars not included.

2. Regulations
    • Start/stop codes are automatically applied.
    • Check character (C, K) is automatically applied.
    • 2 character set expression conforms to Code 128.
       However, items marked with a ☆ (a star) are codes that can only be used with Code 128, and not with Code 93.

5-2-6 NW7 (CODERBAR)
NW7 normally uses either A through D as the start/stop codes and represents special symbols (- (minus sign) / $ (dollar sign) / : (colon) / / (slash) / . (period) / + (plus sign) between 0 to 9.
These are used as carrier package marking bar codes, DPE (photo prints) and for medical related industries (USA).

1. Length of characters in each mode

Item	Mode 1	Mode 2	Mode 3	Mode 4	Mode 5	Mode 6	Mode 7	Mode 8	Mode 9
Narrow Element Width	2	3	4	2	3	4	2	3	4
Wide Element Width	6	9	12	5	8	10	4	6	8
Ratio	1:3	1:3	1:3	1:2.5	1:2.7	1:2.5	1:2	1:2	1:2
Character Space (Dots)	2	3	4	2	3	4	2	3	4
Length of 1 Character (Normally mm)	3	4.5	6	2.75	4.25	5.5	2.5	3.75	5
(Width mm)	3.5	5.25	7	3.125	5.125	6.25	2.75	4.125	5.5

    • With NW7, lengths differ because narrow elements and wide elements are included according to the characters.
    • Normal characters (narrow: 5, wide: 2) and numbers (0 to 9), - and $
    • Wide characters (narrow: 4, wide: 3) :, /, ., +, A to D
    • The length of 1 character includes the character spacing.

5-3 Appendix 3 Status Specifications

5-3-1 ENQ Command Status
This status is the one the printer transmits using the ENQ command.

Bit	Contents	Status		By Model						
		"0"	"1"	TSP800	TUP900	TSP1000	TSP828L	TUP500	TSP800II	
7	Conversion SW	OPEN	CLOSE	O	×	×	×	×	O	
6	Reception Buffer Overflow	Does not occur	Occurs	O	O	O	O	O	O	
5	Reception Buffer Empty	Has Data	Empty	O	O	O	O	O	O	
4	Fixed at "0"		–	–	–	–	–	–	–	
3	Paper end	Paper	No paper	O	O	O	O	O	O	
2	Other Errors	No Error	Error	O	O	O	O	O	O	
1	Framing Error	No Error	Error	O	O	O	O	O	O	
0	Parity Error	No Error	Error	O	O	O	O	O	O	

- Reception Buffer Overflow/Framing Error/Parity Error
  These errors are cleared after holding that the error occurred and using this command to inquire the status and the error status is sent.
- Other Errors
  Indicates non-recoverable errors and cover open error.

5-3-2 EOT Command Status
This status is the one the printer transmits using the EOT command.

Bit	Contents	Status		By Model						
		"0"	"1"	TSP800	TUP900	TSP1000	TSP828L	TUP500	TSP800II	
7	Fixed at "0"		–	–	–	–	–	–	–	
6	Paper jam at presenter	No Error	Error	×	O	×	×	O	×	
5	Paper Near-end (Outer Side)	Paper	No paper	×	×	×	×	×	×	
4	Fixed at "1"		–	–	–	–	–	–	–	
3	Paper end	Paper	No paper	O	O	O	O	O	O	
2	Paper Near-end (Inner Side)	Paper	No paper	O	O	O	x	O	O	
1	BM Error	No Error	Error	×	O	O	O	O	O	
0	Fixed at "0"		–	–	–	–	–	–	–	

- BM Error
  On models that use a common PE and BM sensor, if a continuous error is detected beyond a determined amount, it indicates not a black mark error, but a paper out error.

5-3-3 Automatic Status

Auto status is a group of states that are automatically returned from the printer to the host when the printer's status has changed. Automatic status is composed of "Header 1," "Header 2" and "plurality of bytes of the printer status" and is continuously returned to the host. The host always uses an identifying method to identify the data for every byte received.

(It is possible that Xon/Xoff codes are exceptionally mixed in the auto status in the Xon/Xoff mode (when using a serial I/F), so it is necessary to consider that on the receiving side.)

The valid/invalid conditions of the auto status abide by the DIPSW or the memory switch settings for the initial values. It is possible to change the conditions using the ESC RS a n command after turning ON the power.

Also, it is possible to get the auto status using the ESC ACK SOH command, regardless of the valid/invalid conditions.

1. Header 1

    Header 1 is the 1 byte length information transmitted at the head of the automatic status.

    The table below shows the composition of the Header 1. Header 1 represents the entire status transmission byte count, including Header 1, using bit 1 to bit 3 and bit 5. The host gets the transmission byte information and always receives the status data for that amount transmission bytes. For reference, the table below shows the relationship of actual transmission bytes and the Header 1. Because the bit 0 that indicates that this is the Header 1 is normally 1 (the second byte and beyond is 0), to detect the Header 1, it is acceptable to verify that bit 0 is 1 and bit 4 = 0 for this data. Note that bit 6 is for future expansion and is ignored in host-side processes.

<Header 1 (First byte)>

Bit	Contents	Status		By Model						
		"0"	"1"	TSP800	TUP900	TSP1000	TSP828L	TUP500	TSP800II	
7	Fixed at "0"		–	–	–	–	–	–	–	
6	Reserved (Fixed at "0")		–	–	–	–	–	–	–	
5	Number of printer status bytes			O	O	O	O	O	O	
4	Fixed at "0"		–	–	–	–	–	–	–	
3	Number of printer status bytes			O	O	O	O	O	O	
2	Number of printer status bytes			O	O	O	O	O	O	
1	Number of printer status bytes			O	O	O	O	O	O	
0	Fixed at "1"	–		–	–	–	–	–	–	

Actual transmission byte count and header 1 table

Transmission Byte Count n (7 ≤ n ≤ 15)	Header 1
7	00001111B (0F Hex)
8	00100001B (21 Hex)
9	00100011B (23 Hex)
10	00100101B (25 Hex)
11	00100111B (27 Hex)
12	00101001B (29 Hex)
13	00101011B (2B Hex)
14	00101101B (2D Hex)
15	00101111B (2F Hex)

2. Header 2

   Header 2 is the 1 byte length information transmitted from the second byte of the automatic status. The table below shows the composition of the Header 2.

   Header 2 represents the auto status version (called automatic status version below) using bit 1 to bit 3 and bit 5. For reference, the table below shows the relationship of actual version bytes and the Header 2. The auto status version will be used as new information is added to the printer status bit positions that were empty, by adding new functions in the future.

   When the host does not control the auto status version, it is acceptable to ignore Header 2 received.

<Header 2 (Second byte)>

Bit	Contents	Status		By Model						
		"0"	"1"	TSP800	TUP900	TSP1000	TSP828L	TUP500	TSP800II	
7	ABS Status Expansion	No Expansion	Expansion	–	–	–	–	–	–	
6	Not Used (Fixed at "0")		–	–	–	–	–	–	–	
5	Version Number			O	O	O	O	O	O	
4	Fixed at "0"		–	–	–	–	–	–	–	
3	Version Number			O	O	O	O	O	O	
2	Version Number			O	O	O	O	O	O	
1	Version Number			O	O	O	O	O	O	
0	Fixed at "0"	–		–	–	–	–	–	–	

Actual automatic status version and header 2 table

Version Number n	Header 2
1	00000010B (02 Hex)
2	00000100B (04 Hex)
3	00000110B (06 Hex)
4	00001000B (08 Hex)
5	00001010B (0A Hex)
6	00001100B (0C Hex)
7	00001110B (0E Hex)
8	00100000B (20 Hex)
9	00100010B (22 Hex)
•	•
•	•
•	•
30	01101100B (6C Hex)
31	01101110B (6E Hex)

Printer status version

Model Name	Version No.	Corresponding Status
TSP800	1 (02 Hex)	Up to printer status 5 (7th byte) loaded
	3 (06 Hex)	Up to printer status 7 (9th byte) loaded :(ROM version 5.0 later)
TUP900	3 (06 Hex)	Up to printer status 7 (9th byte) loaded
TSP1000	3 (06 Hex)	Up to printer status 7 (9th byte) loaded
TSP828L	3 (06 Hex)	Up to printer status 7 (9th byte) loaded
TUP500	3 (06 Hex)	Up to printer status 7 (9th byte) loaded
TSP800II	3 (06 Hex)	Up to printer status 7 (9th byte) loaded

3. Printer status

Printer status is the status of the printer sent from the 3rd byte of the automatic status.

For the printer status, (the number of bytes added in Header 1 minus two) is returned.

Printer status is always updated for new information. (No log exists.)

The following shows the composition of the status.

<Printer status 1 Printer status (Third byte)>

Bit	Contents	Status		By Model						
		"0"	"1"	TSP800	TUP900	TSP1000	TSP828L	TUP500	TSP800II	
7	Fixed at "0"		–	–	–	–	–	–	–	
6	OFFLINE By Switch Input	No	Yes	×	×	×	×	–	×	
5	Cover Status	CLOSE	OPEN	O	O	O	O	O	O	
4	Fixed at "0"		–	–	–	–	–	–	–	
3	ONLINE/OFFLINE Status	ONLINE	OFFLINE	O	O	O	O	O	O	
2	Compulsion SW	OPEN	CLOSE	O	×	×	×	×	O	
1	<ETB> Command	Not Executed	Executed	O	O	O	O	O	O	
0	Fixed at "0"		–	–	–	–	–	–	–	

• <ETB> Command

Cleared when received at the host (by clearing bit 1 to 0, automatic status is not targeted to occur).

<Printer status 2 Error information (Fourth byte)>

Bit	Contents	Status		By Model						
		"0"	"1"	TSP800	TUP900	TSP1000	TSP828L	TUP500	TSP800II	
7	Fixed at "0"		–	–	–	–	–	–	–	
6	Stopped by high head temperature	Not stopped	Stopped	O	O	O	O	O	O	
5	Non-recoverable Error	No Error	Error	O	O	O	O	O	O	
4	Fixed at "0"		–	–	–	–	–	–	–	
3	Auto-cutter Error	No Error	Error	O	O	O	×	O	O	
2	Mechanical Error	No Error	Error	×	×	×	×	×	×	
	Head Thermistor Error	No Error	Error	–	–	–	–	O	–	
1	Not Used (Fixed at "0")			–	–	–	–	–	–	
0	Fixed at "0"		–	–	–	–	–	–	–	

\<Printer status 3 Error information (Fifth byte)\>

Bit	Contents	Status		By Model						
		"0"	"1"	TSP800	TUP900	TSP1000	TSP828L	TUP500	TSP800II	
7	Fixed at "0"		–	–	–	–	–	–	–	
6	Reception Buffer Overflow	Does not occur	Occurs	O	O	O	O	O	O	
5	Command Errors	No Error	Error	O	O	O	O	O	O	
4	Fixed at "0"		–	–	–	–	–	–	–	
3	BM Error	No Error	Error	×	O	O	O (*)	O	O	
2	Paper jam at presenter	No Error	Error	×	O	x	x	O	×	
1	Head Up Error	No Error	Error	×	×	×	×	–	×	
	Power Voltage Error	No Error	Error	–	–	–	–	O	–	
0	Fixed at "0"		–	–	–	–	–	–	–	

- Reception Buffer Overflow
  Cleared to 0 when returned to the host.
- Command Errors
  This bit is set to "1" when command codes or parameters outside of standard are sent.
  Command errors cleared to 0 when returned to the host.
- BM Error
  On models that use a common PE and BM sensor, if a continuous error is detected beyond a determined amount, it indicates not a black mark error, but a paper out error.

(*) TSP828L (Label Printer) BM errors occur for the following causes.

TSP828L	Sensor	BM Error Causes
Tear Bar Mode	Transmissive Type	Detected label paper over 400 mm Detected base paper over 400 mm Detected page error (When MSW is valid) When length error detected (When MSW is valid)
	Reflective Type	Detected white over 400 mm Detected page error (When MSW is valid) When length error detected (When MSW is valid)
Peeling Mode	Transmissive Type	Detected label paper over 400 mm Detected base paper over 400 mm Detected page error When length error detected (When MSW is valid)
	Reflective Type	Detected white over 400 mm Detected page error When length error detected (When MSW is valid)

<Printer status 4 Sensor information (Sixth byte)>

Bit	Contents	Status		By Model						
		"0"	"1"	TSP800	TUP900	TSP1000	TSP828L	TUP500	TSP800II	
7	Fixed at "0"		–	–	–	–	–	–	–	
6	Not Used (Fixed at "0")		–	–	–	–	–	–	–	
5	Not Used (Fixed at "0")		–	–	–	–	–	–	–	
4	Fixed at "0"		–	–	–	–	–	–	–	
3	Paper End	Paper	No paper	O	O	O	O	O	O	
2	Paper Near-end (Inner Side)	Paper	No paper	O	O	O	O	O	O	
1	Paper Near-end (Outer Side)	Paper	No paper	×	×	x	x	×	×	
0	Fixed at "0"		–	–	–	–	–	–	–	

<Printer status 5 Sensor information (Seventh byte)>

Bit	Contents	Status		By Model						
		"0"	"1"	TSP800	TUP900	TSP1000	TSP828L	TUP500	TSP800II	
7	Fixed at "0"		–	–	–	–	–	–	–	
6	Not Used (Fixed at "0")		–	–	–	–	–	–	–	
5	Not Used (Fixed at "0")		–	–	–	–	–	–	–	
4	Fixed at "0"		–	–	–	–	–	–	–	
3	Slip BOF Detector	Paper	No paper	×	×	×	×	×	×	
2	Slip TOF Detector	Paper	No paper	×	×	×	×	×	×	
1	Presenter Paper	No paper	Paper	–	×	–	–	×	–	
	Stack Sensor Paper Detector	No paper	Paper	–	–	O	–	–	–	
	Detector	No paper	Paper	–	–	O	O	–	–	
0	Fixed at "0"		–	–	–	–	–	–	–	

<Printer status 6 ETB counter (Eighth byte)>

Bit	Contents	Status		By Model						
		"0"	"1"	TSP800 Ver.50or later	TUP900	TSP1000	TSP828L	TUP500	TSP800II	
7	Fixed at "0"		–	–	–	–	–	–	–	
6	ETB Counter Bit-4			O	O	O	O	O	O	
5	ETB Counter Bit-3			O	O	O	O	O	O	
4	Fixed at "0"		–	–	–	–	–	–	–	
3	ETB Counter Bit-2			O	O	O	O	O	O	
2	ETB Counter Bit-1			O	O	O	O	O	O	
1	ETB Counter Bit-0			O	O	O	O	O	O	
0	Fixed at "0"		–	–	–	–	–	–	–	

(*) ETB Counter

> This counter is the 5 bit ETB counter.
> (It counts from 0 to 31. When ther counter overflows, it counts up from 31 to 0.)
> This counter is incremented by 1 using the <ETB> command.
> The ETB counter is initialized by the following commands. When doing so, ASB ETB status is cleared.
> However, when initializing the ETB counter, ASB is not transmitted.
>
> <ETB Counter Initialization Commands>
> • <ESC> <RS> E n: ETB Counter Initialization

<Printer status 7 Position for presenter paper (Ninth byte)>

Bit	Contents	Status "0"	Status "1"	TSP800 Ver.50 or later	TUP900	TSP1000	TSP828L	TUP500	TSP800II	
7	Fixed at "0"		–	–	–	–	–	–	–	
6	Not Used (Fixed at "0")		–	x	○	x	x	○	x	
5	Not Used (Fixed at "0")		–	x	○	x	x	○	x	
4	Fixed at "0"		–	x	–	–	–	–	–	
3	Presenter Paper Position	(See table below)		x	○	x	x	○	x	
2	Presenter Paper Position	(See table below)		x	○	x	x	○	x	
1	Presenter Paper Position	(See table below)		x	○	x	x	○	x	
0	Fixed at "0"		–	–	–	–	–	–	–	

- This status is valid only on models provided with a presenter. Models not provided with a presenter should send this status Fixed at "0".
- This status is made valid and invalid using the memory switch only on models provided with a presenter. When valid, the presenter paper position status is updated, but when invalid, the presenter paper position status is Fixed at "0" and there is no change in status.
- Details of presenter paper position

Bit 3	bit 2	bit 1	Presenter Paper Position
0	0	0	Paper position 0 State where there is no paper in presenter
0	0	1	Paper position 1 State where paper is supplied (loop state)
0	1	0	Paper position 2 (Reserved)
0	1	1	Paper position 3 State where paper is discharged (Can be pulled out)
1	0	0	Paper position 4 (Reserved)
1	0	1	Paper position 5 (Reserved)
1	1	0	Paper position 6 State where paper is recovered
1	1	1	Paper position 7 State where paper is pulled out.

- Paper position status transition for presenter operation mode

Operating Mode	Paper	Transition of Presenter Paper Position
Loop take-up	Recovery	Position 0 to Position 1 to (Paper Cut) to Position 3 to (Paper Recovery) to Position 6 to Position 0
Internal recovery	Pull out	Position 0 to Position 1 to (Paper Cut) to Position 3 to (Paper Pull out) to Position 7 to Position 0
Loop take-up	Recovery	Position 0 to Position 1 to (Paper Cut) to Position 3 to (Paper Recovery) to Position 6 to Position 0
Front discharge	Pull out	Position 0 to Position 1 to (Paper Cut) to Position 3 to (Paper Pull out) to Position 7 to Position 0
No loop	Recovery	Position 0 to Position 1 to (Paper Cut) to Position 3 to (Paper Recovery) to Position 6 to Position 0
Internal recovery	Pull out	Position 0 to Position 1 to (Paper Cut) to Position 3 to (Paper Pull out) to Position 7 to Position 0
No loop	Recovery	Position 0 to Position 1 to (Paper Cut) to Position 3 to (Paper Recovery) to Position 6 to Position 0
Front discharge	Pull out	Position 0 to Position 1 to (Paper Cut) to Position 3 to (Paper Pull out) to Position 7 to Position 0
Recovery invalid	Recovery	Position 0 to Position 1 to (Paper Cut) to Position 6 to Position 0
	Pull out	Position 0 to Position 1 to (Paper Cut) to Position 6 to Position 0

4. Cautions
   Do not use ENQ, EOT, ESC, ACK and SOH when auto status is valid. Invalidate the automatic status in advance using the DIPSW (memory switch) or the ESC RS a n command to query these.

5. How to identify statuses

Command/Functions	Status							
	bit 7	bit 6	bit 5	bit 4	bit 3	bit 2	bit 1	bit 0
XON	0	0	0	1	0	0	0	1
XOFF	0	0	0	1	0	0	1	1
ENQ	*	*	*	0	*	*	*	*
EOT	*	*	*	1	*	*	*	0
ASB (Header 1)	0	*	*	0	*	*	*	1
ASB (Other than Header 1)	0	*	*	0	*	*	*	0

0 = Fixed at "0" bits / 1 = fixed at "1" bits / * = variable bits.

5-3-4 Printer Status Transmission Specifications for Ethernet I/F, and Wireless LAN I/F
The following will describe printer status transmission specifications for using an Ethernet interface and a wireless LANinterface.

1) Transmission format

• For transmitting only STAR ASB
   | STAR ASB (Second Byte Bit -7 = 1) | + | Length | (Length = 0x0000)
 • For transmitting printer status other than STAR ASB
   | STAR ASB (Second Byte Bit -7=1) | + | Length | + | Status Data |

Details on Length
• 2 byte value indicating byte count of Status Data (0x0000 ≤ Length ≤ 0x0200)
• When status data is 10 bytes, Length = 0x000a
• When transmitting only STAR ASB, append Length x 0x0000
• When Length is appended for STAR ASB second byte bit -7, this is set to bit -7=1

Status analysis detects the total byte count of ASB using the first byte of STAR ASB, and detects
whether Length is appended using the second byte bit -7 of STAR ASB.
It is also possible to analyze the status bygetting the byte count of subsequent byte counts.

2) | Status Data | transmission format

| Status Type | + | Separator character 1 | + | Data Type | + | Status Length | + | ***Printer Status***

+ | Separator character 2 |

1. Status Type (2 Bytes or 4 Bytes)
    • First and second bytes
      Indicate the cause to generate a printer status.
      • "00":   Reserved
      • "01" to "09":   STAR real-time status request command
      • "10" to "49":   STAR status request command
      • "50":   Reserved
      • "51" to "59":   Reserved
      • "60" to "99":   Reserved
      • "A0" to "FF":   Reserved
    • Third and fourth bytes
      When a cause occurs, these indicate the command n parameter.
      If there is no n parameter, the third and fourth bytes can be omitted.
      <Ex.> When n = 0x31 using the ESC ¥ 3 n command, the third and fourth bytes are "31".

2. Separator character 1 (1 byte)
   Sends ":".

3. Data Type (1 byte)
   Indicate printer status data; sends "B" (binary type).

4. Status Length (2 byte)
   2 byte value indicating printer status byte count.

5. Printer Status (Variable length)
   Status contents vary according to the cause with the status sent by the printer.
   See the command causes and automatic status for details on the content of statuses.

6. Separator character 2 (1 byte)
   Sends ";".

3) Status transmission specification list

Status Cause	STAR ASB	Length	Status Data						
			Status Type		Separated character 1	Data Type	Status Length	Printer Status	Separated character 2
			First/Second Bytes Cause	Third/Fourth Bytes n Parameter					
ASB Automatic Status*1	ASB	0x0000	--	--	--	--	--	--	--
ESC ACK SOH Printer Status Request	ASB	0x0000	--	--	--	--	--	--	--
ENQ Printer Status Request	ASB	0x0008	"01"	Omitted	":"	"B"	0x0001	Status	";"
EOT Printer Status Request	ASB	0x0008	"02"	Omitted	":"	"B"	0x0001	Status	";"
ESC GS ETX n1 n2 Printing End Counter Request	ASB	0x000F	"20"	Omitted	":"	"B"	0x0008	Status	";"
ESC ¥ 3 n Presenter Counter Request	ASB	0x0011	"13"	"00 ≤ n ≤ "01" "30" ≤ n ≤ "31"	":"	"B"	0x0008	Status	";"
ESC GS x 1 PDF417 Information Request	ASB	0x000C	"16"	Omitted	":"	"B"	0x0005	Status	";"
ESC GS y l QR Code Information Request	ASB	0x000D	"19"	Omitted	":"	"B"	0x0006	Status	";"

*1 The automatic status is sent to all of the hosts when the printing port (TCP port 9100) is connected.

5-4 Appendix 4 Print Regions By Model and Parameter Definition Region List

<Horizontal direction (X direction)>

Model Name	Print Region (Dot Count)	Position Specification Parameter Defined Region [mm]	Area, Size Specification Parameter Defined Region [mm]	Size Specification Parameter Defined Region [Bytes]
TSP800	104 mm (832)	"0000" to "1039"	"0001" to "1040"	"0001" to "0104"
TUP900	104 mm (832)	"0000" to "1039"	"0001" to "1040"	"0001" to "0104"
	80 mm (640)	"0000" to "0799"	"0001" to "0800"	"0001" to "0080"
	72 mm (576)	"0000" to "0719"	"0001" to "0720"	"0001" to "0072"
TSP1000	80 mm (640)	"0000" to "0799"	"0001" to "0800"	"0001" to "0080"
	72 mm (576)	"0000" to "0719"	"0001" to "0720"	"0001" to "0072"
TSP828L	104 mm (832)	"0000" to "1039"	"0001" to "1040"	"0001" to "1040"
TUP500	80 mm (640)	"0000" to "0799"	"0001" to "0800"	"0001" to "0080"
TSP800II	104 mm (832)	"0000" to "1039"	"0001" to "1040"	"0001" to "0104"

<Vertical direction (Y direction)>

Model Name	Print Region (Dot Count)	Position Specification Parameter Defined Region [mm]	Area, Size Specification Parameter Defined Region [mm]	Size Specification Parameter Defined Region [Dots]
TSP800	200 mm (1600)	"0000" to "1999"	"0001" to "2000"	"0001" to "1600"
TUP900	300 mm (2400)	"0000" to "2999"	"0001" to "3000"	"0001" to "2400"
TSP1000	300 mm (2400)	"0000" to "2999"	"0001" to "3000"	"0001" to "2400"
TSP828L (Single Color)	300 mm (2400)	"0000" to "2999"	"0001" to "3000"	"0001" to "2400"
TSP828L (Two Color)	150 mm (1200)	"0000" to "1499"	"0001" to "1500"	"0001" to "1200"
TUP500 (Single Color)	300 mm (2400)	"0000" to "2999"	"0001" to "3000"	"0001" to "2400"
TUP500 (Two Color)	150 mm (1200)	"0000" to "1499"	"0001" to "1500"	"0001" to "1200"
TSP800II (Single Color)	250 mm (2000)	"0000" to "2499"	"0001" to "2500"	"0001" to "2000"
TSP800II (Two Color)	125 mm (1000)	"0000" to "1249"	"0001" to "1250"	"0001" to "1000"

5-5 Appendix 5 Maximum Number of Input Characters for Each Version of QR Code

Model 1

Version	Cell Count on One Side	Mistake Correction Level	Number of Characters	English Characters	Binary	Kanji
1	21	L	40	24	17	10
		M	33	20	14	8
		Q	25	15	11	6
		H	16	10	7	4
2	25	L	81	49	34	20
		M	66	40	28	17
		Q	52	31	22	13
		H	33	20	14	8
3	29	L	131	79	55	33
		M	100	60	42	25
		Q	81	49	34	20
		H	52	31	22	13
4	33	L	186	113	78	48
		M	138	84	58	35
		Q	114	69	48	29
		H	76	46	32	19
5	37	L	253	154	106	65
		M	191	116	80	49
		Q	157	95	66	40
		H	105	63	44	27
6	41	L	321	194	134	82
		M	249	151	104	64
		Q	201	122	84	51
		H	133	81	56	34
7	45	L	402	244	168	103
		M	311	188	130	80
		Q	253	154	106	65
		H	167	101	70	43
8	49	L	493	299	206	126
		M	378	229	158	97
		Q	301	183	126	77
		H	203	123	85	52
9	53	L	585	354	244	150
		M	441	267	184	113
		Q	369	223	154	94
		H	239	145	100	61
10	57	L	690	418	287	177
		M	526	319	219	135
		Q	433	262	180	111
		H	291	176	121	74
11	61	L	800	485	333	205
		M	608	368	253	156
		Q	493	299	205	126
		H	342	207	142	87
12	65	L	915	555	381	234
		M	694	421	289	178
		Q	579	351	241	148
		H	390	236	162	100
13	69	L	1030	624	429	264
		M	790	479	329	202
		Q	656	398	273	168
		H	454	275	189	116
14	73	L	1167	707	486	299
		M	877	531	365	225
		Q	738	447	307	189
		H	498	302	207	127

Model 2

Version	Cell Count on One Side	Mistake Correction Level	Number of Characters	English Characters	Binary	Kanji
1	21	L	41	25	17	10
		M	34	20	14	8
		Q	27	16	11	7
		H	17	10	7	4
2	25	L	77	47	32	20
		M	63	38	26	16
		Q	48	29	20	12
		H	34	20	14	8
3	29	L	127	77	53	32
		M	101	61	42	26
		Q	77	47	32	20
		H	58	35	24	15
4	33	L	187	114	78	48
		M	149	90	62	38
		Q	111	67	46	28
		H	82	50	34	21
5	37	L	255	154	106	65
		M	202	122	84	52
		Q	144	87	60	37
		H	106	64	44	27
6	41	L	322	195	134	82
		M	255	154	106	65
		Q	178	108	74	45
		H	139	84	58	36
7	45	L	370	224	154	95
		M	293	178	122	75
		Q	207	125	86	53
		H	154	93	64	39
8	49	L	461	279	192	118
		M	365	221	152	93
		Q	259	157	108	66
		H	202	122	84	52
9	53	L	552	335	230	141
		M	432	262	180	111
		Q	312	189	130	80
		H	235	143	98	60
10	57	L	652	395	271	167
		M	513	311	213	131
		Q	364	221	151	93
		H	288	174	119	74
11	61	L	772	468	321	198
		M	604	366	251	155
		Q	427	259	177	109
		H	331	200	137	85
12	65	L	883	535	367	226
		M	691	419	287	177
		Q	489	296	203	125
		H	374	227	155	96
13	69	L	1022	619	425	262
		M	796	483	331	204
		Q	580	352	241	149
		H	427	259	177	109
14	73	L	1101	667	458	282
		M	871	528	362	223
		Q	621	376	258	159
		H	468	283	194	120
15	77	L	1250	758	520	320
		M	991	600	412	254
		Q	703	426	292	180
		H	530	321	220	136

Version	Cell Count on One Side	Mistake Correction Level	Number of Characters	English Characters	Binary	Kanji
16	81	L	1408	854	586	361
		M	1082	656	450	277
		Q	775	470	322	198
		H	602	365	250	154
17	85	L	1548	938	644	397
		M	1212	734	504	310
		Q	876	531	364	224
		H	674	408	280	173
18	89	L	1725	1046	718	442
		M	1346	816	560	345
		Q	948	574	394	243
		H	746	452	310	191
19	93	L	1903	1153	792	488
		M	1500	909	624	384
		Q	1063	644	442	272
		H	813	493	338	208
20	97	L	2061	1249	858	528
		M	1600	970	666	410
		Q	1159	702	482	297
		H	919	557	382	235
21	101	L	2232	1352	929	572
		M	1708	1035	711	438
		Q	1224	742	509	314
		H	969	587	403	248
22	105	L	2409	1460	1003	618
		M	1872	1134	779	480
		Q	1358	823	565	348
		H	1056	640	439	270
23	109	L	2620	1588	1091	672
		M	2059	1248	857	528
		Q	1468	890	611	376
		H	1108	672	461	284
24	113	L	2812	1704	1171	721
		M	2188	1326	911	561
		Q	1588	963	661	407
		H	1228	744	511	315
25	117	L	3057	1853	1273	784
		M	2395	1451	997	614
		Q	1718	1041	715	440
		H	1286	779	535	330
26	121	L	3283	1990	1367	842
		M	2544	1542	1059	652
		Q	1804	1094	751	462
		H	1425	864	593	365
27	125	L	3514	2132	1465	902
		M	2701	1637	1125	692
		Q	1933	1172	805	496
		H	1501	910	625	385
28	129	L	3669	2223	1528	940
		M	2857	1732	1190	732
		Q	2085	1263	868	534
		H	1581	958	658	405
29	133	L	3909	2369	1628	1002
		M	3035	1839	1264	778
		Q	2181	1322	908	559
		H	1677	1016	698	430
30	137	L	4158	2520	1732	1066
		M	3289	1994	1370	843
		Q	2358	1429	982	604
		H	1782	1080	742	457

Version	Cell Count on One Side	Mistake Correction Level	Number of Characters	English Characters	Binary	Kanji
31	141	L	4417	2677	1840	1132
		M	3486	2113	1452	894
		Q	2473	1499	1030	634
		H	1897	1150	790	486
32	145	L	4686	2840	1952	1201
		M	3693	2238	1538	947
		Q	2670	1618	1112	684
		H	2022	1226	842	518
33	149	L	4965	3009	2068	1273
		M	3909	2369	1628	1002
		Q	2805	1700	1168	719
		H	2157	1307	898	553
34	153	L	5253	3183	2188	1347
		M	4134	2506	1722	1060
		Q	2949	1787	1228	756
		H	2301	1394	958	590
35	157	L	5529	3351	2303	1417
		M	4343	2632	1809	1113
		Q	3081	1867	1283	790
		H	2361	1431	983	605
36	161	L	5836	3537	2431	1496
		M	4588	2780	1911	1176
		Q	3244	1966	1351	832
		H	2524	1530	1051	647
37	165	L	6153	3729	2563	1577
		M	4775	2894	1989	1224
		Q	3417	2071	1423	876
		H	2625	1591	1093	673
38	169	L	6479	3927	2699	1661
		M	5039	3054	2099	1292
		Q	3599	2181	1499	923
		H	2735	1658	1139	701
39	173	L	6743	4087	2809	1729
		M	5313	3220	2213	1362
		Q	3791	2298	1579	972
		H	2927	1774	1219	750
40	177	L	7089	4296	2953	1817
		M	5596	3391	2331	1435
		Q	3993	2420	1663	1024
		H	3057	1852	1273	784

5-6 Appendix 6 TSP828L Cutter Command Specifications

		Plain Paper (BM Invalid)	Label Paper (BM Valid)			
			Tear Bar		Peeling Mode	
			Transmissive Sensor	Reflective Sensor	Transmissive Sensor	Reflective Sensor
<ESC> B	+	Print + Feed to Tear Bar + Positive Adjustment	Print + BM Detection + Feed to Tear Bar	Print + BM Detection + Feed to Tear Bar + Positive Adjustment	Print + BM Detection + Feed to Peeling Position	Print + BM Detection + Feed to Peeling Position
	-	Print + Feed to Tear Bar + Negative Adjustment	Print + BM Detection + Feed to Tear Bar	Print + BM Detection + Feed to Tear Bar + Negative Adjustment		
	*	Print + Feed to Tear Bar + Positive Adjustment	Print + BM Detection + Feed to Tear Bar	Print + BM Detection + Feed to Tear Bar + Positive Adjustment		
	/	Print + Feed to Tear Bar + Negative Adjustment	Print + BM Detection + Feed to Tear Bar	Print + BM Detection + Feed to Tear Bar + Negative Adjustment		
	@	Print	Print + BM Detection	Print + BM Detection		
	Omitted	Print + Feed to Tear Bar	Print + BM Detection + Feed to Tear Bar	Print + BM Detection + Feed to Tear Bar		
<ESC> T	+	Print + Feed to Tear Bar + Positive Adjustment	Print + BM Detection + Feed to Tear Bar	Print + BM Detection + Feed to Tear Bar + Positive Adjustment		
	-	Print + Feed to Tear Bar + Negative Adjustment	Print + BM Detection + Feed to Tear Bar	Print + BM Detection + Feed to Tear Bar + Negative Adjustment		
	@	Print	Print + BM Detection	Print + BM Detection		
	Omitted	Print + Feed to Tear Bar	Print + BM Detection + Feed to Tear Bar	Print + BM Detection + Feed to Tear Bar		
<ESC> J	+	Print + Positive Adjustment	Print + BM Detection + Positive Adjustment	Print + BM Detection + Positive Adjustment		
	-	Print	Print + BM Detection	Print + BM Detection		
	@	Print	Print + BM Detection	Print + BM Detection		
	Omitted	Print	Print + BM Detection	Print + BM Detection		

6. SPECIAL APPENDIX COMMAND LIST SUPPORTED BY MODEL FOR EACH I/F

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● Standard Commands

Class	Commands	Model Name						
		TSP800	TUP900	TSP1000	TSP828L	TUP500	TSP800II	
Format Settings	ESC C	Spe. A	Spe. A	Spe. A	Spe. B	Spe. B	Spe. B	
	ESC D	○	○	○	○	○	○	
	ESC L	Spe. A	Spe. B	Spe. B	Spe. C	Spe. D	Spe. D	
	ESC E	○	○	○	○	○	○	
	ESC P C	Spe. A	Spe. B	Spe. B	Spe. C	Spe. D	Spe. D	
	ESC Y	○	○	○	○	○	○	
	ESC P B	Spe. A	Spe. A	Spe. A	Spe. B	Spe. C	Spe. C	
	ESC B	○	○	○	○	○	○	
Data Setting	ESC X	○	○	○	○	○	○	
	ESC R C	○	○	○	○	○	○	
	ESC G	○	○	○	○	○	○	
	ESC R B	○	○	○	○	○	○	
	ESC Q	Spe. A	Spe. A	Spe. A	Spe. B	Spe. B	Spe. B	
	ESC H	Spe. A	Spe. A	Spe. A	Spe. B	Spe. B	Spe. B	
Other Settings	ESC F	○	○	○	○	○	○	
	ESC N	○	○	○	○	○	○	
	ESC Z	○	○	○	○	○	○	
	ESC GS =	×	×	×	×	○	○	
	ESC GS t	×	×	×	×	○	○	
	ESC RS d	×	Spe. A	Spe. A	Spe. B	Spe. C	Spe. D	
	ESC RS r	×	Spe. A	Spe. A	Spe. B	Spe. C	Spe. C	
Flash Memory Registration	ESC w	×	Spe. A	Spe. A	Spe. B	Spe. C	Spe. C	
	ESC r	×	○	○	○	○	○	
	ESC q	×	Spe. A	Spe. A	Spe. B	Spe. B	Spe. B	
	ESC h	×	Spe. A	Spe. A	Spe. B	Spe. B	Spe. B	
	ESC k	×	Spe. A	Spe. A	Spe. B	Spe. B	Spe. B	
	ESC FS q	×	○	○	○	○	○	
	ESC K	○	Spe. A	Spe. A	Spe. B	Spe. B	Spe. B	
	ESC RS L m	×	○ Ver. 5.0 or later	×	×	○ Ver. 4.0 or later	×	
Control Command	ESC I	○	○	○	○	○	○	
	ESC W	○	○	○	○	○	○	
	ESC GS #	Spe. A	Spe. B	Spe. B	Spe. B	Spe. B	Spe. B	
	ESC ?	○	○	○	○	○	○	
	ESC GS BEL	×	×	○	×	×	×	
	ESC GS SUB DC1	×	×	×	×	○	×	
	ESC GS SUB DC2	×	×	×	×	○	×	
	ESC GS SUB DC3	×	×	×	×	○	×	

Class	Commands	Model Name						
		TSP800	TUP900	TSP1000	TSP828L	TUP500	TSP800II	
Status	ESC RS a	Spe. A	Spe. B	Spe. B	Spe. B	Spe. C	Spe. C	
	ESC ACK SOH	○	○	○	○	○	○	
	ENQ	○	○	○	○	○	○	
	EOT	○	○	○	○	○	○	
	ESC ACK CAN	×	×	×	×	○	○	
	ETB	Spe. A	Spe. B	Spe. B	Spe. B	Spe. B	Spe. B	
	ESC RS E	×	○	○	○	○	○	
	ESC GS ETX	×	Ver. 5.0 or later	×	×	Ver. 2.0 or later	○	

● Presenter Related Commands

Class	Commands	Model Name						
		TSP800	TUP900	TSP1000	TSP828L	TUP500	TSP800II	
Presenter Related Commands	ESC ¥ 0	×	○	×	×	○	×	
	ESC ¥ 1	×	○	×	×	○	×	
	ESC ¥ 3	×	○	×	×	○	×	
	ESC ¥ 4	×	○	×	×	○	×	

● PDF417 commands

Class	Commands	Model Name						
		TSP800	TUP900	TSP1000	TSP828L	TUP500	TSP800II	
PDF417 Commands	ESC GS x S 0	×	Ver. 3.1 or later	○	○	○	○	
	ESC GS x S 1	×	Ver. 3.1 or later	○	○	○	○	
	ESC GS x S 2	×	Ver. 3.1 or later	○	○	○	○	
	ESC GS x S 3	×	Ver. 3.1 or later	○	○	○	○	
	ESC GS x D	×	Ver. 3.1 or later	○	○	○	○	
	ESC GS x T	×	Spe. A Ver. 3.1 or later	Spe. A	Spe. B	Spe. B	Spe. B	
	ESC GS x P	×	Ver. 3.1 or later	○	○	○	○	
	ESC GS x I	×	Ver. 3.1 or later	○	○	○	○	

● QR code commands

Class	Commands	Model Name						
		TSP800	TUP900	TSP1000	TSP828L	TUP500	TSP800II	
QR Code Commands	ESC GS y S 0	×	×	Ver. 1.2 or later	○	○	○	
	ESC GS y S 1	×	×	Ver. 1.2 or later	○	○	○	
	ESC GS y S 2	×	×	Ver. 1.2 or later	○	○	○	
	ESC GS y D 1	×	×	Ver. 1.2 or later	○	○	○	
	ESC GS y D 2	×	×	Ver. 1.2 or later	○	○	○	
	ESC GS y T	×	×	Spe. A Ver. 1.2 or later	Spe. B	Spe. B	Spe. B	
	ESC GS y P	×	×	Ver. 1.2 or later	○	○	○	
	ESC GS y I	×	×	Ver. 1.2 or later	○	○	○	

● Two-color print commands

Class	Commands	Model Name						
		TSP800	**TUP900**	**TSP1000**	**TSP828L**	**TUP500**	**TSP800II**	
Two-color Print	ESC RS C	×	x	X	Spe. A	Spe. B	Spe. B	

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● Standard Commands

Class	Commands	Model Name						
		TSP800	TUP900	TSP1000	TSP828L	TUP500	TSP800II	
Format Settings	ESC C	×	Spe. A	×	×	×	×	
	ESC D	×	○	×	×	×	×	
	ESC L	×	Spe. B	×	×	×	×	
	ESC E	×	○	×	×	×	×	
	ESC P C	×	Spe. B	×	×	×	×	
	ESC Y	×	○	×	×	×	×	
	ESC P B	×	Spe. A	×	×	×	×	
	ESC B	×	○	×	×	×	×	
Data Setting	ESC X	×	○	×	×	×	×	
	ESC R C	×	○	×	×	×	×	
	ESC G	×	○	×	×	×	×	
	ESC R B	×	○	×	×	×	×	
	ESC Q	×	Spe. A	×	×	×	×	
	ESC H	×	Spe. A	×	×	×	×	
Other Settings	ESC F	×	○	×	×	×	×	
	ESC N	×	○	×	×	×	×	
	ESC Z	×	○	×	×	×	×	
	ESC GS =	×	×	×	×	×	×	
	ESC GS t	×	×	×	×	×	×	
	ESC RS d	×	Spe. A	×	×	×	×	
	ESC RS r	×	Spe. A	×	×	×	×	
Flash Memory Registration	ESC w	×	Spe. A	×	×	×	×	
	ESC r	×	○	×	×	×	×	
	ESC q	×	Spe. A	×	×	×	×	
	ESC h	×	Spe. A	×	×	×	×	
	ESC k	×	Spe. A	×	×	×	×	
	ESC FS q	×	○ (*)	×	×	×	×	
	ESC K	×	Spe. A	×	×	×	×	
	ESC RS L m	×	○ Ver. 5.0 or later	×	×	×	×	
Control Command	ESC I	×	○	×	×	×	×	
	ESC W	×	○	×	×	×	×	
	ESC GS #	×	Spe. B (*)	×	×	×	×	
	ESC ?	×	○	×	×	×	×	
	ESC GS BEL	×	×	×	×	×	×	
	ESC GS SUB DC1	×	×	×	×	×	×	
	ESC GS SUB DC2	×	×	×	×	×	×	
	ESC GS SUB DC3	×	×	×	×	×	×	

Class	Commands	Model Name						
		TSP800	TUP900	TSP1000	TSP828L	TUP500	TSP800II	
Status	ESC RS a	×	×	×	×	×	×	
	ESC ACK SOH	×	×	×	×	×	×	
	ENQ	×	×	×	×	×	×	
	EOT	×	×	×	×	×	×	
	ESC ACK CAN	×	×	×	×	×	×	
	ETB	×	Spe. B	×	×	×	×	
	ESC RS E	×	○	×	×	×	×	
	ESC GS ETX	×	Ver. 5.0 or later	×	×	×	×	

● Presenter Related Commands

Class	Commands	Model Name						
		TSP800	TUP900	TSP1000	TSP828L	TUP500	TSP800II	
Presenter Related Commands	ESC ¥ 0	×	○	×	×	×	×	
	ESC ¥ 1	×	○	×	×	×	×	
	ESC ¥ 3	×	×	×	×	×	×	
	ESC ¥ 4	×	○	×	×	×	×	

(*) It is necessary to turn the printer off once, then turn it on again after resetting the printer because it will experience a hang up.

● PDF417 commands

Class	Commands	Model Name						
		TSP800	TUP900	TSP1000	TSP828L	TUP500	TSP800II	
PDF417 Commands	ESC GS x S 0	×	Ver. 3.1 or later	×	×	×	×	
	ESC GS x S 1	×	Ver. 3.1 or later	×	×	×	×	
	ESC GS x S 2	×	Ver. 3.1 or later	×	×	×	×	
	ESC GS x S 3	×	Ver. 3.1 or later	×	×	×	×	
	ESC GS x D	×	Ver. 3.1 or later	×	×	×	×	
	ESC GS x T	×	Spe. A Ver. 3.1 or later	×	×	×	×	
	ESC GS x P	×	Ver. 3.1 or later	×	×	×	×	
	ESC GS x I	×	Ver. 3.1 or later	×	×	×	×	

● QR code commands

Class	Commands	Model Name						
		TSP800	TUP900	TSP1000	TSP828L	TUP500	TSP800II	
QR Code Commands	ESC GS y S 0	×	×	×	×	×	×	
	ESC GS y S 1	×	×	×	×	×	×	
	ESC GS y S 2	×	×	×	×	×	×	
	ESC GS y D 1	×	×	×	×	×	×	
	ESC GS y D 2	×	×	×	×	×	×	
	ESC GS y T	×	×	×	×	×	×	
	ESC GS y P	×	×	×	×	×	×	
	ESC GS y I	×	×	×	×	×	×	

Two-color print commands

Class	Commands	Model Name						
		TSP800	**TUP900**	**TSP1000**	**TSP828L**	**TUP500**	**TSP800II**	
Two-color Print	ESC RS C	×	×	x	x	x	×	

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● Standard Commands

Class	Commands	Model Name						
		TSP800	TUP900	TSP1000	TSP828L	TUP500	TSP800II	
Format Settings	ESC C	Spe. A	Spe. A	Spe. A	Spe. B	Spe. B	Spe. B	
	ESC D		○	○	○	○	○	
	ESC L	Spe. A	Spe. B	Spe. B	Spe. C	Spe. D	Spe. D	
	ESC E		○	○	○	○	○	
	ESC P C	Spe. A	Spe. B	Spe. B	Spe. C	Spe. D	Spe. D	
	ESC Y		○	○	○	○	○	
	ESC P B	Spe. A	Spe. A	Spe. A	Spe. B	Spe. C	Spe. C	
	ESC B		○	○	○	○	○	
Data Setting	ESC X		○	○	○	○	○	
	ESC R C		○	○	○	○	○	
	ESC G		○	○	○	○	○	
	ESC R B		○	○	○	○	○	
	ESC Q	Spe. A	Spe. A	Spe. A	Spe. B	Spe. B	Spe. B	
	ESC H	Spe. A	Spe. A	Spe. A	Spe. B	Spe. B	Spe. B	
Other Settings	ESC F		○	○	○	○	○	
	ESC N		○	○	○	○	○	
	ESC Z		○	○	○	○	○	
	ESC GS =	×	×	×	×	○	○	
	ESC GS t	×	×	×	×	○	○	
	ESC RS d	×	Spe. A	Spe. A	Spe. B	Spe. C	Spe. D	
	ESC RS r	×	Spe. A	Spe. A	Spe. B	Spe. C	Spe. C	
Flash Memory Registration	ESC w	×	Spe. A	Spe. A	Spe. B	Spe. C	Spe. C	
	ESC r	×	○	○	○	○	○	
	ESC q	×	Spe. A	Spe. A	Spe. B	Spe. B	Spe. B	
	ESC h	×	Spe. A	Spe. A	Spe. B	Spe. B	Spe. B	
	ESC k	×	Spe. A	Spe. A	Spe. B	Spe. B	Spe. B	
	ESC FS q	×	○	○	○	○	○	
	ESC K		Spe. A	Spe. A	Spe. B	Spe. B	Spe. B	
	ESC RS L m	×	○ Ver. 5.0 or later	×	×	○ Ver. 4.0 or later	×	
Control Command	ESC I		○	○	○	○	○	
	ESC W		○	○	○	○	○	
	ESC GS #	Spe. A	Spe. B	Spe. B	Spe. B	Spe. B	Spe. B	
	ESC ?		○	○	○	○	○	
	ESC GS BEL	×	×	○	×	×	×	
	ESC GS SUB DC1	×	×	×	×	○	×	
	ESC GS SUB DC2	×	×	×	×	○	×	
	ESC GS SUB DC3	×	×	×	×	○	×	

Class	Commands	Model Name						
		TSP800	**TUP900**	**TSP1000**	**TSP828L**	**TUP500**	**TSP800II**	
Status	ESC RS a	Spe. A	Spe. B	Spe. B	Spe. B	Spe. C	Spe. C	
	ESC ACK SOH		○	○	○	○	○	
	ENQ		○	○	○	○	○	
	EOT		○	○	○	○	○	
	ESC ACK CAN	×	×	×	×	○	○	
	ETB	Spe. A Ver. 5.0 or later	Spe. B	Spe. B	Spe. B	Spe. B	Spe. B	
	ESC RS E	×	○	○	○	○	○	
	ESC GS ETX	×	Ver. 5.0 or later	×	×	Ver. 2.0 or later	○	

● Presenter Related Commands

Class	Commands	Model Name						
		TSP800	**TUP900**	**TSP1000**	**TSP828L**	**TUP500**	**TSP800II**	
Presenter Related Commands	ESC ¥ 0	×	○	×	×	○	×	
	ESC ¥ 1	×	○	×	×	○	×	
	ESC ¥ 3	×	○	×	×	○	×	
	ESC ¥ 4	×	○	×	×	○	×	

● PDF417 commands

Class	Commands	Model Name						
		TSP800	**TUP900**	**TSP1000**	**TSP828L**	**TUP500**	**TSP800II**	
PDF417 Commands	ESC GS x S 0	×	Ver. 3.1 or later	○	○	○	○	
	ESC GS x S 1	×	Ver. 3.1 or later	○	○	○	○	
	ESC GS x S 2	×	Ver. 3.1 or later	○	○	○	○	
	ESC GS x S 3	×	Ver. 3.1 or later	○	○	○	○	
	ESC GS x D	×	Ver. 3.1 or later	○	○	○	○	
	ESC GS x T	×	Spe. A Ver. 3.1 or later	Spe. A	Spe. B	Spe. B	Spe. B	
	ESC GS x P	×	Ver. 3.1 or later	○	○	○	○	
	ESC GS x I	×	Ver. 3.1 or later	○	○	○	○	

- QR code commands

Class	Commands	Model Name						
		TSP800	**TUP900**	**TSP1000**	**TSP828L**	**TUP500**	**TSP800II**	
QR Code Commands	ESC GS y S 0	×	×	Ver. 1.2 or later		○	○	
	ESC GS y S 1	×	×	Ver. 1.2 or later		○	○	
	ESC GS y S 2	×	×	Ver. 1.2 or later		○	○	
	ESC GS y D 1	×	×	Ver. 1.2 or later		○	○	
	ESC GS y D 2	×	×	Ver. 1.2 or later		○	○	
	ESC GS y T	×	×	Spe. A Ver. 1.2 or later	Spe. B	Spe. B	Spe. B	
	ESC GS y P	×	×	Ver. 1.2 or later		○	○	
	ESC GS y I	×	×	Ver. 1.2 or later		○	○	

- 2-color Printing Related command

Class	Commands	Model Name						
		TSP800	**TUP900**	**TSP1000**	**TSP828L**	**TUP500**	**TSP800II**	
2-color Printing Related	ESC RS C	x	x	x	Spe. A	Spe. B	Spe. B	

= USB Mode by Model =

	USB Mode		
	Mode 0	**Mode 1**	**Mode 2**
TSP800	×	Ver. 5.0 or later	Ver. 5.0 or later
TUP900	○	○	○
TSP1000	×	○	○
TSP828L	×	○	○
TUP500	×	○	○
TSP800II	×	○	○

The status acquisition command is ignored in Modes 0 and 1.

(*)

The status request command is ignored on the following models for USB printer class.

TSP800, TUP900, TSP1000 and TSP828L

6-4 Ethernet I/F

● Standard Commands

Class	Commands	Model Name						
		TSP800	**TUP900**	**TSP1000**	**TSP828L**	**TUP500**	**TSP800II**	
Format Settings	ESC C	Ver. 7.3 or later Spe. A	×	Spe. A	Spe. B	Spe. B	Spe. B	
	ESC D	Ver. 7.3 or later	×	○	○	○	○	
	ESC L	Ver. 7.3 or later Spe. A	×	Spe. B	Spe. C	Spe. D	Spe. D	
	ESC E	Ver. 7.3 or later	×	○	○	○	○	
	ESC P C	Spe. A	×	Spe. B	Spe. C	Spe. D	Spe. D	
	ESC Y	Ver. 7.3 or later	×	○	○	○	○	
	ESC P B	Ver. 7.3 or later Spe. A	×	Spe. A	Spe. B	Spe. C	Spe. C	
	ESC B	Ver. 7.3 or later	×	○	○	○	○	
Data Setting	ESC X	Ver. 7.3 or later	×	○	○	○	○	
	ESC R C	Ver. 7.3 or later	×	○	○	○	○	
	ESC G	Ver. 7.3 or later	×	○	○	○	○	
	ESC R B	Ver. 7.3 or later	×	○	○	○	○	
	ESC Q	Ver. 7.3 or later Spe. A	×	Spe. A	Spe. B	Spe. B	Spe. B	
	ESC H	Ver. 7.3 or later Spe. A	×	Spe. A	Spe. B	Spe. B	Spe. B	
Other Settings	ESC F	Ver. 7.3 or later	×	○	○	○	○	
	ESC N	Ver. 7.3 or later	×	○	○	○	○	
	ESC Z	Ver. 7.3 or later	×	○	○	○	○	
	ESC GS =	×	×	×	×	○	○	
	ESC GS t	×	×	×	×	○	○	
	ESC RS d	×	×	Spe. A	Spe. B	Spe. C	Spe. D	
	ESC RS r	×	×	Spe. A	Spe. B	Spe. B	Spe. B	

Class	Commands	Model Name						
		TSP800	TUP900	TSP1000	TSP828L	TUP500	TSP800II	
Flash Memory Registration	ESC w	×	×	Spe. A	Spe. B	Spe. C	Spe. C	
	ESC r	×	×	○	○	○	○	
	ESC q	×	×	Spe. A	Spe. B	Spe. B	Spe. B	
	ESC h	×	×	Spe. A	Spe. B	Spe. B	Spe. B	
	ESC k	×	×	Spe. A	Spe. B	Spe. B	Spe. B	
	ESC FS q	×	×	○	○	○	○	
	ESC K	Ver. 7.3 or later	×	Spe. A	Spe. B	Spe. B	Spe. B	
	ESC RS L m	×	○ Ver. 5.0 or later	×	×	○ Ver. 4.0 or later	×	
Control Command	ESC I	Ver. 7.3 or later	×	○	○	○	○	
	ESC W	Ver. 7.3 or later	×	○	○	○	○	
	ESC GS #	Ver. 7.3 or later Spe. A	×	Spe. B	Spe. B	Spe. B	Spe. B	
	ESC ?	Ver. 7.3 or later	×	○	○	○	○	
	ESC GS BEL	×	×	○	×	×	×	
	ESC GS SUB DC1	×	×	×	×	○	×	
	ESC GS SUB DC2	×	×	×	×	○	×	
	ESC GS SUB DC3	×	×	×	×	○	×	
Status	ESC RS a	Ver. 7.3 or later Spe. A	×	×	×	Ver. 2.0 or later Spe. C	Spe. C	
	ESC ACK SOH	Ver. 7.3 or later	×	○	○	○	○	
	ENQ	Ver. 7.3 or later	×	○	○	○	○	
	EOT	Ver. 7.3 or later	×	○	○	○	○	
	ESC ACK CAN	×	×	×	×	○	○	
	ETB	Ver. 7.3 or later Spe. A	×	Spe. B	Spe. B	Spe. B	Spe. B	
	ESC RS E	×	×	○	○	○	○	
	ESC GS ETX	×	×	×	×	Ver. 2.0 or later	○	

● Presenter Related Commands

Class	Commands	Model Name						
		TSP800	TUP900	TSP1000	TSP828L	TUP500	TSP800II	
Presenter Related Commands	ESC ¥ 0	×	×	×	×	○	×	
	ESC ¥ 1	×	×	×	×	○	×	
	ESC ¥ 3	×	×	×	×	○	×	
	ESC ¥ 4	×	×	×	×	○	×	

● PDF417 commands

Class	Commands	Model Name						
		TSP800	TUP900	TSP1000	TSP828L	TUP500	TSP800II	
PDF417 Commands	ESC GS x S 0	×	×	O	O	O	O	
	ESC GS x S 1	×	×	O	O	O	O	
	ESC GS x S 2	×	×	O	O	O	O	
	ESC GS x S 3	×	×	O	O	O	O	
	ESC GS x D	×	×	O	O	O	O	
	ESC GS x T	×	×	O	O	O	O	
	ESC GS x P	×	×	O	O	O	O	
	ESC GS x I	×	×	O	O	O	O	

● QR code commands

Class	Commands	Model Name						
		TSP800	TUP900	TSP1000	TSP828L	TUP500	TSP800II	
QR Code Commands	ESC GS y S 0	×	×	Ver. 1.2 or later	O	O	O	
	ESC GS y S 1	×	×	Ver. 1.2 or later	O	O	O	
	ESC GS y S 2	×	×	Ver. 1.2 or later	O	O	O	
	ESC GS y D 1	×	×	Ver. 1.2 or later	O	O	O	
	ESC GS y D 2	×	×	Ver. 1.2 or later	O	O	O	
	ESC GS y T	×	×	Ver. 1.2 or later	O	O	O	
	ESC GS y P	×	×	Ver. 1.2 or later	O	O	O	
	ESC GS y I	×	×	Ver. 1.2 or later	O	O	O	

● Two-color print commands

Class	Commands	Model Name						
		TSP800	TUP900	TSP1000	TSP828L	TUP500	TSP800II	
Two-color Print	ESC RS C	×	×	X	Spe. A	Spe. B	Spe. B	

6-5 Wireless LAN I/F

● Standard Commands

Class	Commands	Model Name						
		TSP800	**TUP900**	**TSP1000**	**TSP828L**	**TUP500**	**TSP800II**	
Format Settings	ESC C	Ver. 7.3 or later Spe. A	×	Spe. A	×	×	×	
	ESC D	Ver. 7.3 or later	×	○	×	×	×	
	ESC L	Ver. 7.3 or later Spe. A	×	Spe. B	×	×	×	
	ESC E	Ver. 7.3 or later	×	○	×	×	×	
	ESC P C	Spe. A	×	Spe. B	×	×	×	
	ESC Y	Ver. 7.3 or later	×	○	×	×	×	
	ESC P B	Ver. 7.3 or later Spe. A	×	Spe. A	×	×	×	
	ESC B	Ver. 7.3 or later	×	○	×	×	×	
Data Setting	ESC X	Ver. 7.3 or later	×	○	×	×	×	
	ESC R C	Ver. 7.3 or later	×	○	×	×	×	
	ESC G	Ver. 7.3 or later	×	○	×	×	×	
	ESC R B	Ver. 7.3 or later	×	○	×	×	×	
	ESC Q	Ver. 7.3 or later Spe. A	×	Spe. A	×	×	×	
	ESC H	Ver. 7.3 or later Spe. A	×	Spe. A	×	×	×	
Other Settings	ESC F	Ver. 7.3 or later	×	○	×	×	×	
	ESC N	Ver. 7.3 or later	×	○	×	×	×	
	ESC Z	Ver. 7.3 or later	×	○	×	×	×	
	ESC GS =	×	×	×	×	×	×	
	ESC GS t	×	×	×	×	×	×	
	ESC RS d	×	×	Spe. A	×	×	×	
	ESC RS r	×	×	Spe. A	×	×	×	

Class	Commands	Model Name						
		TSP800	TUP900	TSP1000	TSP828L	TUP500	TSP800II	
Flash Memory Registration	ESC w	×	×	Spe. A	×	×	×	
	ESC r	×	×	○	×	×	×	
	ESC q	×	×	Spe. A	×	×	×	
	ESC h	×	×	Spe. A	×	×	×	
	ESC k	×	×	Spe. A	×	×	×	
	ESC FS q	×	×	○	×	×	×	
	ESC K	Ver. 7.3 or later	×	Spe. A	×	×	×	
	ESC RS L m	×	×	×	×	×	×	
Control Command	ESC I	Ver. 7.3 or later	×	○	×	×	×	
	ESC W	Ver. 7.3 or later	×	○	×	×	×	
	ESC GS #	Ver. 7.3 or later Spe. A	×	Spe. B	×	×	×	
	ESC ?	Ver. 7.3 or later	×	○	×	×	×	
	ESC GS BEL	×	×	○	×	×	×	
	ESC GS SUB DC1	×	×	×	×	×	×	
	ESC GS SUB DC2	×	×	×	×	×	×	
	ESC GS SUB DC3	×	×	×	×	×	×	
Status	ESC RS a	Ver. 7.3 or later Spe. A	×	×	×	×	×	
	ESC ACK SOH	Ver. 7.3 or later	×	○	×	×	×	
	ENQ	Ver. 7.3 or later	×	○	×	×	×	
	EOT	Ver. 7.3 or later	×	○	×	×	×	
	ESC ACK CAN	×	×	×	×	×	×	
	ETB	Ver. 7.3 or later Spe. A	×	Spe. B	×	×	×	
	ESC RS E	×	×	○	×	×	×	
	ESC GS ETK	×	×	×	×	×	×	

● Presenter Related Commands

Class	Commands	Model Name						
		TSP800	TUP900	TSP1000	TSP828L	TUP500	TSP800II	
Presenter Related Commands	ESC ¥ 0	×	×	×	×	×	×	
	ESC ¥ 1	×	×	×	×	×	×	
	ESC ¥ 3	×	×	×	×	×	×	
	ESC ¥ 4	×	×	×	×	×	×	

● PDF417 commands

Class	Commands	Model Name						
		TSP800	**TUP900**	**TSP1000**	**TSP828L**	**TUP500**	**TSP800II**	
PDF417 Commands	ESC GS x S 0	×	×	○	×	×	×	
	ESC GS x S 1	×	×	○	×	×	×	
	ESC GS x S 2	×	×	○	×	×	×	
	ESC GS x S 3	×	×	○	×	×	×	
	ESC GS x D	×	×	○	×	×	×	
	ESC GS x T	×	×	○	×	×	×	
	ESC GS x P	×	×	○	×	×	×	
	ESC GS x I	×	×	○	×	×	×	

● QR code commands

Class	Commands	Model Name						
		TSP800	**TUP900**	**TSP1000**	**TSP828L**	**TUP500**	**TSP800II**	
QR Code Commands	ESC GS y S 0	×	×	Ver. 1.2 or later	×	×	×	
	ESC GS y S 1	×	×	Ver. 1.2 or later	×	×	×	
	ESC GS y S 2	×	×	Ver. 1.2 or later	×	×	×	
	ESC GS y D 1	×	×	Ver. 1.2 or later	×	×	×	
	ESC GS y D 2	×	×	Ver. 1.2 or later	×	×	×	
	ESC GS y T	×	×	Ver. 1.2 or later	×	×	×	
	ESC GS y P	×	×	Ver. 1.2 or later	×	×	×	
	ESC GS y I	×	×	Ver. 1.2 or later	×	×	×	

● Two-color print commands

Class	Commands	Model Name						
		TSP800	**TUP900**	**TSP1000**	**TSP828L**	**TUP500**	**TSP800II**	
Two-color Print	ESC RS C	×	×	×	×	×	×	