TOSHIBA

TOSHIBA Bar Code Printer

B-SX6T/SX8T-TS12-QM-R/TS12-CN

External Equipment Interface Specification

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1. SCOPE

This specification applies to the external equipment interface for use with the general-purpose bar code printer.

1.1 APPLICABLE MODEL

B-SX6T-TS12-QM-R, B-SX6T-TS12-CN (hereinafter referred to as “B-SX6T”)

B-SX8T-TS12-QM-R, B-SX8T-TS12-CN (hereinafter referred to as “B-SX8T”)

2. GENERAL DESCRIPTION

The external equipment interface connects the printer to the host computer through a serial interface (RS-232C/USB), parallel interface (Centronics), or a network for making various settings and printing labels.

This specification describes how to use the external equipment interface for the TEC Printer Command Language (TPCL).

The following table shows the system configuration and difference between the above-mentioned two models.

<table>
<tr><td colspan="3"></td><td>B-SX6T</td><td>B-SX8T</td></tr>
<tr><td colspan="3">Print head type</td><td colspan="2">305 dpi (12 dots/mm)</td></tr>
<tr><td rowspan="3">Memory</td><td colspan="2">Flash ROM</td><td colspan="2">16 MB × 1 = 16 MB</td></tr>
<tr><td rowspan="2">SDRAM</td><td>Whole</td><td colspan="2">16 MB × 1 = 16 MB</td></tr>
<tr><td>Image buffer of whole SDRAM</td><td colspan="2">5 MB</td></tr>
<tr><td colspan="3">RS-232C</td><td colspan="2">Option</td></tr>
<tr><td colspan="3">Centronics</td><td colspan="2">Standard</td></tr>
<tr><td colspan="3">USB</td><td colspan="2">Standard</td></tr>
<tr><td colspan="3">Expansion I/O</td><td colspan="2">Option</td></tr>
<tr><td colspan="3">100BASE LAN board</td><td colspan="2">Standard</td></tr>
<tr><td colspan="3">Cutter module</td><td colspan="2">Option</td></tr>
<tr><td colspan="3">Strip module</td><td colspan="2">Option</td></tr>
<tr><td colspan="3">Wireless LAN module</td><td colspan="2">Option</td></tr>
<tr><td colspan="3">Ribbon saving module</td><td>Option</td><td>Standard</td></tr>
<tr><td colspan="3">RFID module</td><td colspan="2">Option</td></tr>
</table>

3. INTERFACE

3.1 SERIAL INTERFACE

(1)	Type:	Conforming to RS-232C
(2)	Communication Mode:	Full duplex
(3)	Transmission Speed:	2400 bps 4800 bps 9600 bps 19200 bps 38400 bps 115200 bps
(4)	Synchronization Method:	Start-stop synchronization
(5)	Start Bit:	1 bit
(6)	Stop Bit:	1 bit 2 bits
(7)	Data Length:	7 bits 8 bits
(8)	Parity:	None Even Odd
(9)	Error Detection:	Parity error: Vertical parity error check Framing error: This error occurs if no stop bit is found in the frame specified starting with the start bit.
(10)	Protocol:	No-procedure method
(11)	Data Input Code:	ASCII code European character set 8 bit code Graphics 8 bit code JIS 8 code Shift JIS Kanji code JIS Kanji code UTF-8
(12)	Receive Buffer:	1 MB * The use of the receive buffer is shared between interfaces.

(13) Flow Control: XON/XOFF (DC1/DC3) Protocol
READY/BUSY (DTR) Protocol
XON/XOFF (DC1/DC3) Protocol + READY/BUSY (DTR) Protocol
READY/BUSY (RTS) Protocol

① XON/XOFF (DC1/DC3) Protocol

- When initialized after the power is turned on, this printer becomes ready to receive data and sends an XON code (11H). (Transmission or non-transmission of the XON code is selectable by means of the parameter setting.)
- The printer sends an XOFF code (13H) when the free space of the receive buffer becomes 10K bytes or less.
- The printer sends an XON code (11H) when the free space of the receive buffer becomes 512K bytes or more.
- After the receive buffer has become full, the printer discards data received, without storing it in the buffer. (After detecting the XOFF code, the host computer must stop transmission before the printer receive buffer becomes full.)
- The printer sends an XOFF code (13H) when the power is off. (Transmission or non-transmission of the XOFF code is selectable by means of the parameter setting.)
- The DTR signal is always “High” (READY).
- The RTS signal is always “High”.

② READY/BUSY (DTR) Protocol

- When initialized after the power is turned on, this printer becomes ready to receive data and turns the DTR signal to “High” level (READY).
- The printer turns the DTR signal to “Low” level (BUSY) when the free space of the receive buffer becomes 10K bytes or less.
- The printer turns the DTR signal to “High” level (READY) when the free space of the receive buffer becomes 512K bytes or more.
- After the receive buffer has become full, the printer discards data received, without storing it in the buffer. (After detecting the BUSY signal, the host computer must stop transmission before the printer receive buffer becomes full.)
- The RTS signal is always “High”.

③ XON/XOFF (DC1/DC3) Protocol + READY/BUSY (DTR) Protocol

- When initialized after the power is turned on, this printer becomes ready to receive data and turns the DTR signal to “High” level (READY). The printer also sends an XON code (11H).
- When the free space of the receive buffer becomes 10K bytes or less, the printer turns the DTR signal to “Low” level (BUSY) and sends an XOFF code (13H).
- When the free space of the receive buffer becomes 512K bytes or more, the printer turns the DTR signal to “High” level (READY) and sends an XON code (11H).
- After the receive buffer has become full, the printer discards data received, without storing it in the buffer. (After detecting the XOFF code or BUSY signal, the host computer must stop transmission before the printer receive buffer becomes full.)
- The printer sends an XOFF code (13H) when the power is off.
- The RTS signal is always “High”.

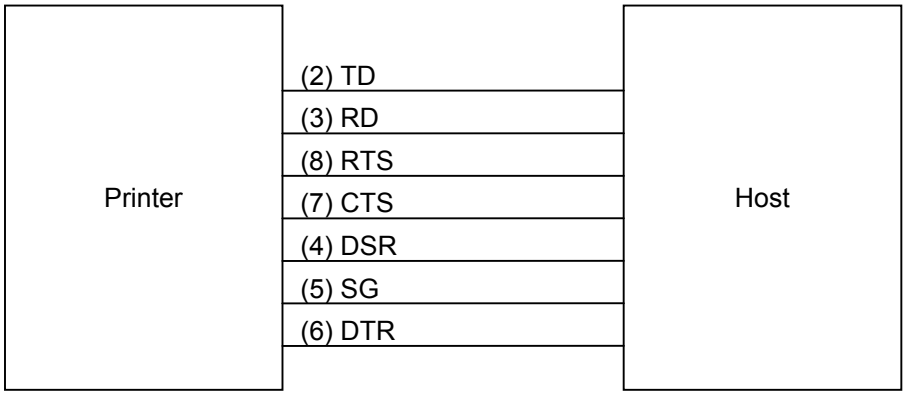
④ READY/BUSY (RTS) Protocol

- When initialized after the power is turned on, this printer turns the RTS signal to “High” (READY).
- The printer turns the RTS signal to “Low” (BUSY) when the free space of the receive buffer becomes 10K bytes or less.
- The printer turns the RTS signal to “High” (READY) when the free space of the receive buffer becomes 512K bytes or more.
- After the receive buffer has become full, the printer discards data received, without storing it in the buffer. (After detecting the BUSY signal, the host computer must stop transmission before the printer receive buffer becomes full.)
- The DTR signal is always “High” (READY).
- The DSR signal from the host must always be “High”.

* When the flow control is performed with a Windows PC, “READY/BUSY (RTS) protocol” should be selected, and “Hardware” should be selected for the flow control in the Windows communication port setting.

NOTE: *For “READY/BUSY (DTR) protocol”, data should be sent in 200 ms after the DTR signal is turned to “High” (READY). For “READY/BUSY (RTS) protocol”, data should be sent in 200 ms after the RTS signal is turned to “High” (READY).*

(14) Input/Output Signals

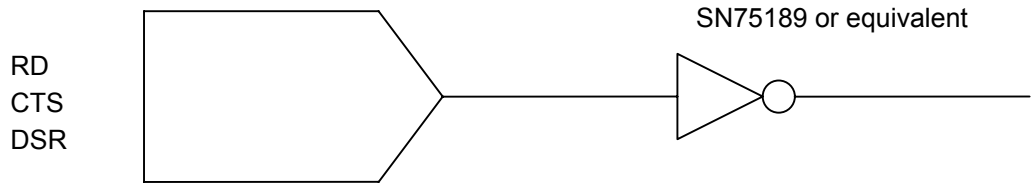


(15) Connector Pin Assignment and Signal Description

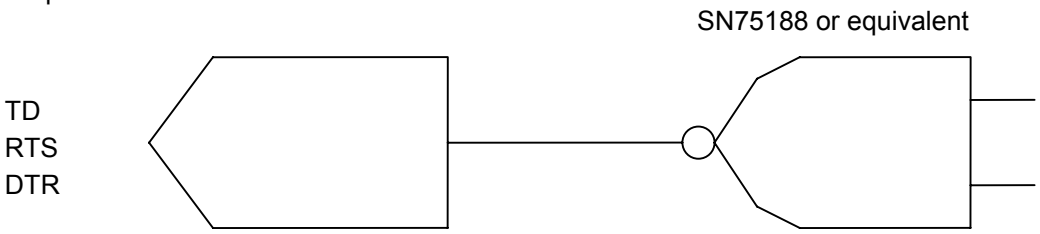
Pin No.	Signal Name	Function	Signal Direction
1	(N. C)		
2	TD	• Line for data which the printer sends to the host. • Logic 1 is a Low level, while logic 0 is a High level. • It is in the Low (Mark) state when no transmission is in progress.	Printer →
3	RD	• Line for data which the printer receives from the host. • Logic 1 is a Low level, while logic 0 is a High level. • It is in the Low (Mark) state when no transmission is in progress.	← Host
4	DSR	• Input signal from the host. • For the printer to receive data, it must be at “High” level.	← Host
5	SG	• Ground line for all data and control signals.	
6	DTR	• Output signal to the host. For the READY/BUSY (DTR) protocol or XON/XOFF (DC1/DC3) protocol + READY/BUSY (DTR) protocol: • It indicates the ready state for the received data. • It is at “Low” level when the receive buffer is near full, and at “High” level when near empty. For the XON/XOFF (DC1/DC3) protocol or READY/BUSY (RTS) protocol: • After the power is turned on, it is always at “High”.	Printer →
7	CTS	• Input signal from the host. • For the printer to send data, it must be at “High” level.	← Host
8	RTS	• Output signal to the host. For the READY/BUSY (RTS) protocol: • It indicates the ready state for the received data. • It is at “Low” when the receive buffer is nearly full, and at “High” when nearly empty. For protocol other than the READY/BUSY (RTS) protocol: • After the power is turned on, it is always at “High” level.	Printer →
9	(N. C)		

(16) Interface Circuit

- Input Circuit



- Output Circuit



- Signal Levels

Input Voltage H ..... +3 to +15 V
L ..... −3 to −15 V

Output Voltage H ..... +6 to +13 V
L ..... −6 to −13 V

3.2 PARALLEL INTERFACE

(1) Type: Centronics

(2) Mode: Conforms to IEEE1284 Compatibility mode and Nibble mode

(3) Data Input Method: Parallel 8 bits (DATA1 to 8)

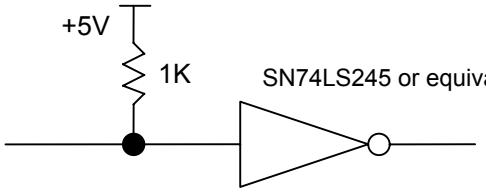
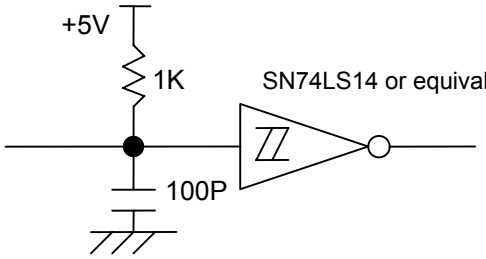
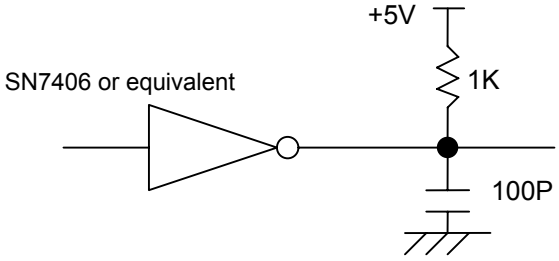
(4) Control Signals:

Compatibility mode	Nibble mode
nStrobe	HostClk
nAck	PrtClk
Busy	PtrBusy
PError	AckDataReq
Select	Xflag
nAutoFd	HostBusy
nInit	nInit
nFault	nDataAvail
nSelectIn	IEEE1284Active

(5) Data Input Code: ASCII code
European character set 8 bit code
Graphics 8 bit code
JIS 8 code
Shift JIS Kanji code
JIS Kanji code
UTF-8

(6) Receive Buffer: 1 MB
* The use of the receive buffer is shared between interfaces.

(7) Input/Output Circuit Configuration and Input/Output Conditions:

	Signal	Configuration	
Input	DATA1 to 8		Logic level (Input) "1" = 2 to 5 V "0" = 0 to 0.4 V
	nStrobe/HostClk nInit/nInit/ nAutoFd/HostBusy/ nSelectIn/IEEE1284Active		
Output	Busy/PtrBusy/ nFault/nDataAvail nAck/PtrClk Select/Xflag PError/AckDataReq		Logic level (Input) "1" = 2.4 to 5 V "0" = 0 to 0.4 V

(8) Connector:

Printer

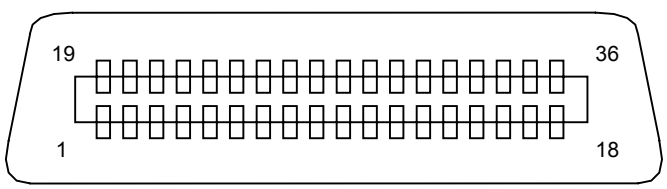
Amp. Japan	552742-1 or equivalent
DDK	57RE-40360-73B or equivalent

Cable

Amp. Japan	552470-1 or equivalent
DDK	57E-30360 or equivalent

(9) Connector Pin Diagram (IEEE1284-B Connector):

Pin No.	Signal Name	
	Compatibility Mode	Nibble mode
1	nStrobe	HostClk
2	Data 1	Data 1
3	Data 2	Data 2
4	Data 3	Data 3
5	Data 4	Data 4
6	Data 5	Data 5
7	Data 6	Data 6
8	Data 7	Data 7
9	Data 8	Data 8
10	nAck	PtrClk
11	Busy	PtrBusy
12	PError	AckDataReq
13	Select	Xflag
14	nAutoFd	HostBusy
15	NC	NC
16	0V	0V
17	CHASSIS GND	CHASSIS GND
18	+5V (for detection)	+5V (for detection)
19	TWISTED PAIR GND (PIN1)	TWISTED PAIR GND (PIN1)
20	TWISTED PAIR GND (PIN2)	TWISTED PAIR GND (PIN2)
21	TWISTED PAIR GND (PIN3)	TWISTED PAIR GND (PIN3)
22	TWISTED PAIR GND (PIN4)	TWISTED PAIR GND (PIN4)
23	TWISTED PAIR GND (PIN5)	TWISTED PAIR GND (PIN5)
24	TWISTED PAIR GND (PIN6)	TWISTED PAIR GND (PIN6)
25	TWISTED PAIR GND (PIN7)	TWISTED PAIR GND (PIN7)
26	TWISTED PAIR GND (PIN8)	TWISTED PAIR GND (PIN8)
27	TWISTED PAIR GND (PIN9)	TWISTED PAIR GND (PIN9)
28	TWISTED PAIR GND (PIN10)	TWISTED PAIR GND (PIN10)
29	TWISTED PAIR GND (PIN11)	TWISTED PAIR GND (PIN11)
30	TWISTED PAIR GND (PIN31)	TWISTED PAIR GND (PIN31)
31	nInit	nInit
32	nFault	nDataAvail
33	0V	0V
34	NC	NC
35	NC	NC
36	nSelectIn	IEEE1284Active



(10) Input/Output Signals :

Compatibility mode

① Data 1 to 8 (Printer ← Host)

- Input data signals for the 1st to 8th bits.
- Logic 1 is “High” level.
- Min. data pulse width of 2.5 µsec.

② nStrobe (Printer ← Host)

- Synchronizing signal for reading the above data.
- Normally at “High” level. The data is read at the rise of the Low level pulse.
- Minimum data pulse width of 0.5 µsec.

③ Busy (Printer → Host)

- This signal indicates that the printer is in a Busy state.
- When initialized after the power is turned on, the printer becomes ready to receive data and turns the signal to “Low” level.
- The signal turns to “High” level (in a Busy state) when data is set from the host (at the fall of the nStrobe signal).
- The signal turns to “Low” level when the printer reads the data.
- When the free space of the receive buffer becomes 512 bytes or less, the printer keeps the signal at “High” level (in a Busy state) for 10 seconds when data is set from the host, to extend the data read interval.
- When the receive buffer has become full, the printer stops reading data. When data is set from the host, then, it keeps the signal at “High” level (in a Busy state) until the receive buffer has a free space.
- The signal is kept at “High” level (in a Busy state) until one of the following states is cleared.
  - PAUSE state caused by the [PAUSE] key
  - Paper end state
  - Ribbon end state
  - Head open state
  - Printer error state
  - Initialization in progress upon receipt of the nInit signal

④ nAck (Printer → Host)

- This signal indicates that the printer has read the data set by the host and is ready to receive the next data.
- The signal is normally at “High”. It is at “Low” for about 5 µsec. after the fall of the BUSY signal. The host should usually set data after the ACK signal is turned from “Low” to “High”.
- If the nAck signal is ignored and the next data is set while the nAck signal is Low, the “LOW” level continues about further 5 µsec at the fall of the BUSY signal. However, the data can be received properly.

⑤ nInit (Printer ← Host)

- Reset request signal from the host.
- Normally at “High” level. An input of this signal at “Low” level causes the printer to be initialized in the same manner as when the power is turned on.

  * When “Reset process when the nInit signal is ON” is set to “OFF” in the parameter setting in the system mode, the printer is not initialized even if it receives this signal at low level.
- When the nInit signal is input during printing, the printer completes printing one tag/label which is being printed, cancels the next processing, then is initialized in the same manner as when the power is turned on.

  * When “Reset process when the nInit signal is ON” is set to “OFF” in the parameter setting in the system mode, the next process proceeds without being canceled.
- Minimum pulse width of 0.5 µsec.

⑥ Select (Printer → Host)

- This is an output signal which indicates whether the printer is in Pause state or placed online. The printer can receive data while placed online.
- The signal is at “Low” level while the printer is in a Pause state.
- The signal is kept at “Low” level (in a Pause state) until one of the following states is cleared.
  - Pause state caused by the [PAUSE] key
  - Paper end state
  - Ribbon end state
  - Head open state
  - Printer error state
  - Initialization in progress upon power on or receipt of the nInit signal

⑦ nFault (Printer → Host)

- Output signal indicating that the printer is in a Fault state.
- At “Low” level while the printer is in a Fault state.
- The signal is kept at “Low” level (in a Fault state) until one of the following states is cleared.
  - Pause state caused by the [PAUSE] key
  - Paper end state
  - Ribbon end state
  - Head open state
  - Printer error state
  - Initialization in progress upon power on or receipt of the nInit signal

⑧ PError (Printer → Host)

- Output signal indicating a label end or ribbon end state.
- At “High” level when the printer is in a label end or ribbon end state.
- Turns to “Low” level when the label end or ribbon end state is cleared.

⑨ +5 V

- This is not a signal but a +5 V power supply voltage.
- The maximum current of 500 mA can be taken out.

⑩ nSelectIn (Printer ← Host)

- Not used

⑪ nAutoFd (Printer ← Host)

- Not used

Nibble mode

① PtrClk (Printer → Host)

- Reverse data transfer phase: It is used for evaluating data sent to the host.
- Reverse idle phase: When the printer changes the signal from Low to High, an interrupt informing the host that the data is available, occurs

② PtrBusy (Printer → Host)

- Reverse data transfer phase: Data bit 3 is used for the first transfer. Data bit 7 is used for the second transfer. Indicates the forward channel is in a Busy state.

③ AckDataReq (Printer → Host)

- Reverse data transfer phase: Data bit 2 is used for the first transfer. Data bit 6 is used for the second transfer.
- Reverse idle phase: This signal is set to high until the data transfer is requested by the host. Then, the process is performed according to the nDataAvail signal.

④ Xflag (Printer ← Host)

- Reverse data transfer phase: Data bit 1 is used for the first transfer. Data bit 5 is used for the second transfer.

⑤ HostBusy (Printer ← Host)

- Reverse data transfer phase: It indicates that the host can receive data from the printer by setting the signal to low. Then, the host sets the signal to high, and sends the Ack indicating that the nibble data is received. When the signal is set to low after one reverse channel data transfer is performed, the interface phase changes to the idle phase. At that time, there is no available data on the printer.
- Reverse idle phase: When this signal is set to high according to the low pulse of the PtrClk signal, the host enters the reverse data transfer phase again. If this signal is set to high when the IEEE1284 Active signal is low, the IEEE1284 idle phase stops, and the interface enters the Compatibility mode.

⑥ nDataAvail (Printer → Host)

- Reverse data transfer phase: When the signal is low, it indicates the printer has data to be sent to the host. And it is used for sending data bits 0 and 4.
- Reverse idle phase: It is used for indicating that the data is available.

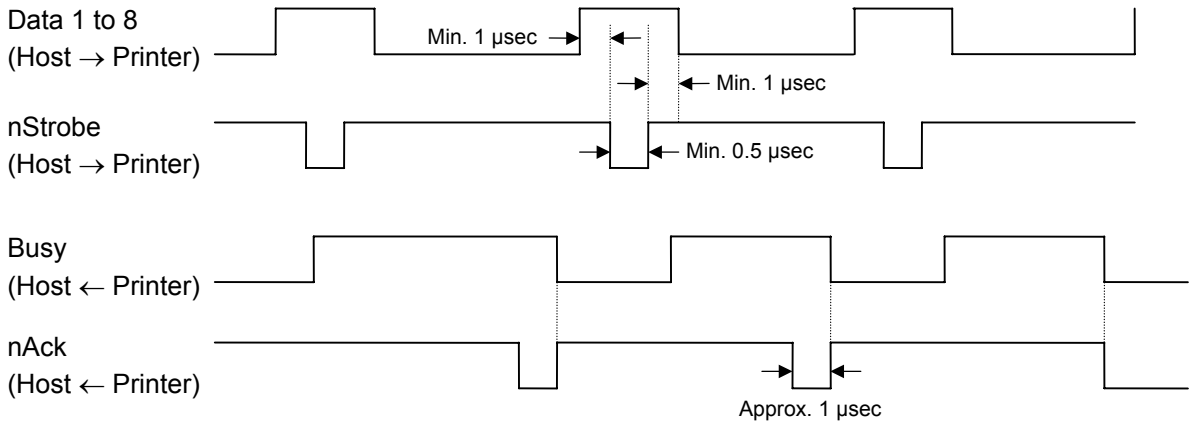
(11) Timing Chart

① When receiving normal data:

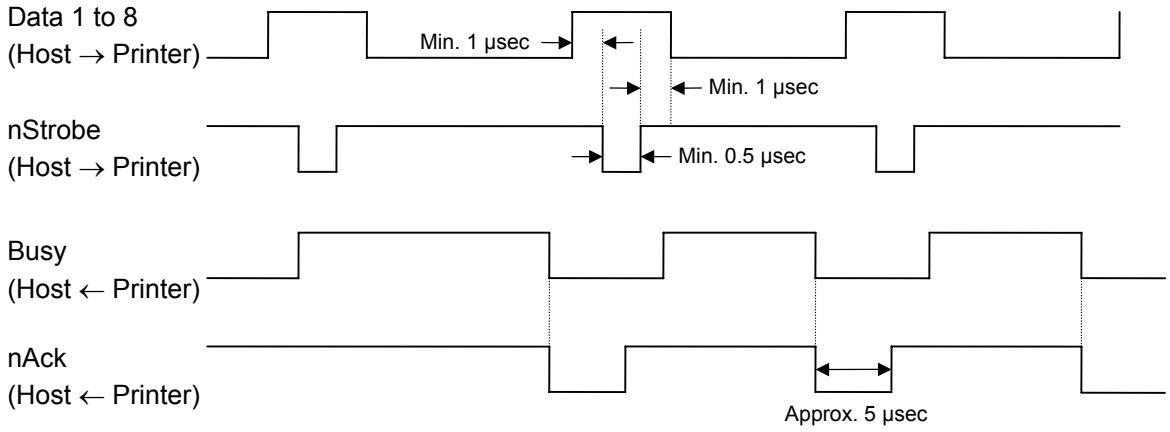
For the Compatibility mode, one of two types of timing for BUSY-ACK can be selected.

a) Timing 1 (Default)

● When the USB board has not been installed:

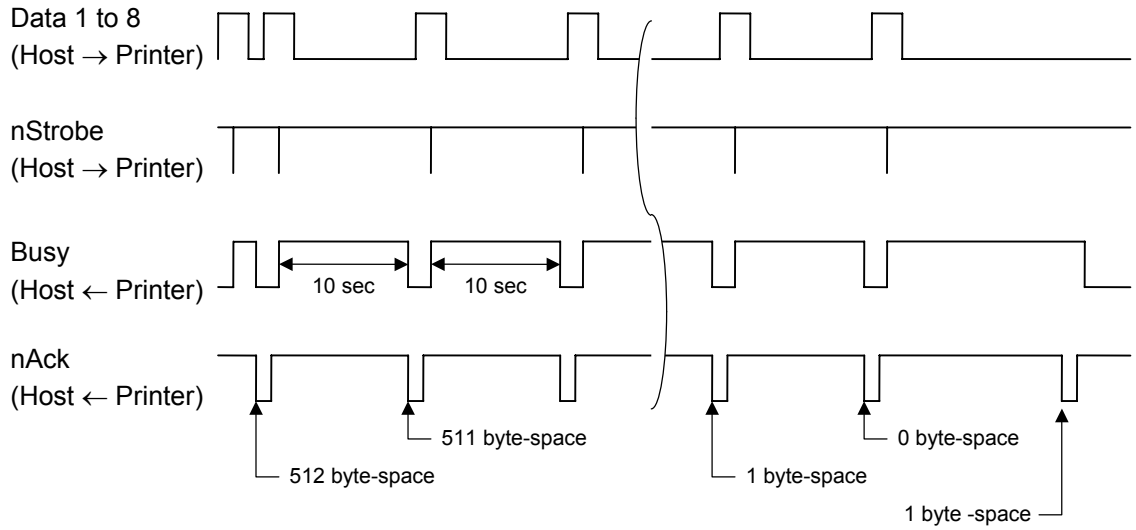


b) Timing 2



② Receiving data in the Compatibility mode when the free space of the receive buffer is 512 bytes or less:

- When the free space of the receive buffer becomes 512 bytes or less, the printer stores all data already received in the receive buffer, continues to be in a Busy state (Busy signal at "High" level) for 10 seconds to extend the data read interval when data is set from the host, then reads the data 10 seconds later.
- If the free space becomes 513 bytes or more while waiting for reading data for 10 seconds, the printer will receive the data with the normal data receive timing.
- When there is no free space in the receive buffer, the printer stops reading data. When data is set from the host, then the printer continues to be in a Busy state (Busy signal at "High" level) until the receive buffer has a free space.



(12) Relationship between Printer Setting and PC Setting and Their Operation Modes

Host setting / Printer setting	Windows95/98/Me		WindowsNT4.0		Windows2000/XP	
	Compatibility	ECP	Compatibility	ECP	Compatibility	ECP
Compatibility mode (SPP)	SPP	SPP	SPP	SPP	SPP	SPP

* SPP mode operations include support for the Nibble mode.

* The printer returns the following 13 byte-status to the Nibble mode negotiation immediately after the [ESC] WS [LF] [NUL] is received. The printer returns 23 bytes (described in *(13) Status with the receive buffer free space information* on the next page) to the Nibble mode negotiation immediately after the [ESC] WB [LF] [NUL] is received.

Status to be returned immediately after the [ESC] WS [LF] [NUL] is received (13 bytes):

SOX	STX	Status			Remaining count				ETX	EOT	CR	LF
01H	02H	3XH	3XH	3XH	3XH	3XH	3XH	3XH	03H	04H	0DH	0AH

(13) Status with the receive buffer free space information

The printer should return a status with the receive buffer free space information to the Nibble mode negotiation immediately after [ESC] WB [LF] [NUL] is received, as described below.

Status to be returned immediately after [ESC] WB [LF] [NUL] is sent (23 bytes):

SOH	01H	Indicates the header of the status block
STX	02H	
Status	3XH	Printer status * Details are described later.
	3XH	
Status type	33H	Indicates that the status includes the receive buffer free space information.
Remaining count	3XH	Remaining number of labels to be printed * Details are described later.
	3XH	
	3XH	
	3XH	
Length	3XH	Total number of bytes of this status block.
	3XH	
Free space of receive buffer	3XH	Free space of the receive buffer “00000” (0K byte) to “99999” (99999K bytes) However, the maximum value should be the receive buffer capacity.
	3XH	
	3XH	
	3XH	
	3XH	
Receive buffer capacity	3XH	Receive buffer capacity “00000” (0K byte) to “99999” (99999K bytes) However, the maximum value differs depending on the models.
	3XH	
	3XH	
	3XH	
	3XH	
CR	0DH	Indicates the end of the status block.
LF	0AH	

3.3 USB INTERFACE

(1) Standard: Conforming to USB Standard Rev. 2.0

(2) Data Transfer Type: Control transfer, Bulk transfer

(3) Transfer Rate: Full speed (12 Mbps)

(4) Transfer Control Method: Status with the receive buffer free space information is sent in response to a read request immediately after [ESC] WB [LF][NUL], as described in Section 3.2 PARALLEL INTERFACE, (13).
This status response enables the host to send data so as not to make the receive buffer full.

3.4 NETWORK INTERFACE

(1) Configuration
- ① 100BASE LAN
- ② Wireless LAN module

(2) Protocol: TCP/IP

(3) Network Specifications
- ① LPR server function
- ② WEB printer function
- ③ Socket communication function

* For more details of the network, refer to the Network Specification (EAA-2167).

4. KEY OPERATION FUNCTIONS

4.1 SYSTEM MODE FUNCTIONS

The system mode has the following functions for the printer self-test and setting various parameters. For details, refer to Key Operation Specification (EAA-2305).

(1) Self-diagnosis

- Maintenance counter/various parameters printouts
- Automatic self-diagnosis
- Head broken dots check

(2) Various parameters settings

- Character code selection
- Selection of character 0
- RS-232C communication speed
- RS-232C data length
- RS-232C stop bit length
- RS-232C parity
- RS-232C transmission control
- Language for LCD messages
- Auto forward feed standby
- Head up cut in cut mode
- Ribbon saving function
- Control code
- Ribbon type
- Strip wait status selection
- [FEED] key function
- Kanji code selection
- Euro code setting
- Automatic print head check
- Centronics ACK/BUSY timing setting
- Web printer function setting
- Media sensor type
- Reset process when the nInit signal is ON
- Expansion I/O interface
- Plug-and-play operation mode
- Label end/ribbon end process setting
- Pre-strip function setting
- Reverse feed speed setting
- MaxiCode specification setting
- Strip motor torque
- Stabilizer function
- Automatic calibration
- LAN enable/disable setting
- SNMP setting
- IP address settings
- MAC address setting
- Storage area setting
- Socket communication setting
- BASIC interpreter setting
- DHCP setting

- RTC low battery check
- RTC data renewal timing
- System mode password operation setting

(3) Various parameters settings

- Feed amount fine adjustment
- Cut (strip) position fine adjustment
- Reverse feed amount fine adjustment
- X-coordinate fine adjustment
- Print tone fine adjustment (Thermal transfer print mode)
- Print tone fine adjustment (Direct thermal print mode)
- Ribbon motor drive voltage fine adjustment (Take-up side)
- Ribbon motor drive voltage fine adjustment (Feed side)
- Reflective sensor manual threshold fine adjustment
- Transmissive sensor manual threshold fine adjustment

(4) Test print

- Print conditions setting
- 1-dot slant line printout
- 3-dot slant line printout
- Character printout
- Bar code printout
- Non-printing
- Line printout for the assembly process check
- Automatic printout for the assembly process check (Transmissive sensor)
- Automatic printout for the assembly process check (Reflective sensor)

(5) Sensor display/adjustment

- Thermal head thermistor state display
- Ambient temperature sensor state display
- Reflective sensor state display/adjustment
- Transmissive sensor state display/adjustment
- Reflective sensor adjustment value setting (no paper level)
- Transmissive sensor adjustment value setting (no paper level)

(6) RAM clear

- Maintenance counter clear
- Parameter clear

(7) IP address setting

- Printer IP address
- Gateway IP address
- Subnet mask
- Socket communication port
- DHCP setting
- DHCP client ID setting
- DHCP host name setting

(8) BASIC setting

- BASIC enable/disable setting
- BASIC file browser
- BASIC trace setting
- Extend BASIC mode

(9) Assembly process check

- Option check

(10) RFID Setting

- RFID module type selection
- RFID tag type selection
- RFID error tag detection
- Max. number of RFID issue retries
- Max. number of RFID read retries
- RFID read retry timeout
- Max. number of RFID write retries
- RFID write retry timeout
- RFID adjustment for retry
- RFID radio output power level setting
- RFID AGC threshold setting
- Q value setting
- AGC threshold for data write
- AGC threshold lower limit for retry
- Hibiki tag multi-word write
- Password to protect error tag detection
- Access password setting
- Automatic unlock function setting

(11) Initial values after RAM clear

- Initial values after maintenance counter clear

Parameter	Initial Value
Label distance covered	0 km
Printed distance	0 km
Cut count	0
Head up/down count	0
Ribbon motor drive time	0 hour
Head up solenoid drive time	0 hour
RS-232C hardware error count	0
System error count	0
Momentary power interruption count	0

- Initial values after parameter clear

Parameter	Initial Value
Feed amount fine adjustment (PC)	0 mm
Cut position (or strip position) fine adjustment (PC)	0 mm
Reverse feed amount fine adjustment (PC)	0 mm
Print tone fine adjustment (Thermal transfer print mode) (PC)	0
Print tone fine adjustment (Direct thermal print mode) (PC)	0
Ribbon motor drive voltage fine adjustment (Take-up side) (PC)	0
Ribbon motor drive voltage fine adjustment (Feed side) (PC)	0
Feed amount fine adjustment (Key)	0 mm
Cut position (or strip position) fine adjustment (Key)	0 mm
Reverse feed amount fine adjustment (Key)	0 mm
Print tone fine adjustment (Thermal transfer print mode) (Key)	0
Print tone fine adjustment (Direct thermal print mode) (Key)	0
Ribbon motor drive voltage fine adjustment (Take-up side) (Key)	0
Ribbon motor drive voltage fine adjustment (Feed side) (Key)	0
X-coordinate fine adjustment (Key)	0 mm
Transmissive sensor manual threshold fine adjustment value	1.4 V
Reflective sensor manual threshold fine adjustment value	1.0 V
Type of character code	PC-850
Character of 0	“0” (without slash mark)
Communication speed	9600 bps
Data length	8 bits
Stop bit length	1 bit
Parity	NONE

Parameter		Initial Value
Flow control		XON/XOFF + READY/BUSY (DTR) protocol: (XON output when the power is on, XOFF output when the power is off)
Language for LCD messages		English
Auto forward feed standby		OFF
Head up cut in cut mode		OFF (Print head is not raised.)
Ribbon saving function	B-SX6T	OFF (Not activated.)
	B-SX8T	ON (Activated.) (When the head lever is set to “2” (tag).)
Type of control code		Auto
Strip wait status selection		OFF
[FEED] key function		FEED (One label is fed.)
Kanji code		TYPE1
Euro code		B0H
Automatic print head check		OFF
Centronics ACK/BUSY timing setting		TYPE 1
Web printer function		OFF
Media sensor type		CENTER (Fixed sensor)
Reset process when the nInit signal is ON		OFF (Reset is not performed.)
Expansion I/O operation mode		TYPE1
Plug-and-play operation mode		OFF
Label end/ribbon end process setting		Printing is stopped when a label end or ribbon end is detected.
Pre strip process setting		OFF
Reverse feed speed		3”/sec
MaxiCode specification setting		TYPE 1 (Compatible with existing version)
Strip motor torque setting		R0 (Standard media)
Stabilizer function setting		ON (Activated only in the direct thermal print mode.)
Automatic calibration		OFF
LAN enable/disable setting		LAN: Enabled, SNMP: Enabled
Status response		ON
Label pitch		76.2 mm
Effective print length		74.2 mm
Effective print width	B-SX6T	170.6 mm
	B-SX8T	213.3 mm
Print method		Thermal transfer
Type of sensor		Transmissive sensor
Feed speed		4”/sec
Issue mode		Batch
PC save automatic call		ON
BASIC interpreter setting		OFF
BASIC interpreter trace setting		OFF
DHCP setting		OFF
RFID module type selection		None
RFID tag type selection		None
RFID error tag detection		None
Password to protect error tag detection		OFF: 0000

Parameter	Initial Value
Access password setting	00000000
Automatic unlock function setting	OFF
Max. number of RFID issue retries	3
Max. number of RFID read retries	5
RFID read retry time-out	4.0 sec.
Max. number of RFID write retries	5
RFID write retry time-out	2.0 sec.
RFID adjustment for retry	Invalid: 0 mm
RFID radio output power level setting	18
RFID AGC threshold setting	0
Q value	0
AGC threshold for data write	0
AGC threshold lower limit for retry	0
Hibiki tag multi-word write	0: OFF
Number of times RFID write succeeded	0
Number of times RFID write failed	0
System mode password operation setting	OFF

- The total label distance covered, sensor adjustment values (system mode <5>), IP address setting, socket communication number setting, and data of flash memory are not cleared by RAM clear.
- Number of times RFID write succeeded and number of times RFID write failed are not cleared by RAM clear.
- System mode password operation setting is not cleared by RAM clear.
- Password setting to protect error tag detection, access password setting, and automatic unlock function setting are not cleared by RAM clear. (The values in the table are the factory default.)

4.2 ONLINE MODE FUNCTIONS

The online mode has the following functions for issuing labels and setting the threshold.
(For details, refer to Key Operation Specification (EAA-2305).)

(1) Issuing labels (by external equipment interface commands)
(2) Paper feed (by the [FEED] key)
(3) Pause (Halts issuing labels by the [PAUSE] key)
(4) Restart (Reissues labels by the [RESTART] key after halting issuing labels or after the occurrence of an error.)
(5) Reset (Enters a usual initial state which is obtained after the power is turned on, using the [RESTART] key.)
(6) Error indication
(7) Threshold setting
(8) Various parameters settings
(9) Various fine adjustments setting
(10) Dumping of receive buffer
(11) BASIC expansion mode
(12) Auto calibration setting
(13) LAN enable/disable setting
(14) RTC setting

4.3 DOWNLOAD MODE SETTING FUNCTION

When the power is turned on while holding down the [FEED], [PAUSE], and [RESTART] keys at the same time, the printer enters the download mode. Therefore, the usual operations cannot be performed.
For details, refer to the Key Operation Specification (EAA-2305).

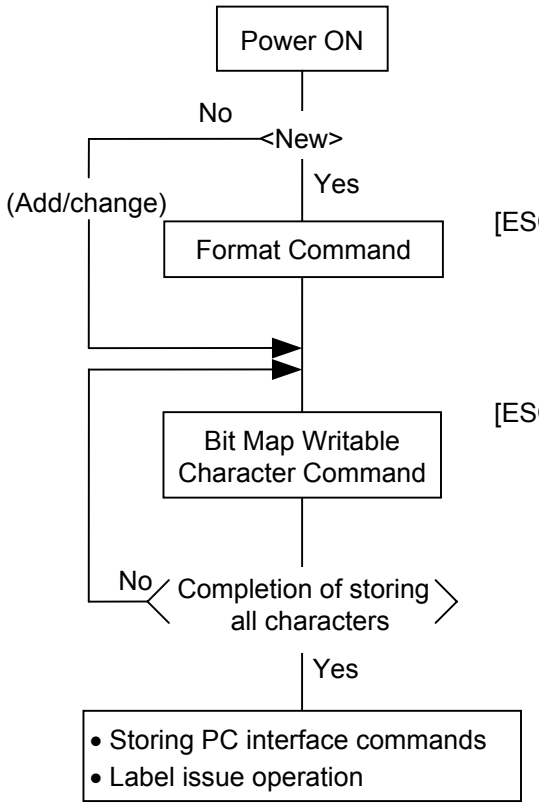
5. TRANSMISSION SEQUENCE

This section describes the outline of the transmission sequence.

5.1 INITIAL SETTING

Writable characters, logos, and PC interface commands must be stored before the label issue operation.

(1) Storing writable characters and logos



[ESC] J1: Formats the flash memory.

[ESC] XD: Stores writable characters or logos on the flash memory.

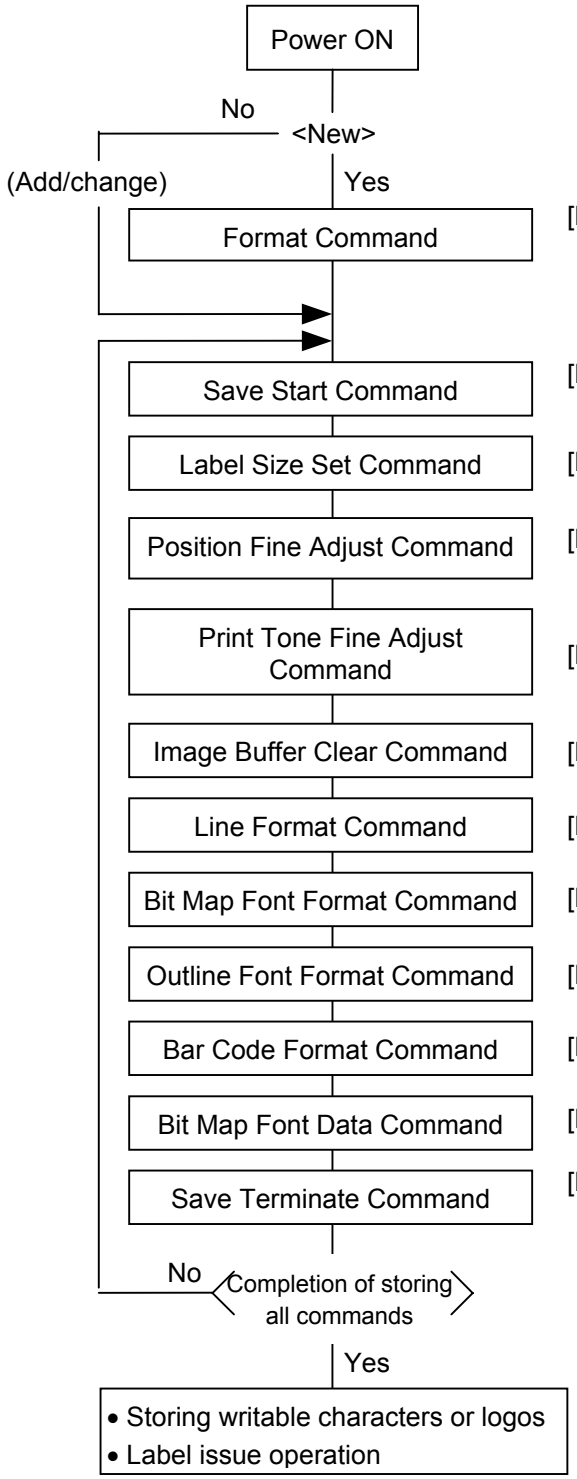
NOTES: *(1) Store writable characters or logos only when it is required to do so.*

(2) When the flash memory is used, the memory will be taken up with every such storing if the Format Command is not sent before storing already stored writable characters or logos.

(3) When the flash memory is used, and another operation (storing PC interface commands or label issue operation) is performed after storing writable characters or logos, the image buffer will be cleared automatically.

(4) If further storing operation does not take place after storing writable characters or logos, the printer automatically enters the online mode (label issue operation) in about 10 seconds. In this case, when the flash memory is used, the image buffer will be cleared automatically.

(2) Storing PC interface commands



[ESC] J1: Formats the flash memory.

[ESC] XO: Declares the start of saving PC interface commands.

[ESC] D: Sets the label size.

[ESC] AX: Adjusts the feed amount, cut position, and back feed amount.

[ESC] AY: Adjusts the print tone.

[ESC] C: Clears the image buffer.

[ESC] LC: Sets the line format and draws it.

[ESC] PC: Sets the bit map font format.

[ESC] PV: Sets the outline font format.

[ESC] XB: Sets the bar code format.

[ESC] RC: Draws data of the bit map font.

[ESC] XP: Declares the termination of saving PC interface commands.

NOTES: *(1) Store the PC commands only when it is required to do so.*

(2) When the flash memory is used, the memory will be taken up with every such storing if the Format Command is not sent before storing already stored PC interface commands.

(3) When the flash memory is used, and another operation (storing writable characters or logos, label issue operation) is performed after storing PC interface commands, the image buffer will be cleared automatically.

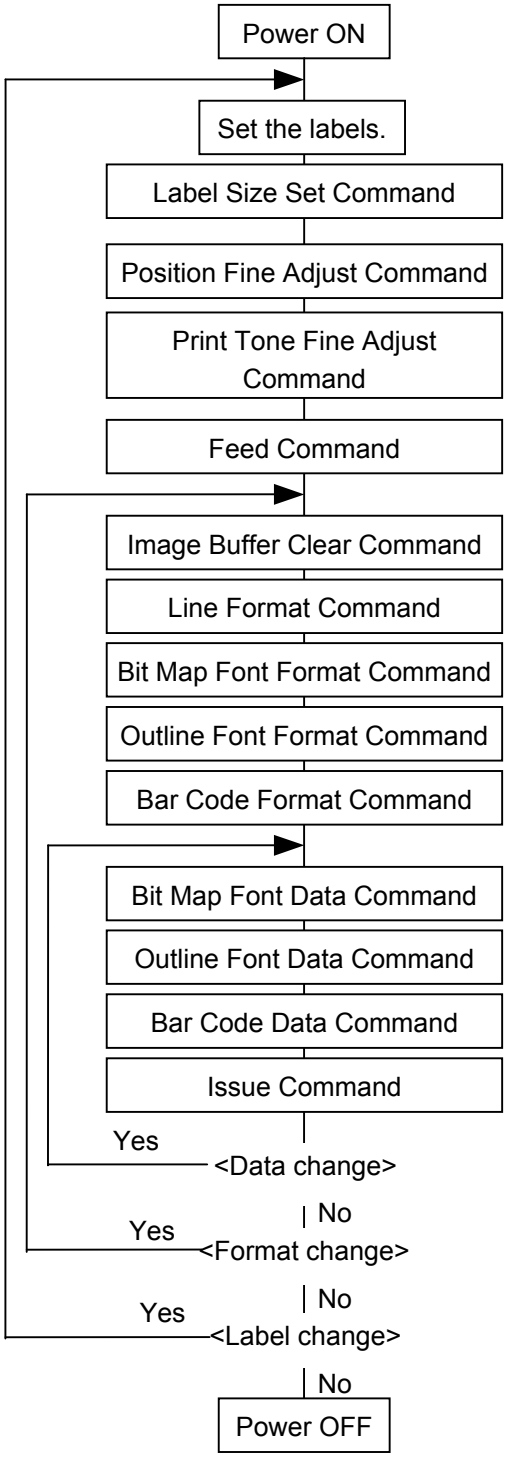
(4) Select commands to be stored as the occasion demands.

(5) If further storing operation does not take place after storing PC interface commands, the printer enters the online mode (label issue operation) in about 10 seconds. In this case, the image buffer will be cleared automatically.

5.2 LABEL ISSUE OPERATION

An example of the label issue operation is described below.

(1) When the Saved Data Call Command is not used:



[ESC] D: Sets the label size.

[ESC] AX: Adjusts the feed amount, cut position, and back feed amount.

[ESC] AY: Adjusts the print tone.

[ESC] T: Feeds one label to align with the print start position.

[ESC] C: Clears the image buffer.

[ESC] LC: Sets the line format and draws it.

[ESC] PC: Sets the bit map font format.

[ESC] PV: Sets the outline font format.

[ESC] XB: Sets the bar code format.

[ESC] RC: Draws bit map font data.

[ESC] RV: Draws outline font data.

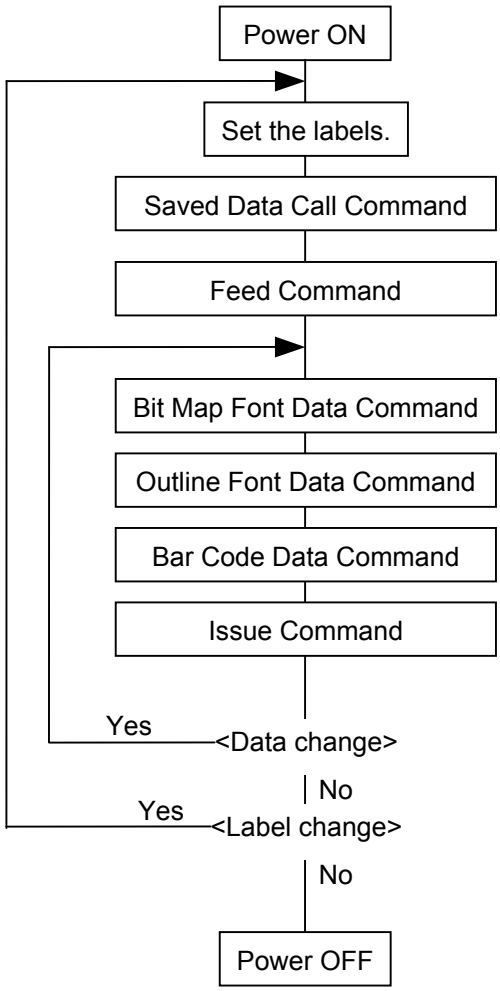
[ESC] RB: Draws bar code data.

[ESC] XS: Issues (prints) the label.

NOTES: *(1) When loading new type paper, the Label Size Set Command and the Feed Command must always be sent. When using the same paper after the power is turned off and on, the Label Size Set Command and the Feed Command may be omitted.*

(2) After the power is turned off and on, the Bit Map Font Format Command, the Outline Font Format Command, and the Bar Code Format Command should be sent as occasion demands because they are not stored in memory.

(2) When the Saved Data Call Command is used:



[ESC] XQ: Calls the label format stored in the flash memory.

[ESC] T: Feeds one label to align with the print start position.

[ESC] RC: Draws bit map font data.

[ESC] RV: Draws outline font data.

[ESC] RB: Draws bar code data.

[ESC] XS: Issues (prints) the label.

NOTES: *(1) When loading new type paper, the Feed Command must always be sent. When using the same paper after the power is turned off and on, the Feed Command may be omitted.*

(2) If "automatic call at power on" has previously been selected for the Saved Data Call Command, the Saved Data Call Command may be omitted after the power is turned off and on.

(3) When the XML data is used:
Print data in XML format can be sent to the printer.

* *For details, refer to the XML Data Print Specification (TAA-1320).*

6. INTERFACE COMMANDS

6.1 OUTLINE OF COMMANDS

(1) Format of Interface command

ESC	Command & Data	LF	NUL

- The length from [ESC] to [LF] [NUL] must be as specified by each command.
- There are the following three kinds of control codes:
  ① ESC (1BH), LF (0AH), NUL (00H)
  ② { (7BH), | (7CH), } (7DH)
  ③ Code set in the system mode

(2) How to use reference

Function — Describes the outline of the function of the command.

Format — Shows the format of the command.

The format designation method should conform to the following rules:

- Each set of small letters (such as aa, bbbb) indicates a parameter item.
- An item enclosed in parentheses may be omitted.
- "…" indicates the repetition of an item.
- Brackets and parentheses are used only in coding, and must not be transmitted in practice.
- Other symbols must always be inserted at designated positions when transmitted.

Term — Explains the term(s) used in the format.

* "0 to 999" described in the entry range indicates that up to 3-digit variable-length entry is allowed. (Entry of "001" or "009" is also possible.) "000 to 999" indicates that the entry must be fixed to 3 digits.

Explanation — Explains the command in detail.

Note — Supplementary explanation of the command.

Refer to — Related commands

Examples — Explains the command examples.

[ESC] T20C30 [LF] [NUL]

The above corresponds to the transfer of the following:

1B	54	32	30	43	33	30	0A	00
[ESC]	T	2	0	C	3	0	[LF]	[NUL]

(3) Precautions

The commands and parameters described in this specification must always be used. If any command or parameter other than those covered in this specification are used, the printer's operation will not be guaranteed. The commands must be used in the online mode. If any command is transmitted in the system mode, the printer will not operate. However, only the Reset Command can be used.

6.2 LIST OF COMMANDS

Description of command for creating application

Label Size Set Command	[ESC] D 31
Position Fine Adjust Command	[ESC] AX 35
Print Tone Fine Adjust Command	[ESC] AY 42
Ribbon Motor Drive Voltage Fine Adjust Command	[ESC] RM 43
Image Buffer Clear Command	[ESC] C 44
Clear Area Command	[ESC] XR 45
Line Format Command	[ESC] LC 47
Bit Map Font Format Command	[ESC] PC 52
Outline Font Format Command	[ESC] PV 67
Bar Code Format Command	[ESC] XB 83
Bit Map Font Data Command	[ESC] RC 131
Outline Font Data Command	[ESC] RV 136
Bar Code Data Command	[ESC] RB 139
Issue Command	[ESC] XS 153
Feed Command	[ESC] T 168
Eject Command	[ESC] IB 174
Forward/Reverse Feed Command	[ESC] U1, [ESC] U2 175
Storage Area Allocate Command	[ESC] XF 177
Flash Memory Format Command	[ESC] J1 179
2-byte Writable Character Code Range Command	[ESC] XE 180
Bit Map Writable Character Command	[ESC] XD 181
Graphic Command	[ESC] SG 190
Save Start Command	[ESC] XO 199
Save Terminate Command	[ESC] XP 200
Saved Data Call Command	[ESC] XQ 201
Head Broken Dots Check Command	[ESC] HD 202
Message Display Command	[ESC] XJ 203
Reset Command	[ESC] WR 205
Reset Command	[ESC] W@ 206
Status Request Command	[ESC] WS 207
Receive Buffer Free Space Request Command	[ESC] WB 208
Version Information Acquire Command	[ESC] WV 209
Printer Option Status Acquire Command	[ESC] WN 210
IP Address Set Command	[ESC] IP 211
Socket Communication Port Set Command	[ESC] IS 212
DHCP Function Set Command	[ESC] IH 213
Pass-through Command	[ESC] @002 214
Internal Serial Interface Parameter Set Command	[ESC] IZ 215

Description of the commands for system administrators

Parameter Set Command	[ESC] Z2;1 216
Fine Adjustment Value Set Command	[ESC] Z2;2 221
RFID Parameter Set Command	[ESC] Z2;3 223
Batch Reset Command	[ESC] Z0 225

Description of the commands for Real Time Clock (RTC)

Real Time Clock Set Command	[ESC] JT 227

Description of the commands related to RFID

RFID Tag Position Adjustment Command [ESC] @003.....229
RFID Tag Read Command [ESC] WF.....232
RFID Void Pattern Print Command [ESC] @006.....235
RFID Data Write Command [ESC] @012.....236

6.3 COMMANDS FOR CREATING APPLICATION

6.3.1 LABEL SIZE SET COMMAND [ESC] D

Function Sets the size of a label or tag paper.

Format [ESC] Daaaa, bbbb, cccc (, dddd) [LF] [NUL]

Term

aaaa: Pitch length of the label or tag
4 digits or 5 digits (in 0.1 mm units)
4 digits: 0100 (10.0 mm) to 9999 (999.9 mm)
5 digits: 00100 (10.0 mm) to 17090 (1709.0 mm)

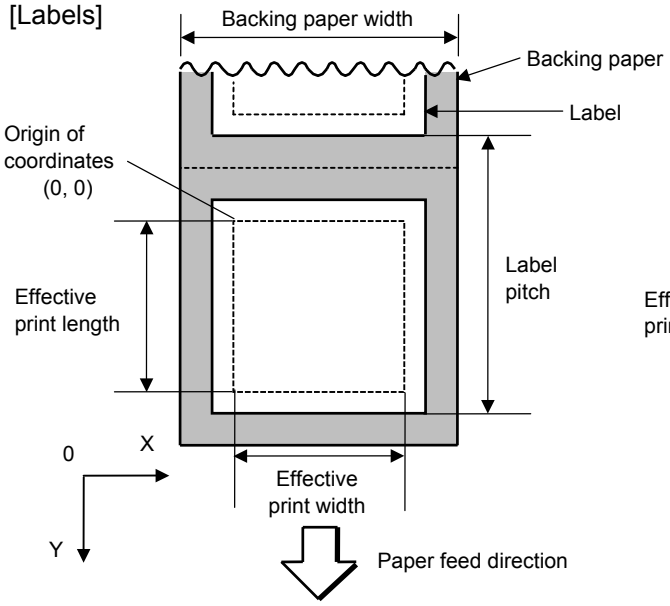
bbbb: Effective print width
Fixed to 4 digits (in 0.1 mm units)
0100 (10.0 mm) to 2133 (213.3 mm)

cccc: Effective print length
4 digits or 5 digits (in 0.1 mm units)
4 digits: 0055 (5.5 mm) to 9999 (999.9 mm)
5 digits: 00055 (5.5 mm) to 17050 (1705.0 mm)

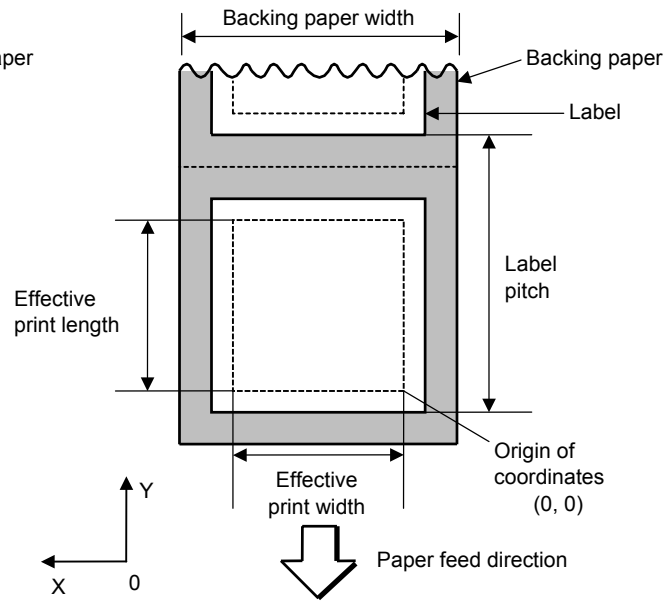
dddd: Backing paper width
(Omissible. When omitted, the initial value is used as the effective print width.)
Fixed to 4 digits (in 0.1 mm units)
1016 (101.6 mm) to 2250 (225.0 mm)

Explanation

[Labels]

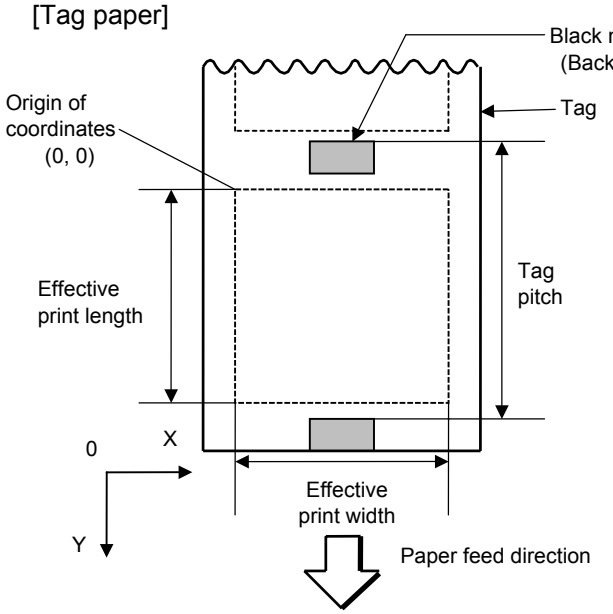


[Printing direction: Bottom first]

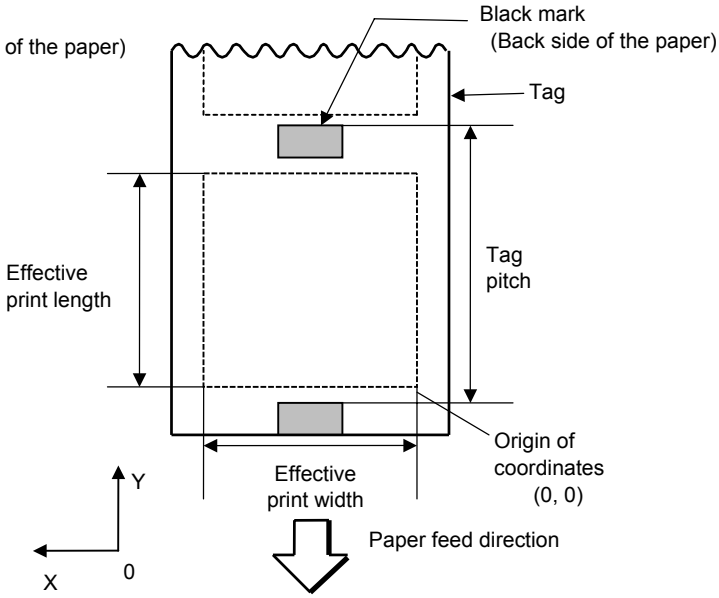


[Printing direction: Top first]

[Tag paper]

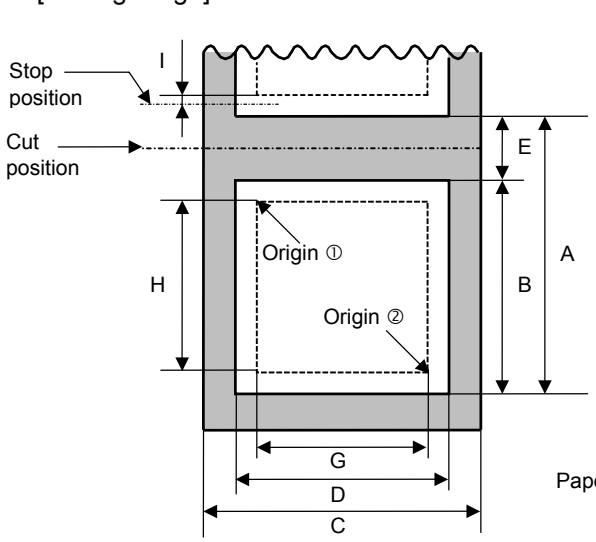


[Printing direction: Bottom first]

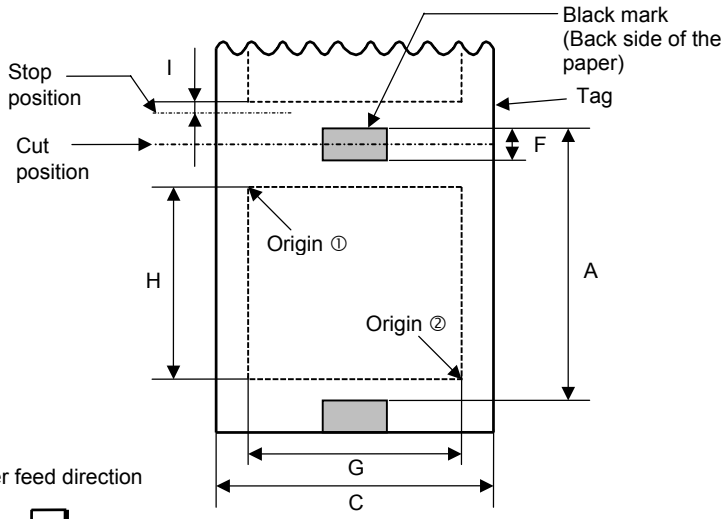


[Printing direction: Top first]

[Setting range]



[Labels]



[Tags]

[mm]

Item \ Model / Issue mode			B-SX6T			B-SX8T		
			Batch	Strip	Cut	Batch	Strip	Cut
Thermal head dot density			12 dots/mm (305 dpi)			12 dots/mm (305 dpi)		
Thermal head width			170.6 mm			213.3 mm		
A: Label pitch / Tag pitch	Label	Min	10.0	25.4	38.0	10.0	25.4	38.0
		Max.	1709.0			1368.0		
	Tag	Min.	10.0	---	25.4	10.0	---	25.4
		Max.	1709.0	---	1709.0	1368.0	---	1368.0
B: Label length		Min.	7.5	22.9	25.0	7.5	22.9	25.0
		Max.	1366.0		1362.0	1366.0		1362.0
C: Backing paper width / Tag width		Min.	101.6					
		Max.	225.0					
D: Label width		Min.	98.6					
		Max.	222.0					
E: Label-to-label gap		Min.	2.5		6.0	2.5		6.0
		Max.	20.0					
F: Black mark length		Min.	2.5					
		Max.	10.0					
G: Effective print width		Min.	10.0					
		Max.	170.6			213.3		
H: Effective print length	Label	Min.	5.5	20.9	23.0	5.5	20.9	23.0
		Max.	1705.0			1364.0		
	Tag	Min.	8.0	---	23.4	8.0	---	23.4
		Max.	1705.0	---	1705.0	1364.0	---	1364.0
I: Slow up/ down interval	Slow-up		1.0					
	Slow-down		1.0					
J: Thickness	Label		130 μm to 170 μm					
	Tag		100 μm to 170 μm					
K: Max. effective print length for on-the-fly issuing			852.0			682.0		

When a cut issue is performed, label length B should be as follows:

$$\text{Label length } B \geq 35.0 \text{ mm} - \left(\frac{\text{Label-to-label gap}}{2}\right)$$

Notes

(1) Before changing the label size or type of sensor, the Label Size Set Command must first be transmitted.

(2) The Label Size Set Command is stored in memory (retained even if the power is turned off).

(3) After sending the Label Size Set Command, the Feed Command ([ESC] T) must be transmitted prior to printing, to feed one piece of paper so that the print head position aligns with the print start position.

(4) The origin of drawing coordinates, print stop position (print head position when printing stops), and cut position are determined according to the parameters of the Label Size Set Command as shown in the figure on the preceding page. For the print stop position in strip issue mode, refer to the section of the Position Fine Adjust Command. The effective print area is centered on the label/tag.

(5) Printing cannot be performed in the slow up (1 mm) and slow down (1 mm) areas. Consequently, [A: Label pitch/Tag pitch] − [H: Effective print length] ≥ 2 mm must be assumed.

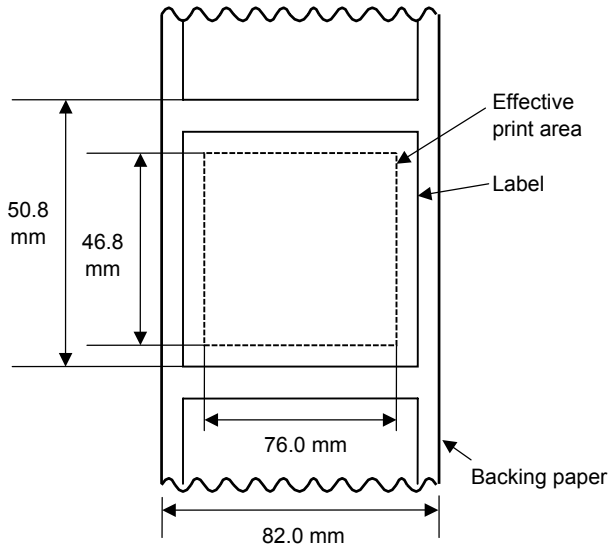
(6) The origin of drawing coordinates, print stop position (print head position when printing stops), and cut position are adjustable by the Fine Adjust Commands and according to the fine adjustment settings in the system mode.

(7) The tag rotation designation of the Issue Command ([ESC] XS) causes the origin of drawing coordinates to be origin ① in the case of “bottom first” and to be origin ② in the case of “top first”, as shown in the figure.

(8) The parameters must be as shown in the figure and table. Any value or paper outside the range results in a failure of printing or an error.

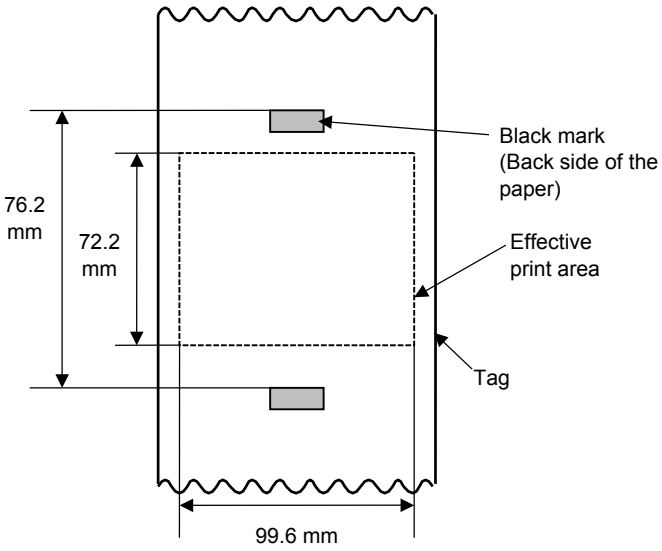
(9) Where an effective print length is specified within the range of “max. effective print length for on-the-fly”, non-stop printing is possible even if the data to be printed is different one by one, because printing and drawing of the next label are processed at the same time. [On-the-fly issue]
However, printing may stop every label depending on the volume of drawing data.

. Examples (1) Labels



[ESC] D0508, 0760, 0468, 0820 [LF] [NUL]
[ESC] T20C40 [LF] [NUL]

(2) Tags



[ESC] D0762, 0996, 0722 [LF] [NUL]
[ESC] T10C40 [LF] [NUL]

6.3.2 POSITION FINE ADJUST COMMAND [ESC] AX

Function

① Adjusts the feed amount so that the label stops at the position in front of or behind the automatically set print start position.

② Adjusts the cut position so that the label is cut at a position in front of or behind the automatically set cut position, or adjusts the strip position so that the label stops at the position in front of or behind the automatically set strip position.

③ Adjusts the reverse feed amount to the home position after a cut, or adjusts the reverse feed amount to the home position after a strip operation.

Format

[ESC] AX; abbb, cddd, eff [LF] [NUL]

Term

a: Indicates the direction of the print start position fine adjustment
- +: Front
- −: Behind

bbb: Fine adjustment value
000 to 500 (in 0.1 mm units)

c: Indicates the direction of the cut position (or strip position) fine adjustment
- +: Front
- −: Behind

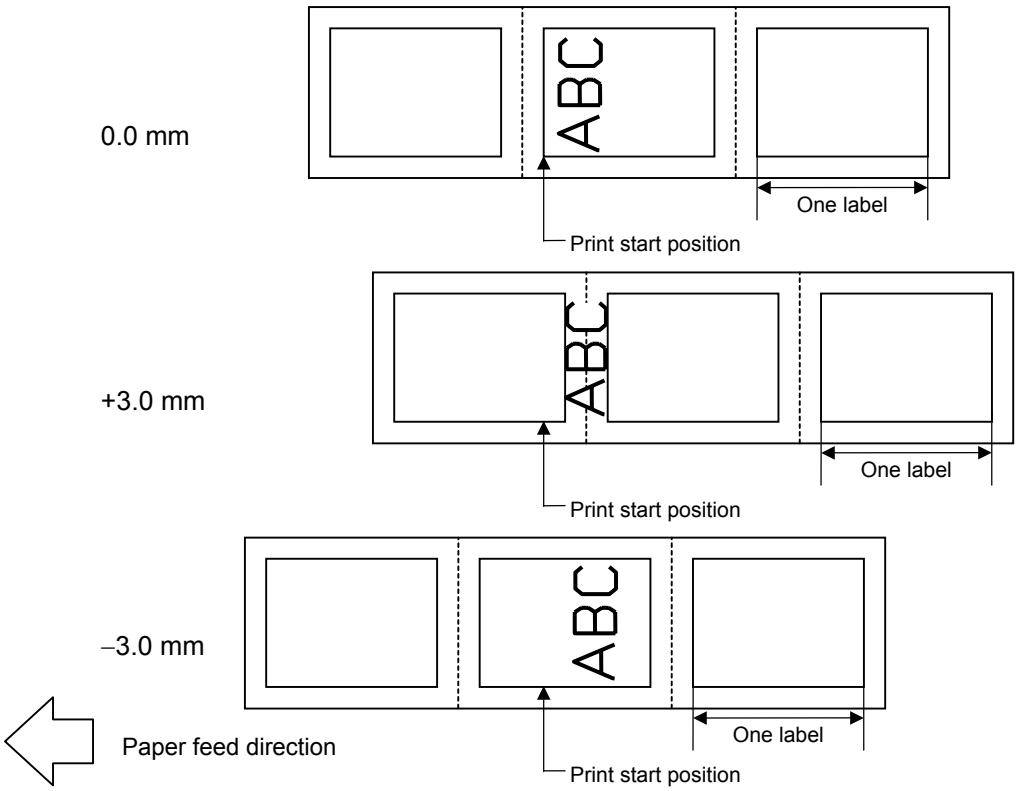
ddd: Fine adjustment value
000 to 500 (in 0.1 mm units)

e: Indicates whether the reverse feed amount is to be increased or decreased.
- +: Increase
- −: Decrease

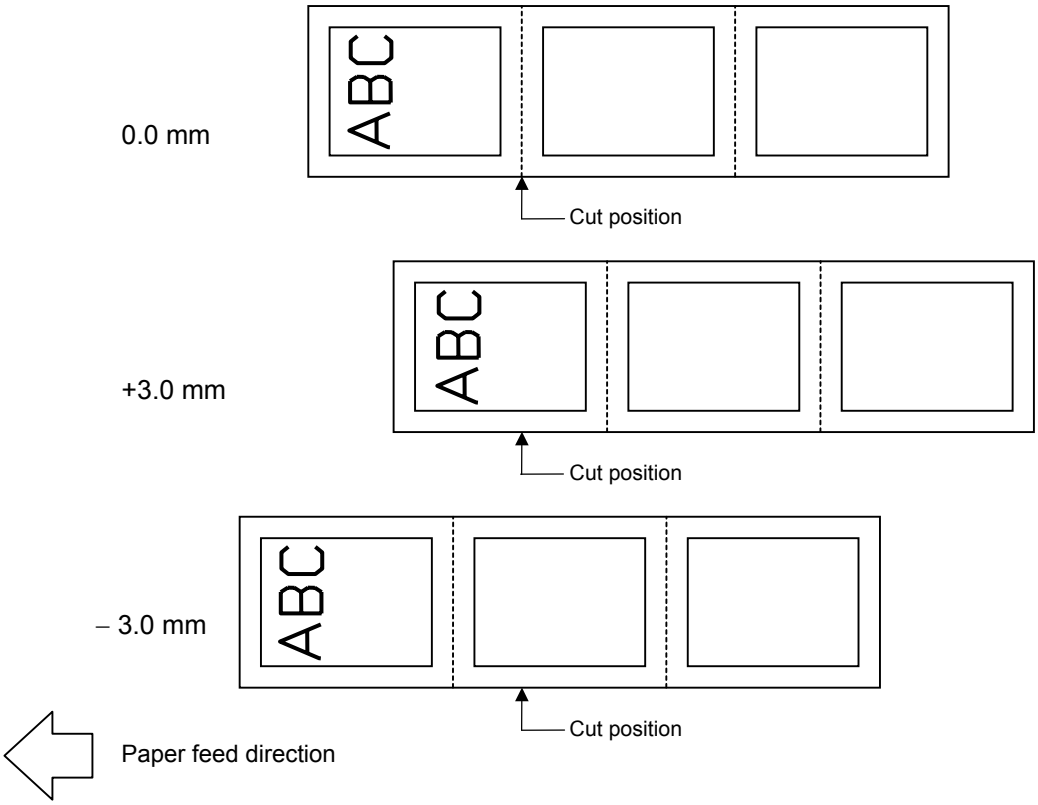
ff: Reverse feed amount fine adjustment value
00 to 99 (in 0.1 mm units)

Explanation [Print Start Position Fine Adjustment]

(To fine adjust the print start position so that it shifts backward or forward)

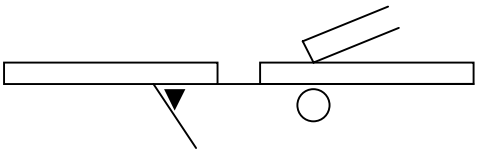


[Cut Position Fine Adjustment] (To fine adjust the cut position backward or forward)

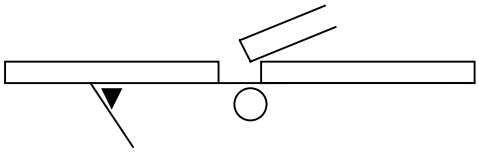


[Strip Position Fine Adjustment]

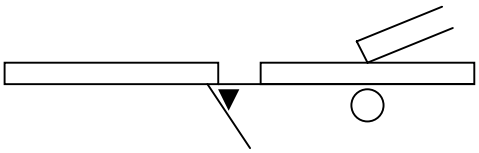
0.0 mm

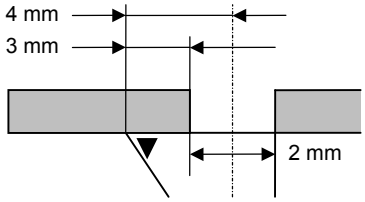


+3.0 mm



–3.0 mm



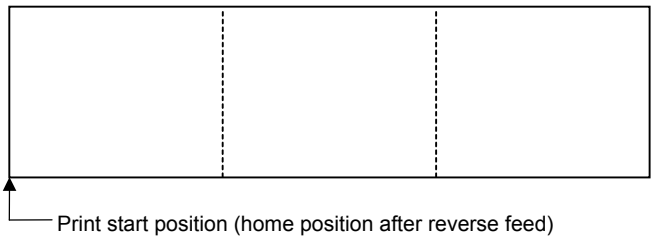


- In strip issue mode, a label is stopped at the position where the distance between the middle point of the label-to-label gap and the edge of the strip shaft is 4 mm, since the label-to-label gap is assumed to be 2 mm.
- When the print start position is not proper, it should be adjusted using the strip position fine adjustment function.
- When the label-to-label gap is 5 mm or more, the effective print length should be set to the maximum (label pitch -2 mm). Then, the print start position should be adjusted using the strip position fine adjust function.

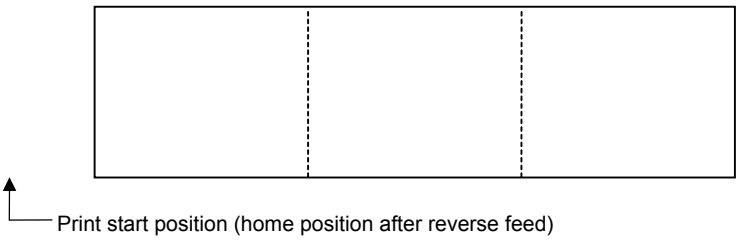
[Reverse Feed Amount Fine Adjustment]

(To fine adjust the reverse feed amount so that the print start position shifts backward or forward)

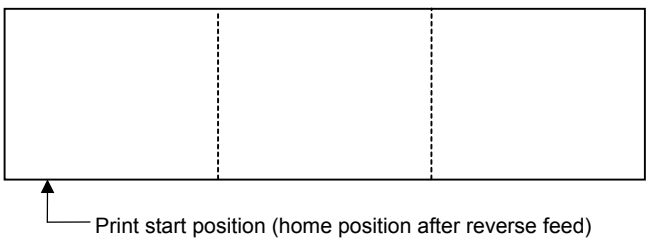
0.0 mm

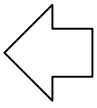


+3.0 mm



- 3.0 mm





Paper feed direction

Notes

(1) If the print start position fine adjustment (feed amount fine adjustment), cut position (or strip position) fine adjustment or reverse feed amount fine adjustment has been set in the system mode (by key operation on the printer), the fine adjustment value will be the sum of the value set by this command and that in the system mode. Each maximum fine adjustment value is as follows. However, the maximum print start position fine adjustment (feed amount fine adjustment) value must be within the label pitch.

Print start position fine adjustment.....±50.0 mm
Cut position (or strip position) fine adjustment.....±50.0 mm
Reverse feed amount fine adjustment .....±9.9 mm

(2) After changing the fine adjustment value by this command, one label must be fed by the Feed Command ([ESC] T) to adjust the print start position.

(3) Each fine adjustment value is stored in memory (retained even if the power is turned off).

(4) If a fine adjustment value is improper, printing will not be performed correctly.

(For example, if the reverse feed amount fine adjustment value is not properly set, the print position differs between the labels to be cut and those not to be cut. If the label is excessively fed backward, it will not be fed correctly during printing.
In the strip issue mode, the print start position may differ between the first label and the second label. The reverse feed amount fine adjustment for the strip issue is used to adjust the feed amount so that a label is stopped at the correct position where the automatic forward feed is ready to be performed.)

(5) The cut position (or the strip position) fine adjustment and the reverse feed amount fine adjustment are effective only when the printer is in cut issue or strip issue mode.

(6) How the labels with the label pitch of 38 mm or less are handled in the cut issue mode:

Method 1

Under the conditions described below, the printer performs cut issue as follows.

Head up → Forward feed to the cut position → Head down → Cut → Head up → Reverse feed to the home position → Head down

Condition An issue command, feed command, and eject command are received.
Label pitch = 38.0 mm or less
Cut issue
Transmissive sensor
Cut position fine adjustment value = +10.0 mm or less
Issue mode = C

* *A head up and a head down are performed only when the optional ribbon saving module is installed. When the option is not installed, a head up or head down action is not performed. In that case, use Method 2.*

***NOTES**:*

1. *If the print head is raised when the edge of the label being ejected passes the paper feed roller, the sensor may not be able to deteact an error even if it occurs..*
2. *The print head may not be raised depending on the rise of the solenoid's temperature.*

Method 2 The minimum label pitch for the normal cut issue is 38.0 mm. When a label with the label pitch of less than 38.0 mm is used, the edge of the label may be caught on the edge of the thermal head during a reverse feed to the home position, after the gap between labels is cut. As a result, the label may not be returned to the proper home position. In this case, fine adjust the cut position by using the following method to solve this problem. However, this method causes one or more printed labels to remain between the print head and the cutter. It is required to eject those labels by issuing or feeding labels.

(a) How to calculate the cut position fine adjustment value

The cut position fine adjustment value is calculated using the following formula. If the paper still is not fed back to the proper home position using the value obtained, the cut position should be adjusted using any other value.

$$\text{Cut position fine adjustment value} = \text{(Number of labels remaining between the print head and the cutter)} \times \text{(Label pitch)}$$

$$= \frac{32.8\ \text{mm}}{\text{Label pitch}} \times \text{(Label pitch)}$$

↑ Any decimal remainders are dropped.

(Example) Label pitch = 30.0 mm

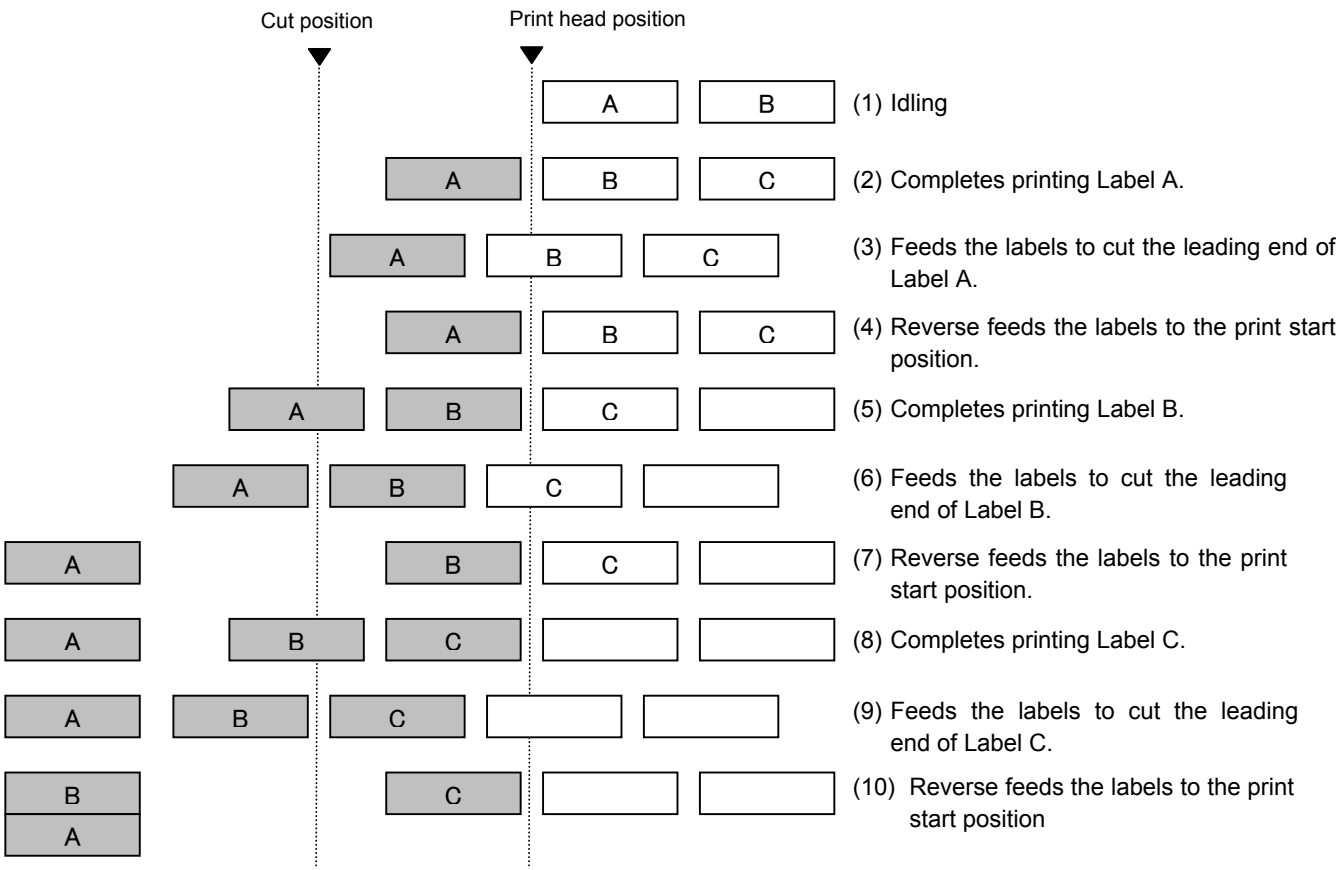
$$\text{Cut position fine adjustment value} = \frac{32.8\ \text{mm}}{30.0\ \text{mm}} \times (30.0\ \text{mm})$$

$$= 1 \times 30.0\ \text{mm}$$

$$= +30.0\ \text{mm}$$

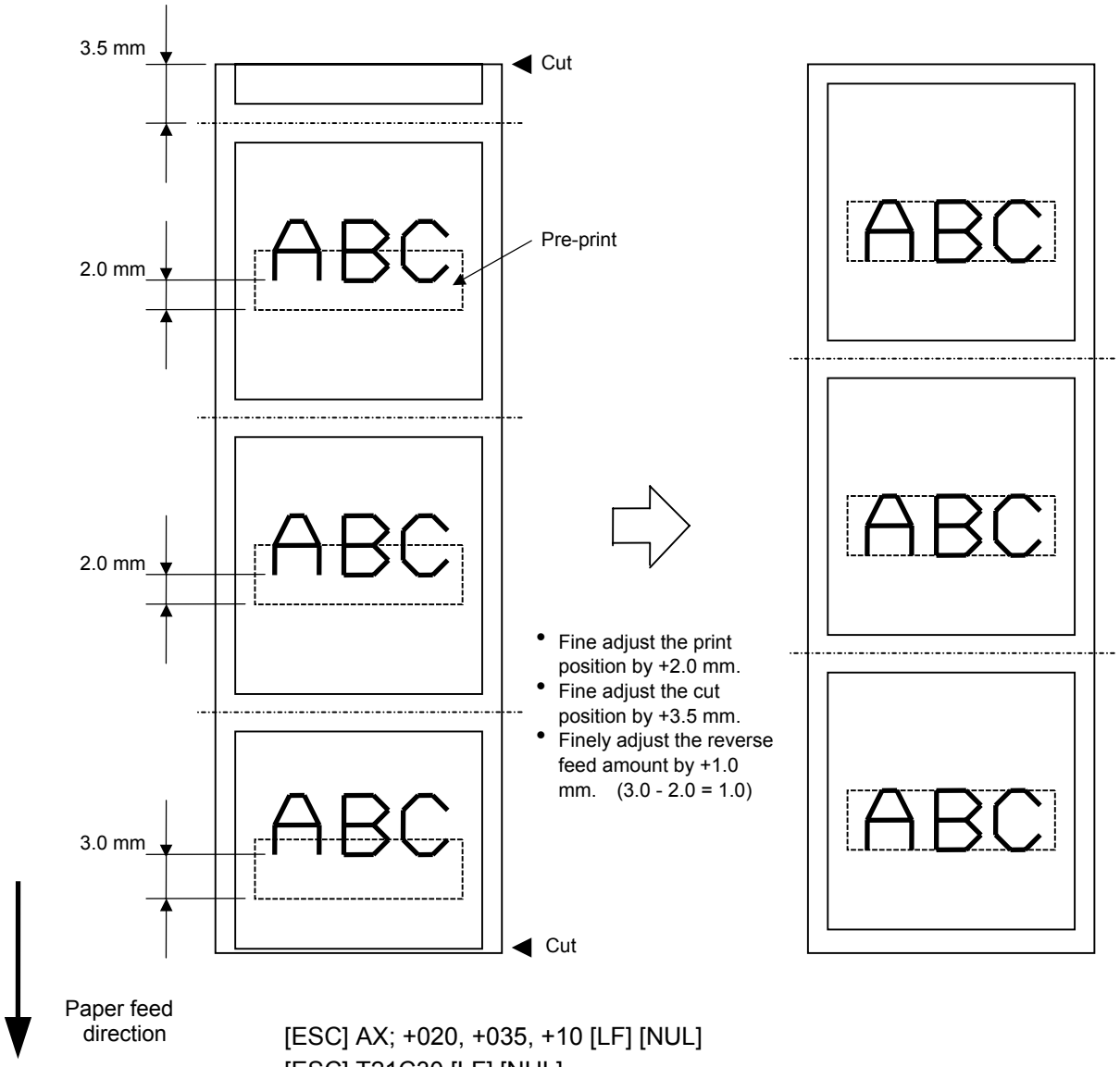
(b) Operation example

Issue count: 3, Cut interval: 1



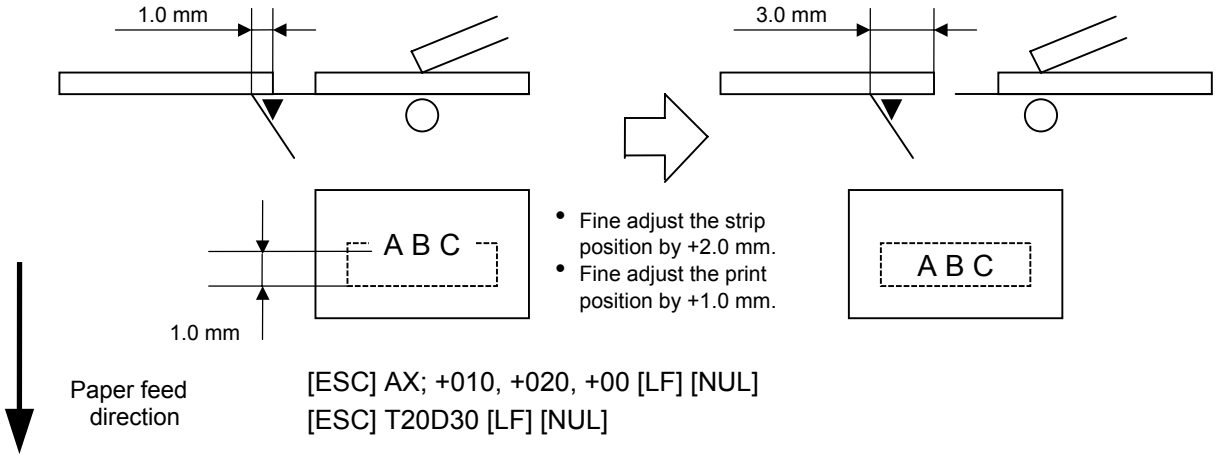
(7) Labels may not return to the home position depending on the print conditions, even if the same amount of reverse feed is performed. When the media sensor is used and if the label pitch (or tag pitch) is almost the same size as the distance between the print head and the media sensor (72.1 mm), a label/tag may not be returned to the home position by a reverse feed after a cut issue, a strip issue, or an automatic forward feed standby function. It may result in an error. In such cases, increasing the reverse feed amount (fine adjusting the reverse feed amount in the + direction) can prevent this error.

Examples (1) Cut issue



[ESC] AX; +020, +035, +10 [LF] [NUL]
[ESC] T21C30 [LF] [NUL]

(2) Strip issue



[ESC] AX; +010, +020, +00 [LF] [NUL]
[ESC] T20D30 [LF] [NUL]

6.3.3 PRINT TONE FINE ADJUST COMMAND [ESC] AY

Function Adjusts the print tone which was automatically set.

Format [ESC] AY; abb, c [LF] [NUL]

Term

a: Indicates whether to increase or decrease the print tone.
+: Increase (darker)
–: Decrease (lighter)

bb: Print tone fine adjustment value
00 to 10 (in units of 1 step)

c: Indicates the print mode (thermal transfer or direct thermal)
0: Thermal transfer
1: Direct thermal

Explanation

(1) The print tone fine adjustment is performed by adjusting the length of time to apply voltage to the thermal head.

(2) If the print tone fine adjustment value has been set in system mode (by key operation on the printer), the fine adjustment value will be the sum of the value set by this command and that in the system mode. The maximum fine adjustment value for each of the thermal transfer and direct thermal print modes is ±10.

(3) The fine adjustment values in thermal transfer print mode and direct thermal print mode can be set independently.

(4) The Print Tone Fine Adjust Command is stored in memory (retained even if the power is turned off).

(5) The factory default of the fine adjustment value is 00, for both the fine adjust command and the system mode fine adjustment.

(6) The maximum adjustment value differs depending on the print speed. When the value exceeds the maximum, it is automatically corrected to the maximum value.

	B-SX6T		B-SX8T	
Print speed	Direct thermal	Thermal transfer	Direct thermal	Thermal transfer
3 ips	+10 step	+10 step	+10 step	+10 step
4 ips	+5 step	+5 step	+5 step	+5 step
8 ips	+2 step	+2 step	+2 step	+2 step

Examples To set the print tone to “–2” for the thermal transfer mode.

[ESC] AY; -02, 0 [LF] [NUL]

To set the print tone to “+3” for the direct thermal mode.

[ESC] AY; +03, 1 [LF] [NUL]

6.3.4 RIBBON MOTOR DRIVE VOLTAGE FINE ADJUST COMMAND [ESC] RM

Function Fine adjusts the drive voltage of the ribbon motor.

Format [ESC] RM; abbcdd [LF] [NUL]

Term

a: Direction of the ribbon take-up motor voltage fine adjustment
-: Negative (The voltage is lowered.)

bb: Fine adjustment value for the ribbon take-up motor
00 to 15 (in units of 1 step)

c: Direction of the ribbon feed motor voltage fine adjustment
-: Negative (The voltage is lowered.)
+: Positive (The voltage is increased.)

dd: Fine adjustment value for the ribbon feed motor
Negative direction: 00 to 15 (in units of 1 step)
Positive direction: 00 to 10 (in units of 1 step)

Explanation

(1) If the ribbon wrinkles, it can be solved by a find adjustment of the ribbon motor drive voltage by this command.

(2) −1 step corresponds to −5% of the standard drive voltage.

(3) The ribbon motor drive voltage fine adjustment value is stored in memory (retained even if the power is turned off).

(4) If the ribbon motor drive voltage fine adjustment value has been set in the system mode (by key operation on the printer), the fine adjustment value will be the sum of the value set by this command and that in the system mode. The maximum fine adjustment values are as shown below.

Model	Take-up side		Feed side	
	Min.	Max.	Min.	Max.
B-SX6T	-15	-0	-15	+10
B-SX8T	-15	-0	-15	+10

(5) When a RAM clear is performed, the fine adjustment value for each of the command (take-up/feed) and the system mode will be reset to 00.

(6) The factory default of the fine adjustment values is 00, for both command (take-up/feed) and the system mode.

Example To set the value for the ribbon take-up motor to “−3”, and the value for the ribbon feed motor to “−2”.

[ESC] RM; -03-02 [LF] [NUL]

6.3.5 IMAGE BUFFER CLEAR COMMAND [ESC] C

Function Clears the image buffer for drawing characters, lines, bar codes, and graphics.

Format [ESC] C [LF] [NUL]

Explanation

(1) After changing the label size, the image buffer must be cleared.

(2) The increment/decrement designation (described later) is effective until the Image Buffer Clear Command is transmitted.

(3) The link field designation (described later) is effective until the Image Buffer Clear Command is transmitted.

(4) The RFID format and data are cleared.

(5) RFID tag position adjustment value set in the RFID Tag Position Adjustment Command @003 is cleared.

Examples

[ESC] D0508, 0760, 0468 [LF] [NUL]
[ESC] T20C41 [LF] [NUL]
[ESC] C [LF] [NUL]
[ESC] RC000; ABC [LF] [NUL]
[ESC] RC001; DEF [LF] [NUL]
[ESC] XS; I, 0001, 0002C31000 [LF] [NUL]

6.3.6 CLEAR AREA COMMAND [ESC] XR

Function Clears the designated area or reverses the white/black dot pattern in the designated area in the drawing area.

Format [ESC] XR; aaaa, bbbb, cccc, dddd, e [LF] [NUL]

Term

aaaa: X-coordinate of the designated area start point
Fixed to 4 digits (in 0.1 mm units)

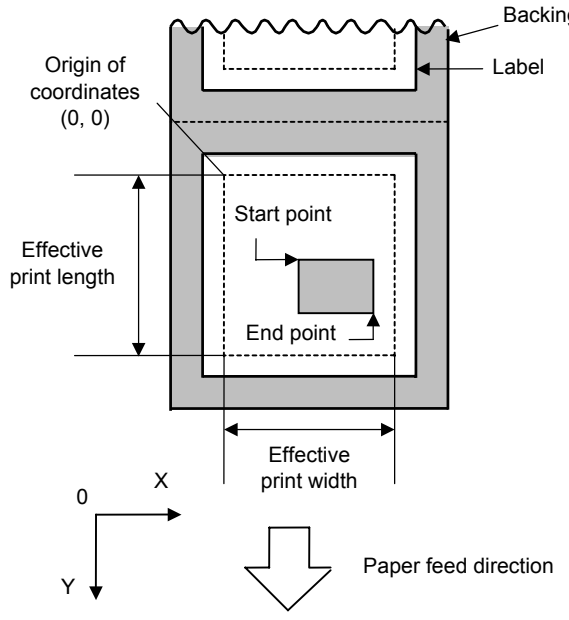
bbbb: Y-coordinate of the designated area start point
4 or 5 digits (in 0.1 mm units)

cccc: X-coordinate of the designated area end point
Fixed to 4 digits (in 0.1 mm units)

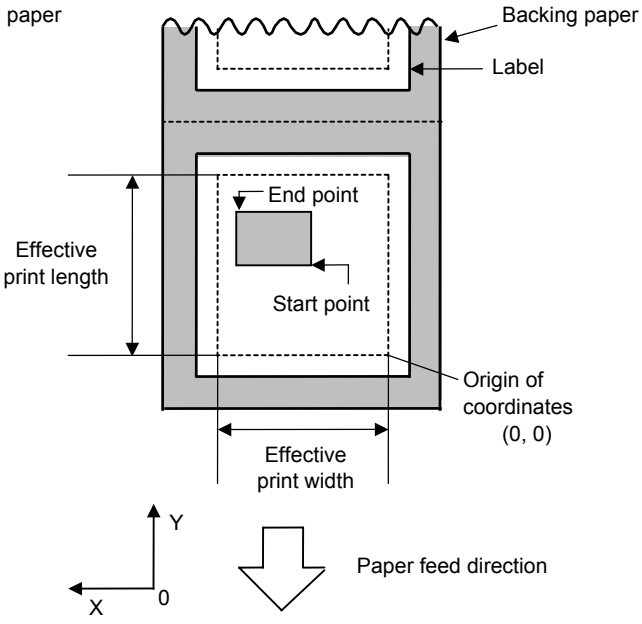
dddd: Y-coordinate of the designated area end point
4 or 5 digits (in 0.1 mm units)

e: Type of clear
A: Clears the contents in the designated area to zero.
B: Reverses the white/black dot pattern in the designated area.

Explanation



[Printing direction: Bottom first]



[Printing direction: Top first]

Notes

(1) Print result will be the same even if the start and end point coordinates are reversed.

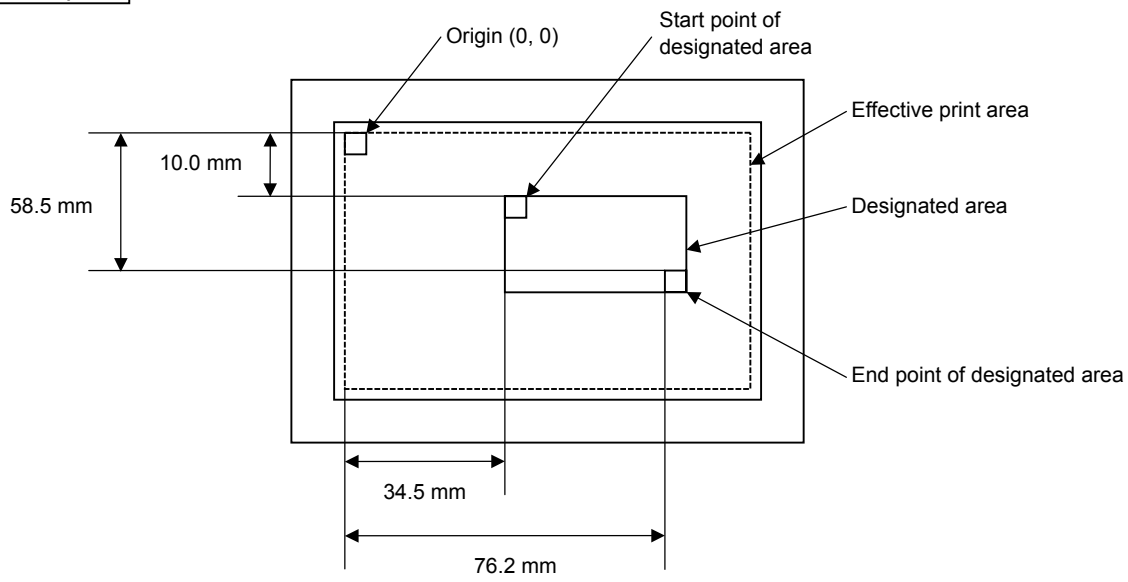
(2) Print result will be the same even if the start point is set to the upper right and the end point is set to the lower left, respectively.

(3) The start and end point coordinates of the designated area must be set within the effective print area set by the Label Size Set Command ([ESC] D).

[Effective print area] [mm]

Item \ Model / Issue mode			B-SX6T			B-SX8T		
			Batch	Strip	Cut	Batch	Strip	Cut
Print head dot density			12 dots/mm (305 dpi)			12 dots/mm (305 dpi)		
Print head width			170.6 mm			213.3 mm		
G: Effective print width		Min.	10.0			10.0		
		Max.	170.7			213.3		
H: Effective print length	Label	Min.	5.5	20.9	23.0	5.5	20.9	23.0
		Max.	1705.0			1364.0		
	Tag	Min.	8.0	---	23.4	8.0	---	23.4
		Max.	1705.0	---	1705.0	1364.0	---	1364.0

Example



[ESC] XR; 0345, 0100, 0762, 0585, A [LF] [NUL]
[ESC] RC000; ABC [LF] [NUL]
[ESC] RC001; DEF [LF] [NUL]
[ESC] XS; I, 0001, 0002C3000 [LF] [NUL]

6.3.7 LINE FORMAT COMMAND [ESC] LC

Function Sets the line format and draws the line.

Format [ESC] LC; aaaa, bbbb, cccc, dddd, e, f (, ggg) [LF] [NUL]

Term

aaaa: X-coordinate of the start point
Fixed to 4 digits (in 0.1 mm units)

bbbb: Y-coordinate of the start point
4 or 5 digits (in 0.1 mm units)

cccc: X-coordinate of the end point
Fixed to 4 digits (in 0.1 mm units)

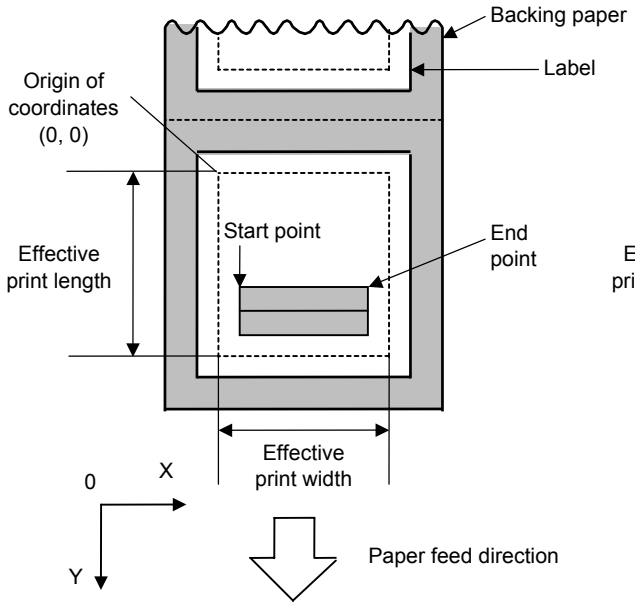
dddd: Y-coordinate of the end point
4 or 5 digits (in 0.1 mm units)

e: Type of line
0: Line (horizontal, vertical, or slant)
1: Rectangle
2: Reserved
3: Reserved

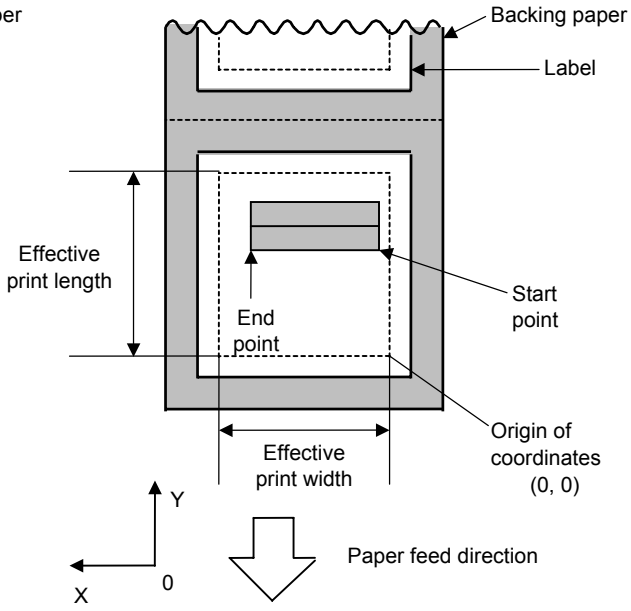
f: No. of line width dots
1 to 9 (in 0.1 mm units)

ggg: Radius of rounded corners of a rectangle
(Omissible. When omitted, rectangle corners are not rounded.)
Fixed to 3 digits (in 0.1 mm units)

Explanation



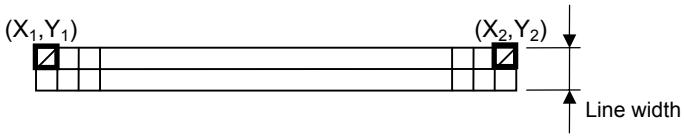
[Printing direction: Bottom first]



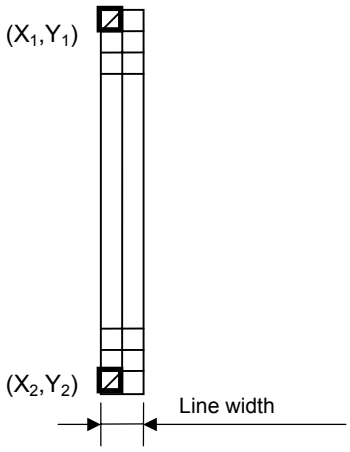
[Printing direction: Top first]

[Line]

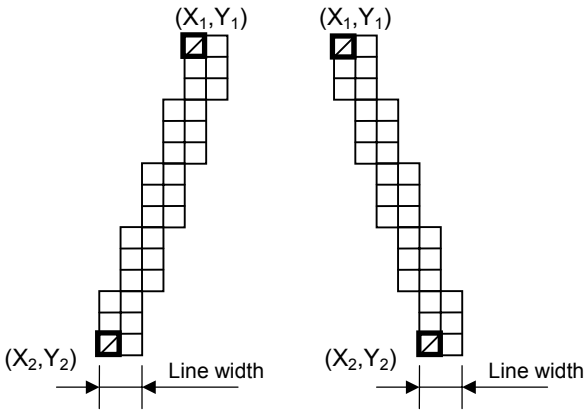
(1) Horizontal line (In the case of $|Y_2 - Y_1| = 0$)



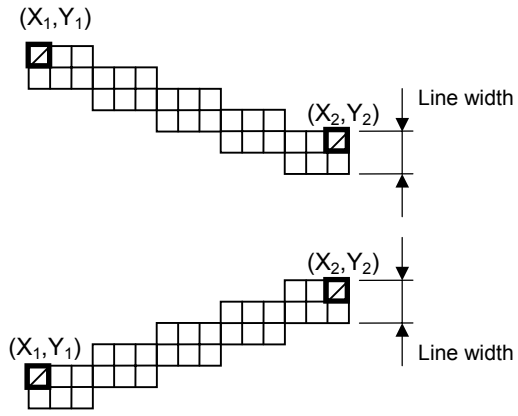
(2) Vertical line (In the case of $|X_2 - X_1| = 0$)



(3) Slant line A ($|X_2 - X_1| \leq |Y_2 - Y_1|$)

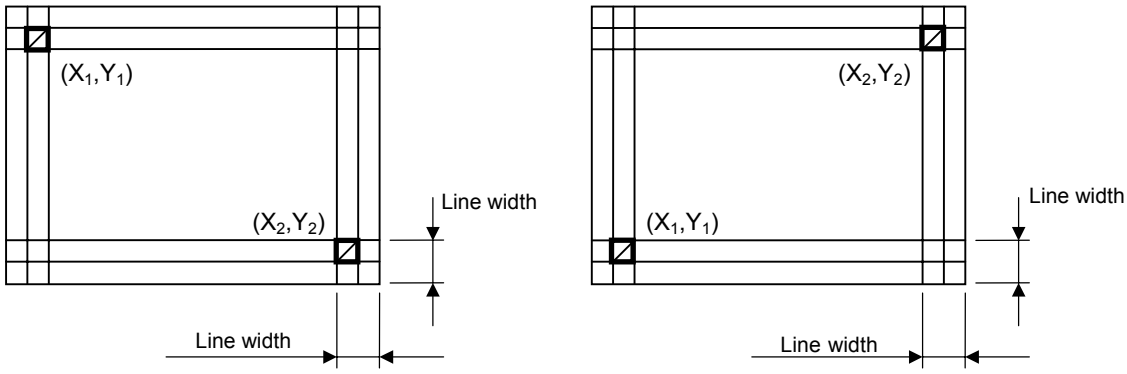


(4) Slant line B ($|X_2 - X_1| > |Y_2 - Y_1|$)

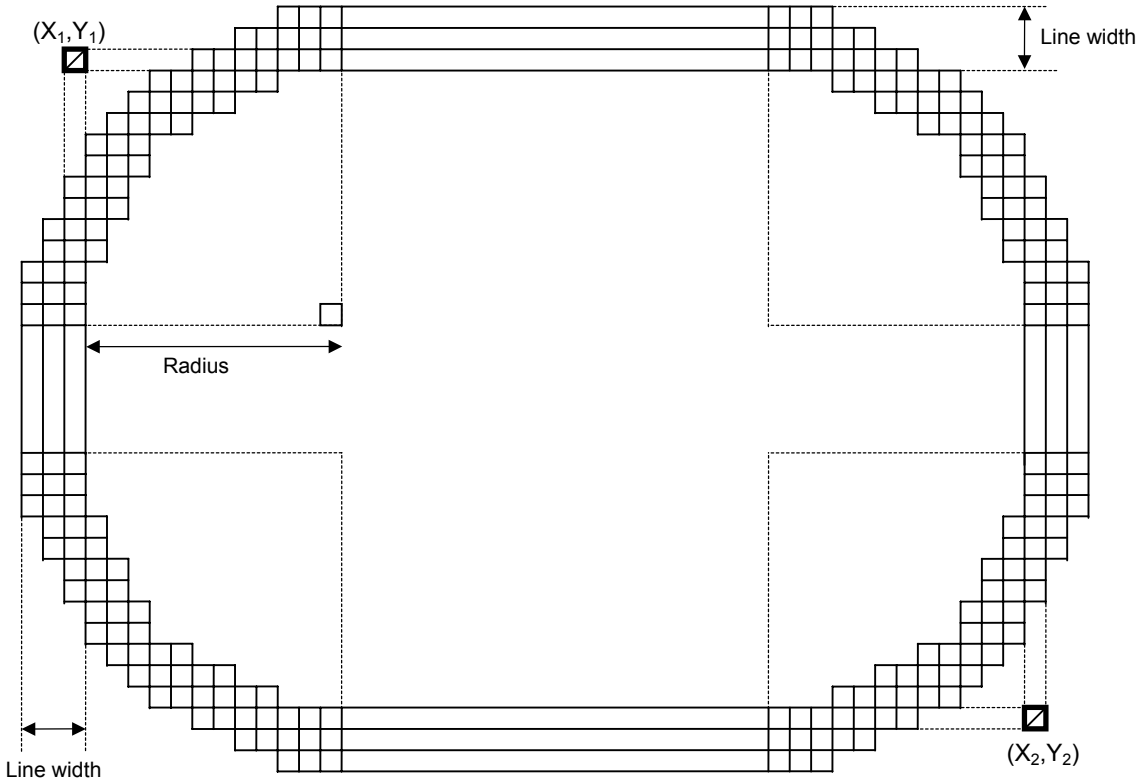


[Rectangle]

(1) Radius of rounded corners = 000, or parameter is omitted



(2) Radius of rounded corners ≠ 000



Notes

(1) When a line is designated, a horizontal line, vertical line, or slant line A/B is drawn according to the start and end point coordinates.

(2) Print result will be the same even if the start and end point coordinates are reversed.

(3) The start and end point coordinates must be set so that the result of line drawing will be within the effective print area set by the Label Size Set Command ([ESC] D).

(4) Designation of the radius of the rounded corner is effective only when the type of line is set to 1 (rectangle). When the type of line is set to 0, designation of the radius is ignored. When the type of line is set to 1 and the radius of the rounded corner is set to 000 or omitted, a normal rectangle is drawn.

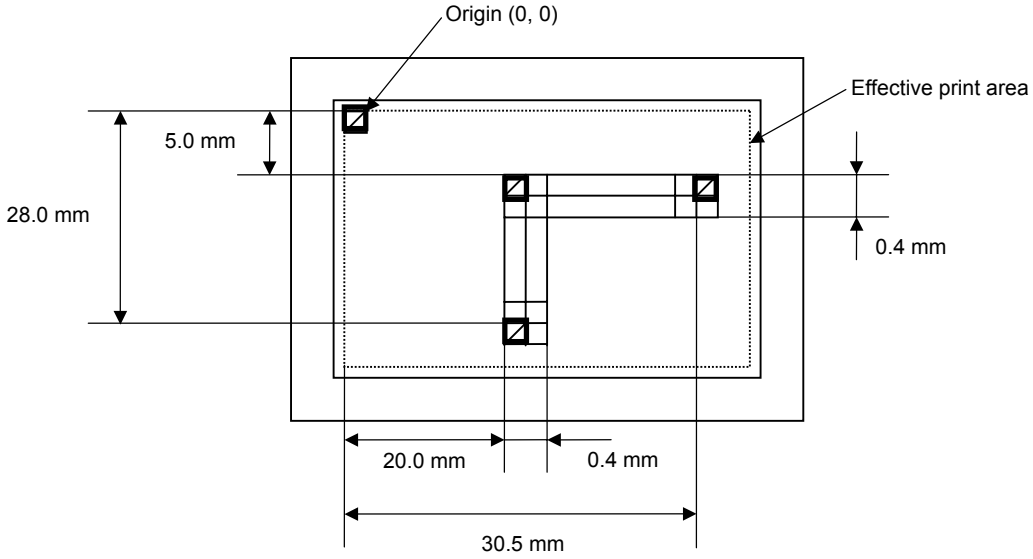
(5) On the following condition, a circle is supposed to be drawn:

$$\frac{|X_2 - X_1|}{2} = \frac{|Y_2 - Y_1|}{2} \leq \text{[Radius of rounded corners]}$$

[Effective print area] [mm]

Item \ Model / Issue mode			B-SX6T			B-SX8T		
			Batch	Strip	Cut	Batch	Strip	Cut
Print head dot density			12 dots/mm (305 dpi)			12 dots/mm (305 dpi)		
Print head width			170.6			213.3		
G: Effective print width		Min.	10.0			10.0		
		Max.	170.7			213.3		
H: Effective print length	Label	Min.	5.5	20.9	23.0	5.5	20.9	23.0
		Max.	1705.0			1364.0		
	Tag	Min.	8.0	---	23.4	8.0	---	23.4
		Max.	1705.0	---	1705.0	1364.0	---	1364.0

Example



[ESC] C [LF] [NUL]
[ESC] LC; 0200, 0350, 0305, 0050, 0, 4 [LF] [NUL]
[ESC] LC; 0200, 0050, 0200, 0280, 0, 4 [LF] [NUL]
[ESC] XS; I, 0001, 0002C3000 [LF] [NUL]

6.3.8 BIT MAP FONT FORMAT COMMAND [ESC] PC

Function Sets the format indicating where and how the bit map font is to be printed on a label.

Format

① [ESC] PCaaa; bbbb, cccc, d, e, ff (, ghh), ii, j (, Jkkll) (, Mm) (, nooooooooo) (, Zpp) (, Pq) (=rrr------rrr) [LF] [NUL]

② [ESC] PCaaa; bbbb, cccc, d, e, ff (, ghh), ii, j (, Jkkll) (, Mm) (, nooooooooo) (, Zpp) (, Pq) (; ss_1, ss_2, ss_3, ------, ss_{20}) [LF] [NUL]

Term

aaa: Character string number
000 to 199 (two-digit number, 00 to 99, are also acceptable.)

bbbb: X-coordinate of the print origin of character string
Fixed to 4 digits (in 0.1 mm units)

cccc: Y-coordinate of the print origin of character string
4 digits or 5 digits (in 0.1 mm units)

d: Character horizontal magnification
1 to 9 (integral multiplication)

* Two-digit designation enables the magnifications in 0.5 units (05 to 95: 0.5 to 9.5 magnifications).
The magnification can be designated in 0.1 units between 0.5 to 1. (06 to 09: 0.6 to 0.9 magnifications).

d d
- Designation in 0.5 magnification units : 0 or 5 (5 to 9, up to 1 magnification)
- Integral multiplication : 0 to 9

e: Character vertical magnification
1 to 9 (integral multiplication)

* Two-digit designation enables the magnifications in 0.5 units (05 to 95: 0.5 to 9.5 magnifications).
The magnification can be designated in 0.1 units between 0.5 to 1. (06 to 09: 0.6 to 0.9 magnifications).

e e
- Designation in 0.5 magnification units : 0 or 5 (5 to 9, up to 1 magnification)
- Integral multiplication : 0 to 9

ff: Type of font

A:	Times Roman (Medium)	8 point
B:	Times Roman (Medium)	10 point
C:	Times Roman (Bold)	10 point
D:	Times Roman (Bold)	12 point
E:	Times Roman (Bold)	14 point
F:	Times Roman (Italic)	12 point
G:	Helvetica (Medium)	6 point
H:	Helvetica (Medium)	10 point
I:	Helvetica (Medium)	12 point
J:	Helvetica (Bold)	12 point
K:	Helvetica (Bold)	14 point
L:	Helvetica (Italic)	12 point
M:	Presentation (Bold)	18 point
N:	Letter Gothic (Medium)	9.5 point
O:	Prestige Elite (Medium)	7 point
P:	Prestige Elite (Bold)	10 point

Q: Courier (Medium) 10 point
R: Courier (Bold) 12 point
S: OCR-A 12 point
T: OCR-B 12 point
U(a): Kanji (16x16 dots) (Square Gothic) or writable character 41 (16x16 dots)
V(a): Kanji (24x24 dots) (Square Gothic) or writable character 42 (24x24 dots)
W(a): Kanji (32x32 dots) (Square Gothic) or writable character 43 (32x32 dots)
X(a): Kanji (48x48 dots) (Square Gothic) or writable character 44 (48x48 dots)
a: Reserved
to
p: Reserved
q: Gothic 725 Black
v: Kanji (24x24 dots) (Mincho)
w: Kanji (32x32 dots) (Mincho)
01 (a): Writable character 1 (1×1 dot to 720×720 dots)
to
40 (a): Writable character 40 (1×1 dot to 720×720 dots)
51 (a): 2-byte code set writable character 1 (1×1 dot to 720×720 dots)
to
55 (a): 2-byte code set writable character 5 (1×1 dot to 720×720 dots)

a: Drive
(Omissible. When omitted, flash ROM on the CPU board is selected.)
0: Flash ROM on the CPU board
1: Reserved
2: Reserved.

* Fonts A to L, and q are proportional fonts.

ghh: Fine adjustment of character-to-character space
(Omissible. When omitted, space is adjusted according to the designated font.)

g: Designates whether to widen or narrow the character-to-character space.
+: Widen
−: Narrow

hh: No. of space dots between characters
00 to 99 (in units of dots)

ii: Rotational angles of a character and character string

00:	0° (char.)	0° (char.-string)
11:	90° (char.)	90° (char.-string)
22:	180° (char.)	180° (char.-string)
33:	270° (char.)	270° (char.-string)
01:	0° (char.)	90° (char.-string)
12:	90° (char.)	180° (char.-string)
23:	180° (char.)	270° (char.-string)
30:	270° (char.)	0° (char.-string)

For font type U, V, W, X, v, or w only

j: Character attribution

B: Black character

W (aabb): Reverse character

aa: No. of dots from the character string to the end of the black background in the horizontal direction

bb: No. of dots from the character string to the end of the black background in the vertical direction

aa: 01 to 99 (in units of dots)
bb: 01 to 99 (in units of dots)

F (aabb): Boxed character

aa: No. of dots from the character string area to the box in the horizontal direction

bb: No. of dots from the character string area to the box in the vertical direction

aa: 01 to 99 (in units of dots)
bb: 01 to 99 (in units of dots)

C (aa): Stroked out character

aa: No. of dots from the character string area to the end of the stroke

aa: 01 to 99 (in units of dots)

* Descriptions in parentheses are omissible.
(When omitted, it is character magnification (horizontal or vertical magnifications, whichever is larger) × 6 dots.)

Jkkll: Bold character designation
(Omissible. When omitted, this process is not performed.)

kk: No. of horizontal shift dots
00 to 16 (in units of dots)

ll: No. of vertical shift dots
00 to 16 (in units of dots)

Mm: Type of check digits to be attached.
(Omissible. When omitted, this process is not performed)

m: Type of check digit

0: Modulus 10 (Draws data and check digit)
1: Modulus 43 (Draws data and check digit)
2: DBP Modulus 10 (Draws check digit only)

nooooooooo: Increment and decrement

(Omissible. When omitted, incrementing/decrementing is not performed.)

n: Designates whether to increment or decrement.

+: Increment
-: Decrement

ooooooooo: Skip value
0000000000 to 9999999999

Zpp: Zero suppression
(Omissible. When omitted, zero suppression is not performed.)

pp: No. of digits after zero suppression
00 to 20

Pq: Alignment (Omissible, When omitted, the alignment is set to left.)

q: Designates the character position

1: Left
2: Center
3: Right

4aaaa: Justification

aaaa: Character string area of X direction
B-SX6T: 0050 to 1706 (in units of 0.1 mm)
B-SX8T: 0050 to 2133 (in units of 0.1 mm)

5aaaabbbcc: Automatic line feed

aaaa: Character string area of X direction
B-SX6T: 0050 to 1706 (in units of 0.1 mm)
B-SX8T: 0050 to 2133 (in units of 0.1 mm)

bbb: Line feed spacing
010 to 500 (in units of 1 mm)

cc: Number of lines
01 to 99

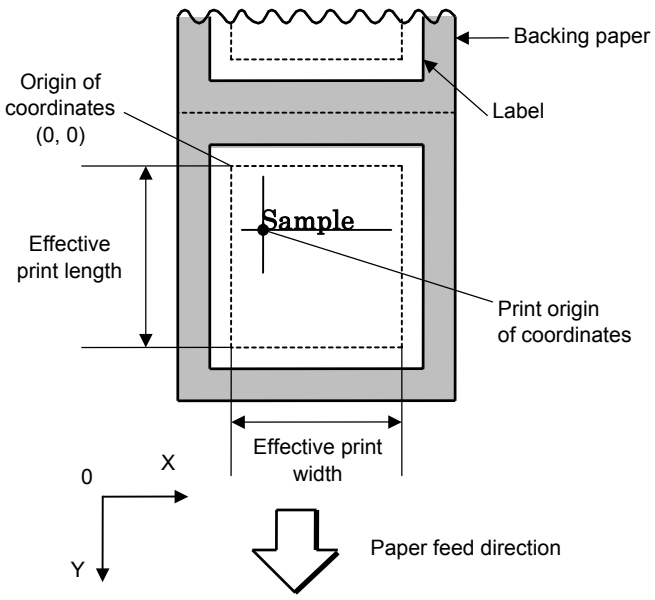
rrr------rrr: Data string to be printed (Omissible)
Max. 255 digits

ss_1, ss_2, ss_3, ------, ss_{20}: Link field No. (Omissible)
01 to 99 (1 to 99 can be also used.)
Up to 20 fields can be designated using commas.

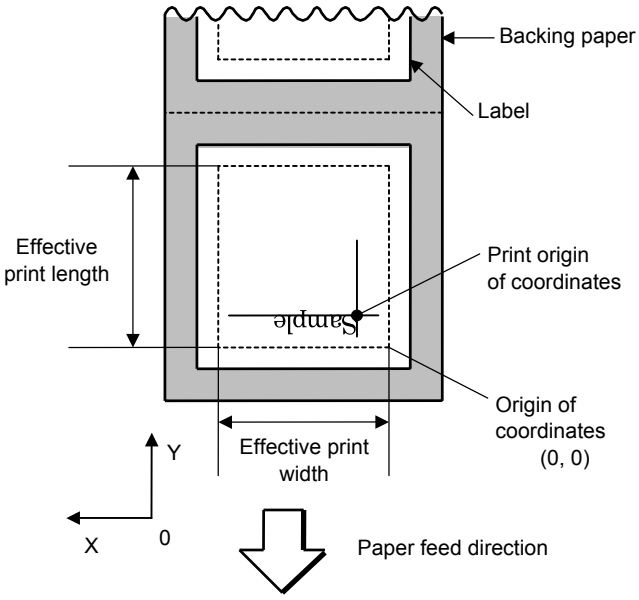
Explanation (1) Character string number

When drawing by the Data Command ([ESC] RC), the format designated by the character string number is selected.

(2) Print origin of coordinates



[Printing direction: Bottom first]



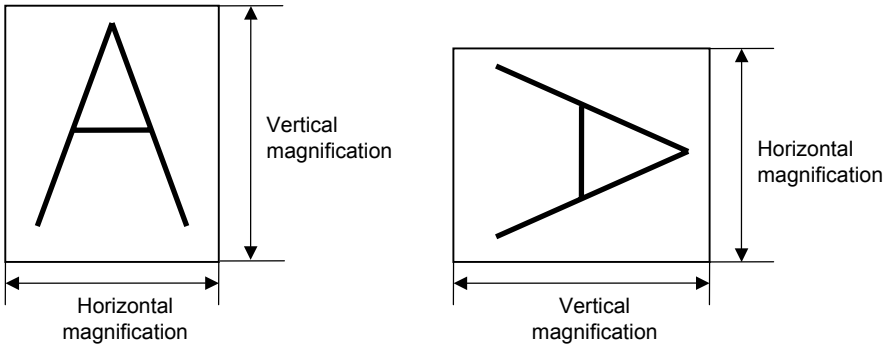
[Printing direction: Top first]

The print origin of coordinates must be set so that the characters are drawn within the effective print area set by the Label Size Set Command ([ESC] D).

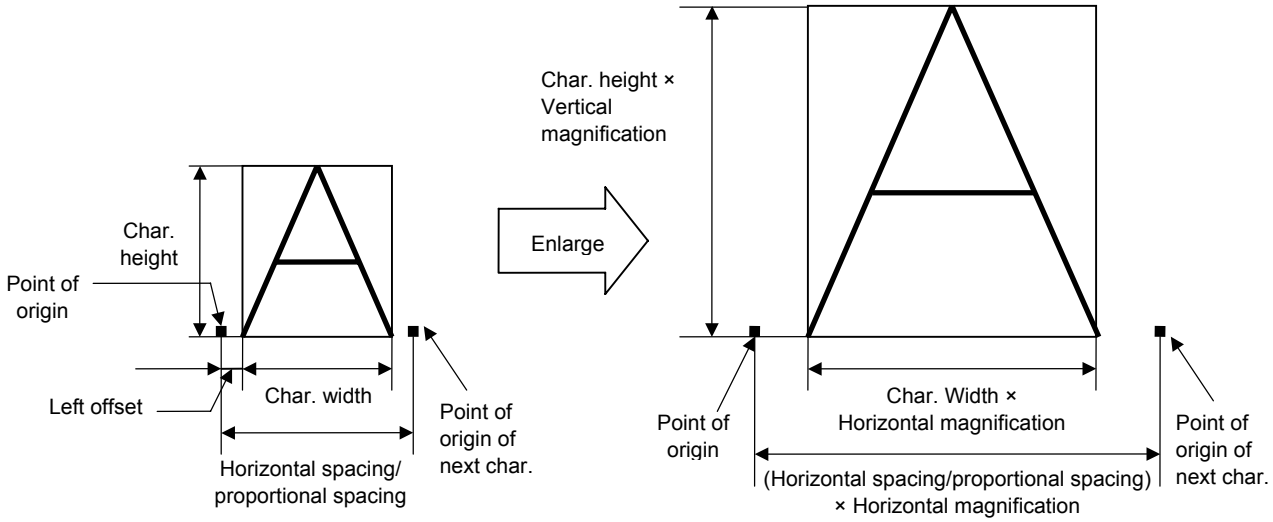
[Effective print area] [mm]

Item \ Model / Issue mode			B-SX6T			B-SX8T		
			Batch	Strip	Cut	Batch	Strip	Cut
Print head dot density			12 dots/mm (305 dpi)			12 dots/mm (305 dpi)		
Print head width			170.6 mm			213.3 mm		
G: Effective print width		Min.	10.0			10.0		
		Max.	170.7			213.0		
H: Effective print length	Label	Min.	5.5	20.9	23.0	5.5	20.9	23.0
		Max.	1705.0			1364.0		
	Tag	Min.	8.0	---	23.4	8.0	---	23.4
		Max.	1705.0	---	1705.0	1364.0	---	1364.0

(3) Horizontal magnification and vertical magnification



[Relationship between drawing coordinates and magnification]



(4) Type of font

A: Times Roman:

B: Times Roman

C: Times Roman

D: Times Roman

E: Times Roman

F: Times Roman

G: Helvetica

H: Helvetica

I: Helvetica

J: Helvetica

K: Helvetica

L: Helvetica

M: Presentation

N: Letter Gothic

O: Prestige Elite

P: Prestige Elite

Q: Courier

R: Courier

S: OCR-A

T: OCR-B

q: Gothic 725 Black

U: Kanji (16x16 dots)

V: Kanji (24x24 dots) あいう亜唖娃阿哀愛ＡＢＣ１２３ABC123苺澤弐壼遙瑤％＃＆ａｂｃアイウⅠⅡⅢ春夏秋冬かきくけこサシスセソ以伊位依

W: Kanji (32x32 dots) あいう亜唖娃阿哀愛ＡＢＣ１２３ABC123苺澤弐壼遙瑤％＃＆ａｂｃアイウⅠⅡⅢ春夏秋冬

X: Kanji (48x48 dots) あいう亜唖娃阿哀愛ＡＢＣ１２３ABC123苺澤弐壼遙瑤％＃＆

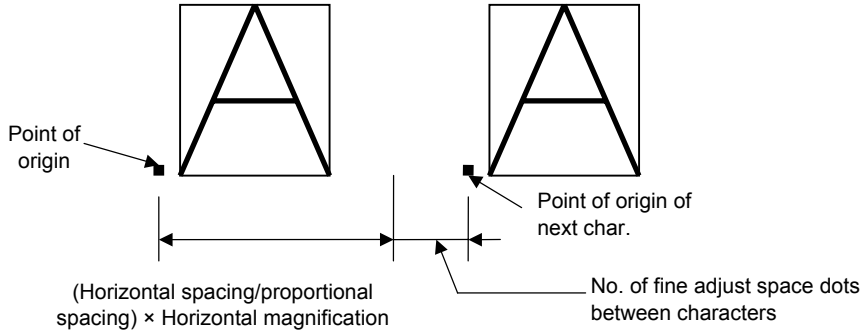
v: Kanji (24x24 dots)

w: Kanji (32x32 dots) あいう亜唖娃阿哀愛ＡＢＣ１２３ABC123苺澤弐壼遙瑤％＃＆ａｂｃアイウⅠⅡⅢ春夏秋冬

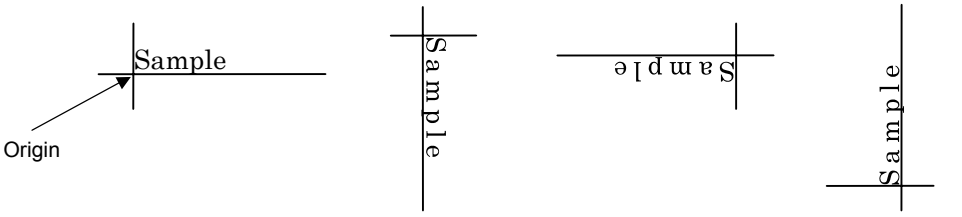
***NOTE**: To print font type U, V, W, X, v, or w, the Kanji Character Generator is required. Even if a font type corresponding to "Reserved" is specified, a command error will not occur.*

(5) Fine adjustment of character-to-character space

If no character-to-character space is specified or the number of space dots between characters is 0, drawing will take place according to the horizontal spacing/proportional spacing determined for each character. When character-to-character space is specified, drawing will take place according to the value obtained by adding the character spacing/proportional spacing to the specified value.



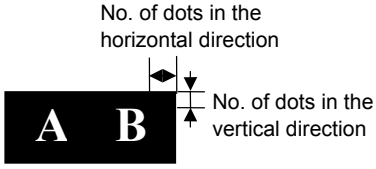
(6) Rotational angles of a character and character string



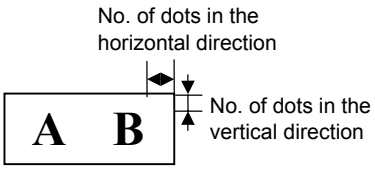
0° (00) 90° (11) 180° (22) 270° (33)

(7) Selection of character attribution

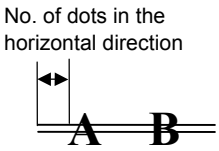
Black characters



Reverse characters

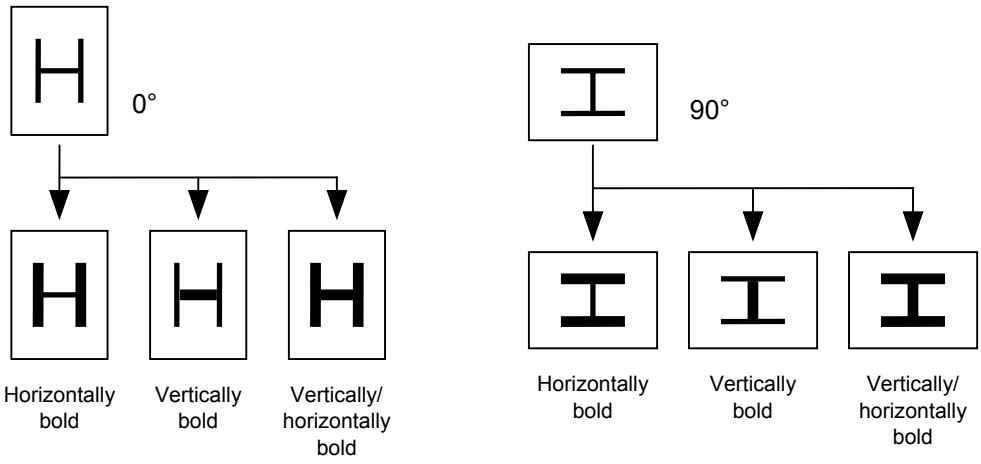


Boxed characters



Stroked out characters

(8) Bold character designation



(9) Check digit to be attached

When Modulus 10 or Modulus 43 is selected, the check digit of a data string is calculated and attached to the data string for drawing.
In case of Modulus 10, when the data includes any data other than numerals, drawing is not performed. In case of Modulus 43, when the data includes any data other than CODE39, drawing is not performed, either.

When DBP Modulus 10 is selected, the check digit of a data string is calculated and only the check digit is drawn. When the data includes any data other than numerals, drawing is not performed. For the font types 51 to 55, the check digit cannot be designated. (Even if it is designated, it is ignored, and the printer operates as if there was no designation.)

* DBP Modulus 10 is Modulus 10 exclusively for Deutsche Bundespost Postdienst.

(10) Increment/decrement

Printing is performed while the data is incremented or decremented every time a label is issued. When the data string exceeds the maximum number of digits (40), the data string will not be drawn. When the font type is U, V, W, X, v, w or 51 to 55, the incrementing/decrementing cannot be designated. (Even if it is designated, it is ignored, and the printer operates as if there was no designation.)

Initial value	0000	0000	0000	0000	999999
INC/DEC	+10	+10	+10	+10	+1
Zero suppression	Not designated	5	3	0	3
1st label	0000	0000	␣000	0000	999999
2nd label	0010	0010	␣010	0010	␣␣␣000
3rd label	0020	0020	␣020	0020	␣␣␣001
4th label	0030	0030	␣030	0030	␣␣␣002
5th label	0040	0040	␣040	0040	␣␣␣003

Letters and numerals for increment/decrement

For the data string, up to 40 digits (including letters, numerals, and symbols) are possible. Only the numerals are picked up and calculated for incrementing/decrementing, and then are returned to the previous position to draw the data.

Example of increment/decrement calculation

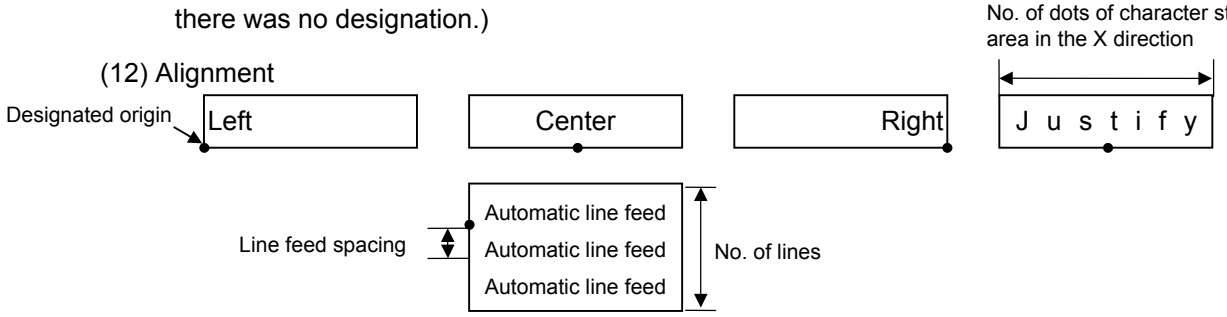
Initial value	00000	A0A0A	7A8/9	A2A0A
INC/DEC	+1	+1	+3	-3
1st label	00000	A0A0A	7A8/9	A2A0A
2nd label	00001	A0A1A	7A9/2	A1A7A
3rd label	00002	A0A2A	7A9/5	A1A4A
4th label	00003	A0A3A	7A9/8	A1A1A
5th label	00004	A0A4A	8A0/1	A0A8A

(11) Zero suppression

No. of digits after zero suppression	0	1	2	2	3	4	5
Data	0000	0000	0000	0A12	0123	0123	0123
Print	0000	␣␣␣0	␣␣00	␣A12	␣123	0123	0123

Zero(s) in a data string is replaced with a space(s) from the upper digits, according to the designated number of digits. However, if the number of digits after zero suppression is greater than the data string, the data string will be drawn without performing zero suppression. Where the data string exceeds the maximum number of digits (40), the data string will not be drawn. For the font type U, V, W, X, v, w, or 51 to 55, zero suppression is not designated. (Even if it is designated, it is ignored, and the printer operates as if there was no designation.)

(12) Alignment



If characters are not placed on one line when the justification and the automatic line feed are designated, the following steps are performed.

The value of the character-to-character space is gradually narrowed. When characters are not placed on one line even if the value is set to 0, character-to-character space will be returned to the former value, and then the horizontal magnification for a character is reduced by 0.5 times.

If characters are still not placed on one line, the value of the character-to-character space and the horizontal magnification are gradually reduced alternately. When characters are not placed on one line even if the character magnification is set to 0.5 times and the character-to-character space is set to 0, that field is not drawn. (The same previous field is also not drawn.)

When 01, 12, 23, or 30 is specified for the character/character string rotational angle, a specification of alignment (center, left, right, justification, or automatic line feed) is ignored.

(13) Data string to be printed

Drawing data can be programmed by designating the number of digits after the symbol "=." Up to 255 digits of characters can be printed. However, when the font type is U, V, W, X, e, j, v, or w, maximum of 127 digit characters can be printed. If the number of digits exceeds the upper limit, the excessive data will be discarded.
For the character code table, refer to the character code table mentioned later.

(14) Link field No.

The link field No. can be programmed by designating it after the symbol ";". After the link field No. is designated using the Format Command, the data strings are linked by the Link Field Data Command to draw an image.
Up to 20 fields can be linked.

The following shows an example of linked fields on the two continuous labels.

[Format Command]

[ESC] PC01;	; 01 [LF] [NUL]	:	Link field No. 1 is designated.
[ESC] PC02;	; 03 [LF] [NUL]	:	Link field No. 3 is designated.
[ESC] PC03;	; 04 [LF] [NUL]	:	Link field No. 4 is designated.
[ESC] XB01;	; 03, 04 [LF] [NUL]	:	Link fields No. 3 and No. 4 are designated.

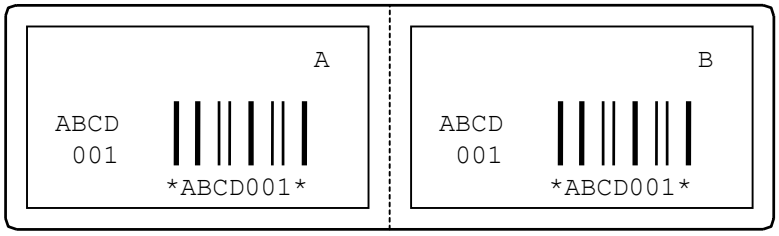
[ESC] PC04;	; 02 [LF] [NUL]	:	Link field No. 2 is designated.
[ESC] PC05;	; 03 [LF] [NUL]	:	Link field No. 3 is designated.
[ESC] PC06;	; 04 [LF] [NUL]	:	Link field No. 4 is designated.
[ESC] XB02;	; 03, 04 [LF] [NUL]	:	Link fields No. 3 and No. 4 are designated.

Designating link field No.

[Data Command]

[ESC] RC; A [LF] B [LF] ABCD [LF] 001 [LF] [NUL]

Link field No. 4
Link field No. 3
Link field No. 2
Link field No. 1



Notes

(1) Attachment of the check digit, increment/decrement, and zero suppression are performed according to the following priority. If any of the conditions is improper, no drawing will take place.

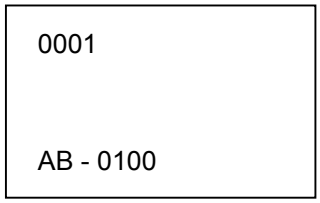
(For example, the zero(s) is replaced with a space(s) as a result of zero suppression, but the modulus 10 designated to be attached cannot be calculated.)

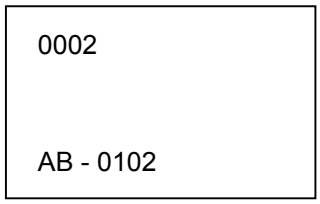
Increment/decrement > zero suppression > attachment of check digit

(2) Up to 32 fields for which incrementing/decrementing has been designated can be drawn. If the total of bit map font, outline font or bar code increment/decrement fields exceeds 32, drawing will take place without incrementing/decrementing any excessive field. The field to be incremented or decremented is kept incremented or decremented until the Image Buffer Clear Command ([ESC] C) is transmitted.

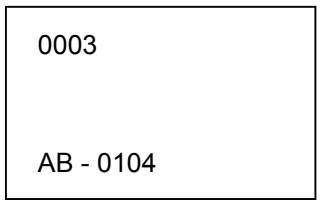
[Example]

1) Format Command (Increment character string No. 001 (+1))
2) Format Command (No incrementing for character string No. 002)
3) Format Command (Increment character string No. 003 (+2))
4) Image Buffer Clear Command
5) Data Command (Character string No. 001 “0001”)
6) Data Command (Character string No. 002 “AB-”)
7) Data Command (Character string No. 003 “0100”)
8) Issue Command (2 labels)

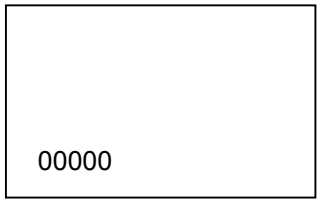




9) Issue Command (1 label)



10) Image Buffer Clear Command
11) Data Command (Character string No. 002 “00000”)
12) Issue Command (1 label)



(3) The Bit Map Font Format Command may be connected to the Outline Font Format Command when transmitted.

[ESC] P C001; 0100, 0150, 1, 1, A, 00, B [LF]
C002; 0350, 0180, 1, 1, A, 00, B [LF]
C005; 0200, 0300, 25, 2, C, +05, 00, B, +0000000001 [LF]
V01; 0500, 0400, 0100, 0100, A, 00, B [LF] [NUL]

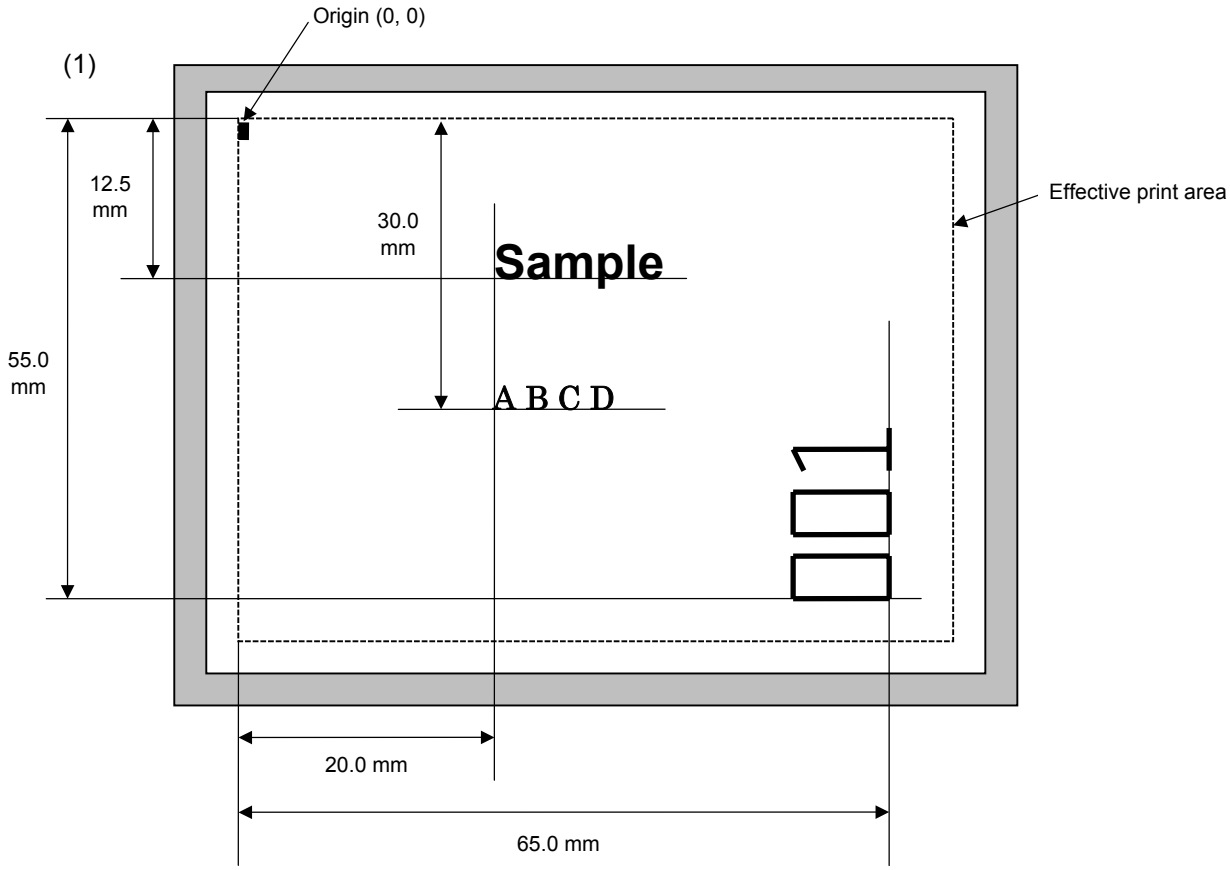
(4) In case that the drawing data is changed for every label, the field of the drawing data for the previous label is automatically cleared using the character string number, then the next drawing data is printed. Therefore, the character string number should be designated according to the drawing fields. Since the automatic field clear is not performed between the Clear Command ([ESC] C) and Issue Command ([ESC] XS), the fixed data may be drawn using the same character string number. In this case, the Format Command and Data Command should be sent alternately. (After the Issue Command is sent, the fields with the same character string number are automatically cleared until the Clear Command is sent.)

(5) The link field designation is cleared after reformatting data using the same character string No. without designating the link field.
The link field designation can be also cleared by the Image Buffer Clear Command.

(6) A print data string and link field No. cannot be programmed at the same time.

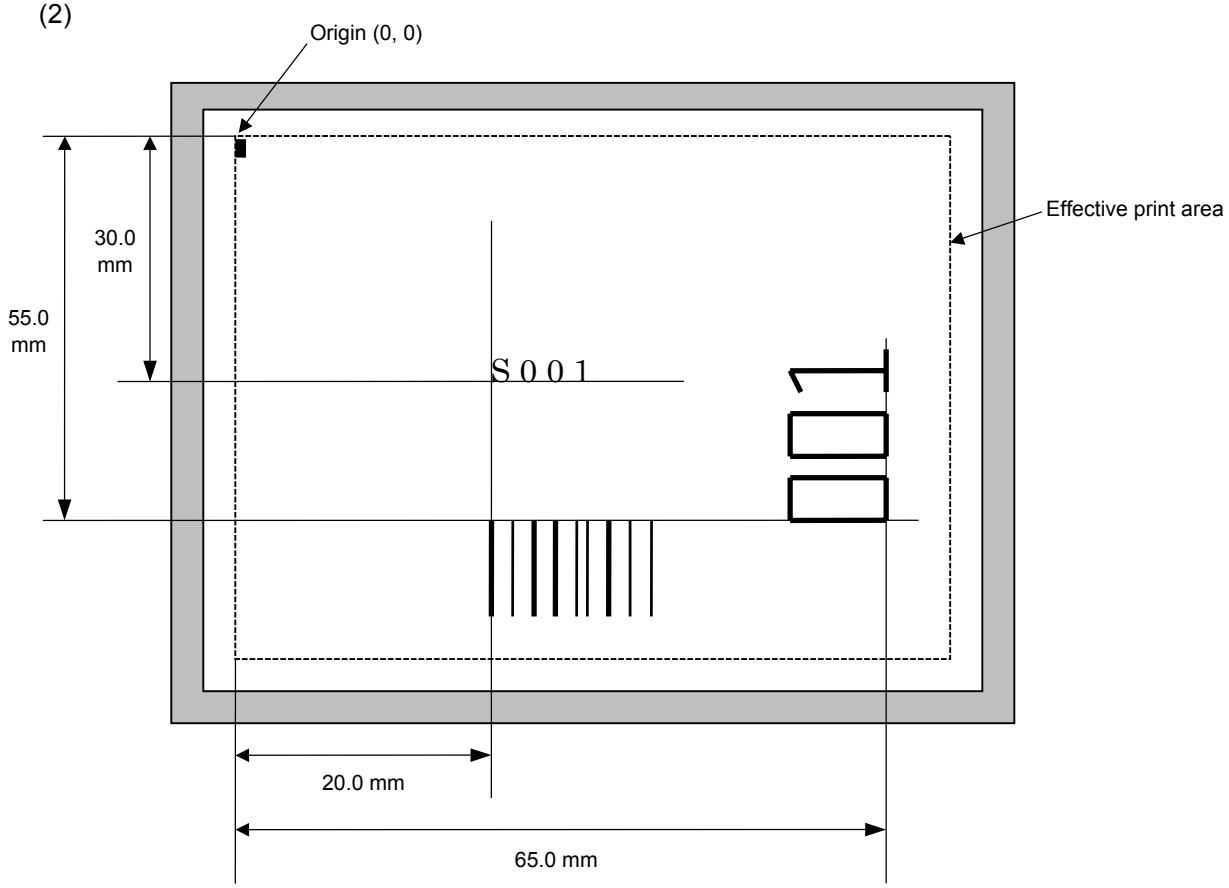
Refer to Bit Map Font Data Command ([ESC] RC)
Outline Font Format Command ([ESC] PV)
Bar Code Format Command ([ESC] XB)

Examples



[ESC] C [LF] [NUL]
[ESC] PC000; 0200, 0300, 1, 1, A, 00, B=ABCD [LF] [NUL]
[ESC] PC001; 0200, 0125, 1, 1, C, 00, B [LF] [NUL]
[ESC] PC002; 0650, 0550, 2, 2, G, 33, B, +0000000001 [LF] [NUL]
[ESC] RC001; Sample [LF] [NUL]
[ESC] RC002; 001 [LF] [NUL]
[ESC] XS; I, 0002, 0002C3000 [LF] [NUL]

(2)



[ESC] C [LF] [NUL]
[ESC] PC001; 0200, 0300, 1, 1, C, 00, B; 01, 02 [LF] [NUL]
[ESC] PV01; 0650, 0550, 0200, 0150, B, 33, B; 02 [LF] [NUL]
[ESC] XB01; 0200, 0550, 3, 1, 03, 03, 08, 08, 03, 0, 0150; 01, 02 [LF] [NUL]
[ESC] RC; S [LF] 001 [LF] [NUL]
[ESC] XS; I, 0002, 0002C3000 [LF] [NUL]

6.3.9 OUTLINE FONT FORMAT COMMAND [ESC] PV

Function: Sets the format to indicate where and how the outline font is to be printed.

⊙ Fonts other than TrueType font

Format

① [ESC] PVaa; bbbb, cccc, dddd, eeee, f (, ghhh), ii, j (, Mk) (, lmmmmmmmmmm) (, Znn) (, Po) (=ppp------ppp) [LF] [NUL]

② [ESC] PVaa; bbbb, cccc, dddd, eeee, f (, ghhh), ii, j (, Mk) (, lmmmmmmmmmm) (, Znn) (, Po) (; qq_1, qq_2, qq_3, ------, qq_{20}) [LF] [NUL]

Term

aa: Character string number
00 to 99

bbbb: X-coordinate of the print origin of character string
Fixed to 4 digits (in 0.1 mm units)

cccc: Y-coordinate of the print origin of character string
4 digits or 5 digits (in 0.1 mm units)

dddd: Character width
0020 to 0850 (in 0.1 mm units)

eeee: Height of the character
0020 to 0850 (in 0.1 mm units)

f: Type of font
A: TEC FONT1 (Helvetica [bold])
B: TEC FONT1 (Helvetica [bold] proportional)
E: Price Font 1
F: Price Font 2
G: Price Font 3
H: TEC FONT2 DUTCH801 Bold (Times Roman Proportional)
I: TEC FONT3 BRUSH738 Regular (Pop Proportional)
J: TEC FONT4 GOTHIC725 Black (Proportional)

ghhh: Fine adjustment of character-to-character space
(Omissible. When omitted, the space is adjusted according to the designated font.)

g: Designates whether to widen or narrow the character-to-character space.
+: Widen
−: Narrow

hhh: No. of space dots between characters
000 to 512 (in units of dots)

ii: Rotational angles of a character and character string

00:	0° (char.)	0° (char.-string)
11:	90° (char.)	90° (char.-string)
22:	180° (char.)	180° (char.-string)
33:	270° (char.)	270° (char.-string)

j: Character attribution

B: Black character

W (aabb): Reverse character

aa: No. of dots from the character string to the end of the black background in the horizontal direction.

bb: No. of dots from the character string to the end of the black background in the vertical direction.

aa: 01 to 99 (in units of dots)
bb: 01 to 99 (in units of dots)

F (aabb): Boxed character

aa: No. of dots from the character string area to the box in the horizontal direction.

bb: No. of dots from the character string area to the box in the vertical direction.

aa: 01 to 99 (in units of dots)
bb: 01 to 99 (in units of dots)

C (aa): Stroked out character

aa: No. of dots from the character string area to the end of the stroke

aa: 01 to 99 (in units of dots)

* Parameter in parentheses are omissible.
(If omitted, it is character size (the character width or height, whichever is greater) ÷ 8 dots.)

Mk: Type of the check digit to be attached
(Omissible. When omitted, the check digit is not drawn.)

k: Type of check digit

0: Modulus 10 (Draws data and check digit)
1: Modulus 43 (Draws data and check digit)
2: DBP Modulus 10 (Draws check digit only)

lmmmmmmmmmm: Increment and decrement
(Omissible. When omitted, incrementing/decrementing is not performed.)

l: Designates whether to increment or decrement.

+: Increment
–: Decrement

mmmmmmmmmm: Skip value
0000000000 to 9999999999

Znn: Zero suppression
(Omissible. When omitted, zero suppression is not performed.)

nn: No. of digits after zero suppression
00 to 20

Po: Alignment (Omissible. When omitted, the alignment is set to the left.)

o: Designates the character position.

1: Left

2: Center

3: Right

4aaaa: Justification

aaaa: X direction of character string area

B-SX6T: 0050 to 1706 (in 0.1 mm units)

B-SX8T: 0050 to 2133 (in 0.1 mm units)

ppp------ppp: Data string to be printed (Omissible)

Max. 255 digits

qq_1, qq_2, qq_3, ------, qq_{20}: Link field No. (Omissible)

01 to 99 (1 to 99 can also be used.)

Up to 20 fields can be designated using commas.

⊙ TrueType font

Format [ESC] PVaa; bbbb, cccc, dddd, eeee, ff, g (, hiii), jj, k (=ppp ------ ppp) [LF] [NUL]

Term

aa: Character string number
00 to 99

bbbb: X-coordinate of the print origin of character string
Fixed to 4 digits (in 0.1 mm units)

cccc: Y-coordinate of the print origin of character string
4 or 5 digits (in 0.1 mm units)

dddd: Character width
0020 to 0850 (in 0.1 mm units)

eeee: Height of the character
0020 to 0850 (in 0.1 mm units)

ff: Type of font
01: BalloonPExtBol (File name: Ballp_eb.ttf)
02: BlacklightD (File name: Blklt_rg.ttf)
03: BrushScrD (File name: Brush_rg.ttf)
04: CG Times (File name: Tec_cgt.ttf)
05: CG Times Bold (File name: Tec_cgtb.ttf)
06: CG Times Italic (File name: Tec_cgti.ttf)
07: Clarendon Condensed Bold (File name: Tec_clcd.ttf)
08: FlashPBol (File name: Flash_bd.ttf)
09: Garamond Kursiv Halbfett (File name: Tec_gmkh.ttf)
10: GoudyHeaP (File name: Gdyhp_rg.ttf)
11: GilliesGotDBol (File name: Gilli_bd.ttf)
12: GilliesGotLig (File name: Gilli_lt.ttf)
13: NimbusSanNovTUltLigCon (File name: Nsnct_ul.ttf)
14: Ryahd (File name: ryahd.ttf)
15: Ryahd Bold (File name: ryahdbd.ttf)
16: CG Triumvirate (File name: Trium.ttf)
17: CG Triumvirate Condensed Bold (File name: Triumcb.ttf)
18: Univers Medium (File name: Tec_uni.ttf)
19: Univers Bold (File name: Tec_unib.ttf)
20: Univers Medium Italic (File name: Tec_unii.ttf)
21: add_on TrueTypeFont 1
22: add_on TrueTypeFont 2
23: add_on TrueTypeFont 3
24: add_on TrueTypeFont 4
25: add_on TrueTypeFont 5
26: (Reserved)
27: (Reserved)
28: (Reserved)
29: (Reserved)
30: (Reserved)

(*1) The font types 21 to 30 are the fonts to be added by the user.
(*2) For the fonts stored in flash ROM on the CPU board, parameter “ff” for the type of font corresponds to the font type according to the setting made when fonts are stored.

g: Drive
Indicates where the TrueType font files are stored.

0: Flash ROM on the CPU board

hiii: Fine adjustment of character-to-character space
(Omissible. When omitted, the space is adjusted according to the designated font.)

h: Designates whether to widen or narrow the character-to-character space.
+: Widen
−: Narrow

iii: No. of space dots between characters
000 to 512 (in units of dots)

jj: Rotational angles of a character and character string

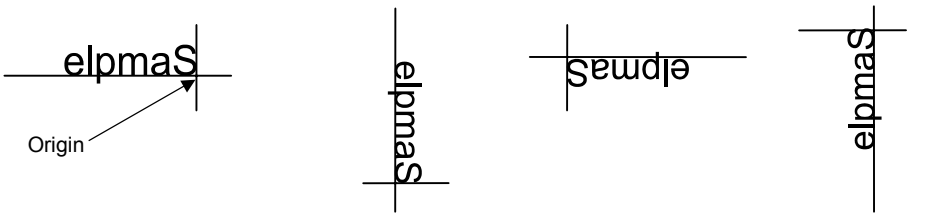
00:	0° (char.)	0° (char.-string)
11:	90° (char.)	90° (char.-string)
22:	180° (char.)	180° (char.-string)
33:	270° (char.)	270° (char.-string)

k: Character attribution
B: Black character

ppp------ppp: Data string to be printed (Omissible)
Max. 255 digits

* TrueType fonts are not included in the standard character generator data. Therefore, they need be installed in the flash ROM on the CPU board.
For the TrueType font installation procedure and details, refer to the TrueType Font Specification (TAA-1416).

* If Arabic is selected as the character code, letters are drawn from right to left.

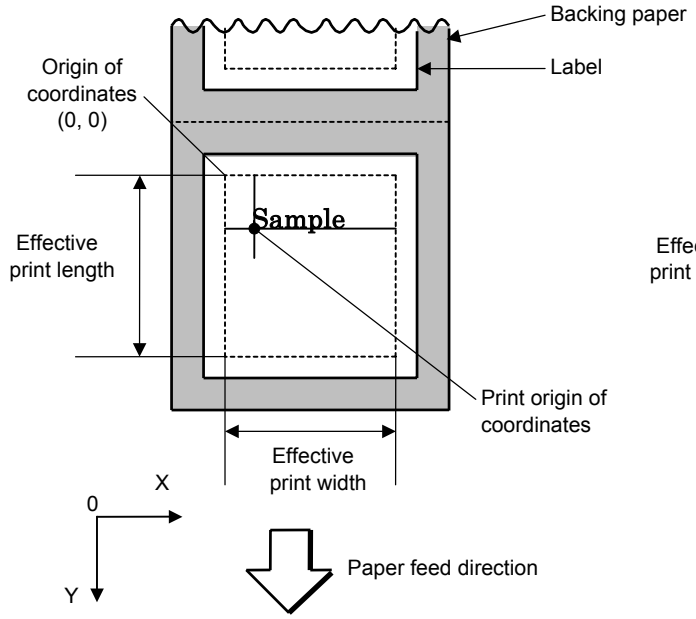


0° (00) 90° (11) 180° (22) 270° (33)

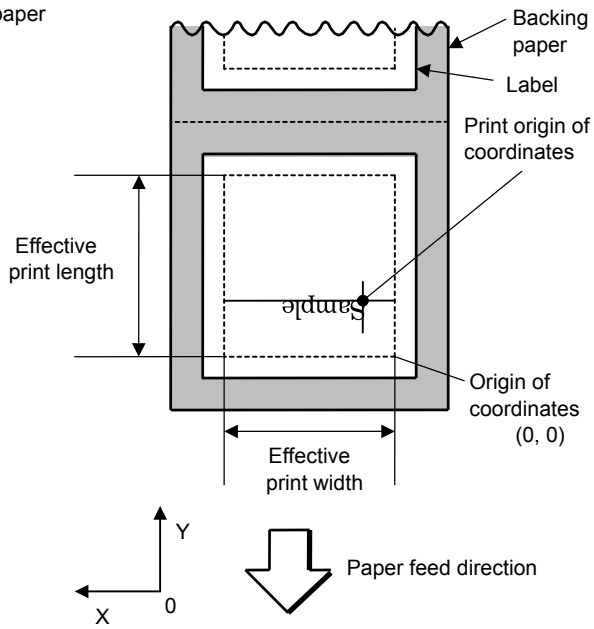
Explanation (1) Character string number

When data is drawn by the Data Command ([ESC] RV), the format designated by the character string number is selected.

(2) Print origin of coordinates



[Printing direction: Bottom first]



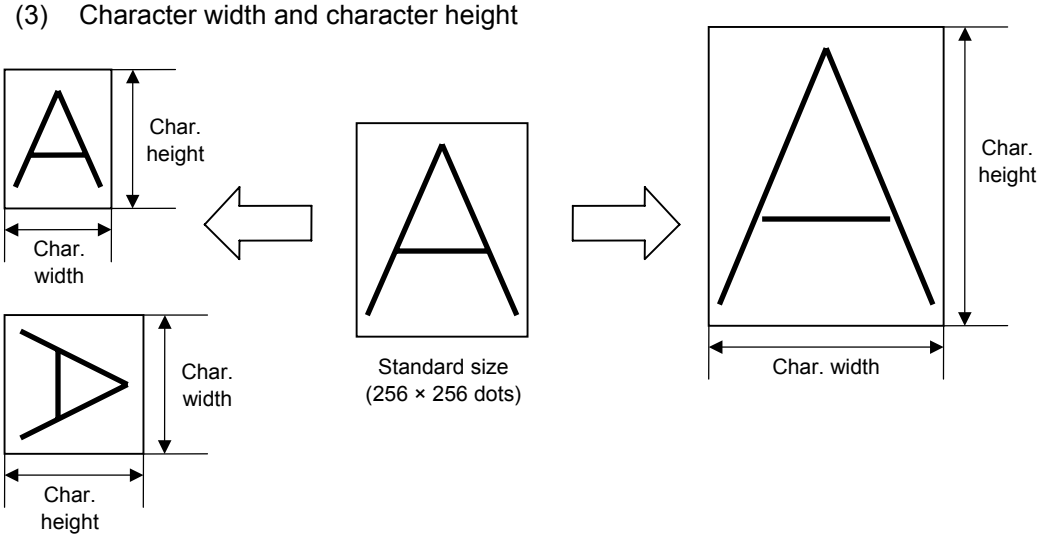
[Printing direction: Top first]

• The print origin of coordinates must be set so the character drawing result will be within the effective print area set by the Label Size Set Command ([ESC] D).

[Effective print area] [mm]

Item \ Model / Issue mode			B-SX6			B-SX8T		
			Batch	Strip	Cut	Batch	Strip	Cut
Print head dot density			12 dots/mm (305 dpi)			12 dots/mm (305 dpi)		
Print head width			170.6 mm			213.3mm		
G: Effective print width		Min.	10.0			10.0		
		Max.	170.7			213.3		
H: Effective print length	Label	Min.	5.5	20.9	23.0	5.5	20.9	23.0
		Max.	1705.0			1364.0		
	Tag	Min.	8.0	---	23.4	8.0	---	23.4
		Max.	1705.0	---	1705.0	1364.0	---	1364.0

(3) Character width and character height



(4) Type of font

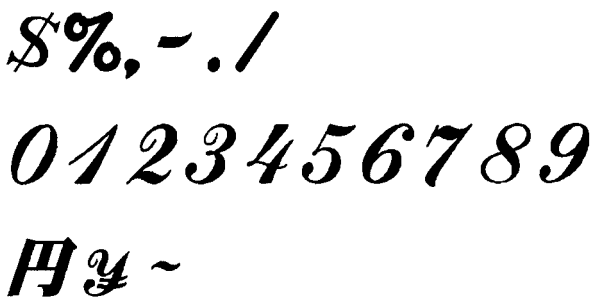
A: TEC FONT1 (Helvetica [bold])

```
  ! " # $ % & ' ( ) * + , - . /
0 1 2 3 4 5 6 7 8 9 : ; < = > ?
@ A B C D E F G H I J K L M N O
` a b c d e f g h i j k l m n o
Ç ü é â ä à å ç ê ë è ï î ì Ä Å
```

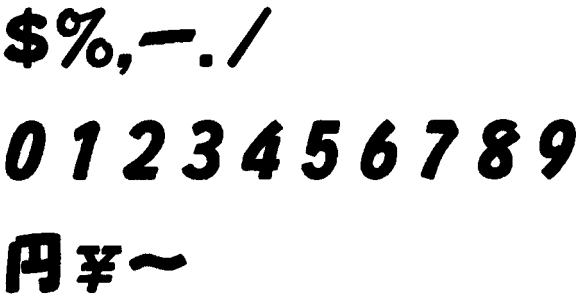
B: TEC FONT1 (Helvetica [bold] proportional)

```
 !"#$%&'()*+,-./
0123456789:;<=>?
@ABCDEFGHIJKLMNO
`abcdefghijklmno
Çüéâäàåçêëèïîì Ä Å
```

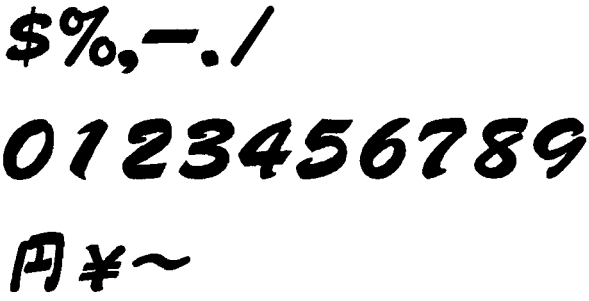
E: Price font 1 (POP font)



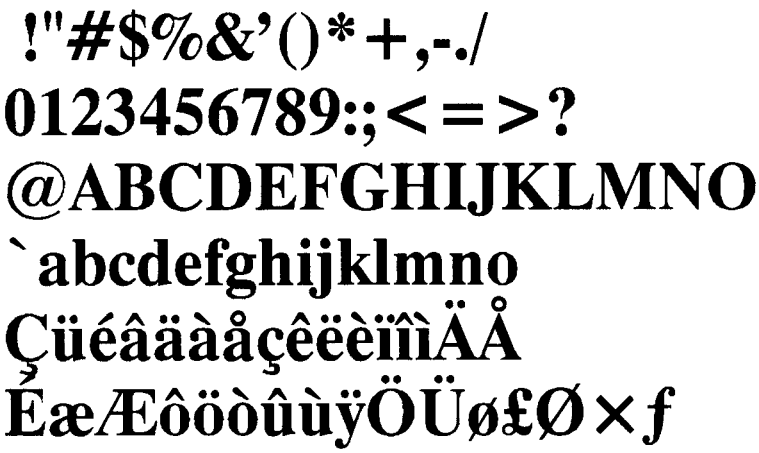
F: Price font 2 (POP font)



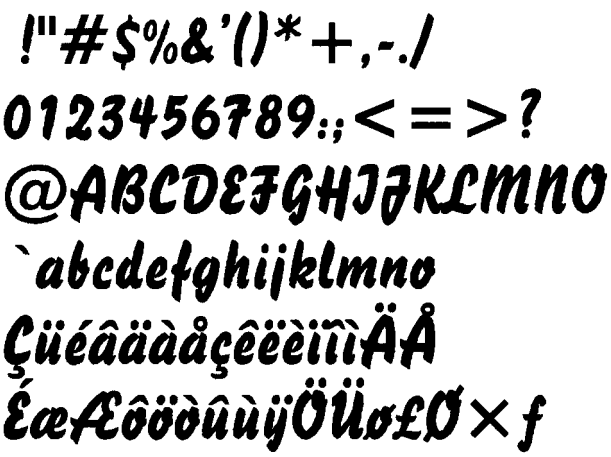
G: Price font 3 (POP font)



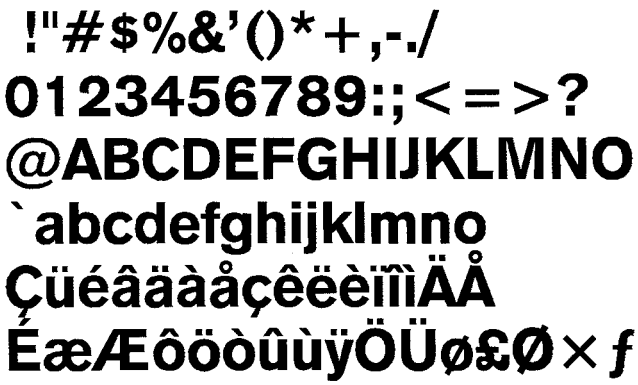
H: DUTCH801 Bold (Times Roman Proportional)



I: BRUSH 738 Regular (Pop Proportional)

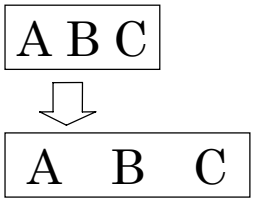


J: GOTHIC725 Black

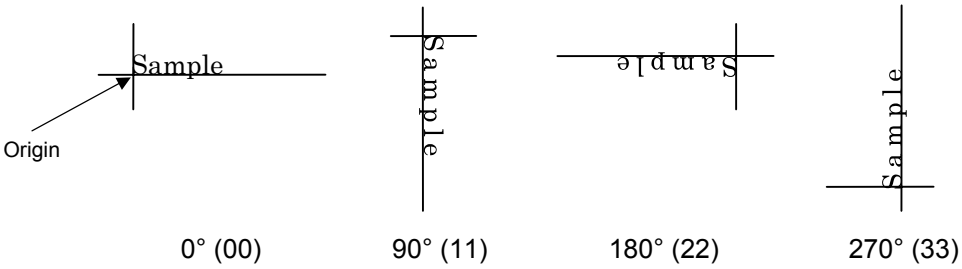


(5) Fine adjustment of character-to-character space

If no character-to-character space is specified or the number of space dots between characters is 0, drawing will take place according to the horizontal spacing/proportional spacing determined for each character. If character-to-character space is specified, drawing will take place according to the value obtained by adding the character spacing/proportional spacing to the specified value. When justify is selected for the alignment, the character-to-character space setting is invalid. (The horizontal spacing/proportional spacing is increased or decreased depending on the character size.)



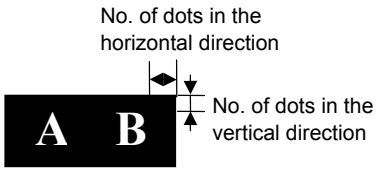
(6) Rotational angles of a character and character string



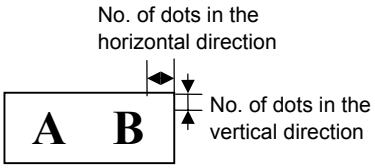
0° (00) 90° (11) 180° (22) 270° (33)

(7) Selection of character attribution

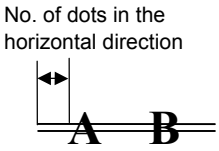
Black characters



Reverse characters



Boxed characters



Stroked out characters

(8) Check digit to be attached

When Modulus 10 or Modulus 43 is selected, the check digit of a data string is calculated and attached to the data string for drawing. In case of Modulus 10, when the data includes any data other than numerals, drawing is not performed. In case of Modulus 43, when the data includes any data other than CODE39, drawing is not performed, either.

When DBP Modulus 10 is selected, the check digit of a data string is calculated and only the check digit is drawn. When the data includes any data other than numerals, drawing is not performed.

* DBP Modulus 10 is Modulus 10 exclusively for Deutsche Bundespost Postdienst only.

(9) Increment/decrement

Printing is performed while the data is incremented or decremented each time a label is issued. Where the data string exceeds the maximum number of digits (40), the data string will not be drawn.

Initial value	0000	0000	0000	0000	999999
INC/DEC	+10	+10	+10	+10	+1
Zero suppression	Not designated	5	3	0	3
1st label	0000	0000	␣000	0000	999999
2nd label	0010	0010	␣010	0010	␣␣␣000
3rd label	0020	0020	␣020	0020	␣␣␣001
4th label	0030	0030	␣030	0030	␣␣␣002
5th label	0040	0040	␣040	0040	␣␣␣003

Letters and numerals for increment/decrement

For the data string, up to 40 digits (including letters, numerals, and symbols) are possible. Only the numerals are selected and calculated for incrementing/ decrementing, and then are returned to the previous position to draw the data.

Example of increment/decrement calculation

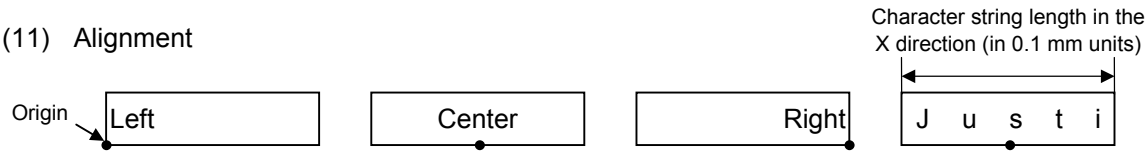
Initial value	00000	A0A0A	7A8/9	A2A0A
INC/DEC	+1	+1	+3	-3
1st label	00000	A0A0A	7A8/9	A2A0A
2nd label	00001	A0A1A	7A9/2	A1A7A
3rd label	00002	A0A2A	7A9/5	A1A4A
4th label	00003	A0A3A	7A9/8	A1A1A
5th label	00004	A0A4A	8A0/1	A0A8A

(10) Zero suppression

No. of digits after zero suppression	0	1	2	2	3	4	5
Data	0000	0000	0000	0A12	0123	0123	0123
Print	0000	␣␣␣0	␣␣00	␣A12	␣123	0123	0123

Zero(s) in a data string is replaced with a space(s) from the upper digits, according to the designated number of digits. However, if the number of digits after zero suppression is greater than the data string, the data string will be drawn without performing zero suppression. Where the data string exceeds the maximum number of digits (40), the data string will not be drawn.

(11) Alignment



If characters are not placed on one line when justification is designated, the width is calculated automatically. When the width is less than the limit value (2 mm) for the outline font, that field is not drawn. (The same previous field is not drawn.)

(12) Data string to be printed

Drawing data can be programmed by designating the number of digits after the symbol "=." Up to 255 digits can be printed. When the number of digits exceeds the maximum value, the excessive data will be discarded. For the character code table, refer to chapter 12 "CHARACTER CODE TABLE".

(13) Link field No.

The link field No. can be programmed by designating it after the symbol ";." After the link field No. is designated using the Format Command, the data strings are linked by the Link Field Data Command to draw an image.
Up to 20 fields can be linked.

The following shows an example of linked fields on the two continuous labels.

[Format Command]

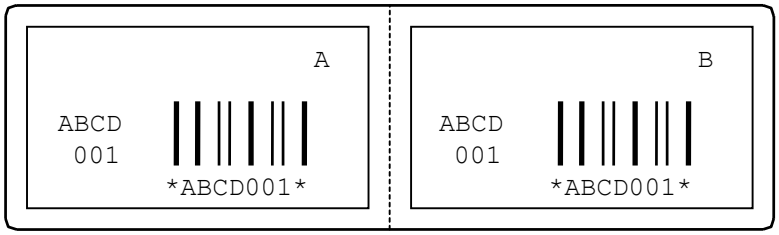
[ESC] PV01;	; 01 [LF] [NUL]	:	Link field No. 1 is designated.
[ESC] PV02;	; 03 [LF] [NUL]	:	Link field No. 3 is designated.
[ESC] PV03;	; 04 [LF] [NUL]	:	Link field No. 4 is designated.
[ESC] XB01;	; 03, 04 [LF] [NUL]	:	Link fields No. 3 and No. 4 are designated.
[ESC] PV04;	; 02 [LF] [NUL]	:	Link field No. 2 is designated.
[ESC] PV05;	; 03 [LF] [NUL]	:	Link field No. 3 is designated.
[ESC] PV06;	; 04 [LF] [NUL]	:	Link field No. 4 is designated.
[ESC] XB02;	; 03, 04 [LF] [NUL]	:	Link fields No. 3 and No. 4 are designated.

Designating the link field No.

[Data Command]

[ESC] RV; A [LF] B [LF] ABCD [LF] 001 [LF] [NUL]

Link field No. 4
Link field No. 3
Link field No. 2
Link field No. 1



Notes

(1) The check digit attachment, increment/decrement, and zero suppression are performed according to the following priority. If any of the conditions are improper, no drawing will take place.

(For example, a zero(s) is replaced by a space(s) as a result of zero suppression, but the modulus 10 designated to be attached cannot be calculated.)

Increment/decrement > zero suppression > attachment of check digit

(2) Up to 32 fields for which incrementing/decrementing has been designated can be drawn. If the total bit map font, outline font, and bar code increment/decrement fields exceeds 32, drawing will take place without incrementing/decrementing any excessive field. The field to be incremented or decremented is incremented or decremented until the Image Buffer Clear Command ([ESC] C) is transmitted.

[Examples]

1) Format Command (Increment character string No. 01 (+1))
2) Format Command (No incrementing for character string No. 02)
3) Format Command (Increment character string No. 03 (+2))
4) Image Buffer Clear Command
5) Data Command (Character string No. 01 “0001”)
6) Data Command (Character string No. 02 “AB-”)
7) Data Command (Character string No. 03 “0100”)
8) Issue Command (2 labels)

0001 AB-0100

0002 AB-0102

9) Issue Command (1 label)

0003 AB-0104

10) Image Buffer Clear Command
11) Data Command (Character string No. 02 “00000”)
12) Issue Command (1 label)

00000

(3) The Outline Font Format Command may be connected to the Bit Map Font Format Command when transmitted.

[ESC] PC001; 0100, 0150, 1, 1, A, 00, B [LF]
C002; 0350, 0180, 1, 1, A, 00, B [LF]
C005; 0200, 0300, 25, 2, C, +05, 00, B, +0000000001 [LF]
V01; 0500, 0400, 0100, 0100, A, 00, B [LF] [NUL]

(4) In case that the drawing data is changed for every label, the field of the drawing data for the previous label is automatically cleared using the character string number, then the next drawing data is printed. Therefore, the character string number should be designated according to the drawing fields. Since the automatic field clear is not performed between the Clear Command ([ESC] C) and Issue Command ([ESC] XS), the fixed data may be drawn using the same character string number. In this case, the Format Command and Data Command should be sent alternately. (After the Issue Command is sent, the fields with the same character string number are automatically cleared until the Clear Command is sent.)

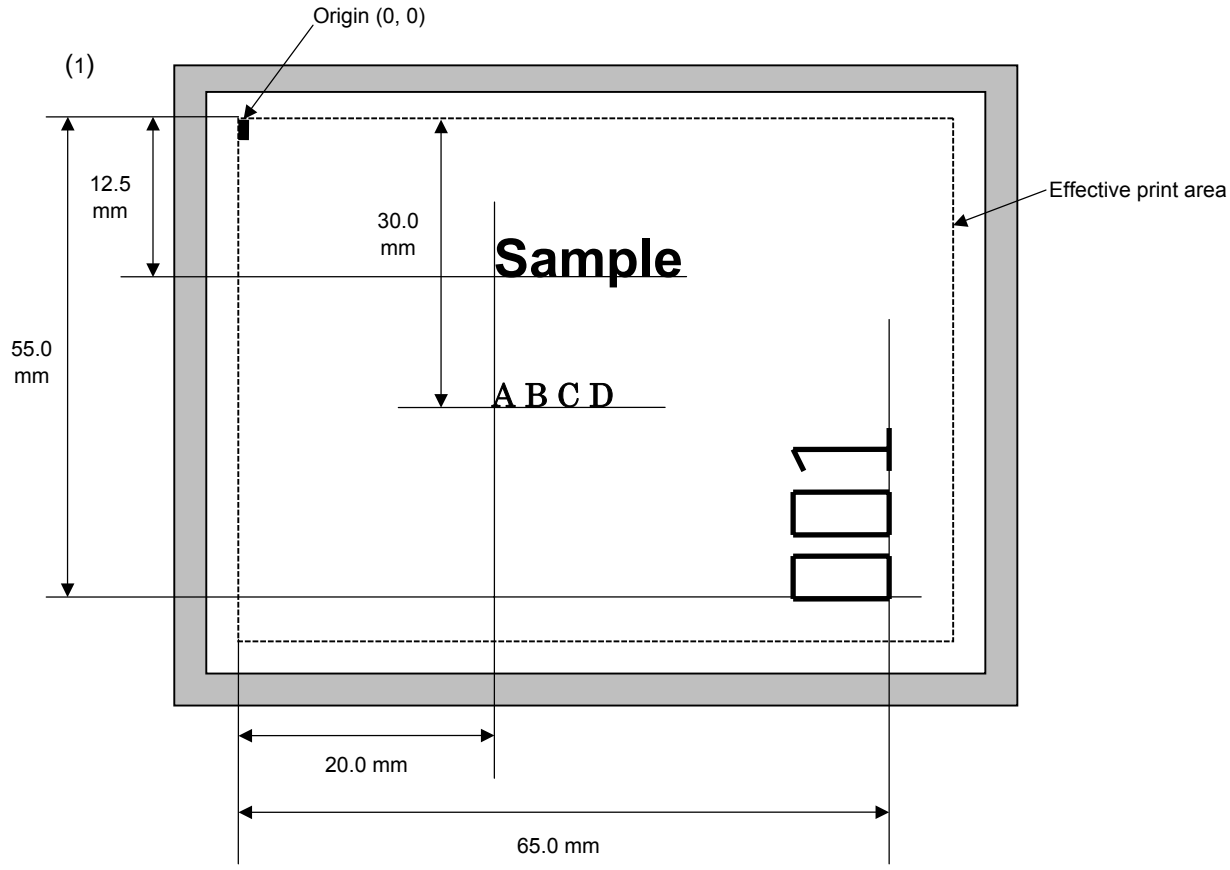
(5) When characters overlap each other due to the character-to-character space fine adjustment, the outline font is not painted properly. Program the fine adjustment value so that characters will not overlap. Also, when drawings such as lines or characters are positioned over the outline font area, the outline font is not painted properly. For font types A and B, the fine adjustment value should be set so that other drawings do not overlap the area in which the outline font is to be drawn. For font types C, E, F and G, the fine adjustment value should be set so that other drawings do not overlap the area of the designated character width and height.

(6) The link field designation can be cleared by omitting the link field designation using the same character string No. and reformatting data.
The link field designation can also be cleared by the Image Buffer Clear Command.

(7) A print data string and the link field No. cannot be programmed at the same time.

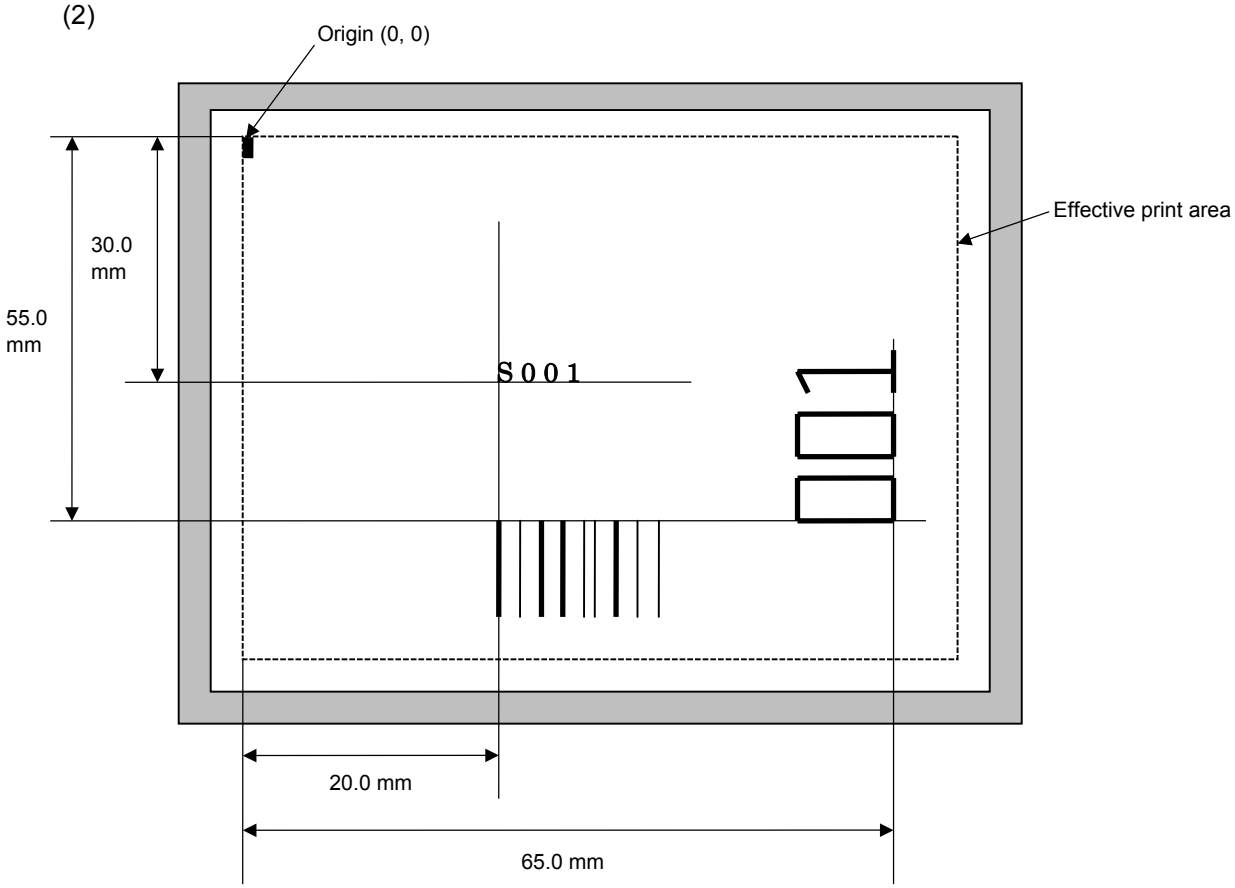
Refer to Outline Font Data Command ([ESC] RV)
Bit Map Font Format Command ([ESC] PC)
Bar Code Format Command ([ESC] XB)

Examples



[ESC] C [LF] [NUL]
[ESC] PV00; 0200, 0300, 0080, 0080, B, 00, B=ABCD [LF] [NUL]
[ESC] PV01; 0200, 0125, 0100, 0100, B, 00, B [LF] [NUL]
[ESC] PV02; 0650, 0550, 0200, 0150, B, 33, B, +0000000001 [LF] [NUL]
[ESC] RV01; Sample [LF] [NUL]
[ESC] RV02; 001 [LF] [NUL]
[ESC] XS; I, 0002, 0002C3000 [LF] [NUL]

(2)



[ESC] C [LF] [NUL]
[ESC] PC001; 0200, 0300, 1, 1, C, 00, B; 01, 02 [LF] [NUL]
[ESC] PV01; 0650, 0550, 0200, 0150, B, 33, B; 02 [LF] [NUL]
[ESC] XB01; 0200, 0550, 3, 1, 03, 03, 08, 08, 03, 0, 0150; 01, 02 [LF] [NUL]
[ESC] RV; S [LF] 001 [LF] [NUL]
[ESC] XS; I, 0002, 0002C3000 [LF] [NUL]

6.3.10 BAR CODE FORMAT COMMAND [ESC] XB

Function

Sets the format to indicate where and how the bar code is to be printed and how it is to be printed.

⊙ In the case of WPC, CODE93, CODE128, UCC/EAN128, Customer bar code, POSTNET, RM4SCC, KIX CODE
(WPC is the generic name for bar codes of JAN, EAN and UPC.)

Format

① [ESC] XBaa; bbbb, cccc, d, e, ff, k, llll (, mnnnnnnnnnn, ooo, p, qq)
(= sss ------ sss) [LF] [NUL]

② [ESC] XBaa; bbbb, cccc, d, e, ff, k, llll (, mnnnnnnnnnn, ooo, p, qq)
(; tt_1, tt_2, tt_3, ------, tt_{20}) [LF] [NUL]

Term

aa: Bar code number
00 to 31

bbbb: X-coordinate of the print origin of bar code
Fixed to 4 digits (in 0.1 mm units)

cccc: Y-coordinate of the print origin of bar code
4 digits or 5 digits (in 0.1 mm units)

d: Type of bar code
- 0: JAN8, EAN8
- 5: JAN13, EAN13
- 6: UPC-E
- 7: EAN13 + 2 digits
- 8: EAN13 + 5 digits
- 9: CODE128 (with auto code selection)
- A: CODE128 (without auto code selection)
- C: CODE93
- G: UPC-E + 2 digits
- H: UPC-E + 5 digits
- I: EAN8 + 2 digits
- J: EAN8 + 5 digits
- K: UPC-A
- L: UPC-A + 2 digits
- M: UPC-A + 5 digits
- N: UCC/EAN128
- R: Customer bar code (Postal code for Japan)
- S: Highest priority customer bar code (Postal code for Japan)
- U: POSTNET (Postal code for U.S)
- V: RM4SCC (ROYAL MAIL 4 STATE CUSTOMER CODE)
  (Postal code for U.K)
- W: KIX CODE (Postal code for Belgium)

e: Type of check digit

1: Without attaching check digit

2: Check digit check

WPC	Modulus 10
CODE93	Modulus 47
CODE128	PSEUDO 103

3: Check digit automatic attachment (1)

WPC	Modulus 10
CODE93	Modulus 47
CODE128	PSEUDO 103
UCC/EAN128	Modulus 10 + Modulus 103
Customer code	Special check digit
POSTNET	Special check digit
RM4SCC	Special check digit

4: Check digit automatic attachment (2)

WPC	Modulus 10 + Price C/D 4 digits

5: Check digit automatic attachment (3)

WPC	Modulus 10 + Price C/D 5 digits

* For the Customer bar code, POSTNET, and RMC4SCC, only “3: Check digit auto attachment (1)” is effective.

ff: 1-module width

01 to 15 (in units of dots)

k: Rotational angle of bar code

0: 0°
1: 90°
2: 180°
3: 270°

llll: Height of the bar code

0000 to 1000 (in 0.1 mm units)

For the Customer bar code, POSTNET, RMC4SCC, and KIX CODE, the height of the long bar is specified.

mnnnnnnnnnn: Increment/decrement
(Omissible. When omitted, incrementing/decrementing is not performed.)

m: Indicates whether to increment or decrement
+: Increment
−: Decrement

nnnnnnnnnn: Skip value
0000000000 to 9999999999

ooo: Length of WPC guard bar
(Omissible. When omitted, the guard bar is not extended.)
000 to 100 (in 0.1 mm units)

p: Selection of print or non-print of numerals under bars
(Omissible. When omitted, the numerals under the bars are not printed.)
0: Non printed.
1: Printed.

qq: No. of digits after zero suppression
(Omissible. When omitted, zero suppression is not performed.)
00 to 20

sss ------ sss: Data string to be printed (Omissible)
Max. 126 digits. However, it varies depending on the type of bar code.

tt_1, tt_2, tt_3, ------. tt_{20}: Link field No. (Omissible)
01 to 99 (1 to 99 can also be used.)
Up to 20 fields can be designated using commas.

* Omissible parameters (such as “Increment/decrement”, “Selection of print or non-print of numerals under bars” and “No. of digits after zero suppression”) cannot be set when the bar code type is Customer bar code, POSTNET, RM4SCC, or KIX CODE.

⊙ In the case of MSI, Interleaved 2 of 5, CODE39, NW7, Industrial 2 of 5, MATRIX 2 of 5 for NEC

Format

① [ESC] XBaa; bbbb, cccc, d, e, ff, gg, hh, ii, jj, k, llll (, mnnnnnnnnnn, p, qq) (, r) (=sss------sss) [LF] [NUL]

② [ESC] XBaa; bbbb, cccc, d, e, ff, gg, hh, ii, jj, k, llll (, mnnnnnnnnnn, p, qq) (, r) (; tt_1, tt_2, tt_3, ------, tt_{20}) [LF] [NUL]

Term

aa: Bar code number
00 to 31

bbbb: X-coordinate of the print origin of bar code
Fixed to 4 digits (in 0.1 mm units)

cccc: Y-coordinate of the print origin of bar code
4 digits or 5 digits (in 0.1 mm units)

d: Type of bar code
1: MSI
2: Interleaved 2 of 5 (ITF)
3: CODE39 (standard)
4: NW7
B: CODE39 (full ASCII)
O: Industrial 2 of 5
a: MATRIX 2 of 5 for NEC

e: Type of check digit
1: Without attaching check digit
2: Check digit check

CODE39	Modulus 43
MSI	IBM modulus 10
ITF	Modulus 10
Industrial 2 of 5	Modulus check character
MATRIX 2 of 5 for NEC	Modulus check character

3: Check digit automatic attachment (1)

CODE39	Modulus 43
MSI	IBM modulus 10
ITF	Modulus 10
Industrial 2 of 5	Modulus check character
MATRIX 2 of 5 for NEC	Modulus check character

4: Check digit automatic attachment (2)

MSI	IBM modulus 10 + IBM modulus 10
ITF	DBP Modulus 10

5: Check digit automatic attachment (3)

MSI	IBM modulus 11 + IBM modulus 10

ff: Narrow bar width
01 to 99 (in units of dots)

gg: Narrow space width
01 to 99 (in units of dots)

* In the case of Industrial 2 of 5, designate an element-to-element space.

hh: Wide bar width
01 to 99 (in units of dots)

ii: Wide space width
01 to 99 (in units of dots)

* In the case of Industrial 2 of 5, the value is fixed to 00.

jj: Character-to-character space width
01 to 99 (in units of dots)

* In the case of MSI and ITF, character-to-character space width is fixed to 00.

k: Rotational angle of bar code
0: 0°
1: 90°
2: 180°
3: 270°

llll: Height of bar code
0000 to 1000 (in 0.1 mm units)

mnnnnnnnnnn: Increment/decrement
(Omissible. When omitted, incrementing/decrementing is not performed.)

m: Indicates whether to increment or decrement
+: Increment
-: Decrement

nnnnnnnnnn: Skip value
0000000000 to 9999999999

p: Selection of print or non-print of numerals under bars
(Omissible. When omitted, the numerals under the bars are not printed.)
0: Not printed.
1: Printed.

qq: No. of digits after zero suppression
(Omissible. When omitted, zero suppression is not performed.)
00 to 20

r: Designates the attachment of start/stop code
(Omissible. When omitted, the start/stop code is automatically attached.)
T: Attachment of start code only
P: Attachment of stop code only
N: Start/stop code unattached

sss------sss: Data string to be printed (Omissible)
Max. 126 digits. However, the number of digits varies depending on the type of bar code.

tt_1, tt_2, tt_3, ------, tt_{20}: Link field No. (Omissible)
01 to 99 (1 to 99 can also be used.)
Up to 20 fields can be designated using commas.

⊙ In the case of GS1 DataBar

Format

① [ESC] XBaa; bbbb, cccc, d, e, ff, g, hhhh (, ijjjjjjjjj, kk) (= sss ------ sss) [LF] [NUL]

② [ESC] XBaa; bbbb, cccc, d, e, ff, g, hhhh (, ijjjjjjjjj, kk) (; tt_1, tt_2, tt_3, ------, tt_{20}) [LF] [NUL]

Term

aa: Bar code number
00 to 31

bbbb: X-coordinate of the print origin of bar code
Fixed to 4 digits (in 0.1 mm units)

cccc: Y-coordinate of the print origin of bar code
4 digits or 5 digits (in 0.1 mm units)

d: Type of bar code
b: GS1 DataBar family

e: Version (Type of GS1 DataBar)
1: GS1 DataBar Omnidirectional/GS1 DataBar Truncated
2: GS1 DataBar Stacked
3: GS1 DataBar Stacked Omnidirectional
4: GS1 DataBar Limited
5: GS1 DataBar Expanded
6: GS1 DataBar Expanded Stacked

ff: 1-module width
01 to 15 (in units of dots)

g: Rotational angle of bar code
0: 0°
1: 90°
2: 180°
3: 270°

hhhh: Height of bar code
0000 to 1000 (in 0.1 mm units)

In the case of GS1 DataBar Truncated, set a value obtained by multiplying one module width by 13.

ijjjjjjjjj: Increment/decrement
(Omissible. When omitted, incrementing/decrementing is not performed.)

i: Indicates whether to increment or decrement
+: Increment
-: Decrement

jjjjjjjjj: Skip value
0000000000 to 9999999999

kk: No. of digits after zero suppression
(Omissible. When omitted, zero suppression is not performed.)
00 to 20

sss ------ sss: Data string to be printed (Omissible)
Max. 126 digits. However, it varies depending on the type of bar code.

tt_1, tt_2, tt_3, ------. tt_{20}: Link field No. (Omissible)
01 to 99 (1 to 99 can also be used.)
Up to 20 fields can be designated using commas.

⊙ In the case of Data Matrix (Two-dimensional code)

Format

① [ESC] XBaa; bbbb, cccc, d, ee, ff, gg, h (, Ciiijjj) (, Jkkllmmmnnn) (= ooo ------ooo) [LF] [NUL]

② [ESC] XBaa; bbbb, cccc, d, ee, ff, gg, h (, Ciiijjj) (, Jkkllmmmnnn) (; pp_1, pp_2, pp_3, ------, pp_{20}) [LF] [NUL]

Term

aa: Bar code number
00 to 31

bbbb: X-coordinate of the print origin of bar code
Fixed to 4 digits (in 0.1 mm units)

cccc: Y-coordinate of the print origin of bar code
4 digits or 5 digits (in 0.1 mm units)

d: Type of bar code
Q: Data Matrix (Two-dimensional code)

ee: ECC type
00: ECC0
01: ECC50
04: ECC50
05: ECC50
06: ECC80
07: ECC80
08: ECC80
09: ECC100
10: ECC100
11: ECC140
12: ECC140
13: ECC140
14: ECC140
20: ECC200

ff: 1-cell width
00 to 99 (in units of dots)

gg: Format ID
01: Format ID 1
02: Format ID 2
03: Format ID 3
04: Format ID 4
05: Format ID 5
06: Format ID 6

* When ECC200 is designated as ECC type, the format ID designation is ignored. When format ID of 11 through 16 is designated, ECC200 is automatically selected (to ensure compatibility with the old model).

h: Rotational angle of bar code

0: 0°
1: 90°
2: 180°
3: 270°

Ciiijjj: No. of cells
(Omissible. When omitted, it is automatically set.)

iii: No. of cells in the X direction 000 to 144

jjj: No. of cells in the Y direction 000 to 144

* Cell setting method varies according to the ECC type.

	ECC0 to ECC140	ECC200
No. of cells to be designated	Odd numbers only	Even numbers only
Min./Max. No. of cells	9 × 9 to 49 × 49	10 × 10 to 144 × 144
Rectangular code	None	18 × 8 32 × 8 26 × 12 36 × 12 36 × 16 48 × 16

- When this parameter is omitted, the number of cells is automatically set. Also, when any data other than the above values are designated for the number of cells in the X and Y directions, the number of cells are automatically set.

Jkkllmmmnnn: Connection setting
(Omissible. When omitted, connection is not made.)

kk:	Code number	01 to 16
ll:	No. of divided codes	02 to 16
mmm:	ID number 1	001 to 254
nnn:	ID number 2	001 to 254

ooo ------ ooo: Data string to be printed (Omissible)
Max. 2000 digits.

pp_1, pp_2, pp_3, ------, pp_{20}: Link field No. (Omissible)
01 to 99 (1 to 99 can also be used.)
Up to 20 fields can be designated using commas.

⊙ In the case of PDF417 (Two-dimensional code)

Format

① [ESC] XBaa; bbbb, cccc, d, ee, ff, gg, h, iiii (=jjj------jjj) [LF] [NUL]

② [ESC] XBaa; bbbb, cccc, d, ee, ff, gg, h, iiii (; kk_1, kk_2, kk_3, ------, kk_{20}) [LF] [NUL]

Term

aa: Bar code number
00 to 31

bbbb: X-coordinate of the print origin of bar code
Fixed to 4 digits (in 0.1 mm units)

cccc: Y-coordinate of the print origin of bar code
4 digits or 5 digits (in 0.1 mm units)

d: Type of bar code
P: PDF417 (Two-dimensional code)

ee: Security level
00: Level 0
01: Level 1
02: Level 2
03: Level 3
04: Level 4
05: Level 5
06: Level 6
07: Level 7
08: Level 8

ff: 1-module width
01 to 10 (in units of dots)

gg: No. of columns (strings)
01 to 30

h: Rotational angle of bar code
0: 0°
1: 90°
2: 180°
3: 270°

iiii: Bar height
0000 to 0100 (in 0.1 mm units)

jjj-----jjj: Data string to be printed (Omissible)
Max. 2000 digits

kk_1, kk_2, kk_3, ------, kk_{20}: Link field No. (Omissible)
01 to 99 (1 to 99 can also be used.)
Up to 20 fields can be designated using commas.

⊙ In the case of MicroPDF417 (Two-dimensional code)

Format

① [ESC] XBaa; bbbb, cccc, d, ee, ff, gg, h, iiii (=jjj------jjj) [LF] [NUL]

② [ESC] XBaa; bbbb, cccc, d, ee, ff, gg, h, iiii (; kk_1, kk_2, kk_3, ------, kk_{20}) [LF] [NUL]

Term

aa: Bar code number
00 to 31

bbbb: X-coordinate of the print origin of bar code
Fixed to 4 digits (in 0.1 mm units)

cccc: Y-coordinate of the print origin of bar code
4 digits or 5 digits (in 0.1 mm units)

d: Type of bar code
X: MicroPDF417 (Two-dimensional code)

ee: Security level
00: Fixed

ff: 1-module width
01 to 10 (in dots)

gg: No. of columns/rows
00 to 38

h: Rotational angle of bar code
0: 0°
1: 90°
2: 180°
3: 270°

iiii: Bar height
0000 to 0100 (in 0.1 mm units)

jjj-----jjj: Data string to be printed (Omissible)
Max. 366 digits

kk_1, kk_2, kk_3, ------, kk_{20}: Link field No. (Omissible)
01 to 99 (1 to 99 can also be used.)
Up to 20 fields can be designated using commas.

The maximum number of columns and rows for the MicroPDF417

Parameter (gg)	No. of columns	No. of rows	Max. number of digits for binary mode	Max. number of digits for upper case letter/space mode	Max. number of digits for numeric mode
00	–	–	150	250	366
01	1	–	22	38	55
02	2	–	43	72	105
03	3	–	97	162	237
04	4	–	150	250	366
05	1	11	3	6	8
06		14	7	12	17
07		17	10	18	26
08		20	13	22	32
09		24	18	30	44
10		28	22	38	55
11	2	8	8	14	20
12		11	14	24	35
13		14	21	36	52
14		17	27	46	67
15		20	33	56	82
16		23	38	64	93
17		26	43	72	105
18	3	6	6	10	14
19		8	10	18	26
20		10	15	26	38
21		12	20	34	49
22		15	27	46	67
23		20	39	66	96
24		26	54	90	132
25		32	68	114	167
26		38	82	138	202
27		44	97	162	237
28	4	4	8	14	20
29		6	13	22	32
30		8	20	34	49
31		10	27	46	67
32		12	34	58	85
33		15	45	76	111
34		20	63	106	155
35		26	85	142	208
36		32	106	178	261
37		38	128	214	313
38		44	150	250	366

"–" for parameter 00 to 04 indicates the numbers of columns/rows which are automatically set by the printer. In this case, the pattern which has a smaller number of code words is automatically selected. When the numbers of code words is equal, the smaller number of columns are selected.

⊙ In the case of QR code (Two-dimensional code)

Format

① [ESC] XBaa; bbbb, cccc, d, e, ff, g, h (, Mi) (, Kj) (, Jkkllmm) (= nnn --- nnn) [LF] [NUL]

② [ESC] XBaa; bbbb, cccc, d, e, ff, g, h (, Mi) (, Kj) (, Jkkllmm) (; oo_1, oo_2, oo_3 ------ oo_{20}) [LF] [NUL]

Term

aa: Bar code number
00 to 31

bbbb: X-coordinate of the print origin of bar code
Fixed to 4 digits (in 0.1 mm units)

cccc: Y-coordinate of the print origin of bar code
4 digits or 5 digits (in 0.1 mm units)

d: Type of bar code
T: QR code (Two-dimensional code)

e: Designation of error correction level
L: High density level
M: Standard level
Q: Reliability level
H: High reliability level

ff: 1-cell width
00 to 52 (in units of dots)

g: Selection of mode
M: Manual mode
A: Automatic mode

h: Rotational angle of the bar code
0: 0°
1: 90°
2: 180°
3: 270°

Mi: Selection of model
(Omissible. When omitted, Model 1 is automatically selected.)
i = 1: Model 1
2: Model 2

Kj: Mask number
(Omissible. When omitted, the number is automatically set.)
j = 0 to 7: Mask number 0 to 7
8: No mask

Jkkllmm: Connection setting
(Omissible. When omitted, connection is not made.)
kk = 01 to 16: Value indicating which divided code is connected.
ll = 01 to 16: Number of divided codes
mm = 00 to FF: A value for all print data (before devided) which have been XORed in units of bytes.

nnn --- nnn: Data string to be printed (Omissible)
Max. 2000 digits

oo_1 --- oo_{20}: Link field No. (Omissible)
01 to 99 (1 to 99 can also be used.)
Up to 20 digits can be designated using commas.

⊙ In the case of MaxiCode Code (Two-dimensional code)

Format ① [ESC] XBaa; bbbb, cccc, d (, e) (, Jffgg) (, Zh) [LF] [NUL]

Term

aa: Bar code number
00 to 31

bbbb: X-coordinate of the print origin of bar code
Fixed to 4 digits (in 0.1 mm units)

cccc: Y-coordinate of the print origin of bar code
4 digits or 5 digits (in 0.1 mm units)

d: Type of bar code
Z: MaxiCode (Two-dimensional code)

e: Mode selection (Omissible)

- When the MaxiCode specification is set to “TYPE1: Compatible with the current version” in the system mode.
  Omitted: Mode 2
  0: Mode 2
  1: Mode 4
  2: Mode 2
  3: Mode 3
  4: Mode 4
  5: Mode 2
  6: Mode 6
  7: Mode 2
  8: Mode 2
  9: Mode 2
- When the MaxiCode specification is set to “TYPE2: Special specification” in the system mode.
  Omitted: Mode 2 or Mode 3(*)
  0: Mode 2 or Mode 3(*)
  1: Mode 4
  2: Mode 2
  3: Mode 3
  4: Mode 4
  5: Mode 2 or Mode 3 (*)
  6: Mode 6
  7: Mode 2 or Mode 3 (*)
  8: Mode 2 or MODE 3 (*)
  9: Mode 2 or MODE 3 (*)
  *: Mode 2 or Mode 3 should be determined depending on the country code of the data command. When the country code is 840, Mode 2 should be selected. For other codes than 840, Mode 3 should be selected.

Jffgg: Connection setting (Omissible. When omitted, connection is not made.)
ff: Code number 01 to 08
gg: No. of divided codes 01 to 08

Zh: Attachment of Zipper block and Contrast block
(Omissible. When omitted, they are not attached.)
h= 0: No attachment of Zipper block and Contrast block
1: Attachment of both Zipper block and Contrast block
2: Attachment of Zipper block
3: Attachment of Contrast block

⊙ In the case of CP code (Two-dimensional code)

Format

① [ESC] XBaa; bbbb, cccc, d, e, ff, g, h (, Ciijj) (= kkkk --- kkk) [LF] [NUL]

② [ESC] XBaa; bbbb, cccc, d, e, ff, g, h (, Ciijj) (; ll_1, ll_2, ll_3, --- ll_{20}) [LF] [NUL]

Term

aa: Bar code number
00 to 31

bbbb: X-coordinate of the print origin of bar code
Fixed to 4 digits (in 0.1 mm units)

cccc: Y-coordinate of the print origin of bar code
4 digits or 5 digits (in 0.1 mm units)

d: Type of bar code
Y: CP code (Two-dimensional code)

e: Designation of ECC (Error Correction Code) level
0: No designation
1: 10%
2: 20%
3: 30%
4: 40%
5: 50%

Only when the number of code characters are specified, “0” (No designation) can be selected. If “0 (No designation)” is selected without specifying the number of code characters, the CP code is not printed. When the number of code characters are specified, blank code areas created after the characters are encoded should all be filled with ECC characters.

ff: 1-cell width
00 to 99 (in units of dots)

g: No. of character bits
0: Automatically set
A: 8 bits

Designates how many bits are used for representing a character.
When “0” is designated, the optimal value is automatically set, according to data.

h: Rotational angle of the bar code
0: 0°
1: 90°
2: 180°
3: 270°

Ciijj: No. of code characters
(When omitted, it is automatically set.)
ii = No. of characters in the X direction: 03 to 22
jj = No. of characters in the Y direction: 02 to 22

“Character” is a unit for code for encoding the CP code.

1 character occupies a 3×3-square block.
When the value for “jj” is larger than that for “ii”, an error occurs.

The number of cells for the code is as follows.
(No. of characters × 3 +2)

kkkk --- kkk: Data string to be printed (Omissible)
Max. 473 digits

ll_1, ll_2, ll_3, --- ll_{20}: Link field No. (Omissible)
01 to 99 (1 to 99 can also be used.)
Up to 20 digits can be designated using commas.

⊙ In the case of RFID (Data write)

Function

Writes a specified data onto an RFID tag. When the feed amount has been set by the RFID Tag Position Adjustment Command ([ESC] @003) for adjusting an RFID tag position, the specified amount of the media is fed forward or backward before writing data.

Format

① [ESC]XBaa; bbbb, cccc, d (,Aeee) (,Ph) (,Fi) (,Tff) (,Djj) (,Gk) (,Cl) (,Smmmm) (,Ennnn) (,Roooooooo) (,Kpppppppp) (,Lqq) (,Jrrrrrrrr) (,Vs) (,Btt) (,uvvvvvvvvvv) (,Hxyyyyyyyy· · ·) (,Qzabcdef· · ·) (,Xghhhhhhhh· · ·) (=www------www) [LF] [NUL]

② [ESC]XBaa; bbbb, cccc, d (,Aeee) (,Ph) (,Fi) (,Tff) (,Djj) (,Gk) (,Cl) (,Smmmm) (,Ennnn) (,Roooooooo) (,Kpppppppp) (,Lqq) (,Jrrrrrrrr) (,Vs) (,Btt) (,uvvvvvvvvvv) (,Hxyyyyyyyy· · ·) (,Qzabcdef· · ·) (,Xghhhhhhhh· · ·) (;ww_1,ww_2,ww_3,-----,ww_{20}) [LF] [NUL]

Term

aa: Bar code number
00 to 31

bbbb: Parameter not referred to
Fixed to 4 digits (in 0.1 mm units)

cccc: Parameter not referred to
4 or 5 digits (in 0.1 mm units)

d: Type of bar code
r: RFID

Aeee: Address where the data is written (Omissible)
000 to 999
Designates the address where data starts to be written.
When omitted, this parameter will be set to 0.

Ph: Partition number (Omissible)
0 to 6
When omitted, 5 will be set.

Fi: Filter number (Omissible)
0 to 7
When omitted, 0 will be set.

Tff: Tag type (Omissible)
00: None
24: EPC Class 1 Generation 2

Designates the type of RFID tag onto which data is to be written.
When omitted, the tag type set in the system mode will be designated.
In accordance with the tag type designated by this setting, the tag type set in the system mode changes.
When “00: NONE” is designated, the backed up tag type will be designated, and the system mode setting will not be changed.

Djj: EPC format (Omissible)
00: No format (When omitted)
10: GID-96
11: SGTIN-64
12: SGTIN-96
13: SSCC-64
14: SSCC-96
15: SGLN-64
16: SGLN-96
17: GRAI-64
18: GRAI-96
19: GIAI-64
20: GIAI-96
21: DoD-64
22: DoD-96
23: SGTIN-198
24: SGLN-195
25: GRAI-170
26: GIAI-202

Gk: Data type (Omissible)
0: No conversion of data (Default)
1: Conversion to binary
2: Conversion to hexadecimal
3: No conversion of data (with separator)
4: Conversion to binary (with separator)
5: Conversion to hexadecimal (with separator)

When a separator is to be used, use a colon ":" (3AH) as a separator between the blocks in the data.
For example:
RB00;UII Code0123:TIDx0123:0000:1111:2222:3333:4444:5555 for the following data:
UII="UII Code0123", TID="TIDx0123", User Data ="0000", U1 Data ="1111", U2 Data ="2222", U3 data = "3333", U4 Data = "4444", and U5 Data = "5555"

Cl: On-the-fly issue (Omissible)
0: Disabled. (On-the-fly issue is not performed. (When omitted))
1: Enabled. (On-the-fly issue is performed.)

- When "1: Enabled" is designated, writing data onto an RFID tag and printing are performed at the same time.
- The positions where RFID data write is started and ended during printing can be designated by the parameters of RFID data write start point designation for on-the-fly issue and RFID data write end point designation for on-the-fly issue, respectively.

Smmmm: RFID data write start point designation for on-the-fly issue (Omissible)
4 or 5 digits (in 0.1 mm units) When omitted, 0 mm will be designated.

Ennnn: RFID data write end point designation for on-the-fly issue (Omissible)
4 or 5 digits (in 0.1 mm units) When omitted, 75.5 mm (which is equals to the distance between the print head and the media sensor) will be designated.

Roooooooo: Access password setting (Omissible)
Fixed to 8-digit hexadecimal number
00000000 to FFFFFFFF

Sets a password to access tags.

Kpppppppp: Kill password setting (Omissible)
Fixed to 8-digit hexadecimal number
00000000 to FFFFFFFF
Sets a kill password for tags.

Lqq: Lock/unlock setting (Omissible)

	Kill password	Access password	EPC code	TID	User data
00	Unlocked	Unlocked	Unlocked	Unlocked	Unlocked
01	Locked	Unlocked	Unlocked	Unlocked	Unlocked
02	Unlocked	Locked	Unlocked	Unlocked	Unlocked
03	Locked	Locked	Unlocked	Unlocked	Unlocked
04	Unlocked	Unlocked	Locked	Unlocked	Unlocked
05	Locked	Unlocked	Locked	Unlocked	Unlocked
06	Unlocked	Locked	Locked	Unlocked	Unlocked
07	Locked	Locked	Locked	Unlocked	Unlocked
08	Unlocked	Unlocked	Unlocked	Locked	Unlocked
09	Locked	Unlocked	Unlocked	Locked	Unlocked
10	Unlocked	Locked	Unlocked	Locked	Unlocked
11	Locked	Locked	Unlocked	Locked	Unlocked
12	Unlocked	Unlocked	Locked	Locked	Unlocked
13	Locked	Unlocked	Locked	Locked	Unlocked
14	Unlocked	Locked	Locked	Locked	Unlocked
15	Locked	Locked	Locked	Locked	Unlocked
16	Unlocked	Unlocked	Unlocked	Unlocked	Locked
17	Locked	Unlocked	Unlocked	Unlocked	Locked
18	Unlocked	Locked	Unlocked	Unlocked	Locked
19	Locked	Locked	Unlocked	Unlocked	Locked
20	Unlocked	Unlocked	Locked	Unlocked	Locked
21	Locked	Unlocked	Locked	Unlocked	Locked
22	Unlocked	Locked	Locked	Unlocked	Locked
23	Locked	Locked	Locked	Unlocked	Locked
24	Unlocked	Unlocked	Unlocked	Locked	Locked
25	Locked	Unlocked	Unlocked	Locked	Locked
26	Unlocked	Locked	Unlocked	Locked	Locked
27	Locked	Locked	Unlocked	Locked	Locked
28	Unlocked	Unlocked	Locked	Locked	Locked
29	Locked	Unlocked	Locked	Locked	Locked
30	Unlocked	Locked	Locked	Locked	Locked
31	Locked	Locked	Locked	Locked	Locked
32	Unlocked	Unlocked	Unlocked	Unlocked	Unlocked
33	Permanent lock	Unlocked	Unlocked	Unlocked	Unlocked
34	Unlocked	Permanent lock	Unlocked	Unlocked	Unlocked
35	Permanent lock	Permanent lock	Unlocked	Unlocked	Unlocked
36	Unlocked	Unlocked	Permanent lock	Unlocked	Unlocked
37	Permanent lock	Unlocked	Permanent lock	Unlocked	Unlocked
38	Unlocked	Permanent lock	Permanent lock	Unlocked	Unlocked
39	Permanent lock	Permanent lock	Permanent lock	Unlocked	Unlocked
40	Unlocked	Unlocked	Unlocked	Permanent lock	Unlocked
41	Permanent lock	Unlocked	Unlocked	Permanent lock	Unlocked

42	Unlocked	Permanent lock	Unlocked	Permanent lock	Unlocked
43	Permanent lock	Permanent lock	Unlocked	Permanent lock	Unlocked
44	Unlocked	Unlocked	Permanent lock	Permanent lock	Unlocked
45	Permanent lock	Unlocked	Permanent lock	Permanent lock	Unlocked
46	Unlocked	Permanent lock	Permanent lock	Permanent lock	Unlocked
47	Permanent lock	Permanent lock	Permanent lock	Permanent lock	Unlocked
48	Unlocked	Unlocked	Unlocked	Unlocked	Permanent lock
49	Permanent lock	Unlocked	Unlocked	Unlocked	Permanent lock
50	Unlocked	Permanent lock	Unlocked	Unlocked	Permanent lock
51	Permanent lock	Permanent lock	Unlocked	Unlocked	Permanent lock
52	Unlocked	Unlocked	Permanent lock	Unlocked	Permanent lock
53	Permanent lock	Unlocked	Permanent lock	Unlocked	Permanent lock
54	Unlocked	Permanent lock	Permanent lock	Unlocked	Permanent lock
55	Permanent lock	Permanent lock	Permanent lock	Unlocked	Permanent lock
56	Unlocked	Unlocked	Unlocked	Permanent lock	Permanent lock
57	Permanent lock	Unlocked	Unlocked	Permanent lock	Permanent lock
58	Unlocked	Permanent lock	Unlocked	Permanent lock	Permanent lock
59	Permanent lock	Permanent lock	Unlocked	Permanent lock	Permanent lock
60	Unlocked	Unlocked	Permanent lock	Permanent lock	Permanent lock
61	Permanent lock	Unlocked	Permanent lock	Permanent lock	Permanent lock
62	Unlocked	Permanent lock	Permanent lock	Permanent lock	Permanent lock
63	Permanent lock	Permanent lock	Permanent lock	Permanent lock	Permanent lock

Designates the areas to be locked. When omitted, no areas are locked.

Jrrrrrrrr: Access to the password-protected tags (Omissible)
Fixed to 8-digit hexadecimal number
00000000 to FFFFFFFF
Accesses the password-protected tags.

Vs: Write data verify designation (Omissible)
0: Verification disabled (When omitted)
1: Verification enabled
This parameter verifies if data has been written successfully. Select “1” (Verification enabled) for tags which may generate a phenomenon that the written data may not be the same as actual data even when an issue has successfully completed. When “1” is selected, it takes more time than when “0” (Verification disabled) is selected.

Btt: Designates the area where the data is written (Omissible)
00: Bank0 (Reserved area)
01: Bank1 (EPC area) (When omitted)
02: Bank2 (TID area)
03: Bank3 (User area)
04: Bank4 (User block 1)
05: Bank5 (User block 2)
06: Bank6 (User block 3)
07: Bank7 (User block 4)
08: Bank8 (User block 5)
(Effective only when Hibiki tag is used.)
Designation of a format for the areas other than Bank 1 is invalid.

uvvvvvvvvvv: Increment/Decrement

(Omissible. When omitted, incrementing/decrementing is not performed.)

u: Indicates whether to increment or decrement

+: Increment

-: Decrement

vvvvvvvvvv: Skip value (10 digits)

0000000000 to 9999999999

Hxyyyyyyyy: User block password setting (Effective only when Hibiki tag is used.)

Designates a password to lock certain user blocks.

Up to five user blocks can be specified continuously.

For example: H4AABBCCDD,H5BBCCDDEE,H6CCDDEEFF

x: Designates a user area bank (4 to 8)

4: Bank4 (User block 1)

5: Bank5 (User block 2)

6: Bank6 (User block 3)

7: Bank7 (User block 4)

8: Bank8 (User block 5)

yyyyyyyy: User block password

Fixed to 8-digit hexadecimal number

00000000 to FFFFFFFF

Qzabcdef: Area lock designation (Effective only when Hibiki tag is used.)

Designates an area lock type.

Area lock type can be specified for up to eight areas continuously.

For example: Q1100000,Q4101010,Q5100010, which indicates:

Bank1:Read lock, Bank4:Read lock, Write lock, Password read/write lock

Bank5:Read lock, Password read/write lock

z: Area bank designation (1 to 8)

1: Bank1 (EPCC/UII bank)

2: Bank2 (TID bank)

3: Bank3 (User area)

4: Bank4 (User block 1)

5: Bank5 (User block 2)

6: Bank6 (User block 3)

7: Bank7 (User block 4)

8: Bank8 (User block 5)

a: Read lock designation

0: Disabled

1: Enabled

b: Read permanent lock designation

0: Disabled

1: Enabled

c: Write lock designation (Effective to Bank4 to Bank8 only)

0: Disabled

1: Enabled

d: Write permanent lock designation (Effective to Bank4 to Bank8 only)

0: Disabled

1: Enabled

e: User block password read/write lock designation (Effective to Bank4 to Bank8 only)

0: Disabled
1: Enabled

f: User block password read/write permanent lock designation (Effective to Bank4 to Bank8 only)
0: Disabled
1: Enabled

NOTES:

1. *Once a permanent lock is enabled for parameter b, d, or f, any subsequent change is disabled.*
2. *When read/write permanent lock is selected, a read/write lock state is retained. To permanently prohibit reading/writing a tag, enable both the read/write lock and the read/write permanent lock. The setting which disables read/write lock and enables read/write permanent lock allows the tag to be read/written permanently.*

Xghhhhhhhh: User block access password execution setting (Effective only when Hibiki tag is used.)
Designates a password to access and write a tag of which user block is write-locked.
Up to five user blocks can be specified continuously.
For example: X4AABBCCDD,X5BBCCDDEE,X6CCDDEEFF

g: Designates a user area bank. (4 to 8)
4: Bank4 (User block 1)
5: Bank5 (User block 2)
6: Bank6 (User block 3)
7: Bank7 (User block 4)
8: Bank8 (User block 5)

hhhhhhhh: User block access password
Fixed to 8-digit hexadecimal number
00000000 to FFFFFFFF

www---www: Print data string (Omissible)
Max. 512 digits, but the number of digits to be written is different depending on the tag types.

ww_1,ww_2,ww_3,-----,ww_{20}: Link field No. (Omissible)
01 to 99 (1 to 99 can also be used.)
Up to 20 fields can be designated using commas.

⊙ In the case of RFID (Data read)

Function

Reads an RFID tag which is positioned above the antenna. When the feed amount has been set by the RFID Tag Position Adjustment Command ([ESC] @003) for adjusting an RFID tag position, the specified amount of the media is fed forward or backward before reading the RFID data. The read RFID data is transmitted included in an RFID read terminate status after printing is completed.

Format

① [ESC] XBaa; bbbb, cccc, d, (, Neee) (, Afff) (, Tgg) (, Ih) (, Jiiiiiii) (,Xjkkkkkkkk · · ·) [LF] [NUL]

Term

aa: Bar code number
00 to 31

bbbb: Parameter not referred to
Fixed to 4 digits (in 0.1 mm units)

cccc: Parameter not referred to
4 or 5 digits (in 0.1 mm units)

d: Type of bar code
f: RFID (data read)

Neee: Number of bytes to be read (Omissible)
0001 to 4096
When omitted, the number of bytes specified for the tag type being used will be designated.

Afff: Address where the data is read (Omissible)
000 to 999
Designates the address where data starts to be read.
When omitted, this parameter will be set to 0.

Tgg: Tag type (Omissible)
00: None
24: EPC Class 1 Generation 2

Designates the type of RFID tag from which data is to be read.
When omitted, the tag type set in the system mode will be designated.
In accordance with the tag type designated by this setting, the tag type set in the system mode changes.
When “00: NONE” is designated, the backed up tag type will be designated, and the system mode setting will not be changed.

Ih: RFID read mode (Omissible)
1: Only user data is read.
2: Only tag ID is read.
3: Both tag ID and user data are read.

When omitted, only user data will be read.
When the tag type is Gen2, user data equals to TID bank + user bank, and tag ID equals to EPC bank.

Jiiiiiiii: Access to the password-protected tags (Omissible)
Fixed to 8-digit hexadecimal number
00000000 to FFFFFFFF
Accesses the password-protected tags.

Xjkkkkkkkk: User block access password execution setting (Effective only when Hibiki tag is used.)
Designates a password to access and read a tag of which user block is read-locked.
Up to five user blocks can be specified continuously.
For example: X4AABBCCDD,X5BBCCDDEE,X6CCDDEEFF

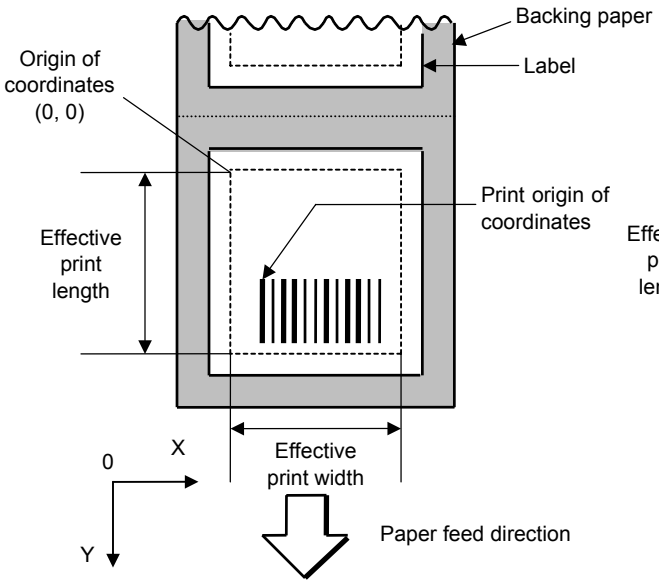
j: Designates a user area bank. (4 to 8)
4: Bank4 (User block 1)
5: Bank5 (User block 2)
6: Bank6 (User block 3)
7: Bank7 (User block 4)
8: Bank8 (User block 5)

kkkkkkkk: User block access password
Fixed to 8-digit hexadecimal number
00000000 to FFFFFFFF

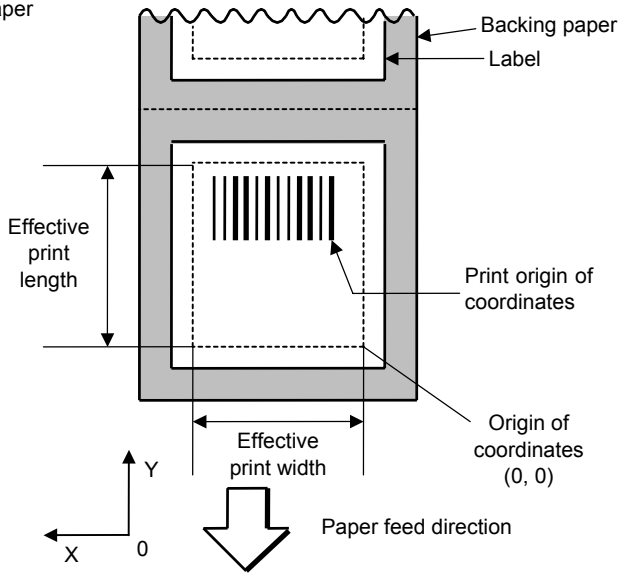
Explanation (1) Bar code number

When drawing bar codes by the Data Command ([ESC] RB), the format designated by the bar code number is selected.

(2) Print origin of coordinates



[Printing direction: Bottom first]



[Printing direction: Top first]

The print origin of coordinates must be set so that the bar code drawing result will be within the effective print area set by the Label Size Set Command ([ESC] D).

[Effective print area] [mm]

Item \ Model / Issue mode			B-SX6T			B-SX8T		
			Batch	Strip	Cut	Batch	Strip	Cut
Print head dot density			12 dots/mm (305 dpi)			12 dots/mm (305 dpi)		
Print head width			170.6 mm			213.3 mm		
G: Effective print width		Min.	10.0			10.0		
		Max.	170.7			213.3		
H: Effective print length	Label	Min.	5.5	20.9	23.0	5.5	20.9	23.0
		Max.	1705.0			1364.0		
	Tag	Min.	8.0	---	23.4	8.0	---	23.4
		Max.	1705.0	---	1705.0	1364.0	---	1364.0

(3) Type of bar code

0: JAN8, EAN8

1: MSI

2: Interleaved 2 of 5

3: CODE39 (standard)

4: NW7

5: JAN13, EAN13

6: UPC-E

7: EAN13 + 2 digits

8: EAN13 +5 digits

9: A: CODE128

B: CODE39 (Full ASCII)

C: CODE93

G: UPC-E + 2 digits

H: UPC-E + 5 digits

I: EAN8 + 2 digits

J: EAN8 + 5 digits

K: UPC-A

L: UPC-A + 2 digits

M: UPC-A + 5 digits

N: UCC/EAN128

O: Industrial 2 of 5

P: PDF417

Q: Data Matrix

R: Customer bar code

S: Highest priority customer bar code

T: QR code

U: POSTNET

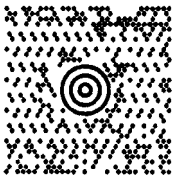
V: RM4SCC

W: KIX code

X: MicroPDF417

Y: CP Code

Z: MaxiCode



b: GS1 DataBar family

GS1 DataBar Omnidirectional

GS1 DataBar Truncated

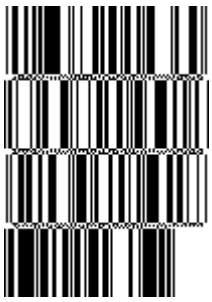
GS1 DataBar Stacked

GS1 DataBar Stacked Omnidirectional

GS1 DataBar Limited

GS1 DataBar Expanded

GS1 DataBar Expanded Stacked



(4) Type of check digit

① When no check digit is attached, a bar code of the data string will be drawn.

② In the case of the check digit check, when each check digit check is performed according to the type of bar code and results in normal, a bar code will be drawn. If the check digit is not proper, the bar code will not be drawn.

③ In the case that the check digit is automatically attached, each check digit is attached according to the type of bar code when a bar code is drawn.

④ If the type of bar code is CODE93, CODE128 (with auto code selection), or UCC/EAN128, the check digit will always be attached regardless of the designation of the type of check digit.

⑤ If the type of bar code is JAN, EAN, or UPC, the designation of no check digit attachment automatically results in the check digit check.

⑥ DBP Modulus 10 is Modulus 10 exclusively for Deutsche Bundespost Postdienst.

(5) Bar width, space width, and character-to-character space

Designate the width of a bar, a space, and a character-to-character space according to the type of bar code. Note that the proper value differs according to the rotational angle of bar code, type, number of digits, print speed, paper used, etc. Examples of such designations are listed below. (1 dot = 1/12 mm)

In case of JAN, EAN, UPC, CODE93, CODE128, UCC/EAN128, PDF417, or MicroPDF417, the width of 2 to 6 modules is automatically calculated only if a 1-module width is designated.

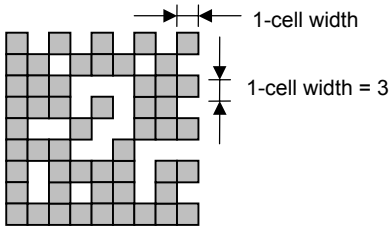
[Example of setting]

Type of bar code	1 module		2 modules		3 modules		4 modules		5 modules		6 modules	
	Bar	Space	Bar	Space	Bar	Space	Bar	Space	Bar	Space	Bar	Space
JAN, EAN, UPC	4		8		12		16		-		-	
CODE93	3		6		9		12		-		-	
CODE128, EAN128	3		6		9		12		-		-	
PDF417	3		6		9		12		15		18	
MicroPDF417	2		4		6		8		10		12	

Type of bar code	Narrow		Wide		Character-to-character space
	Bar	Space	Bar	Space	
MSI	3	3	8	8	0
ITF	3	3	8	8	0
CODE39	3	3	8	8	3
NW7	3	3	8	8	3
Industrial 2 of 5	3	3	8	0	3
MATRIX 2 of 5	3	3	8	8	3

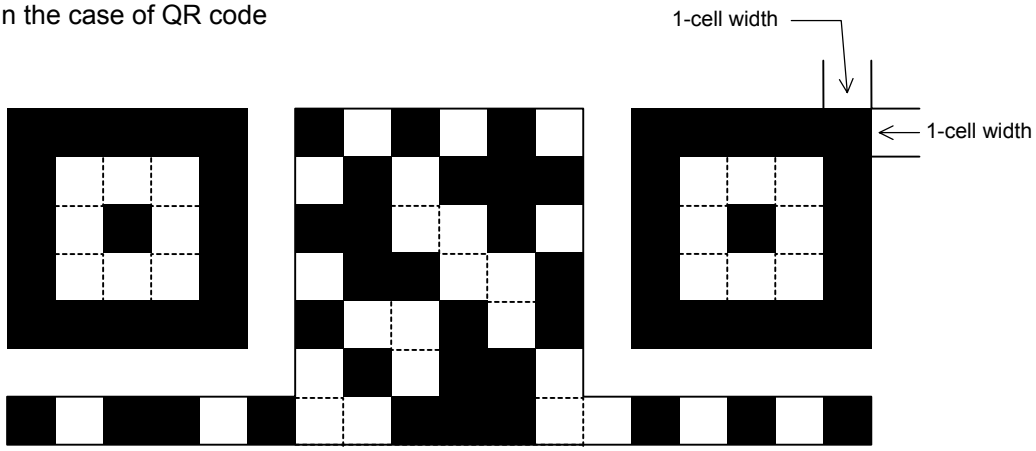
When NW7 is used, transmission of the space character results in a space equals to ‘a narrow space ×12 dots’. In this case, the space is max. 255 dots.

In the case of Data Matrix or CP code



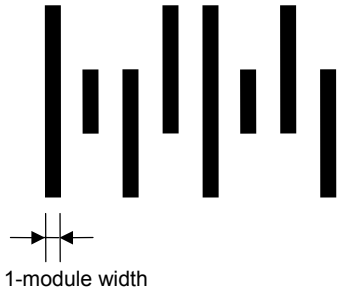
When 1-cell width is set to 00 for the Data Matrix or CP code, a two-dimensional code is not drawn. However, the bar code printed on the previous label is cleared.

In the case of QR code

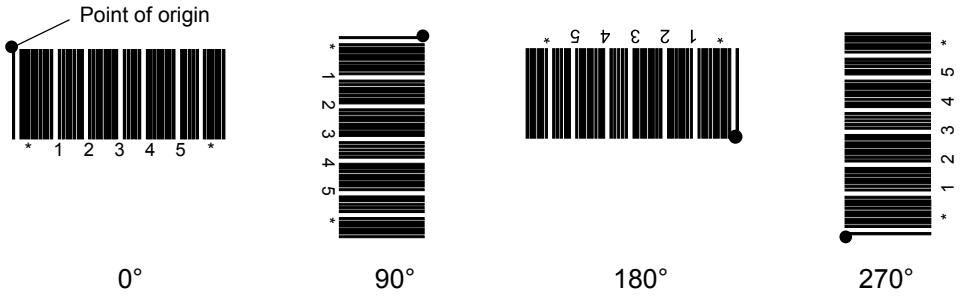


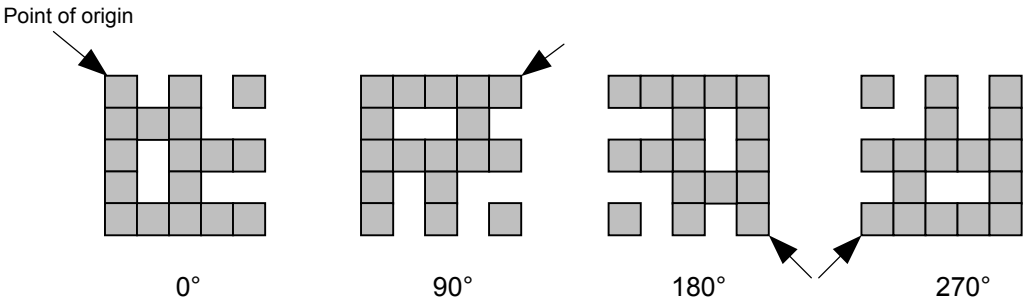
When the 1-cell width is set to 0, a two-dimensional code is not drawn. However, the bar code printed on the previous label is cleared.

In the case of a customer code

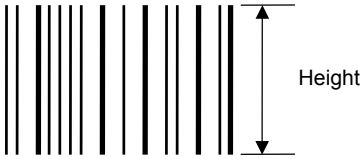


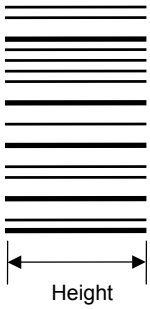
(6) Rotational angle of bar code





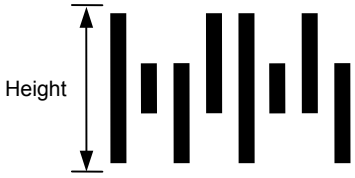
(7) Bar code height





[PDF417, MicroPDF417]

[Postal code]

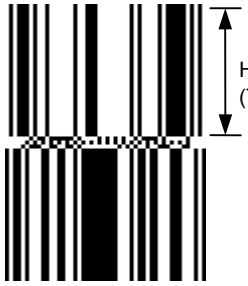


[GS1 DataBar Omnidirectional/GS1 DataBar Truncated]

[GS1 DataBar Stacked]

(The height of the bottom row is 7/5 of the specified height.)

[GS1 DataBar Stacked Omnidirectional]



(The height of the upper row and the bottom row are both the same.)

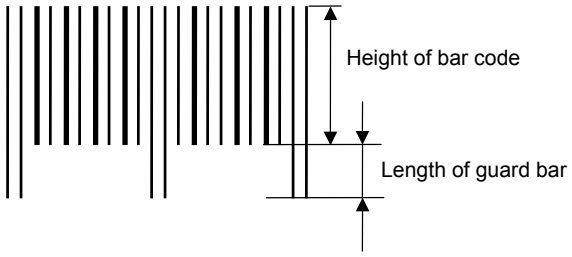
[GS1 DataBar Limited]

[GS1 DataBar Expanded]

When the bar code height is set to 0000, a bar code (including guard bars) and numerals under bars are not drawn. However, the bar code printed on the previous label is cleared.

(8) Length of guard bar

The length of guard bar is valid only when the type of bar code is WPC.
It is ignored in all other cases.

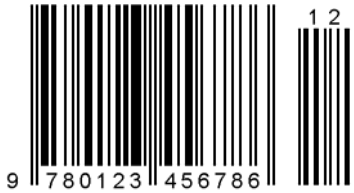


(9) Numerals under bars

Printing numerals under bars is determined according to the parameter for print/non print of numerals under bars. The data of the numerals under bars to be printed depends on the type of bar code. The font type is OCR-B. These numerals are enlarged or reduced only in the horizontal direction according to the width of the bar code. When they are drawn vertically, no enlargement or reduction is applied.

[Drawing positions of numerals under bars]

① In the case of JAN and EAN
(Example) EAN13 + 2 digits



(Example) EAN8

② In the case of UPC
(Example) UPC-A + 2 digits

(Example) UPC-E

③ In the case of bar codes other than JAN, EAN, and UPC
(Example) CODE39

(Example) UCC/EAN128

(10) Start/Stop Code

- This parameter is valid only when the type of bar code is CODE39 and NW7.
- When this parameter is designated, whether the start code and the stop code are attached to the print data to be sent is not checked.
- When this parameter is omitted in the case of CODE39 and NW7, a start/stop code will be attached. The code to be attached is “*” in the case of CODE39, and “a” in the case of NW7.
- For details, refer to chapter 15 “AUTOMATIC ADDITION OF START/STOP CODES”.

(11) Increment/decrement

Printing is performed while the data is incremented or decremented each time a label is issued. Where the data string exceeds the maximum number of digits (40), the data string will not be drawn.

When CODE128 (without auto code selection) is used, the number of the start code (code A, code B, and code C) digits is regarded as 2.

Initial value	0000	0000	0000	0000	999999
INC/DEC	+10	+10	+10	+10	+1
Zero suppression	Not designated	5	3	0	3
1st label	0000	0000	␣ 000	0000	999999
2nd label	0010	0010	␣ 010	0010	␣␣␣ 000
3rd label	0020	0020	␣ 020	0020	␣␣␣ 001
4th label	0030	0030	␣ 030	0030	␣␣␣ 002
5th label	0040	0040	␣ 040	0040	␣␣␣ 003

Letters and numerals for increment/decrement

For CODE39 (standard), CODE39 (full ASCII), NW-7, CODE93, CODE128, even if a data string other than numerals are included in the data, increment/decrement is performed. However, if any code which does not exist in each bar code table is contained in the data, increment/decrement is not performed.

Up to 40 digits (including letters, numerals, and symbols) are possible. Only the numerals are selected and calculated for incrementing/decrementing, and then are returned to the previous position to draw the data.

Example of increment/decrement calculation

Initial value	00000	A0A0A	7A8/9	A2A0A
INC/DEC	+1	+1	+3	-3
1st label	00000	A0A0A	7A8/9	A2A0A
2nd label	00001	A0A1A	7A9/2	A1A7A
3rd label	00002	A0A2A	7A9/5	A1A4A
4th label	00003	A0A3A	7A9/8	A1A1A
5th label	00004	A0A4A	8A0/1	A0A8A

Example of increment/decrement of data including the special codes of CODE128

Increment/decrement calculation starts from the lowest digit in the data strings. If the data string to be calculated is numeric and the next (upper) digit is “>”, this data is a special code (underlined digits shown in the table below). In such case, these two digits are skipped, and the next digit is calculated.

Example of increment/decrement calculation of CODE128

Initial value	00000	00>08	0A>08	0A9>08
INC/DEC	+1	+1	+1	+1
1st label	00000	00>08	0A>08	0A9>08
2nd label	00001	00>09	0A>09	0A9>09
3rd label	00002	01>00	1A>00	1A0>00
4th label	00003	01>01	1A>01	1A0>01
5th label	00004	01>02	1A>02	1A0>02

(12) Zero suppression

No. of digits after zero suppression	0	1	2	2	3	4	5
Data	0000	0000	0000	0A12	0123	0123	0123
Print	0000	␣␣␣0	␣␣00	␣A12	␣123	0123	0123

A zero(s) in a data string is replaced with a space(s) from the upper digits, according to the designated number of digits. However, if the number of digits after zero suppression is greater than the data string, the data string will be drawn without performing zero suppression. Where the data string exceeds the maximum number of digits (40), the data string will not be drawn.

When the print data including start/stop codes are sent, each of the start code and stop code is also counted as a digit. When the bar code type is JAN, EAN, UPC, or UCC/EAN 128, the data will be drawn without performing zero suppression.

(13) Data string to be printed

Drawing data can be programmed by designating the number of digits after the symbol "=." The maximum number of digits to be printed varies according to the types of bar codes. For codes, refer to chapter 13 "BAR CODE TABLE".

(14) Link field No.

The link field No. can be programmed by designating it after the symbol ";." After the link field No. is designated using the Format Command, the data string are linked by the Link Field Data Command to draw an image.
Up to 20 fields can be linked.

The following shows an example of linked fields on the two continuous labels.

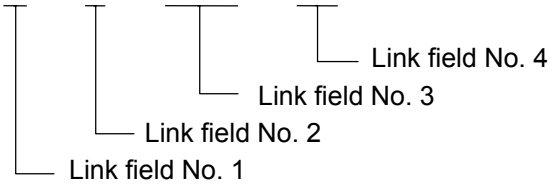
[Format Command]

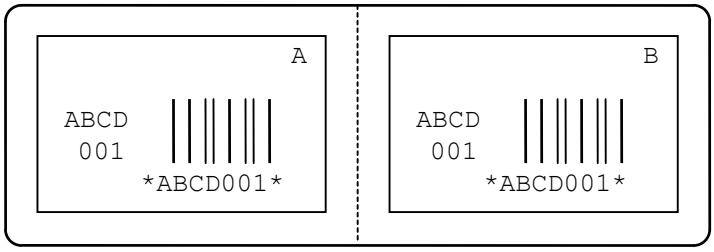
[ESC] PC01;	; 01 [LF] [NUL]	:	Link field No. 1 is designated.
[ESC] PC02;	; 03 [LF] [NUL]	:	Link field No. 3 is designated.
[ESC] PC03;	; 04 [LF] [NUL]	:	Link field No. 4 is designated.
[ESC] XB01;	; 03, 04 [LF] [NUL]	:	Link fields No. 3 and No. 4 are designated.
[ESC] PC04;	; 02 [LF] [NUL]	:	Link field No. 2 is designated.
[ESC] PC05;	; 03 [LF] [NUL]	:	Link field No. 3 is designated.
[ESC] PC06;	; 04 [LF] [NUL]	:	Link field No. 4 is designated.
[ESC] XB02;	; 03, 04 [LF] [NUL]	:	Link fields No. 3 and No. 4 are designated.

Designating the link field No.

[Data Command]

[ESC] RB; A [LF] B [LF] ABCD [LF] 001 [LF] [NUL]





(15) Explanation for Data Matrix

① ECC type

Data Matrix contains a function to correct a code reading error using an error correction code (ECC) and restore normal data. The ECC should be chosen from several types of ECCs according to usage. The general correction ability is as follows. However, it may vary according to the error conditions.

ECC type	Error Correction Ability	Overhead by ECC
ECC0	Low ↕ High	0%
ECC50		25%
ECC80		33%
ECC100		50%
ECC140		75%
ECC200		Approx. 30%

② Format ID

Data Matrix can accept all codes including alphanumerics, symbols and Kanji. Since data compression rate varies depending on codes, a code to be used is designated using the format ID.

Format ID	Code	Details
1	Numbers	0 to 9 space
2	Letters	A to Z space
3	Alphanumerics, symbols	0 to 9 A to Z space . , - /
4	Alphanumerics	0 to 9 A to Z space
5	ASCII (7 bit)	00H to 7FH
6	ISO (8 bit)	00H to FFH (Kanji)

③ Maximum number of digits

The maximum number of digits varies according to the ECC type and format ID.
Since a Kanji character uses 2 bytes, its maximum number of digits becomes half of the following values.

	ECC0	ECC50	ECC80	ECC100	ECC140
Format ID 1	500	457	402	300	144
Format ID 2	452	333	293	218	105
Format ID 3	394	291	256	190	91
Format ID 4	413	305	268	200	96
Format ID 5	310	228	201	150	72
Format ID 6	271	200	176	131	63

	Numeric	Alphanumeric	8 bit
ECC200	2000	2000	1556

For the maximum number of digits in cell units, see the following page.

④ Connection setting

The connection setting is used when the data cannot be expressed with only one two-dimensional code. In short, data is comprised of more than one two-dimensional code. When three two-dimensional codes are used to make up data, for example, information indicating 1/3, 2/3, or 3/3 is inserted into each two-dimensional code. When plural two-dimension codes are printed on the same label, ID numbers enables properly connecting divided codes.
To be more precise, when there are two kinds of two-dimensional data in the same label; They are both comprised of 1/2 and 2/2. To avoid mixing them each other, ID number will help.

Cell size and the effective data capacity

Symbol size		ECC000			ECC050			ECC080			ECC100			ECC140		
Row	Col	Numeric capacity	Alphanum capacity	8-bit byte capacity	Numeric capacity	Alphanum capacity	8-bit byte capacity	Numeric capacity	Alphanum capacity	8-bit byte capacity	Numeric capacity	Alphanum capacity	8-bit byte capacity	Numeric capacity	Alphanum capacity	8-bit byte capacity
9	9	3	2	1	–	–	–	–	–	–	–	–	–	–	–	–
11	11	12	8	5	1	1	–	–	–	–	–	–	–	–	–	–
13	13	24	16	10	10	6	4	4	3	2	1	1	–	–	–	–
15	15	37	25	16	20	13	9	13	9	6	8	5	3	–	–	–
17	17	53	35	23	32	21	14	24	16	10	16	11	7	2	1	1
19	19	72	48	31	46	30	20	36	24	16	25	17	11	6	4	3
21	21	92	61	40	61	41	27	50	33	22	36	24	15	12	8	5
23	23	115	76	50	78	52	34	65	43	28	47	31	20	17	11	7
25	25	140	93	61	97	65	42	82	54	36	60	40	26	24	16	10
27	27	168	112	73	118	78	51	100	67	44	73	49	32	30	20	13
29	29	197	131	86	140	93	61	120	80	52	88	59	38	38	25	16
31	31	229	153	100	164	109	72	141	94	62	104	69	45	46	30	20
33	33	264	176	115	190	126	83	164	109	72	121	81	53	54	36	24
35	35	300	200	131	217	145	95	188	125	82	140	93	61	64	42	28
37	37	339	226	148	246	164	108	214	143	94	159	106	69	73	49	32
39	39	380	253	166	277	185	121	242	161	106	180	120	78	84	56	36
41	41	424	282	185	310	206	135	270	180	118	201	134	88	94	63	41
43	43	469	313	205	344	229	150	301	201	132	224	149	98	106	70	46
45	45	500	345	226	380	253	166	333	222	146	248	165	108	118	78	51
47	47	500	378	248	418	278	183	366	244	160	273	182	119	130	87	57
49	49	500	413	271	457	305	200	402	268	176	300	200	131	144	96	63

Symbol size		ECC200		
Row	Col	Numeric capacity	Alphanum capacity	8-bit byte capacity
10	10	6	3	1
12	12	10	6	3
14	14	16	10	6
16	16	24	16	10
18	18	36	25	16
20	20	44	31	20
22	22	60	43	28
24	24	72	52	34
26	26	88	64	42
32	32	124	91	60
36	36	172	127	84
40	40	228	169	112
44	44	288	214	142
48	48	348	259	172
52	52	408	304	202
64	64	560	418	278
72	72	736	550	366
80	80	912	682	454
88	88	1152	862	574
96	96	1392	1042	694
104	104	1632	1222	814
120	120	2000	1573	1048
132	132	2000	1954	1302
144	144	2000	2000	1556

Rectangular code

Symbol size		ECC200		
Row	Col	Numeric capacity	Alphanum capacity	8-bit byte capacity
8	18	10	6	3
8	32	20	13	8
12	26	32	22	14
12	36	44	31	20
16	36	64	46	30
16	48	98	72	47

(16) Explanation for the PDF417 and MicroPDF417

① Security level

The PDF417 contains a function to correct a code reading error using an error correcting code word and restore normal data. The security level should be designated according to usage.

For the MicroPDF417, the printer sets the security level automatically.

Security level	Error Correction Ability	No. of error correction code words
Level 0	Low ↕ High	0
Level 1		2
Level 2		6
Level 3		14
Level 4		30
Level 5		62
Level 6		126
Level 7		254
Level 8		510

② No. of columns (rows)

The number of rows and the row length (No. of data strings) are variable in the PDF417. Therefore, the form of the symbol can be changed in the proportion of the height and width in accordance with the print space.
The number of columns (the number of data strings) is variable between 1 and 30.
If the number of columns is too small though the data volume is large and the security level is high, drawing may not be performed. This is because the number of rows may exceed 90 when the number of columns is too small. (When the PDF417 is used, the number of rows of a symbol is limited in a range from 3 to 90.)

For the MicroPDF417, not only the number of columns (data strings) but also the number of rows (data lines) can be designated. When setting these values, see the table. Note that the max. number of digits for the set parameter (gg) varies according to the character type. If the number of digits exceeds the max. number of digits for the set parameter (gg), a code is not printed. The number of columns (data strings) is variable in a range from 1 to 4.

The max. number of lines is 44 though it depends on the number of columns.

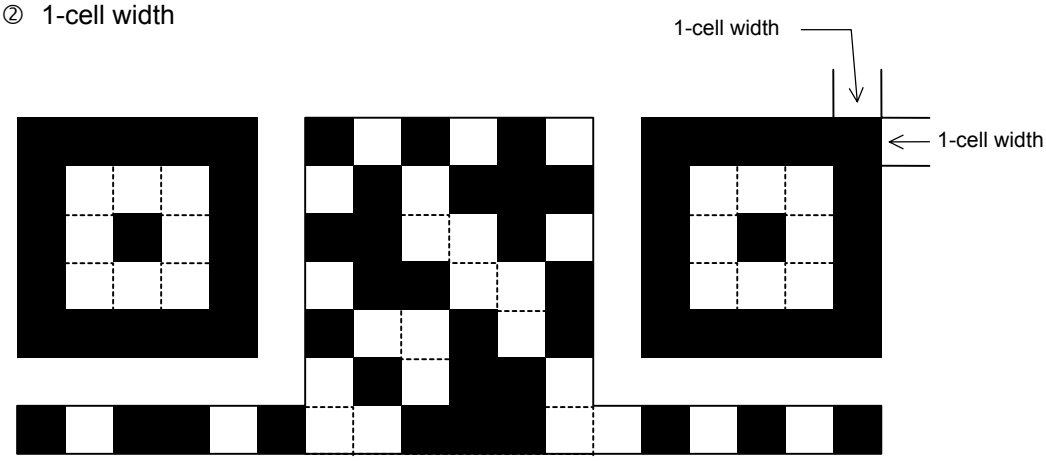
(17) Explanation for QR code

① Error correction level

The QR code contains functions to detect and correct an error. If a part of the data characters is damaged, the data can be restored when this code is read.
There are 4 levels of error correction. The level should be specified according to usage. The general correction ability is as follows.

Level	Error correction ability	Overhead by correcting an error
High density level	Low ↕ High	7%
Standard level		15%
Reliability level		25%
High reliability level		30%

② 1-cell width



When the 1-cell width is set to 0, a two-dimensional code is not drawn. However, the bar code printed on the previous label is cleared.

③ Selection of mode

All codes including alphanumerics, symbols, and Kanji can be used in one QR code. Manual mode or automatic mode can be selected to perform the operation.

④ Selection of model

Model 1: Original specification

Model 2: Extended specification which enhances the function of position correction and can cope with a large amount of data.

⑤ Mask number

It is preferable that the black and white modules are arranged in well-balanced manner so that a QR code is read for sure. The mask number prevents the bit pattern “1011101”, which is characteristically seen in the position detecting pattern, from appearing in the symbol as much as possible.

The mask number is ranging from 0 to 7. The pattern of the code is determined by placing each masking pattern for the mask number over the module pattern. When the mask number is set to 8, masking is not performed. When the parameter is omitted, the most appropriate mask number is automatically selected to perform masking.

⑥ Connection setting

For QR code, data can be divided into several codes. Even though the print space is limited, divided codes can be printed there. The data can be divided into a max. of 16 codes. Parity data is obtained by XORing all input data in units of bytes before dividing. The input data is calculated based on shift JIS for Kanji, or on JIS 8 for others. Examples are shown below:

“0123456789日本 ” is divided into “0123”, “4567”, and “89日本 ”.

Code No. 1	No. of divided codes: 3	Parity data: 85	Data “0123”
Code No. 2	No. of divided codes: 3	Parity data: 85	Data “4567”
Code No. 3	No. of divided codes: 3	Parity data: 85	Data “89日本 ”

* The parity data is the XORed value for “0123456789 日本 ”.

30 31 32 33 34 35 36 37 38 39 93 FA 96 7B = 85

(18) Explanation for MaxiCode

① Connection setting

For MaxiCode, data can be divided into a max. of 8 codes.

(19) Explanation for CP code

① ECC (Error Correction Code) level

The CP code contains a function to correct a code reading error using an error correcting code word and restore normal data. The error correction level should be selected according to usage.

The higher the percentage of the error correcting code word is, the higher the error correcting ability is.

For the CP code, the program is designed so that all remaining areas are used for correcting errors when the number of code characters is specified by a user. When the number of code characters is specified, “0” (No designation) can be used.

When the number of code characters is not specified by a user, a value must be selected from a range of 10% to 50%. The printer automatically determines the number of code characters so that the error correcting code word exceeds the percentage specified by user.

② The number of bits per character

Data is compressed by using the 8-bit compression method. Even if “0” is specified, the data will be compressed in the same way.

Character set for 8 bits

8 bits: ISO (8 bits) 00H to FFH (for Kanji)

③ The number of code characters

For the CP code, a 3×3-cell is used for one block, and a CP code consists of these blocks.

The numbers of characters in the X and Y directions can be set by a user.

If “0” is specified, the printer automatically sets the smallest code size that can contain the data set by the user.

The rectangular code can be also specified. In that case, the value for the Y direction must be smaller than the X direction.

The number of cells per code is as follows.

(No. of code characters) × 3 + 2

(20) Explanation for RFID

[RFID (Data write)]

① The number of bytes to be written

The number of bytes to be written on the tag depends on the type of tag.

② Sequence of writing data on the RFID tag

Data is written on the RFID tag prior to printing. When +3-mm or more feed, or a –3-mm or less feed has been set in the @003 command, the printer performs a forward/reverse feed before printing, according to the command setting.
When writing data onto the RFID tag succeeds, the printer feeds the paper in the direction opposite to the feed performed before data write, and then starts printing.
If writing data fails, and when the parameter of RFID adjustment for retry has been set to +3mm or more, or –3mm or less in the system mode, the printer performs a forward/reverse feed again and retries to write data.
If writing data failed again, the printer prints the void pattern on that paper to abandon it, and retries the next tag up to the max. number of RFID issue retries.

③ Writing binary data on RFID tags

When writing binary data on RFID tags, the data is specified by attaching a '>'. Or, the data is converted to binary format when "conversion to binary" is designated for the data type, and converted to hexadecimal format when "conversion to hexadecimal" is designated for the data type. In the case of binary format, only '0' and '1' are used. In the case of hexadecimal format, '0' to 'F' are used.

(Example) To specify "00H01H02H"

No conversion:	>@>A>B
Conversion to binary:	000000000000000100000010
Conversion to hexadecimal:	000102

For details, refer to Chapter 13 BAR CODE TABLE (15).

④ On-the-fly issue

When "On-the-fly issue" is enabled for RFID write, a data write time depends on the start point, the end point, and the print speed. If that time is shorter than the time required to write data onto an RFID tag (300 msec.), the printer will not perform the on-the-fly issue. When a write error occurs during the on-the-fly issue, the printer will feed the paper backward and print the void pattern on it. When the printer has no ribbon saving module, the RFID tag paper may be jammed at the print head during a reverse feed. Even if the printer includes a ribbon saving module, care must be taken not to cause a paper jam during strip issue.

Success rate of data write onto RFID tags is high when the print speed is as slow as 3 inches/sec. Even if the on-the-fly issue is enabled, it may take much time to issue RFID tag paper because the printer will feed the paper backward when an error occurs. Therefore, the total throughput could be higher when the print condition is set so that the on-the-fly issue is not performed, RFID data is written prior to printing and print speed is 10 inches/sec.

⑤ EPC format

When EPC format is designated, data will be written onto an RFID tag in the format of its own.
Data is all specified with numbers, and no partitions are inserted between the fields.
When EPC format is designated and the number of input digits of print data string is different from the data size to be formatted for the designated format, only the input data of designated size is formatted.
When a format is designated and data other than the one supported by the format, which has designated data string to be printed, is designated, a variable value is written.

⑥ Data type

When “conversion to binary” or “conversion to hexadecimal” is designated for the data type and the number of digits of print data string is less than that for the data type designated, the remaining digits are filled with “0”, then an RFID write is performed. This also applies when a link field is designated. Each field must designate 1-byte data. If data of less than 1 byte is designated, shortfall of data must be filled with “0” and an RFID write is performed.

⑦ Designation of access password registration and kill password registration

When registration of access password or kill password fails, a registration error will result and the printer prints the void pattern.
This setting may not be effective for some of the EPC Class 1 Generation 2 tags.

⑧ Lock/unlock setting

This setting may not be effective for some of the EPC Class 1 Generation 2 tags.

⑨ Access to the password-protected tags

When “Access to the password-protected tags” is designated for an RFID write, the printer prints the void pattern if an access password for the RFID write does not match with the access password designated. Note that data can be written even onto password-protected tags when a designation of “Access to the password-protected tags” is omitted, but an access password cannot be registered when “Access to the password-protected tags” is designated.
This setting may not be effective for some of the EPC Class 1 Generation 2 tags.

[RFID (Data read)]

① The number of bytes to be read

The number of bytes to be read is effective only when the RFID read mode is set to 1 or 3. This parameter is applied to the user data only, not to the tag ID.

② If the number of bytes is specified exceeding the IC capacity, a read error occurs.

③ When a data read is specified in this command and if a data read failed, the printer retries to read data after sending a status notifying the completion of void pattern printing (60H) or stops the operation with an error after sending an RFID write error status (61H).

SOH	01H	Header of the status block
STX	02H	
Status	34H	Printer status
	32H	
Status type	34H	Completion of a data read
Remaining count	3XH	Remaining print count
	3XH	
	3XH	
	3XH	
Tag type	XXH	30H30H: Data read failed. 32H34H: EPC Class 1 Generation 2
	XXH	
Length	XXH	RFID data length
	XXH	
RFID data	XXH	Tag ID + User data Note: Data to be read depends on the RFID read mode.
	XXH	
	:	
	XXH	
	XXH	
ETX	03H	End of the status block
EOT	04H	
CR	0DH	
LF	0AH	

④ If the access password for the RFID write does not match with the access password designated to the tag, a data write cannot be performed. However, a data read is possible. (However, when Hibiki tag is read-locked, a data read is also disabled.)

Notes

(1) The check digit attachment, increment/decrement, and zero suppression are performed according to the following priority. If any of the conditions is improper, no drawing will take place.

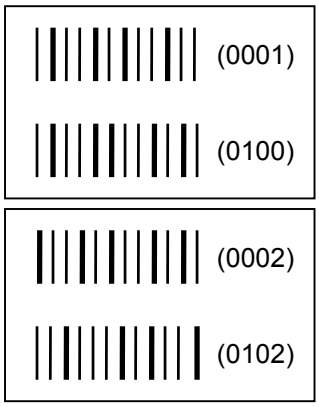
〔 For example, the zero(s) is replaced with a space(s) as a result of zero suppression, but the modulus 10 designated to be attached cannot be calculated. 〕

Increment/decrement > zero suppression > attachment of check digit

(2) Up to 32 fields for which incrementing/decrementing has been designated can be drawn. If the total bit map font, outline font, and bar code increment/decrement fields exceeds 32, drawing will take place without incrementing/decrementing any excessive field. The field to be incremented or decremented is incremented or decremented until the Image Buffer Clear Command ([ESC] C) is transmitted.

[Example]

① Format Command (Increment bar code No. 01 (+1))
② Format Command (Increment bar code No. 02 (+2))
③ Image Buffer Clear Command
④ Data Command (Bar code No. 01 “0001”)
⑤ Data Command (Bar code No. 02 “0100”)
⑥ Issue Command (2 labels)



⑦ Issue Command (1 label)

⑧ Image Buffer Clear Command
⑨ Data Command (Bar code No. 02 “3000”)
⑩ Issue Command (1 label)

(3) More than one Bar Code Format Command can be connected when transmitted.

[ESC] XB01; 0100, 0150, 3, 1, 02, 02, 06, 06, 02, 0, 0150 [LF]
B02; 0350, 0150, 3, 1, 02, 02, 06, 06, 02, 0, 0150 [LF] [NUL]

(4) When the drawing data differs for every label, the field of the drawing data for the previous label is automatically cleared using the bar code number, then the next drawing data is printed. Therefore, the bar code number should be designated so that they differ according to the drawing fields. Since the automatic field clear is not performed between the Clear Command ([ESC] C) and Issue Command ([ESC] XS), the fixed data may be drawn using the same bar code number. In this case, the Format Command and Data Command should be sent alternately. (After the Issue Command is sent, the fields with the same bar code number are automatically cleared until the Clear Command is sent.)

(5) The link field designation is cleared by omitting the link field designation using the same bar code No. and reformatting data.
The link field designation can also be cleared by the Image Buffer Clear Command.

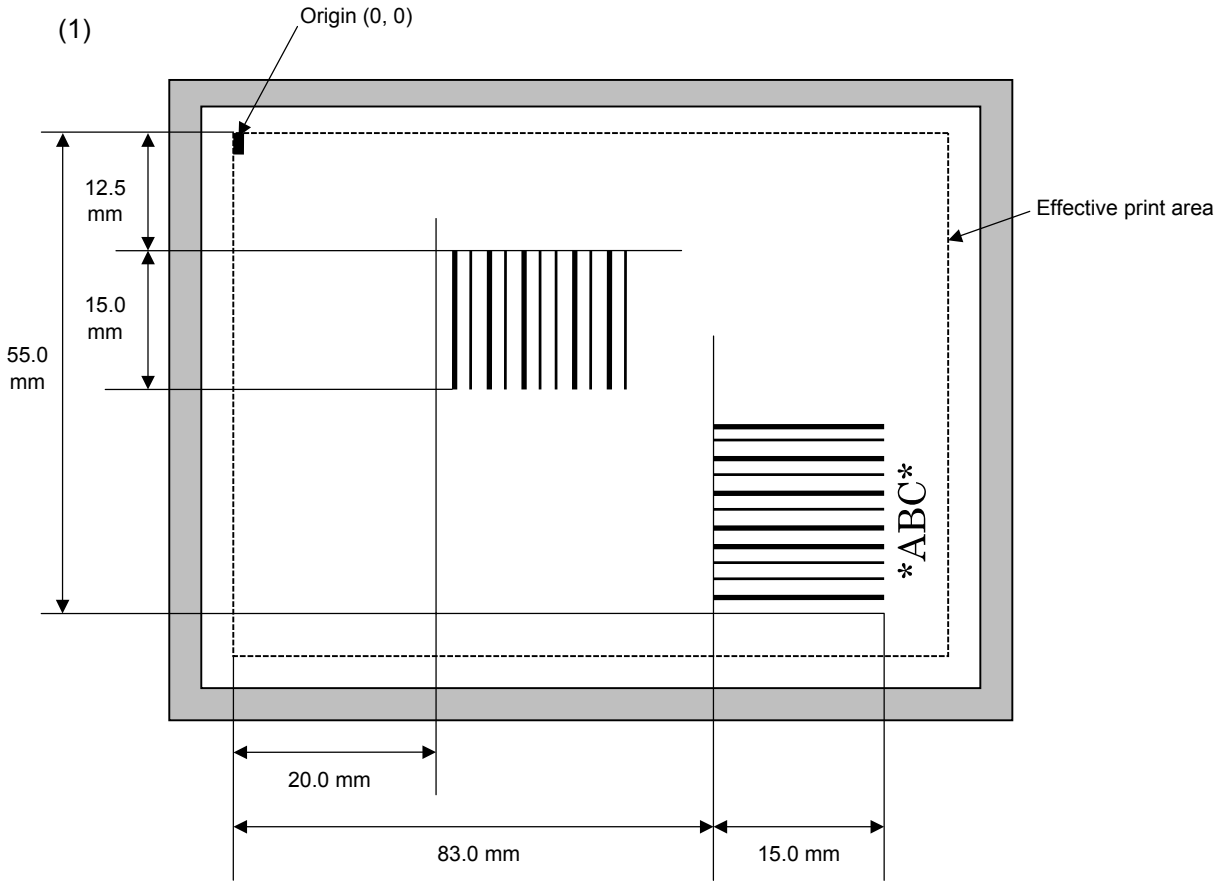
(6) A print data string and the link field No. cannot be programmed at the same time.

Refer to

Bit Map Font Format Command ([ESC] PC)
Outline Font Format Command ([ESC] PV)
Bar Code Data Command ([ESC] RB)

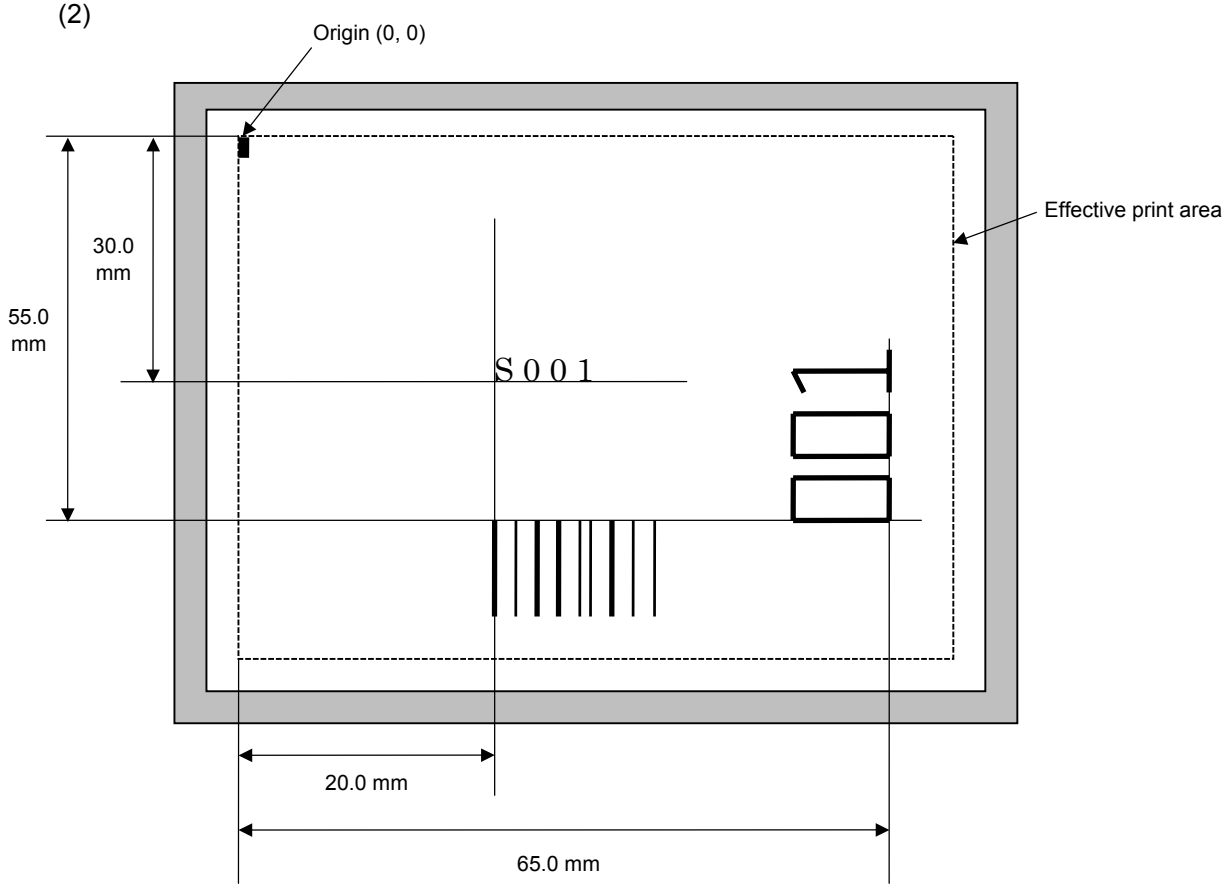
Examples

(1)



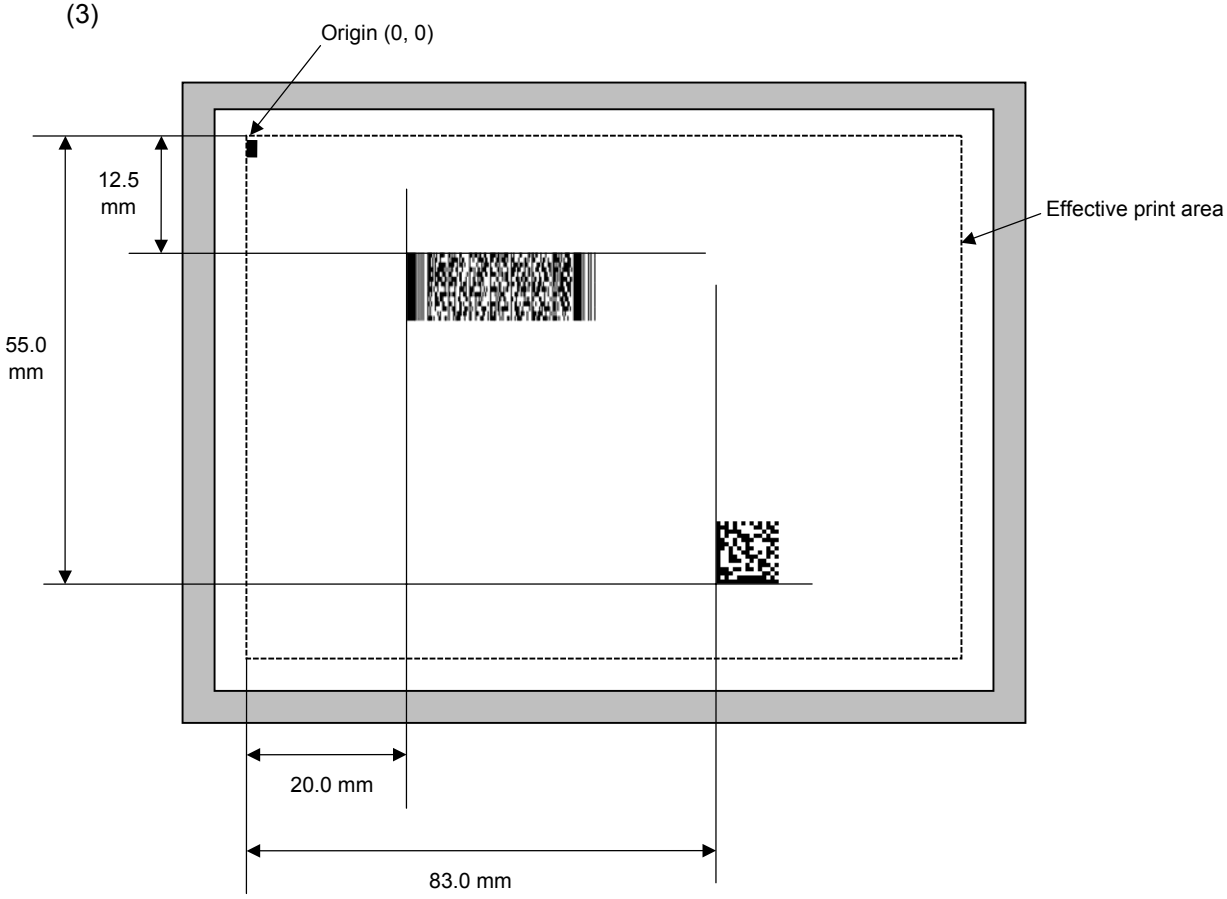
[ESC] C [LF] [NUL]
[ESC] XB01; 0200, 0125, 3, 1, 03, 03, 08, 08, 03, 0, 0150=12345 [LF] [NUL]
[ESC] XB02; 0830, 0550, 3, 1, 02, 04, 07, 08, 04, 3, 0150, +0000000000, 1, 00, N [LF] [NUL]
[ESC] RB02; *ABC* [LF] [NUL]
[ESC] XS; I, 0002, 0002C3000 [LF] [NUL]

(2)



[ESC] C [LF] [NUL]
[ESC] PC001; 0200, 0300, 1, 1, C, 00, B; 01, 02 [LF] [NUL]
[ESC] PV01; 0650, 0550, 0200, 0150, B, 33, B; 02 [LF] [NUL]
[ESC] XB01; 0200, 0550, 3, 1, 03, 03, 08, 08, 03, 0, 0150; 01, 02 [LF] [NUL]
[ESC] RB; S [LF] 001 [LF] [NUL]
[ESC] XS; I, 0002, 0002C3000 [LF] [NUL]

(3)



[ESC] C [LF] [NUL]
[ESC] XB01; 0200, 0125, P, 04, 02, 03, 0, 0010 [LF] [NUL]
[ESC] XB02; 0830, 0550, Q, 08, 03, 05, 3 [LF] [NUL]
[ESC] RB01; PDF417 [LF] [NUL]
[ESC] RB02; Data Matrix [LF] [NUL]
[ESC] XS; I, 0002, 0002C3000 [LF] [NUL]

6.3.11 BIT MAP FONT DATA COMMAND [ESC] RC

Function Provides data for the bit map font row.

Format

① [ESC] RCaaa; bbb ------ bbb [LF] [NUL]

② Link Field Data Command
[ESC] RC; ccc ------ ccc [LF] ddd ------ ddd [LF] ------ [LF] xxx ------ xxx [LF] [NUL]

Term

aaa: Character string number
000 to 199 (Two digits, 00 to 99, also acceptable.)

bbb ------ bbb: Data string to be printed
Max. 255 digits
(Max. 127 digits when the font type is U, V, W, X, v, w, or 51 to 55.)
Any excess data will be discarded.
For the character codes, refer to chapter 12 “CHARACTER CODE TABLE”.

ccc ------ ccc: Data string of link field No. 1

ddd ------ ddd: Data string of link field No. 2

to

xxx ------ xxx: Data string of link field No. 99

Explanation

(1) Link field data string

- After the link field No. is designated in the Format Command, data strings are linked using the Link Field Data Command to draw an image.
- Up to 255 digits of data strings can be linked. However, when the font type is U, V, W, X, v, w, or 51 to 55, up to 127 digits can be linked.
  When the number of digits exceeds the upper limit, excess data will be discarded.
- Up to 99 data strings can be linked.
- Up to 2048 bytes can be used as the command length ([ESC] to [NUL]) of the Link Field Data Command.
- When the data string is omitted in the Link Field Data Command, the following process is performed:
  ① No process will be performed for the field which contains no print data due to the omission.
  ② When the field partially loses print data due to the omission, the only remaining data will be processed as print data.
- The Link Field Data Command can be used for the bit map font fields, outline font fields, and bar code fields.
  (The same result is obtained when any of the “RC,” “RV” or “RB” command code is designated.)

(2) Data string of Kanji code

- When the font type is U, V, W, X, v, or w, Japanese Kanji is used. non-Kanji JIS, JIS level 1, JIS level 2, special characters, half-size alpha-numerals can be printed.
- Character code of Shift JIS, JIS hexadecimal, JIS 8, or the mixture of these codes can be used.

(3) Kanji code selection

- The character code is automatically selected in the manner described below.

① Shift JIS or JIS8

Code of 20h to 7Fh or A0h to DFh are considered as half-size characters (alphanumeric). Others are considered as SHIFT JIS code.

A: Kanji (東京)

[93h] [8Ch] [8Bh] [9Eh]

東 京

B: Kanji + Half-size character (東 ABC 京 abc)

[93h] [8Ch] [41h] [42h] [43h] [8Bh] [9Eh] [61h] [62h] [63h]

東 A B C 京 a b c

C: Half-seize character [123 ｱｲｳ]

[31h] [32h] [33h] [B1h] [B2h] [B3h]

1 2 3 ｱ ｲ ｳ

② JIS hexadecimal

- Data between [ESC]K and [ESC]H are considered as JIS hexadecimal code. Data before [ESC]K or data between [ESC]H and [ESC]K are considered as half-size characters (alphanumeric).

A: Kanji (東京)

[1Bh] [4Bh] [45h] [6Ch] [35h] [7Eh] [1Bh] [48h]

[ESC] K 東 京 [ESC] H

B: Kanji + Half-size character (東 ABC 京 abc)

[1Bh] [4Bh] [45h] [6Ch] [1Bh] [48h] [41h] [42h] [43h] [1Bh] [4Bh] [35h] [7Eh]

[ESC] K 東 [ESC] H A B C [ESC] K 京

[1Bh] [48h] [61h] [62h] [63h]

[ESC] H a b c

• Data between [FS]& and [FS]. are considered as JIS hexadecimal code. Data before [FS]& or data between [FS]. and [FS]& are considered as half-size characters (alphanumeric).

A: Kanji (東京)

[1Ch] [26h] [45h] [6Ch] [35h] [7Eh] [1Ch] [2Eh]
[FS] & 東 京 [FS] .

B: Kanji + Half-size character (東 ABC 京 abc)

[1Ch] [26h] [45h] [6Ch] [1Ch] [2Eh] [41h] [42h] [43h] [1Ch] [26h] [35h] [7Eh]
[FS] & 東 [FS] . A B C [FS] & 京

[1Ch] [2Eh] [61h] [62h] [63h]
[FS] . a b c

• Data between [ESC]$@ and [ESC](J are considered as JIS hexadecimal code. Data before [ESC]$@ or data between [ESC](J and [ESC]$@ are considered as half-size characters (alphanumeric).

A: Kanji (東京)

[1Bh] [24h] [40h] [45h] [6Ch] [35h] [7Eh] [1Bh] [28h] [4Ah]
[ESC] $ @ 東 京 [ESC] (J

B: Kanji + Half-size character (東 ABC 京 abc)

[1Bh] [24h] [40h] [45h] [6Ch] [1Bh] [28h] [4Ah] [41h] [42h] [43h]
[ESC] $ @ 東 [ESC] (J A B C

[1Bh] [24h] [40h] [35h] [7Eh] [1Bh] [28h] [4Ah] [61h] [62h] [63h]
[ESC] $ @ 京 [ESC] (J a b c

(4) To mix Kanji and writable characters on the same field

• The character code should be specified in the manner described below.

① Shift JIS or JIS8

Code of 20h to 7Fh or A0h to DFh are considered as half-size characters (alphanumeric). Others are considered as SHIFT JIS code. Code of F040H to F07EH and F080H to F0FCH are considered as writable characters.

A: Kanji + Writable character (東京 (writable character code F040h))

[93h] [8Ch] [8Bh] [9Eh] [F0h] [40h]
東 京 (Writable character)

B: Kanji + Half-size character + Writable character
(東 ABC 京 abc (writable character code F05Ah))

[93h] [8Ch] [41h] [42h] [43h] [8Bh] [9Eh] [61h] [62h] [63h] [F0h] [5Ah]
東 A B C 京 a b c (Writable character)

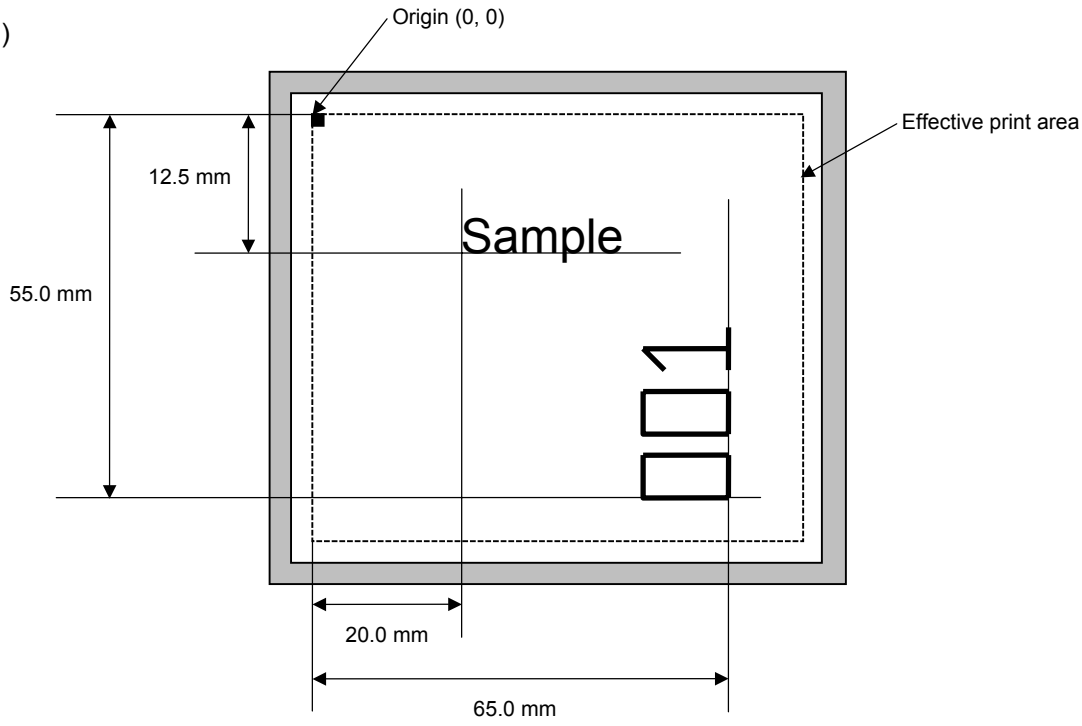
C: Half-size character + Writable character
(123 ｱｲｳ (Writable character code F05Ah))

[31h] [32h] [33h] [B1h] [B2h] [B3h] [F0h] [FCh]
1 2 3 ｱ ｲ ｳ (Writable character)

Refer to Bit Map Font Format Command ([ESC] PC)

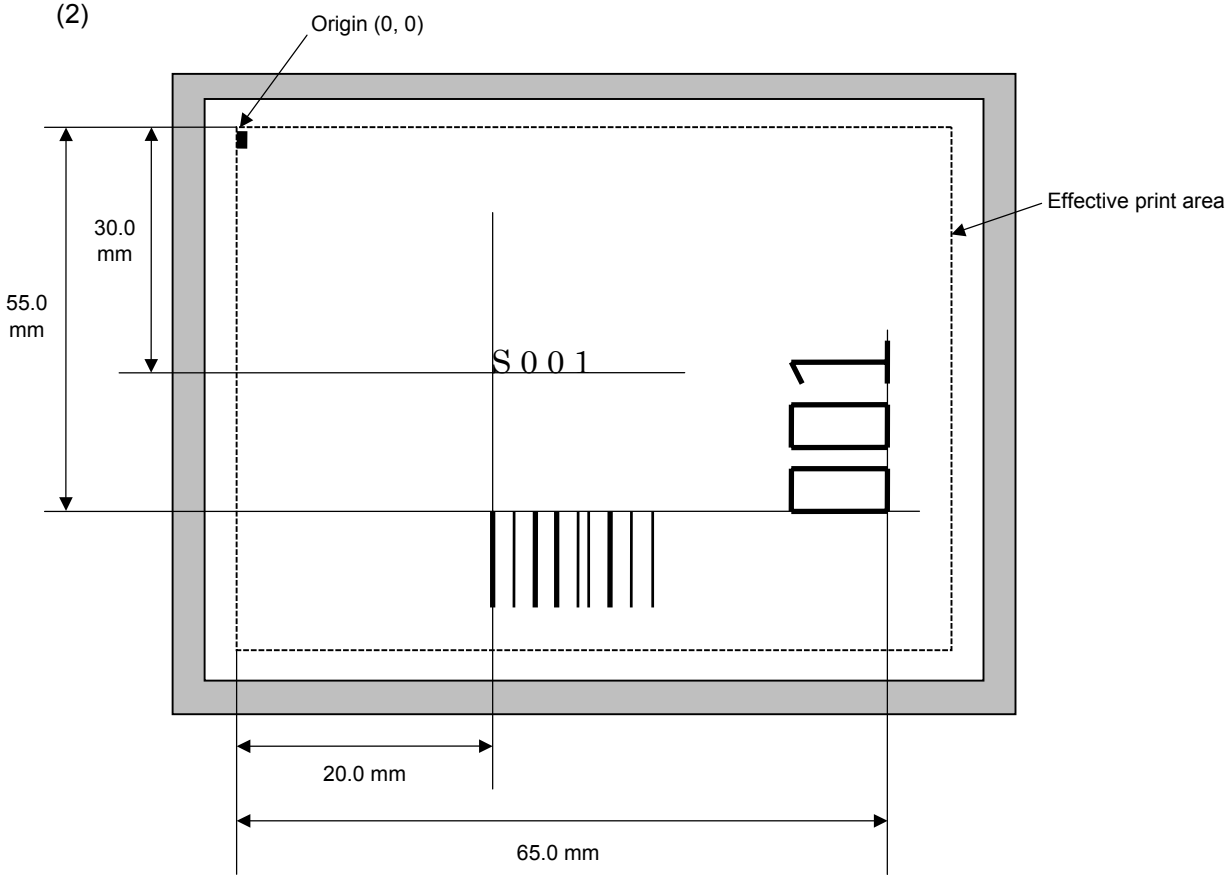
Examples

(1)



[ESC] C [LF] [NUL]
[ESC] PC001; 0200, 0125, 1, 1, C, 00, B [LF] [NUL]
[ESC] PC002; 0650, 0550, 2, 2, G, 33, B, +0000000001 [LF] [NUL]
[ESC] RC001; Sample [LF] [NUL]
[ESC] RC002; 001 [LF] [NUL]
[ESC] XS; I, 0002, 0002C3000 [LF] [NUL]

(2)



[ESC] C [LF] [NUL]
[ESC] PC001; 0200, 0300, 1, 1, C, 00, B; 01, 02 [LF] [NUL]
[ESC] PV01; 0650, 0550, 0200, 0150, B, 33, B; 02 [LF] [NUL]
[ESC] XB01; 0200, 0550, 3, 1, 03, 03, 08, 08, 03, 0, 0150; 01, 02 [LF] [NUL]
[ESC] RC; S [LF] 001 [LF] [NUL]
[ESC] XS; I, 0002, 0002C3000 [LF] [NUL]

6.3.12 OUTLINE FONT DATA COMMAND [ESC] RV

Function Provides data for the outline font row.

Format ① [ESC] RVaa; bbb ------ bbb [LF] [NUL]

② Link Field Data Command
[ESC] RV; ccc ------ ccc [LF] ddd ------ ddd [LF] ------ [LF] xxx ------ xxx [LF] [NUL]

Term

aa: Character string number
00 to 99

bbb ------ bbb: Data string to be printed
Max. 255 digits
Any excess data will be discarded.
For the character codes, refer to chapter 12 “CHARACTER CODE TABLE”.

ccc ------ ccc: Data string of link field No. 1

ddd ------ ddd: Data string of link field No. 2

to

xxx ------ xxx: Data string of link field No. 99

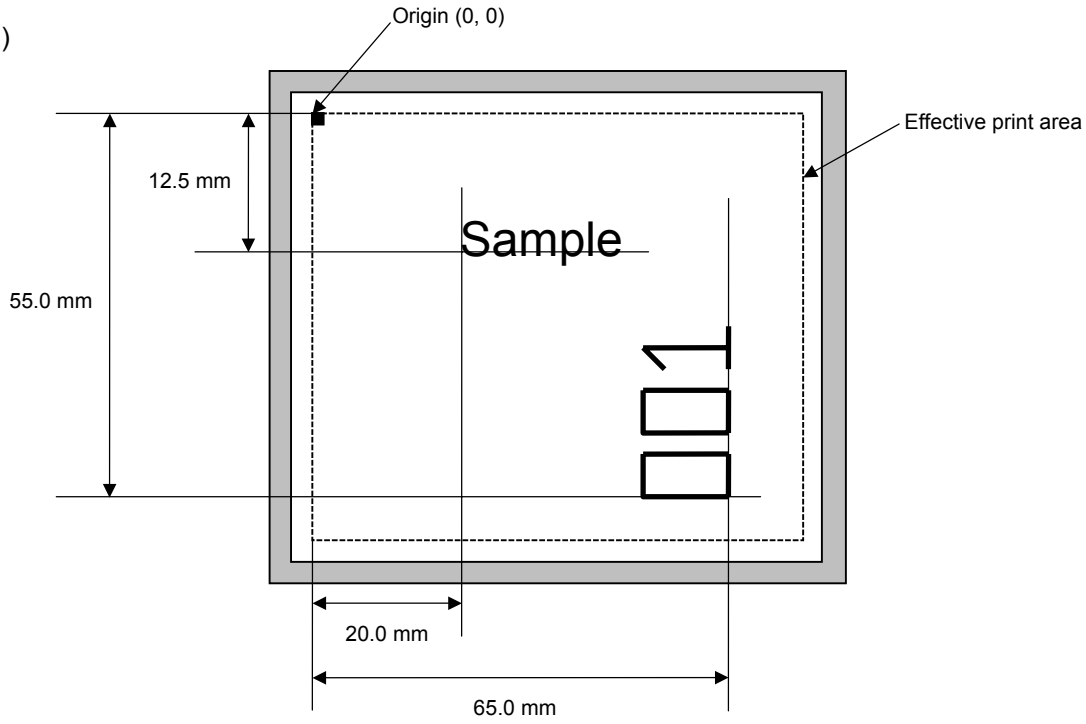
Explanation (1) Link field data string

- After the link field No. is designated in the Format Command, data strings are linked using the Link Field Data Command to draw an image.
- Up to 255 digits of data strings can be linked. Data exceeding the max. number of digits will be discarded.
- Up to 99 data strings can be linked.
- Up to 2048 bytes can be used as the command length ([ESC] to [NUL]) of the Link Field Data Command.
- When the data string is omitted in the Link Field Data Command, the following process is performed:
  - ① No process will be performed for the field which contains no print data due to the omission.
  - ② When the field partially loses print data due to the omission, the only remaining data will be processed as print data.
- The Link Field Data Command can be used for the bit map font fields, outline font fields, and bar code fields.
  (The same result is obtained when any of the “RC,” “RV” or “RB” command code is designated.)

Refer to Outline Font Format Command ([ESC] PV)

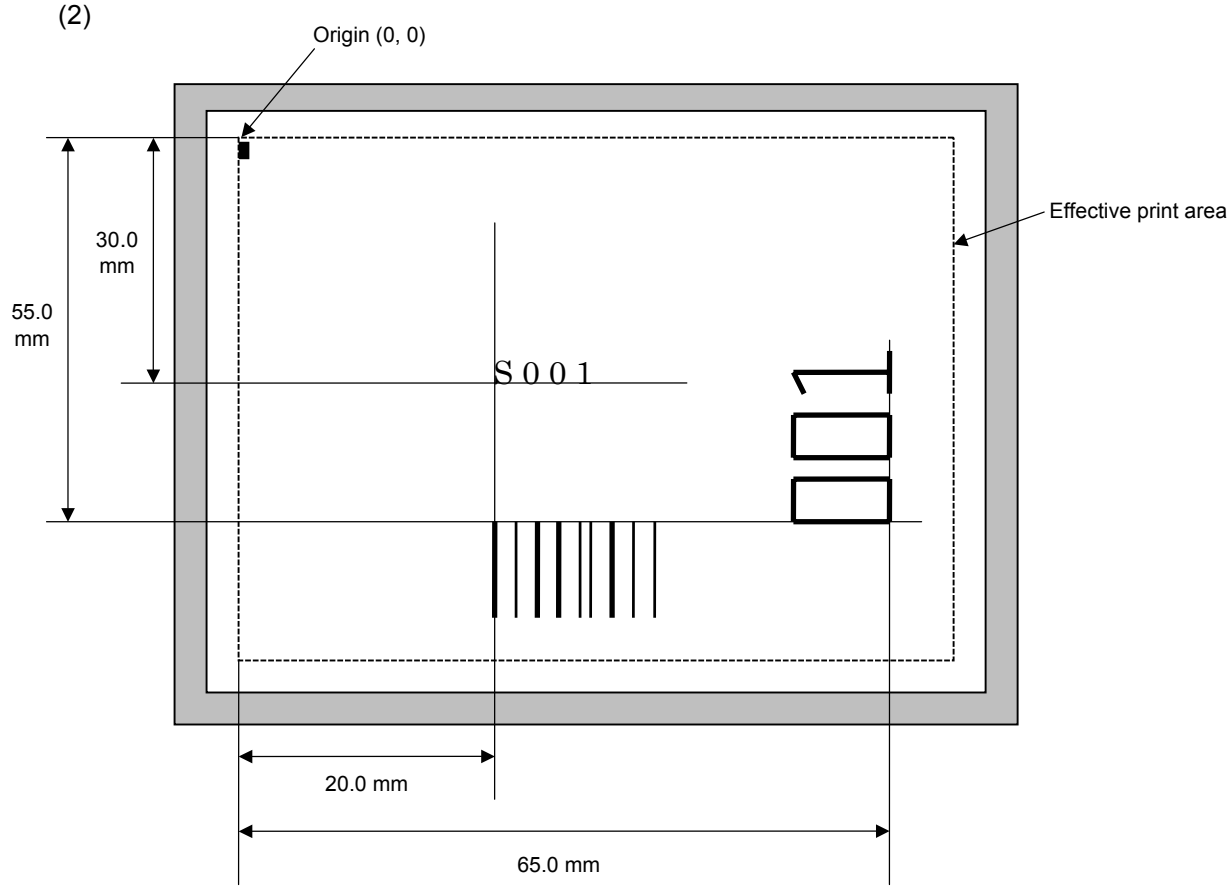
Examples

(1)



[ESC] C [LF] [NUL]
[ESC] PV01; 0200, 0125, 0100, 0100, B, 00, B [LF] [NUL]
[ESC] PV02; 0650, 0550, 0200, 0150, B, 33, B, +0000000001 [LF] [NUL]
[ESC] RV01; Sample [LF] [NUL]
[ESC] RV02; 001 [LF] [NUL]
[ESC] XS; I, 0002, 0002C3000 [LF] [NUL]

(2)



[ESC] C [LF] [NUL]
[ESC] PC001; 0200, 0300, 1, 1, C, 00, B; 01, 02 [LF] [NUL]
[ESC] PV01; 0650, 0550, 0200, 0150, B, 33, B; 02 [LF] [NUL]
[ESC] XB01; 0200, 0550, 3, 1, 02, 02, 06, 06, 02, 0, 0150; 01, 02 [LF] [NUL]
[ESC] RC; S [LF] 001 [LF] [NUL]
[ESC] XS; I, 0002, 0002C3000 [LF] [NUL]

6.3.13 BAR CODE DATA COMMAND [ESC] RB

Function Provides data for the bar code.

Format ① [ESC] RBaa; bbb ------ bbb [LF] [NUL]

② Link Field Data Command
[ESC] RB; ccc ------ ccc [LF] ddd ------ ddd [LF] ------ [LF] xxx ------ xxx [LF] [NUL]

Term

aa: Bar code number
00 to 31

bbb ------ bbb: Data string to be printed
The maximum number of digits varies according to the type of bar code.

ccc ------ ccc: Data string of link field No. 1

ddd ------ ddd: Data string of link field No. 2

to

xxx ------ xxx: Data string of link field No. 99

The Data Command for the MaxiCode is described later.

Explanation

(1) Data check

If the data sting contains data which does not meet the type of bar code, a bar code will not be drawn. If wrong code selection takes place in the data string of CODE128 (without auto code selection), the bar code will not be drawn.

In the case of Data Matrix, if there is data different from the one designated using the format ID, a symbol is not drawn.

(2) No. of digits of data

When data exceeding the maximum number of digits is sent, the excess data will be discarded. For the maximum number of digits for each bar code, see below.

Data Matrix, PDF417, QR code:	2000 digits
CP code:	473 digits
MicroPDF417:	366 digits
MaxiCode:	93 digits
Customer bar code:	20 digits
Highest priority customer bar code:	19 digits
POSTNET:	5, 9, 11 digits
ROYAL MAIL 4 STATE CUSTOMER CODE:	12 digits
KIX CODE:	18 digits
Bar codes other than the above	126 digits

When the number of digits is not proper for the bar code type, the bar code is not drawn.

For the MaxiCode, the maximum number of digits varies according to the mode. In mode 2 or mode 3, the maximum number of digits is 84. In mode 4 or mode 6, the maximum number of digits is 93, respectively.

The maximum number of digits for Data Matrix varies according to the settings for ECC type, format ID, and the cell size. In the case of Kanji, the maximum number of digits becomes half of the values described below since a Kanji character occupies 2 bytes.

Maximum number of digits for Data Matrix

	ECC0	ECC50	ECC80	ECC100	ECC140
Format ID 1	500	457	402	300	144
Format ID 2	452	333	293	218	105
Format ID 3	394	291	256	190	91
Format ID 4	413	305	268	200	96
Format ID 5	310	228	201	150	72
Format ID 6	271	200	176	131	63

	Numeric	Alphanumeric	8 bit
ECC200	2000	2000	1556

The maximum writable data volume on the RFID is 512 bytes. However, the actual writable data volume varies according to the type of tag to be used.

Cell Size and Effective Data Capacity

		ECC000			ECC050			ECC080			ECC100			ECC140		
Symbol size		Numeric capacity	Alphanum capacity	8-bit byte capacity	Numeric capacity	Alphanum capacity	8-bit byte capacity	Numeric capacity	Alphanum capacity	8-bit byte capacity	Numeric capacity	Alphanum capacity	8-bit byte capacity	Numeric capacity	Alphanum capacity	8-bit byte capacity
Row	Col															
9	9	3	2	1	–	–	–	–	–	–	–	–	–	–	–	–
11	11	12	8	5	1	1	–	–	–	–	–	–	–	–	–	–
13	13	24	16	10	10	6	4	4	3	2	1	1	–	–	–	–
15	15	37	25	16	20	13	9	13	9	6	8	5	3	–	–	–
17	17	53	35	23	32	21	14	24	16	10	16	11	7	2	1	1
19	19	72	48	31	46	30	20	36	24	16	25	17	11	6	4	3
21	21	92	61	40	61	41	27	50	33	22	36	24	15	12	8	5
23	23	115	76	50	78	52	34	65	43	28	47	31	20	17	11	7
25	25	140	93	61	97	65	42	82	54	36	60	40	26	24	16	10
27	27	168	112	73	118	78	51	100	67	44	73	49	32	30	20	13
29	29	197	131	86	140	93	61	120	80	52	88	59	38	38	25	16
31	31	229	153	100	164	109	72	141	94	62	104	69	45	46	30	20
33	33	264	176	115	190	126	83	164	109	72	121	81	53	54	36	24
35	35	300	200	131	217	145	95	188	125	82	140	93	61	64	42	28
37	37	339	226	148	246	164	108	214	143	94	159	106	69	73	49	32
39	39	380	253	166	277	185	121	242	161	106	180	120	78	84	56	36
41	41	424	282	185	310	206	135	270	180	118	201	134	88	94	63	41
43	43	469	313	205	344	229	150	301	201	132	224	149	98	106	70	46
45	45	500	345	226	380	253	166	333	222	146	248	165	108	118	78	51
47	47	500	378	248	418	278	183	366	244	160	273	182	119	130	87	57
49	49	500	413	271	457	305	200	402	268	176	300	200	131	144	96	63

		ECC200		
Symbol size		Numeric capacity	Alphanum capacity	8-bit byte capacity
Row	Col			
10	10	6	3	1
12	12	10	6	3
14	14	16	10	6
16	16	24	16	10
18	18	36	25	16
20	20	44	31	20
22	22	60	43	28
24	24	72	52	34
26	26	88	64	42
32	32	124	91	60
36	36	172	127	84
40	40	228	169	112
44	44	288	214	142
48	48	348	259	172
52	52	408	304	202
64	64	560	418	278
72	72	736	550	366
80	80	912	682	454
88	88	1152	862	574
96	96	1392	1042	694
104	104	1632	1222	814
120	120	2000	1573	1048
132	132	2000	1954	1302
144	144	2000	2000	1556

Rectangular code

		ECC200		
Symbol size		Numeric capacity	Alphanum capacity	8-bit byte capacity
Row	Col			
8	18	10	6	3
8	32	20	13	8
12	26	32	22	14
12	36	44	31	20
16	36	64	46	30
16	48	98	72	47

When PDF417 or MicroPDF417 is used, the number of symbol characters, called code words, is limited to 928 or less. Moreover, the data compression rate varies according to the data. Therefore, the maximum number of digits of each mode is as follows.

When letters and numbers are mixed in data in EXC mode, for example, the maximum value becomes smaller than the value provided below, since the internal mode selection code is used.

To correct a reading error by designating the security level, the maximum value becomes further smaller, since the following error correction code words are used.

When the number of the code words exceeds 928, or when the number of rows exceeds 90, a symbol is not drawn.

For the MicroPDF417, the numbers of rows and columns can be specified.
The maximum number of digits varies according to the setting.

In the case of PDF417

- Extended Alphanumeric Compaction (EXC) mode: 1850 digits
- Binary/ASCII Plus mode: 1108 digits
- Numeric compaction mode: 2000 digits

In the case of MicroPDF417

- Binary mode: 150 digits
- Upper case letter/space mode: 250 digits
- Numeric compaction mode: 366 digits

No. of Error Correction Code Words of PDF417 〔For the MicroPDF417, the printer sets the security level automatically.〕

Security level	Error Correction Ability	No. of error correction code words
Level 0	Low ↑ ↓ High	0
Level 1		2
Level 2		6
Level 3		14
Level 4		30
Level 5		62
Level 6		126
Level 7		254
Level 8		510

The maximum number of columns and rows for the MicroPDF417

Parameter (gg)	No. of columns	No. of rows	Max. number of digits for binary mode	Max. number of digits for upper case letter/space mode	Max. number of digits for numeric mode
00	–	–	150	250	366
01	1	–	22	38	55
02	2	–	43	72	105
03	3	–	97	162	237
04	4	–	150	250	366
05	1	11	3	6	8
06		14	7	12	17
07		17	10	18	26
08		20	13	22	32
09		24	18	30	44
10		28	22	38	55
11	2	8	8	14	20
12		11	14	24	35
13		14	21	36	52
14		17	27	46	67
15		20	33	56	82
16		23	38	64	93
17		26	43	72	105
18	3	6	6	10	14
19		8	10	18	26
20		10	15	26	38
21		12	20	34	49
22		15	27	46	67
23		20	39	66	96
24		26	54	90	132
25		32	68	114	167
26		38	82	138	202
27		44	97	162	237
28	4	4	8	14	20
29		6	13	22	32
30		8	20	34	49
31		10	27	46	67
32		12	34	58	85
33		15	45	76	111
34		20	63	106	155
35		26	85	142	208
36		32	106	178	261
37		38	128	214	313
38		44	150	250	366

(3) CODE128 code selection

In the case of CODE128 (with auto code selection), code selection is performed in the following manner. (Conforming to USS-128 APPENDIX-G)

① Determining the start character

(a) If the data begins with four or more consecutive numerals, the start code to be used is (CODE C).

(b) In any case other than (a) in ①, if a control character appears before a small letter (see ④.) or four or more consecutive numerals, the start code is (CODE A).

(c) In none of the above cases, the start code is (CODE B).

② If the data begins with an odd number of digits in (a), ①:

(a) Insert the (CODE A) or (CODE B) character just before the last numeric data. When (FNC1), if found in the number, breaks a pair of digits in the number, insert the (CODE A) or (CODE B) character before the numeric data preceding the (FNC1). Selection of (CODE A) or (CODE B) should conform to (b) and (c) in ①.

③ If four or more digits of numeric data continue in (CODE A) or (CODE B).

(a) When the numeric data is an even number of digits, insert the (CODE C) character just before the first numeric data.

(b) When the numeric data is an odd number of digits, insert the (CODE C) character immediately after the first numeric data.

④ If a control character appears in (CODE B):

(a) In the subsequent data, when a small letter appears before the next control character or four or more consecutive digits, insert the (SHIFT) character before the first control character.

(b) When not so, insert the (CODE B) character just before the first control character.

⑤ If a small letter appears in (CODE A):

(a) In the subsequent data, when a control character appears before the next small letter or four or more consecutive digits, insert the (SHIFT) character before the first small letter.

(b) When not so, insert the (CODE B) character just before the first small letter.

⑥ If any data other than the numerals appears in (CODE C):

(a) Insert the (CODE A) or (CODE B) character just before the data other than the numerals. Selection of (CODE A) or (CODE B) should conform to (b) and (c) in ①.

(4) CODE128 code selection check

Check if selection of (CODE A), (CODE B), or (CODE C) of CODE128 has been set correctly. If an error is found, the bar code will not be drawn.

[Conditions causing an error]

① No start code is designated.

② A small letter (including { , | , } , ~, _) is found in (CODE A).

③ A control character is found in (CODE B).

④ Any data other than the numerals, (FNC1), (CODE A), and (CODE B) is found in (CODE C).

⑤ There are two or more consecutive (SHIFT) characters.

⑥ The number in (CODE C) is an odd number of digits.

⑦ (SHIFT) is followed by (CODE A), (CODE B) or (CODE C).

(5) Kanji code selection

- In the case of Data Matrix, PDF417, and QR code, Kanji codes can be printed. Shift JIS, JIS hexadecimal, JIS 8, or the mixture of these codes can be used.
- Character code is automatically selected in the following manner.

① Shift JIS or JIS8

Code of 20h to 7Fh or A0h to DFh are considered as half-size characters (alphanumeric). Other codes are considered as SHIFT JIS code.

A: Kanji (東京)

[93h] [8Ch] [8Bh] [9Eh]
東 京

B: Kanji + Half-size character (東 ABC 京 abc)

[93h] [8Ch] [41h] [42h] [43h] [8Bh] [9Eh] [61h] [62h] [63h]
東 A B C 京 a b c

C: Half-seize character [123 ｱｲｳ]

[31h] [32h] [33h] [B1h] [B2h] [B3h]
1 2 3 ｱ ｲ ｳ

② JIS hexadecimal

- Data between [ESC]K and [ESC]H are considered as JIS hexadecimal code. Data before [ESC]K or data between [ESC]H and [ESC]K are considered as half-size characters (alphanumeric).

A: Kanji (東京)

[1Bh] [4Bh] [45h] [6Ch] [35h] [7Eh] [1Bh] [48h]
[ESC] K 東 京 [ESC] H

B: Kanji + Half-size character (東 ABC 京 abc)

[1Bh] [4Bh] [45h] [6Ch] [1Bh] [48h] [41h] [42h] [43h] [1Bh] [4Bh] [35h] [7Eh]
[ESC] K 東 [ESC] H A B C [ESC] K 京

[1Bh] [48h] [61h] [62h] [63h]
[ESC] H a b c

• Data between [FS]& and [FS]. are considered as JIS hexadecimal code. Data before [FS]& or data between [FS]. and [FS]& are considered as half-size characters (alphanumeric).

A: Kanji (東京)

[1Ch] [26h] [45h] [6Ch] [35h] [7Eh] [1Ch] [2Eh]
[FS] & 東 京 [FS] .

B: Kanji + Half-size character (東 ABC 京 abc)

[1Ch] [26h] [45h] [6Ch] [1Ch] [2Eh] [41h] [42h] [43h] [1Ch] [26h] [35h] [7Eh]
[FS] & 東 [FS] . A B C [FS] & 京

[1Ch] [2Eh] [61h] [62h] [63h]
[FS] . a b c

• Data between [ESC]$@ and [ESC](J are considered as JIS hexadecimal code. Data before [ESC]$@ or data between [ESC](J and [ESC]$@ are considered as half-size characters (alphanumeric).

A: Kanji (東京)

[1Bh] [24h] [40h] [45h] [6Ch] [35h] [7Eh] [1Bh] [28h] [4Ah]
[ESC] $ @ 東 京 [ESC] (J

B: Kanji + Half-size character (東 ABC 京 abc)

[1Bh] [24h] [40h] [45h] [6Ch] [1Bh] [28h] [4Ah] [41h] [42h] [43h]
[ESC] $ @ 東 [ESC] (J A B C

[1Bh] [24h] [40h] [35h] [7Eh] [1Bh] [28h] [4Ah] [61h] [62h] [63h]
[ESC] $ @ 京 [ESC] (J a b c

③ Others

- "[FS]+ data other than &" are discarded.
- "[ESC]+ data other than K or &" are discarded.
- "[ESC]$+ data other than @" are discarded.

(6) Link field data string

- After the link field No. is designated in the Format Command, data strings are linked using the Link Field Data Command to draw an image.
- The maximum number of data strings after linkage is 2000 digits in the case of Data Matrix or PDF417. For other bar code types, the max. number of data strings is 126 digits. (The value varies according to the type of bar code.) When the number of digits exceeds the maximum value, excess data will be discarded.
- Up to 99 data strings can be linked.
- Up to 2048 bytes can be used as the command length ([ESC] to [NUL]) of the Link Field Data Command.
- When the data string is omitted in the Link Field Data Command, the following process is performed:
  ① No process will be performed for the field which contains no print data due to the omission.
  ② When the field partially loses print data due to the omission, the only remaining data will be processed as print data.
- The Link Field Data Command can be used for the bit map font fields, outline font fields, and bar code fields.
  (The same result is obtained when any of the "RC," "RV", or "RB" command code is designated.)

(7) When manual mode is selected in the Format Command for a QR code

① Numeric mode, alphanumeric and symbol mode, Kanji mode

Mode selection	Data to be printed

② Binary mode

Mode selection	No. of data strings (4 digits)	Data to be printed

③ Mixed mode

Data	"," (comma)	Data	"," (comma)	Data

The QR code can contain all codes including alphanumerics, symbols and Kanji. Since data compression rate varies according to codes, the code to be used is designated when the mode is selected.

Mode	Code	Details
N	Numerals	0 to 9
A	Alphanumerics, symbols	A to Z 0 to 9 space $ % * + - . / :
B	Binary (8-bit)	00H to FFH
K	Kanji	Shift JIS, JIS hexadecimal

If mixed mode is selected, up to 200 modes can be selected in a QR code.

(8) When the automatic mode is selected in the Format Command for a QR code.

Data to be printed

(9) How to transmit the control code data

NUL (00H) = > @ (3EH, 40H)
SOH (01H) = > A (3EH, 41H)
STX (02H) = > B (3EH, 42H)

GS (1DH) = >] (3EH, 5DH)
RS (1EH) = > ^ (3EH, 5EH)
US (1FH) = > _ (3EH, 5FH)

* How to transmit the special codes

> (3EH) = > 0 (3EH, 30H)

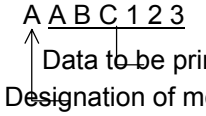
(10) Transfer code for QR code

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0	NUL	DLE	SP	0	@	P	`	p								
1	SOH	DC1	!	1	A	Q	a	q								
2	STX	DC2	”	2	B	R	b	r								
3	ETX	DC3	#	3	C	S	c	s								
4	EOT	DC4	$	4	D	T	d	t								
5	ENQ	NAK	%	5	E	U	e	u								
6	ACK	SYN	&	6	F	V	f	v								
7	BEL	ETB	’	7	G	W	g	w								
8	BS	CAN	(	8	H	X	h	x								
9	HT	EM	)	9	I	Y	i	y								
A	LF	SUB	*	:	J	Z	j	z								
B	VT	ESC	+	;	K	[	k	{								
C	FF	FS	,	<	L	\	l	|							
D	CR	GS	-	=	M	]	m	}								
E	SO	RS	•	>	N	^	n	~								
F	SI	US	/	?	O	_	o	DEL								

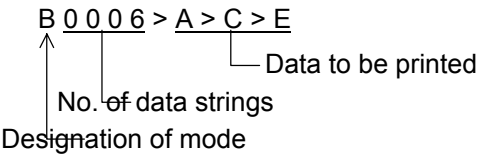
* The shaded parts are Japanese. They are omitted here.

(11) Examples of data designation

① Alphanumeric mode: ABC123

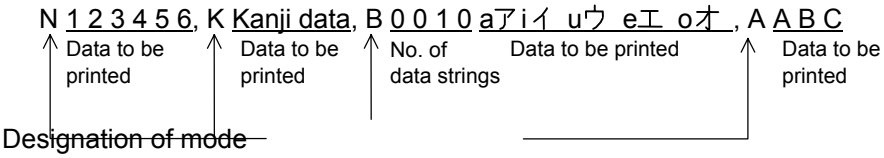


② Binary mode: 01H, 03H, 05H



③ Mixed mode

Numeric mode : 123456
Kanji mode : Kanji data
Binary mode : aア iイ uウ eエ oオ
Alphanumeric mode : ABC



④ Automatic mode

When the data above (③) is designated in automatic mode:

1 2 3 4 5 6 Kanji data aア iイ uウ eエ oオ A B C
Data to be printed

(12) MaxiCode data

For mode 2 or 3:
[ESC] RBaa; bbbbbbbbbcccdddeeeee --- eeeee [LF] [NUL]

For mode 4 or 6:
[ESC] RBaa; fffffffffggggg --- ggggg [LF] [NUL]

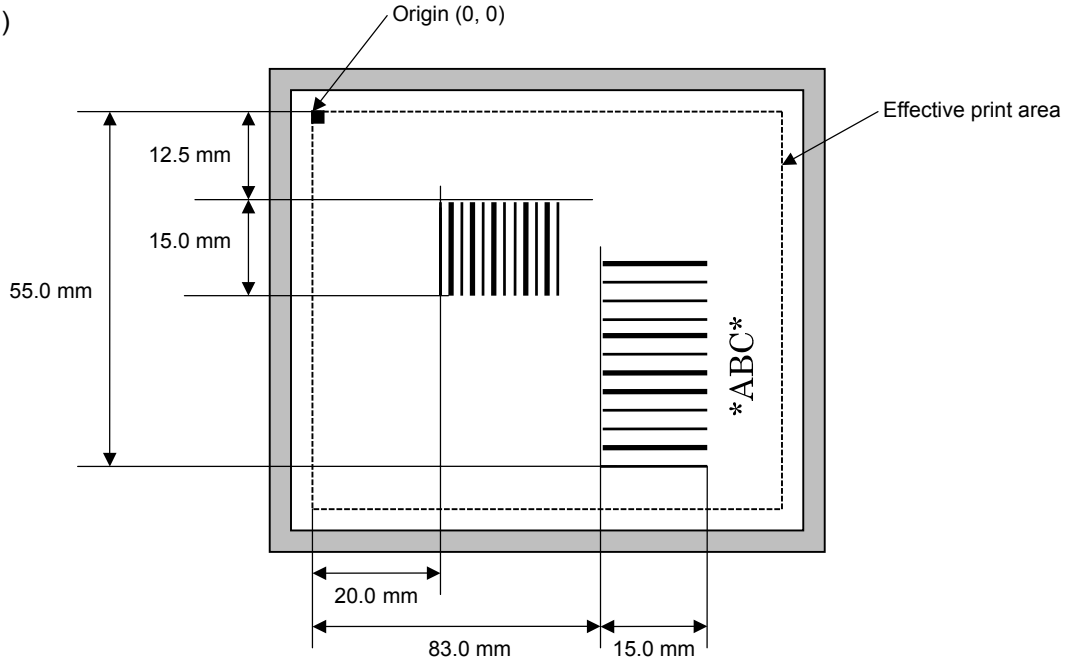
①	bbbbbbbbb:	Postal code	Fixed to 9 digits
•	Mode 2:		
	$b_1b_2b_3b_4b_5$:	Zip code	Fixed to 5 digits (Numeral)
	$b_6b_7b_8b_9$:	Zip code extension	Fixed to 4 digits (Numeral)
•	Mode 3:		
	$b_1b_2b_3b_4b_5b_6$:	Zip code	Fixed to 6 digits (Character of code set A)
	$b_7b_8b_9$:	Vacant	Fixed to 3 digits (20H)
②	ccc:	Class of service	Fixed to 3 digits (Numeral)
③	ddd:	Country code	Fixed to 3 digits (Numeral)
④	eee --- eee:	Message data strings	84 digits
⑤	fffffffff:	Primary message data strings	9 digits
⑥	ggg --- ggg:	Secondary message data strings	84 digits

NOTES:

1. *When any data other than numeral is included in the data string of zip code (mode 2), zip code extension, class of service, or country code, a MaxiCode is not drawn.*
2. *When mode 2 or 3 is selected and if the message data string is less than 84 digits, the printer adds one digit of CR (000000) at the end of the data and fills the remaining digits with FSs (011100) until the data becomes 84 digits. When message data exceeding 84 digits is received, the excess data will be discarded before drawing a MaxiCode.*
3. *When mode 4 or 6 is selected and if the message data is less than 93 digits (9 digits + 84 digits), the printer adds one digit of CR (000000) at the end of the data and fills the remaining digits with FSs (011100) until the data becomes 93 digits. When message data exceeding 93 digits is received, the excess data will be discarded before drawing a MaxiCode.*
4. *Mode 6 should not be used for usual operation since it is used for scanner programming.*
5. *When "TYPE2: Special specification" is set for MaxiCode specification setting in the system mode, the country code for Mode 2 must be 840. Otherwise, a MaxiCode will not be drawn.*
6. *When "TYPE2: Special specification" is set for MaxiCode specification setting in the system mode, the country code for Mode 3 must be other than 840. Otherwise, a MaxiCode will not be drawn.*

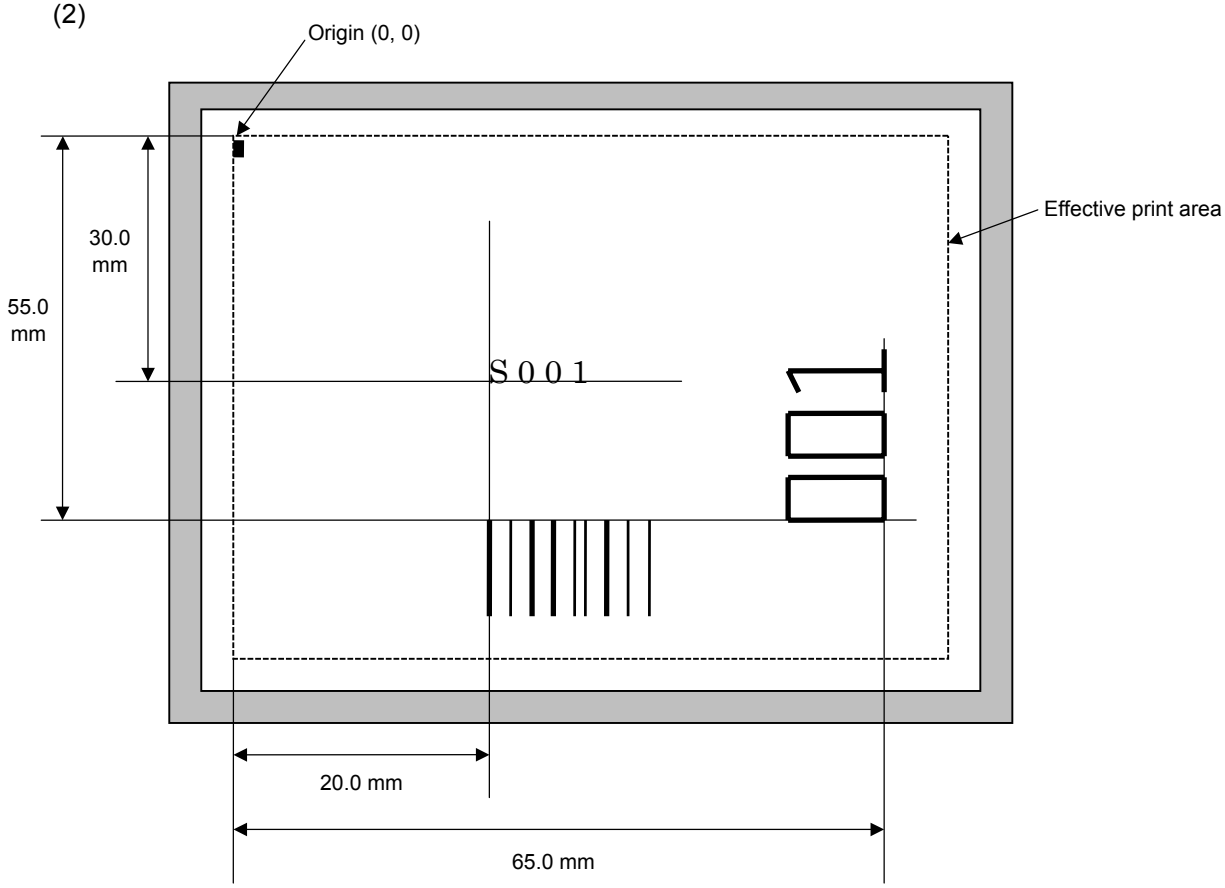
Examples

(1)



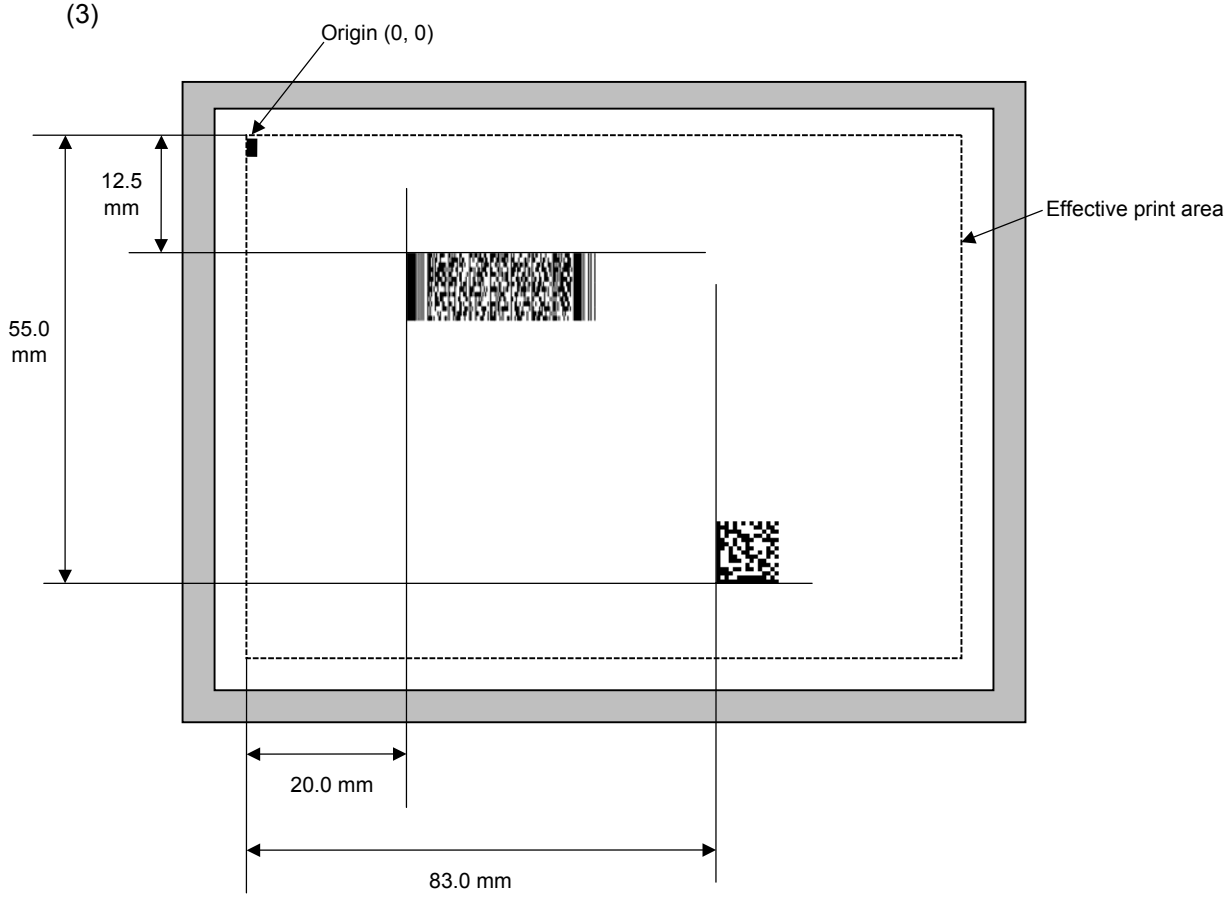
[ESC] C [LF] [NUL]
[ESC] XB01; 0200, 0125, 3, 1, 02, 02, 06, 06, 02, 0, 0150 [LF] [NUL]
[ESC] XB02; 0830, 0550, 3, 1, 02, 04, 07, 08, 04, 3, 0150, +0000000000, 1, 00, N [LF] [NUL]
[ESC] RB01; 12345 [LF] [NUL]
[ESC] RB02; *ABC* [LF] [NUL]
[ESC] XS; I, 0002, 0002C3000 [LF] [NUL]

(2)



[ESC] C [LF] [NUL]
[ESC] PC001; 0200, 0300, 1, 1, C, 00, B; 01, 02 [LF] [NUL]
[ESC] PV01; 0650, 0550, 0200, 0150, B, 33, B; 02 [LF] [NUL]
[ESC] XB01; 0200, 0550, 3, 1, 02, 02, 06, 06, 02, 0, 0150; 01, 02 [LF] [NUL]
[ESC] RB; S [LF] 001 [LF] [NUL]
[ESC] XS; I, 0002, 0002C3000 [LF] [NUL]

(3)



[ESC] C [LF] [NUL]
[ESC] XB01; 0200, 0125, P, 04, 02, 03, 0, 0010 [LF] [NUL]
[ESC] XB02; 0830, 0550, Q, 08, 03, 05, 3 [LF] [NUL]
[ESC] RB01; PDF417 [LF] [NUL]
[ESC] RB02; Data Matrix [LF] [NUL]
[ESC] XS; I, 0002, 0002C3000 [LF] [NUL]

6.3.14 ISSUE COMMAND [ESC] XS

Function Issues labels according to the print conditions programmed.

Format [ESC] XS; I, aaaa, bbbcdefgh [LF] [NUL]

Term

aaaa: Number of labels to be issued
0001 to 9999

bbb: Cut interval. Designates the number of pieces to be printed before a cut operation is performed.
000 to 100 (000 when no cut)

c: Type of sensor
0: No sensor
1: Reflective sensor
2: Transmissive sensor
3: Transmissive sensor (when using manual threshold value)
4: Reflective sensor (when using manual threshold value)

d: Issue mode
C: Batch mode
D: Strip mode (with reverse feed, the strip sensor is activated.)
E: Strip mode (with reverse feed, the strip sensor is ignored, supporting an applicator.)

e: Print speed
3: 3 ips
4: 4 ips
8: 8 ips

f: Use of ribbon
0: No ribbon
1: Ribbon is used. (with ribbon saving function)
2: Ribbon is used. (without ribbon saving function)
3: No ribbon (with head-up function)
***NOTE**: When "Ribbon is used." Is chosen, the ribbon type (Transparent or Non-transparent) will comply with the setting in the system mode.*

g: Print orientation and mirror printing
0: Bottom first printing
1: Top first printing
2: Bottom first mirror printing
3: Top first mirror printing

h: Type of status response
0: No status response
1: Status response is returned.

Explanation

(1) Number of labels to be issued

① If increment/decrement is not specified, the same data will be printed on the designated number of labels.

② If increment/decrement is specified, the designated number of labels will be printed while incrementing/decrementing the designated drawing area one by one.

* The increment/decrement designation is valid until the Image Buffer Clear Command ([ESC] C) is transmitted.

(2) Cut interval

The cut interval is valid only when the cutter has been installed and the issue mode is set to “C”. If an error occurs during an issue with the cut interval designated, the printer ejects the printed paper after a restart, then resumes printing from the paper on which the error occurred.

When the automatic forward feed standby function is enabled in the system mode, the printer automatically performs an approximately 14.0-mm forward feed if no subsequent command is sent from the PC in 1 second after issuing the last label. However, if the label pitch length is 20 mm or less, the edge of the label is caught on the print head, while the label is fed backward to the home position. Therefore, even if the automatic forward feed standby is specified, a forward feed is not performed.

When receiving the Issue Command during the automatic forward feed standby, the printer starts issuing the label after feeding it backward to the print start position.

If any command is sent and processed after the Issue Command is sent, the automatic forward feed is not performed. Therefore, a command should not be sent after the Issue Command is sent. The printer should not be turned off and back to on, or placed in a pause state and reset before the automatic forward feed is performed,. Doing so and pressing the [FEED] key prevents the automatic forward feed from being performed.

If the paper is fed by pressing the [FEED] key of the printer during the forward feed standby, the printer feeds one label, cuts, performs the automatic forward feed, and then stops.

When writing data onto the RFID tag failed and the void pattern is printed, the paper including the void one is cut at the specified cut interval.

(3) Type of sensor

① No sensor: Printing takes place according to the parameter designated by the Label Size Set Command.

② Reflective sensor:

Printing takes place according to the parameter designated by the Label Size Set Command. However, the black marks printed on the back side of the tag paper are automatically detected by the reflective sensor and the paper position is finely adjusted for every piece.

③ Transmissive sensor:

Printing takes place according to the parameter designated by the Label Size Set Command. However, the label-to-label gaps are automatically detected by the transmissive sensor and the paper position is finely adjusted for every piece.

④ Transmissive sensor (when using manual threshold value):

Printing takes place according to the parameter designated by the Label Size Set Command. However, the label-to-label gaps are automatically detected by the transmissive sensor and the paper position is finely adjusted for every piece according to the value set by the threshold setting operation (key operation).

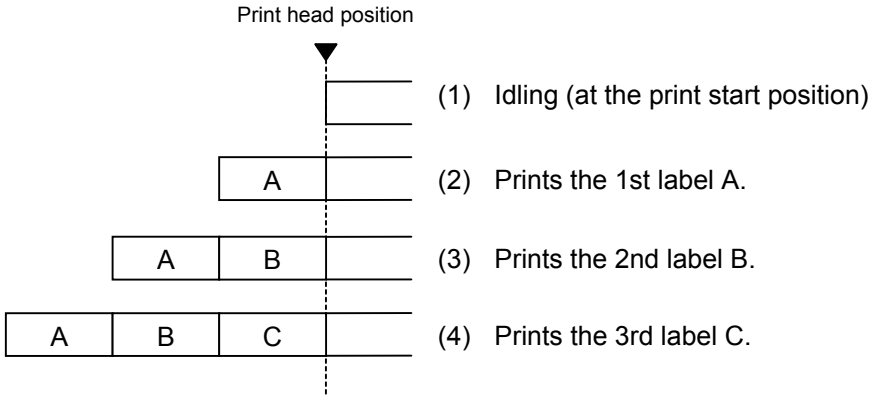
⑤ Reflective sensor (when using manual threshold value)

Printing takes place according to the parameters designated by the Label Size Set Command. However, the black marks printed on the back of the tag paper are automatically detected by the reflective sensor and the paper position is finely adjusted for every piece, according to the value set by the threshold setting operation (key operation).

(4) Issue mode

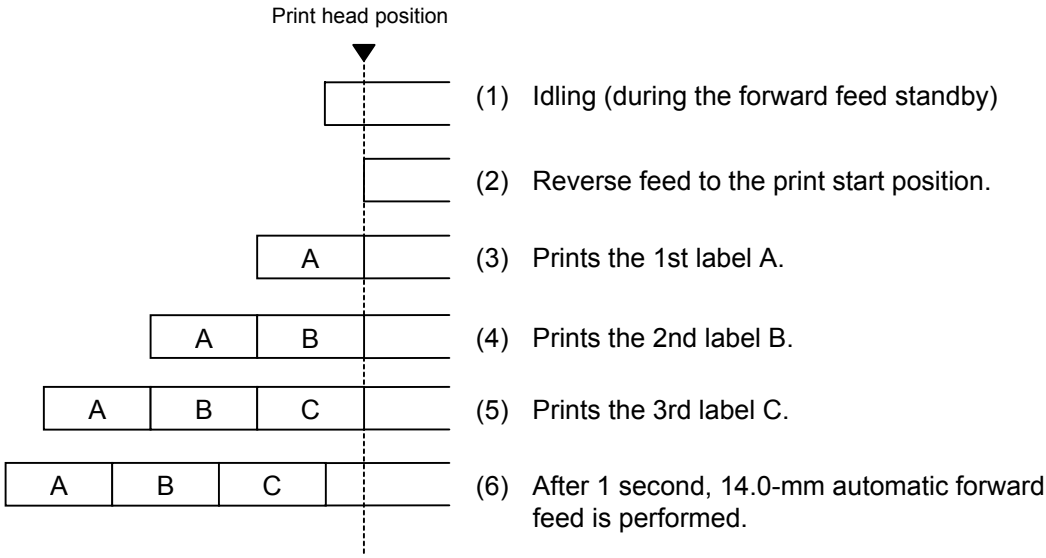
[C: Batch mode (Cut interval: 0, Issue count: 3)]

• "Automatic forward feed standby" has been set to OFF in the system mode.



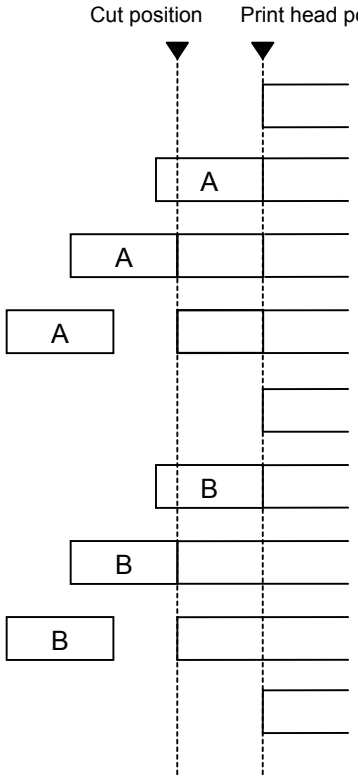
[C: Batch mode (Cut interval: 0, Issue count: 3)]

• "Automatic forward feed standby" has been set to ON in the system mode.



[C: Batch mode (Cut interval: 1, Issue count: 2)]

• “Automatic forward feed standby” has been set to OFF in the system mode.



(1) Idling

(2) Completes printing the 1st label A.

(3) Feeds the 1st label A to the cut position.

(4) Cuts the 1st label (A).

(5) Reverse feed to the print start position.

(6) Completes printing the 2nd label B.

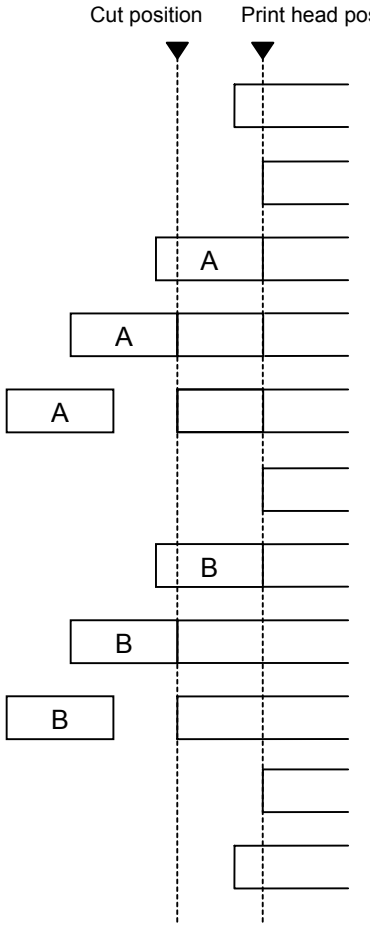
(7) Feeds the 2nd label B to the cut position.

(8) Cuts the 2nd label B.

(9) Reverse feed to the print start position.

[C: Batch mode (Cut interval: 1, Issue count: 2)]

• “Automatic forward feed standby” has been set to ON in the system mode.



(1) Idling (during the forward feed standby)

(2) Reverse feed to the print start position.

(3) Completes printing the 1st label A.

(4) Feeds the 1st label A to the cut position.

(5) Cuts the 1st label A.

(6) Reverse feed to the print start position.

(7) Completes printing the 2nd label B.

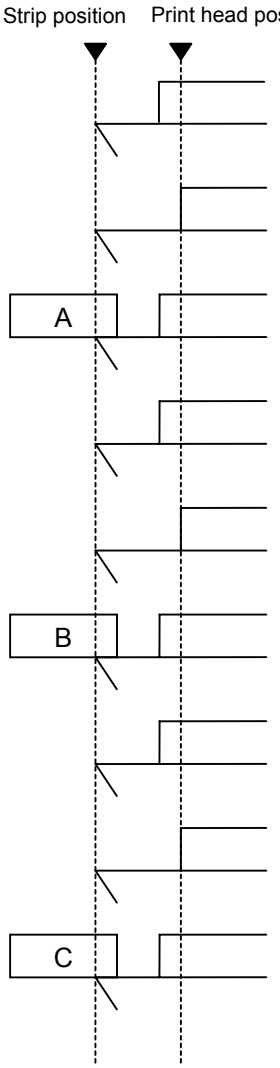
(8) Feeds the 2nd label B to the cut position.

(9) Cuts the 2nd label B.

(10) Reverse feed to the print start position.

(11) After 1 second, 14.0-mm automatic forward feed is performed.

[D: Strip mode (Issue count: 3)]



(1) Idling

(2) Reverse feed to the print start position.

(3) Completes printing the 1st label A.

(4) The 1st label A is removed.

(5) Reverse feed to the print start position.

(6) Completes printing the 2nd label B.

(7) The 2nd label B is removed.

(8) Reverse feed to the print start position.

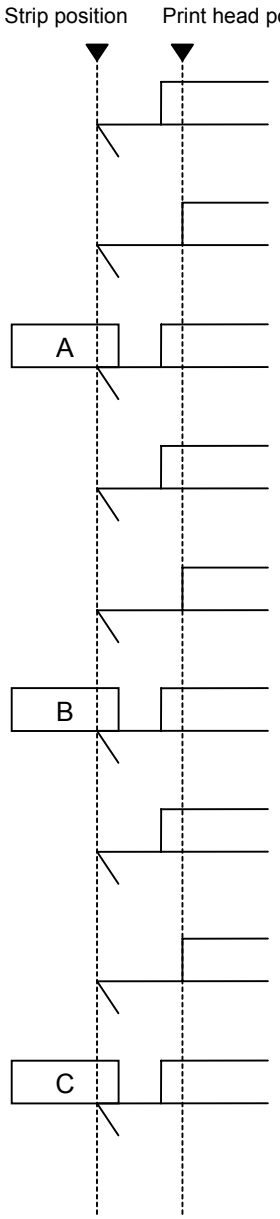
(9) Completes printing the 3rd label C

* The next label is not printed until the 3rd label C is removed.

[E: Strip mode (Issue mode: E)]

The expansion I/O is installed:

The strip sensor is ignored. An label issue is performed by checking a PAUSE signal of the expansion I/O.



(1) Idling
The PAUSE signal of the expansion I/O is turned ON.

(2) The PAUSE signal of the expansion I/O is turned OFF.
Reverse feed to the print start position.

(3) Completes printing the 1st label A.
The PAUSE signal of the expansion I/O is turned ON.

(4) The 1st label A is removed.
The PAUSE signal of the expansion I/O is turned OFF.

(5) Reverse feed to the print start position.

(6) Completes printing the 2nd label B.
The PAUSE signal of the expansion I/O is turned ON.

(7) The 2nd label B is removed.
The PAUSE signal of the expansion I/O is turned OFF.

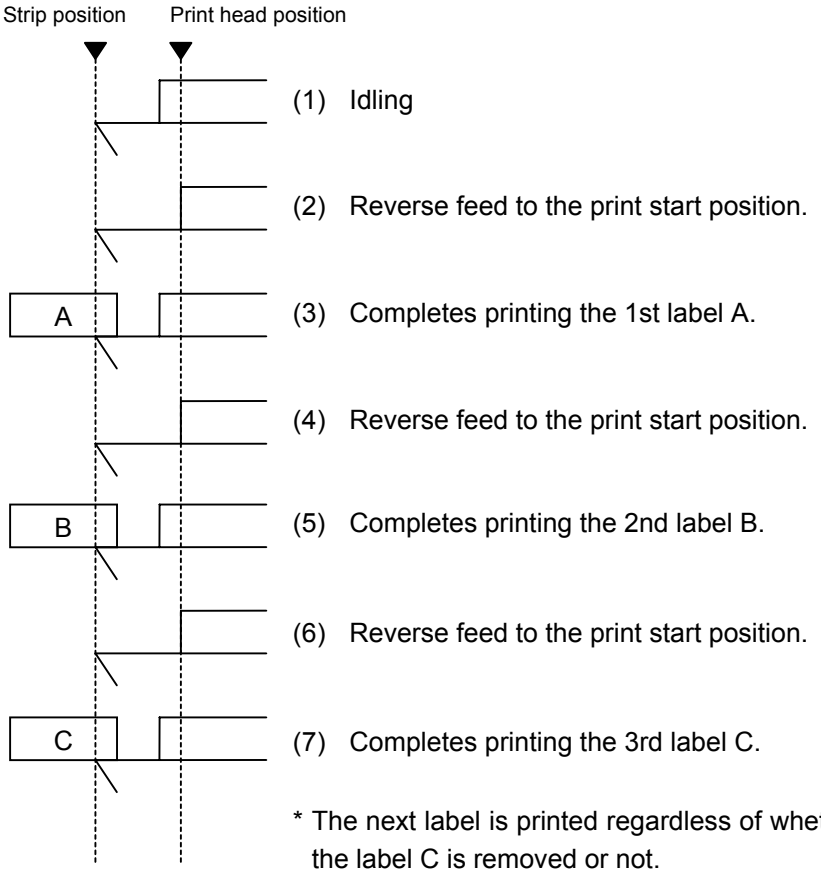
(8) Reverse feed to the print start position.

(9) Completes printing the 3rd label C.
The PAUSE signal of the expansion I/O is turned ON.

* While the PAUSE signal of the expansion I/O is on, a label is not printed.

The expansion I/O is not installed:

The strip sensor is ignored.



*1 This issue mode differs from the issue mode D in the operation that the next label is issued regardless of whether the label is removed or not.

*2 A peripheral device, such as an applicator, needs to control the PAUSE signal of the expansion I/O.

*3 When the issue count is set to 2 or more when the expansion I/O has been installed, the printer continues to issue the specified number of labels as long as the PAUSE signal of the expansion I/O is off.

*4 When the issue count is set to 2 or more when the expansion I/O has not been installed, the specified number of labels are issued.

(5) Print speed

- Printing takes place at the designated speed.
  However, the reverse feed speed in cut mode and strip mode is 3 ips. This can be changed to 2 ips in the system mode.
- The available issue speed varies according to type and size of the paper supply. For details, refer to the Supply Specification.

Parameter	Print speed
1	3 ips
2	
3	
4	4 ips
5	
6	
7	
8	8 ips
9	
A	

(6) Use of ribbon

No ribbon: Thermal paper is used. (Thermal direct issue mode)
Ribbon is used.: The ribbon is used. (Thermal transfer issue mode)
With ribbon saving function:

- When there is a 20 mm or more long non-print area (25 mm or more at the print speed of 8”/sec.) in the feed direction in the batch mode, cut mode or strip mode, the ribbon saving function is performed automatically.
- The minimum print area (in the feed direction) in ribbon saving issue is 8 mm. If the print area is less than 8 mm, printing is performed by automatically assuming the minimum print area of 8 mm.
- Ribbon saving is applicable to the maximum of 4 fields (Max: 4 printing fields + 4 ribbon saving fields).
- When the parameter in the Issue Command is set to “Without ribbon saving function”, or the ribbon saving function is set in the system mode so that it is not used, no ribbon saving will take place.

The ribbon saving function reduces waste of the ribbon by raising the print head for non-print areas so as not to take up unused ribbon. The print head is raised while the solenoid is energized. There are some restrictions in energization of the solenoid.

■ Duty cycle shall be 25% or less.

[Duty cycle calculation formula]

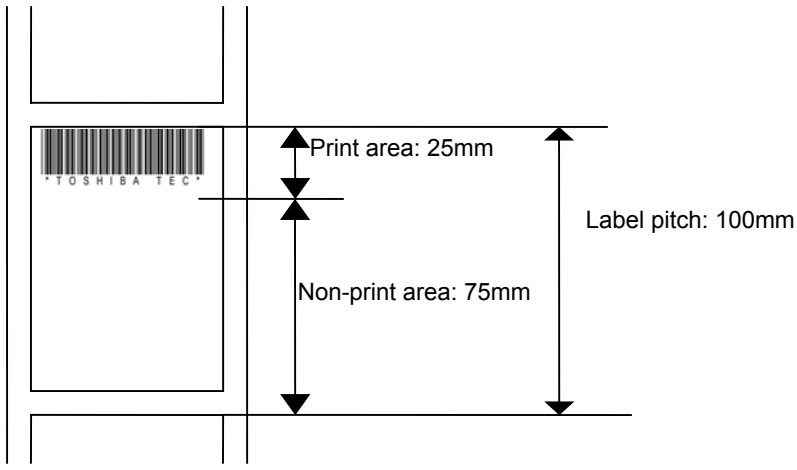
$$\text{Duty cycle} = \frac{\text{Power on time}}{\text{Power on time + Power off time}} \times 100$$

Duty cycle:	Ratio of the distance or time of the ribbon save (energization of the solenoid) per issue
Power on time (distance):	The distance of non-print area or the time while the printer feeds the non-print area of media. The status where the power is applied to the solenoid and the print head is raised.
Power off time (distance):	The distance of print area or the time while the printer prints the print area on media. The status where the power is not applied to the solenoid.

(Example) How to calculate the duty cycle using the time
Power on time = 1 sec., Power off time = 3 sec.

$$\text{Duty cycle} = \frac{1}{1+3} \times 100 = 25\%$$

(Example) How to calculate the duty cycle using the distance



$$\text{Duty cycle} = \frac{75}{75+25} \times 100 = 75\%$$

When the duty cycle calculated by using the above formula exceeds 25%, try to reduce it to 25% or less. The following are examples of the method.

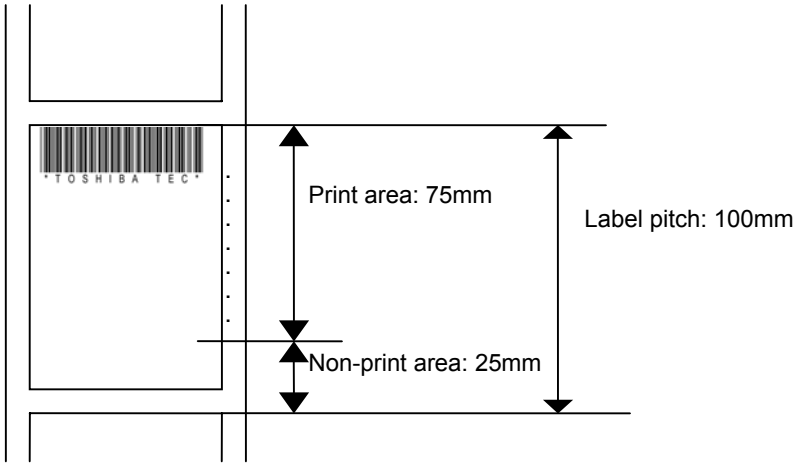
[Example 1]

When the power off time and the power on time is 1 sec., respectively, the duty cycle will be 50%. Providing 2-sec. idle time until a next issue can reduce the duty cycle to 25%.

[Example 2]

Printing tiny symbols, like a dot (.), in non-print area enables the duty cycle to be reduced. In this case, it is recommended that such data is printed on the vertical gaps.

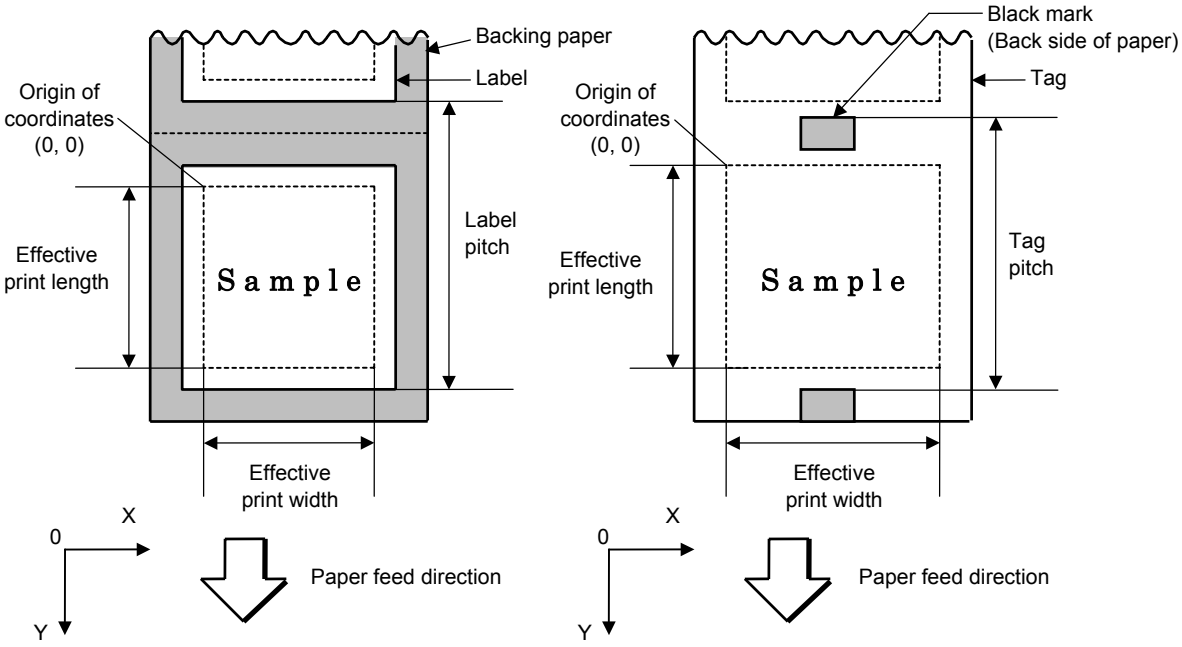
As shown in the diagram below, printing dots on the vertical gap of the print data provided on the previous page can reduce the duty cycle from 75% to 25%.



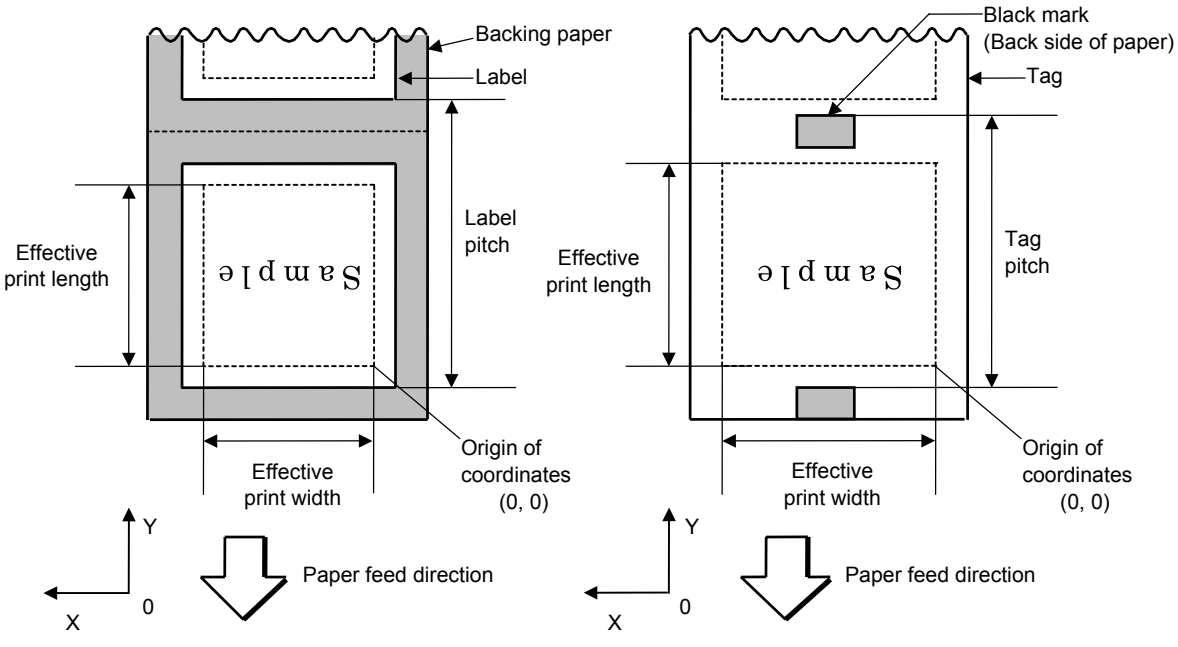
(7) Print orientation and mirror printing

The origin of coordinates and printing direction vary according to the designation of print orientation.

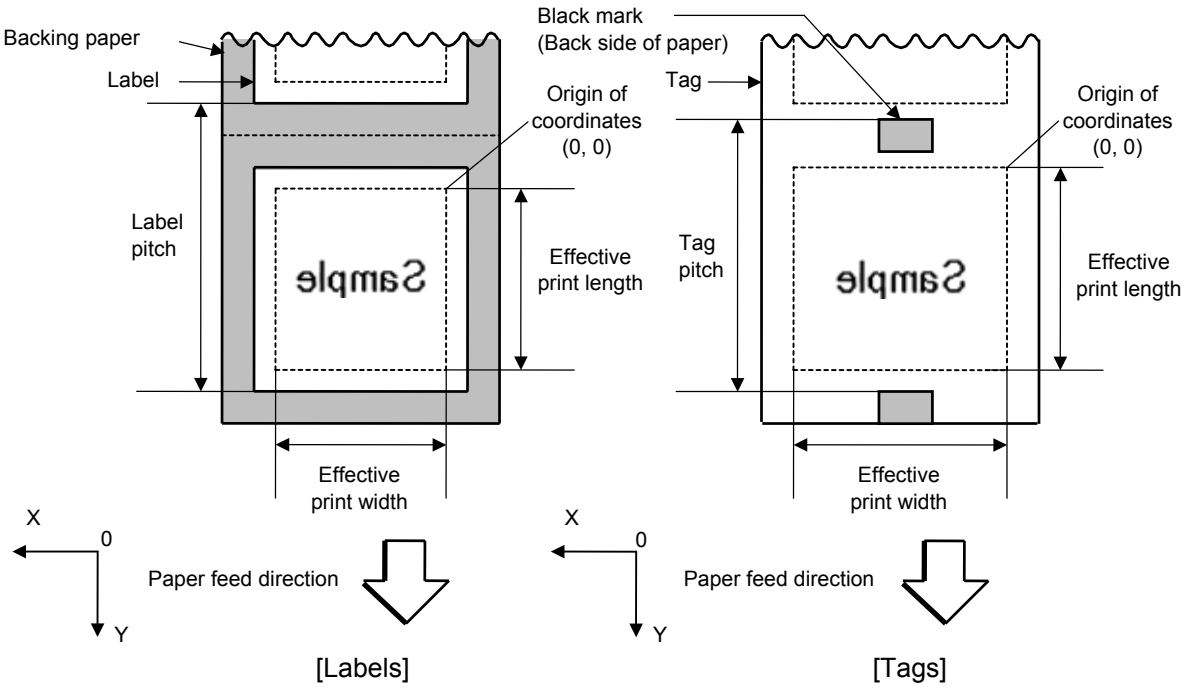
① Bottom first printing



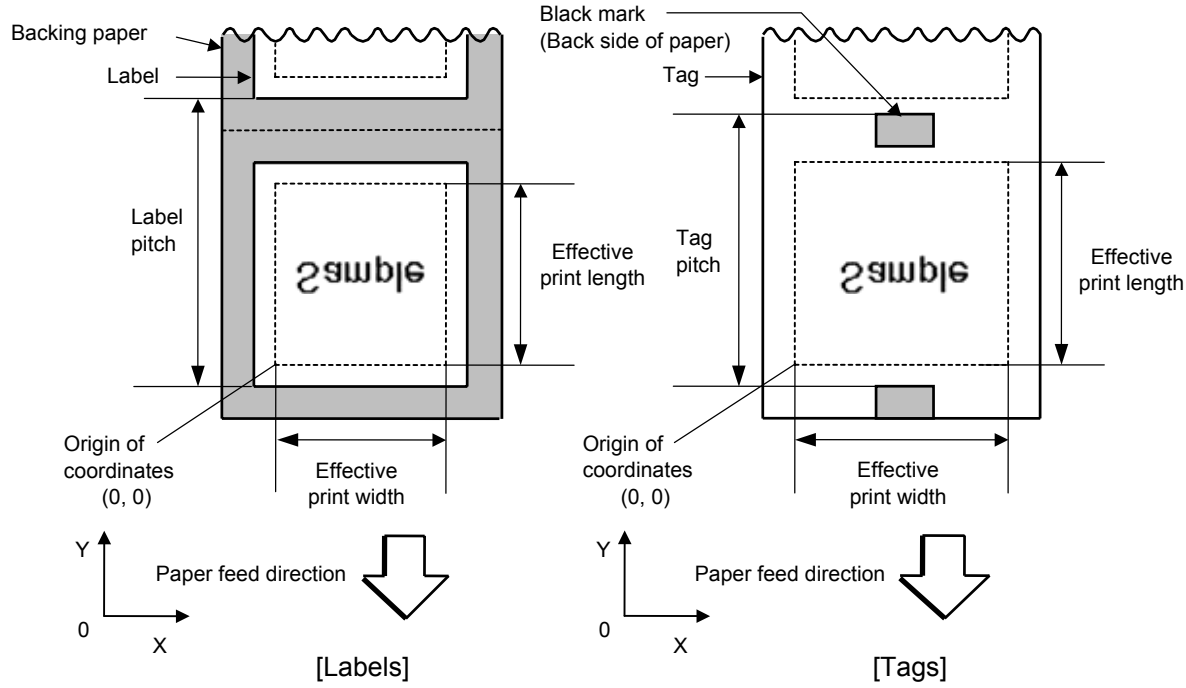
② Top first printing



③ Bottom first mirror printing



④ Top first mirror printing

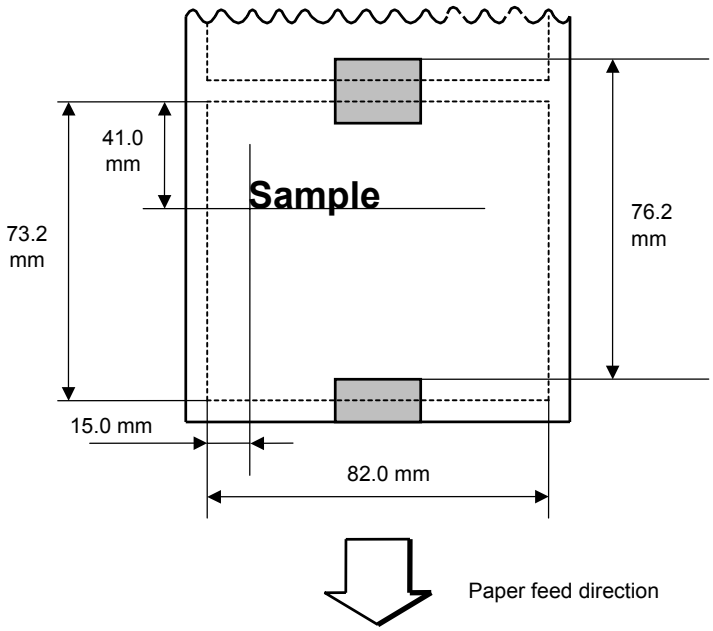


(8) Status response

When the option “Status response is returned.” has been selected, a status response is returned at the end of printing or if an error occurs.
In the batch mode or the cut mode, the print end status response is returned after the designated number of labels have been printed.
In the strip mode, a status response is returned after one label has been printed.

* The setting of the status response parameter during printing must not be changed. Otherwise the status response may not be returned properly.

Examples



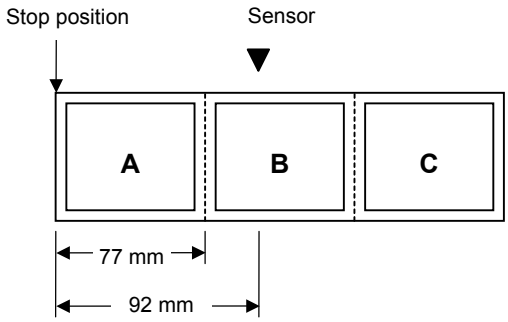
- Issue count: 4 pieces
- Cut interval: 1 piece
- Paper: Tag paper (Reflective sensor is used.)
- Issue mode: Cut issue
- Print speed: 3”/sec.
- Ribbon: Used
- Status response: On

[ESC] D0762, 0820, 0732 [LF] [NUL]
[ESC] T11C40 [LF] [NUL]
[ESC] C [LF] [NUL]
[ESC] PC001; 0150, 0410, 1, 1, A, 00, B [LF] [NUL]
[ESC] RC001; Sample [LF] [NUL]
[ESC] XS; I, 0004, 0011C3201 [LF] [NUL]

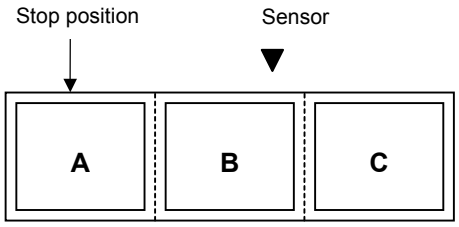
Notes

⊙ Process to stop the label at the home position after a head-open state is detected:

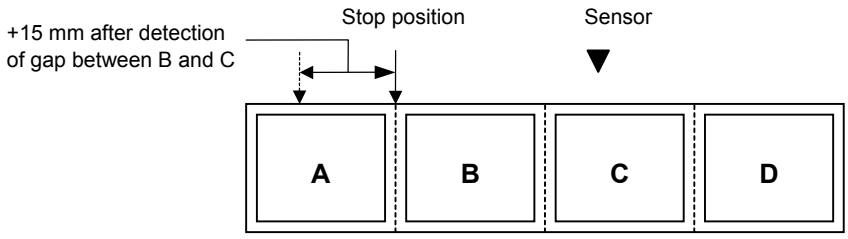
When a gap between labels (or a black mark) is detected during a head open state, the value is set again to stop each label positioned between the sensor and the print head at the home position.



- The labels are moved on the above condition.



- Stop position after feeding one label



* However, an error will result when conditions for occurrence of a feed jam are satisfied.

Paper feed direction

6.3.15 FEED COMMAND [ESC] T

Function Feeds the paper.

Format [ESC] Tabcde [LF] [NUL]

Term

a: Type of sensor
- 0: No sensor
- 1: Reflective sensor
- 2: Transmissive sensor
- 3: Transmissive sensor (when using manual threshold value)
- 4: Reflective sensor (when using manual threshold value)

b: Cut or non-cut
- 0: Non-cut
- 1: Cut

c: Feed mode
- C: Batch mode (Cut and feed when "1 (Cut)" is selected for parameter b.)
- D: Strip mode (with reverse feed)
- E: Strip mode (with reverse feed The strip sensor is ignored. Supporting an applicator.)

d: Feed speed
- 3: 3 ips
- 4: 4 ips
- 8: 8 ips

e: Use of ribbon
- 0: No ribbon
- 1: Ribbon is used. (with ribbon saving function)
- 2: Ribbon is used. (without ribbon saving function)
- 3: No ribbon (with head-up function)

***NOTE**: When "Ribbon is used." Is chosen, the ribbon type (Transparent or Non-transparent) will comply with the setting in the system mode.*

Explanation (1) Type of sensor

① No sensor:
Paper is fed according to the parameter designated by the Label Size Set Command.

② Reflective sensor:
Paper is fed according to the parameter designated by the Label Size Set Command. However, the black marks printed on the back side of the tag paper are automatically detected by the reflective sensor and the stop position is finely adjusted.

③ Transmissive sensor:
Paper is fed according to the parameter designated by the Label Size Set Command. However, the label-to-label gaps are automatically detected by the transmissive sensor and the stop position is finely adjusted.

④ Transmissive sensor (when using manual threshold value):

Paper is fed according to the parameter designated by the Label Size Set Command. However, the label-to-label gaps are automatically detected by the transmissive sensor and the stop position is finely adjusted according to the value set by the threshold set operation (key operation).

⑤ Reflective sensor (when using manual threshold value)

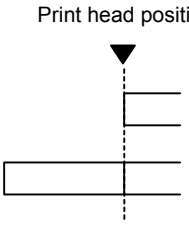
Paper is fed according to the parameters designated by the Label Size Set Command. However, the black marks printed on the back of the tag paper are automatically detected by the reflective sensor and the paper position is finely adjusted for every piece, according to the value set by the threshold set operation (key operation).

(2) Cut/non-cut

This option is valid in the batch mode only. (Non-cut is automatically selected for the strip mode.)

(3) Feed mode

[C: Batch (Non-cut)]

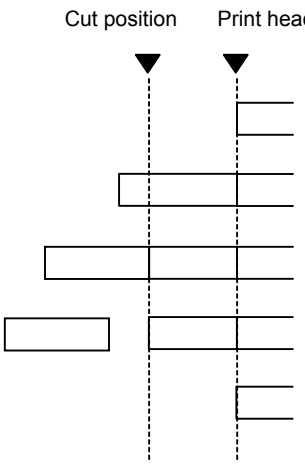


(1) Paper stock is loaded.

(2) Completes a paper feed.
(Feeds the paper to the print start position and stops.)

[C: Batch (Cut)]

• “Automatic forward feed standby” has been set to OFF in the system mode.



(1) Paper stock is loaded.

(2) Completes a paper feed.
(Feeds the paper to the print start position.)

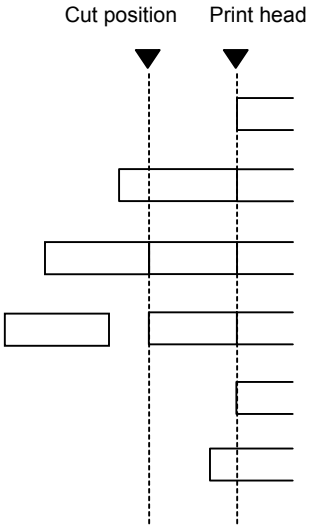
(3) Feeds the paper to the cut position.

(4) Cuts unnecessary paper.

(5) Reverse feed to the print start position.

[C: Batch (Cut)]

• “Automatic forward feed standby” has been set to ON in the system mode.



(1) Paper stock is loaded.

(2) Completes a paper feed.
(Feeds the paper to the print start position is completed.)

(3) Feeds the paper to the cut position.

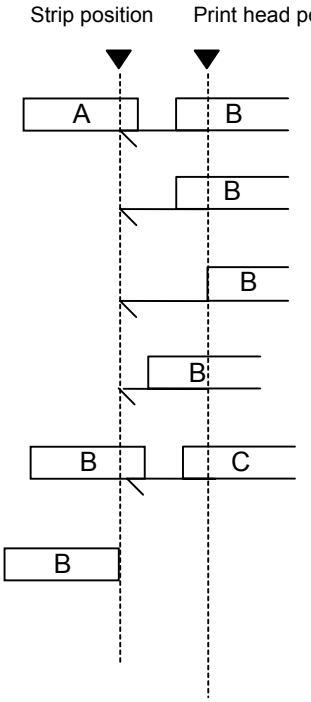
(4) Cuts unnecessary paper.

(5) Reverse feed to the print start position.

(6) After 1 second, 14.0-mm automatic forward feed is performed.

[D: Strip]

•When D: Strip is selected, the “Automatic forward feed standby” is always disabled.



(1) Label stock is loaded.

(2) Label A is removed.

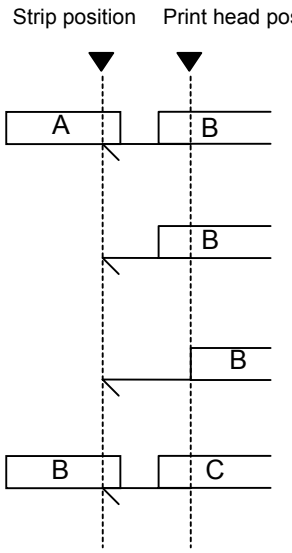
(3) Reverse feed to the print start position.

(4) Starts a paper feed.

(5) Completes the paper feed.
(Feeds the paper to the print start position and stops.)

[E: Strip (Feed mode: E)]

Expansion I/O has been installed:
The strip sensor is ignored. A feed is performed by checking the PAUSE signal of the expansion I/O.



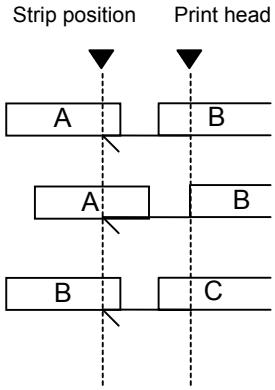
(1) Label stock is loaded.
The PAUSE signal of the expansion I/O is turned ON.

(2) Label A is removed.
The PAUSE signal of the expansion I/O is turned OFF.

(3) Reverse feed to the print start position.

(4) Completes a paper feed.
(Feeds the paper to the print start position and stops.)
The PAUSE signal of the expansion I/O is turned ON.

Expansion I/O is not installed:
A feed is performed regardless of the status of the strip sensor.



(1) Label stock is loaded.

(2) Reverse feed to the print start position

(3) Completes the paper feed.

*1 The feed mode E differs from the feed mode D in the operation that the next label is fed regardless of whether the label is removed or not.

*2: A peripheral device, such as an applicator, needs to control the PAUSE signal of the expansion I/O.

(4) Feed speed

- A paper feed is performed at the designated speed.
  However, the reverse feed speed in the cut mode or the strip mode is 3 ips.
  This can be changed to 2 ips in the system mode.
- The available issue speed varies according to type and size of the paper supply. For details, refer to the Supply Specification.

Parameter	Print speed
1	3 ips
2	
3	
4	4 ips
5	
6	
7	
8	8 ips
9	
A	

(5) Use of ribbon

No ribbon: The ribbon motors are not operated during paper feed.
Ribbon is used.: The ribbon motors are operated during paper feed.
With ribbon saving function:

- When the use of the ribbon saving function is set to ON (used) in the system mode, ribbon saving will be performed automatically.
- When “without ribbon saving function” is selected, or the use of the ribbon saving function is set to OFF (not used) in the system mode, ribbon saving will not be performed.

Notes

(1) If the label size, type of sensor, feed amount fine adjustment, cut position fine adjustment (or strip position fine adjustment), or reverse feed amount fine adjustment is changed, the Feed Command must be sent prior to printing, to adjust the print start position by feeding one label.

(2) The parameter of the Feed Command is stored in memory (retained even if the power is turned off).

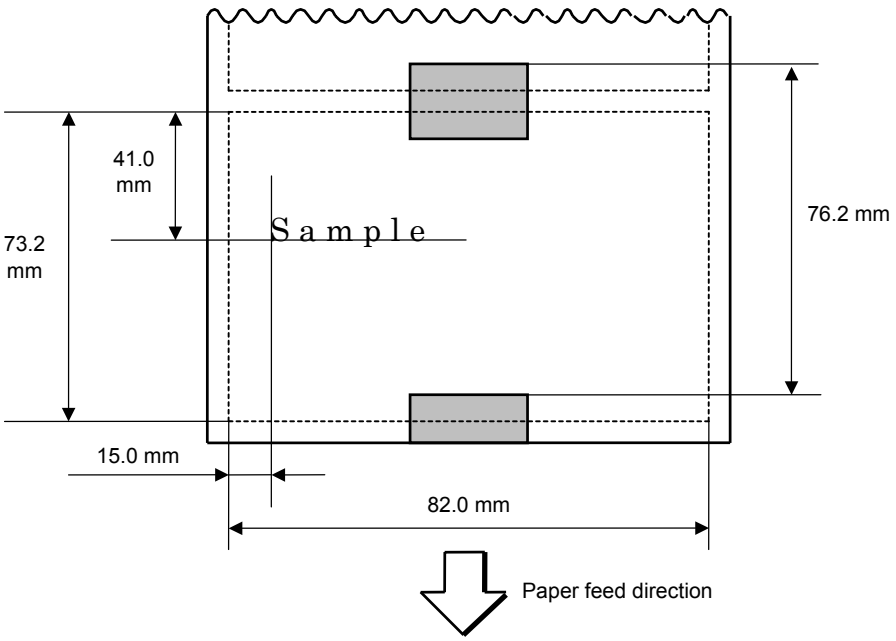
(3) When “status response is returned.” has been selected in the Issue Command parameter setting, a status response is returned after the end of a paper feed or when an error occurs.

(4) For explanation of the process to stop a label at the print start position, refer to the section regarding the Issue Command.

(5) When “Automatic forward feed standby” has been set to ON in the system mode, the printer automatically performs 14.0-mm forward feed if no subsequent command is sent from the PC in 1 second after the last label has been fed. When the Feed Command is received during the forward feed standby, the printer feeds the label backward to the print start position.

* Refer to the section regarding the Issue Command for precautions.

Examples



[ESC] D0762, 0820, 0732 [LF] [NUL]
[ESC] AX; +010, +000, +10 [LF] [NUL]
[ESC] T11C40 [LF] [NUL]
[ESC] C [LF] [NUL]
[ESC] PC001; 0150, 0410, 1, 1, A, 00, B [LF] [NUL]
[ESC] RC001; Sample [LF] [NUL]
[ESC] XS; I, 0004, 0011C3001 [LF] [NUL]

6.3.16 EJECT COMMAND [ESC] IB

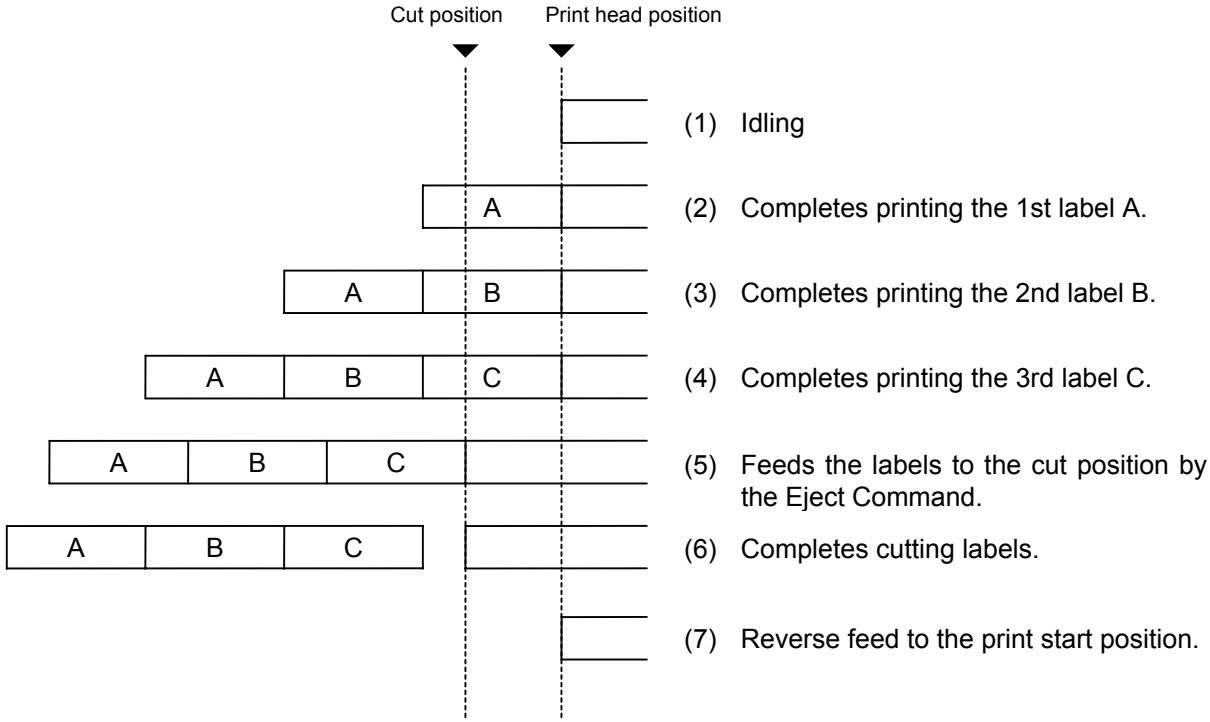
Function Ejects (cuts off) the label remaining between the print head and the cutter, and returns to the original position.

Format [ESC] IB [LF] [NUL]

Notes When “Automatic forward feed standby” has been set to ON in the system mode, the printer automatically performs 14.0-mm forward feed if no subsequent command is sent from the PC in 1 second after an ejection of paper.
When the Eject Command is received in the forward feed standby state, the printer feeds the label backward to the print start position first, and then ejects it.

* Refer to the section regarding the Issue Command for precautions.

Examples




```
[ESC] C [LF] [NUL]
[ESC] PC001; 0200, 0125, 1, 1, A, 00, B [LF] [NUL]
[ESC] RC001; A [LF] [NUL]
[ESC] XS; I, 0001, 0001C3001 [LF] [NUL]
[ESC] RC001; B [LF] [NUL]
[ESC] XS; I, 0001, 0001C3001 [LF] [NUL]
[ESC] RC001; C [LF] [NUL]
[ESC] XS; I, 0001, 0001C3001 [LF] [NUL]
[ESC] IB [LF] [NUL]
```

6.3.17 FORWARD/REVERSE FEED COMMAND [ESC] U1, [ESC] U2

Function

After printing or feeding the paper, feeds the paper to the position where the paper can be torn off manually.
When the next label is to be printed, feeds the paper backward to the print start position.

Format

Forward Feed

[ESC] U1; aaaa (, b) [LF] [NUL]

Reverse Feed

[ESC] U2; aaaa (, b) [LF] [NUL]

Term

aaaa: Forward/reverse feed amount
0030 to 2000 (in 0.1 mm units)

b: Head-up function (Omissible. When omitted, the head-up function is not performed.)
0: Head up function is not performed.
1: Head up function is performed.

Notes

(1) When the [FEED] key is pressed after the Forward Feed Command has been transmitted, one label is fed. And then, the printer automatically feeds the labels for the designated forward feed amount.

(2) The Forward/Reverse Feed Command is stored in memory (retained even if the power is turned off).

(3) The Forward/Reverse Feed Command is ignored in the strip mode and the cut issue mode.

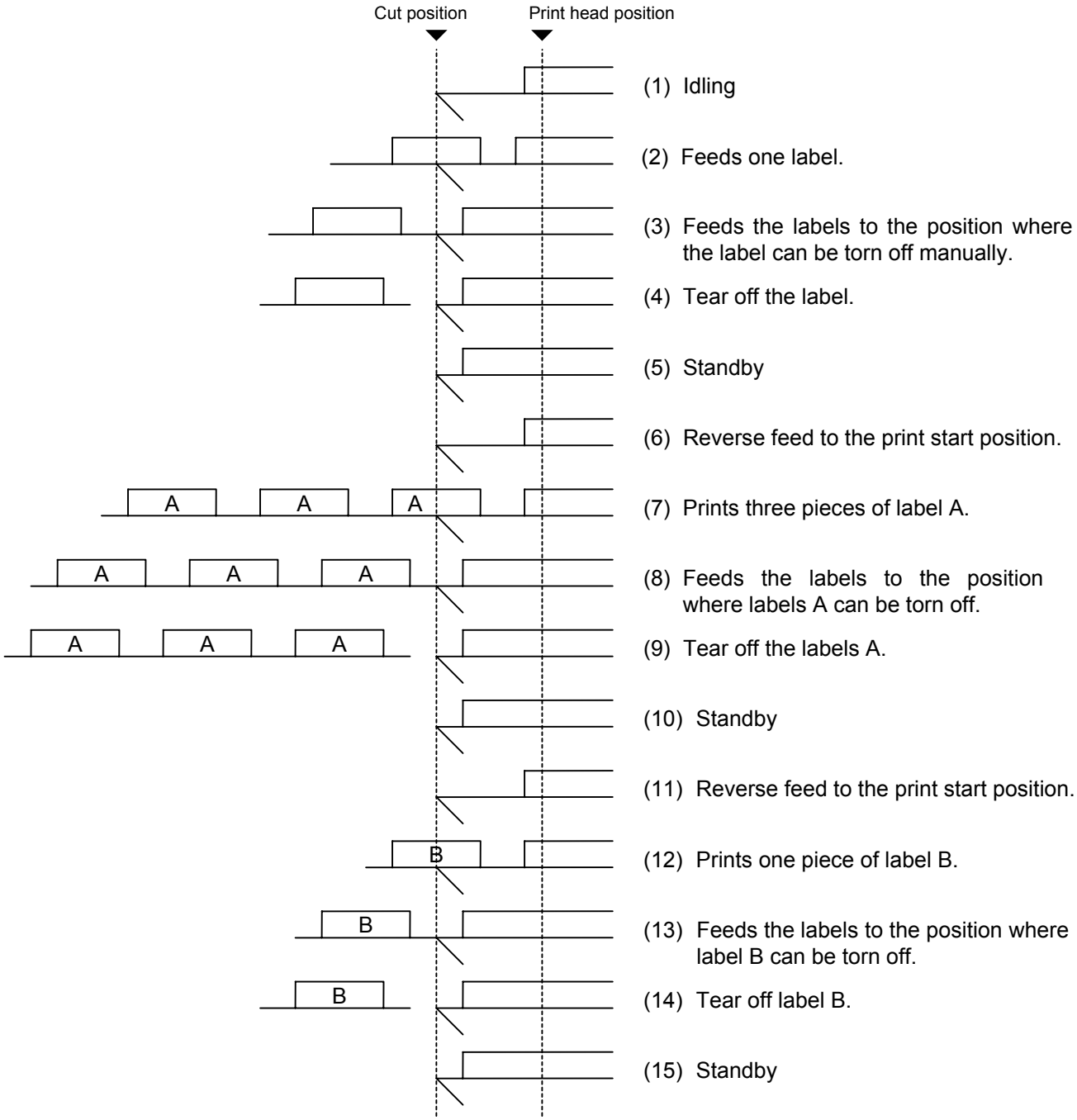
(4) The Forward/Reverse Feed Command feeds the label without ribbon saving even if the ribbon saving issue is designated.

(5) The forward feed is performed at the speed designated by the Issue Command or Feed Command. The reverse feed is performed at 3”/sec.. However, it can be changed in the system mode.

(6) A reverse feed may not be performed as specified, depending on the print conditions. When the media sensor is used and if the label/tag pitch is almost same as the distance between the print head and the media sensor (72.1 mm), a label/tag may not be returned to the print start position, even if the same value is specified for both forward feed and reverse feed. It may result in an error. In such case, making the reverse feed amount larger than the forward feed amount can prevent this error.

(7) When the “Auto forward feed standby” is enabled, this command becomes invalid.

Examples



(1) Idling

(2) Feeds one label.

(3) Feeds the labels to the position where the label can be torn off manually.

(4) Tear off the label.

(5) Standby

(6) Reverse feed to the print start position.

(7) Prints three pieces of label A.

(8) Feeds the labels to the position where labels A can be torn off.

(9) Tear off the labels A.

(10) Standby

(11) Reverse feed to the print start position.

(12) Prints one piece of label B.

(13) Feeds the labels to the position where label B can be torn off.

(14) Tear off label B.

(15) Standby

[ESC] T20C30 [LF] [NUL]
[ESC] U1; 0120 [LF] [NUL]
Tear off the label manually.
[ESC] U2; 0120 [LF] [NUL]
[ESC] RC001; A [LF] [NUL]
[ESC] XS; I, 0003, 0002C3001 [LF] [NUL]
[ESC] U1; 0120 [LF] [NUL]
Tear off the label manually.
[ESC] U2; 0120 [LF] [NUL]
[ESC] RC001; B [LF] [NUL]
[ESC] XS; I, 0001, 0002C3001 [LF] [NUL]
[ESC] U1; 0120 [LF] [NUL]

6.3.18 STORAGE AREA ALLOCATE COMMAND [ESC] XF

Function Allocates the storage area in the flash ROM on the CPU board.

Format [ESC] XF; aa, bb, cc [LF] [NUL]

Term

aa: Size of the TrueType font storage area
00 to 24 (0 KB to 3072 KB) (in units of 128 KB)

bb: Size of bit map writable character storage area
00 to 24 (0 KB to 3072 KB) (in units of 128 KB)

cc: Size of BASIC file storage area
00 to 14 (0 KB to 1792 KB) (in units of 128 KB)
AA: The current BASIC file storage area and contents are retained.

Explanation

(1) The total capacity of the storage area in flash ROM is variable. The minimum capacity is 3072 KB.

⊙ In the case that the size of BASIC file storage area is set in a range of “00” to “14”:

(2) When this command is received, the entire area in flash ROM on the CPU board is cleared.

(3) If this command is not sent, the storage area in flash ROM on the CPU board cannot be used.

(4) The storage areas are allocated in the following order of precedence – the TrueType font storage area, the bit map writable character storage area, and the BASIC file storage area. After these storage areas are allocated, the remaining area is used for the PC save area.

(5) If the sum of the TrueType font storage area, the bit map writable character storage area, and the BASIC file storage area, specified by this command, is 3072 KB, the TrueType font storage area, the bit map writable character storage area, and the BASIC file storage area are allocated as specified, respectively. In this case, however, there is no PC save area.

(6) If the sum of TrueType font storage area, the bit map writable character storage area, and the BASIC file storage area, specified by this command, exceeds 3072 KB, the TrueType font storage area is allocated as specified with the highest priority. Then, the remaining area is allocated to the bit map writable character storage area. If there is still remaining area after the TrueType font storage area and the bit map writable character storage area are allocated, it is used for the BASIC file storage area. There is no PC save area.

(7) When “00” (0 KB) is specified for each of the TrueType font storage area, the bit map writable character storage area, and the BASIC file storage area, the storage area is not allocated.

(8) When “24” (3072KB) is specified for either the TrueType font storage area or the bit map writable character storage area, the entire storage areas are occupied by that area. For example, if “24” is specified for the TrueType Font storage area, the entire storage areas are used for the TrueType Font storage area. The bit map writable character storage area, the BASIC file storage area, and the PC save area cannot be allocated.

⊙ In case that the size of BASIC file storage area is set to “AA”:

(9) When this command is received, the BASIC file storage area is reserved and the other areas in flash ROM on the CPU board are cleared.

(10) If this command is not sent, the storage area in flash ROM on the CPU board cannot be used.
If “AA” is set for the size of the BASIC file storage area with the BASIC file storage area being unallocated, the BASIC file storage area remains unallocated.

(11) The storage areas except for the BASIC file storage area are allocated in the following order of precedence – the TrueType font storage area, and the bit map writable character storage area. After these storage areas are allocated, the remaining area is used for the PC save area.

(12) If the sum of the TrueType font storage area and the bit map writable character storage area, specified by this command, is equal to the size of ‘3072 KB minus the BASIC file storage area size’, the TrueType font storage area and the bit map writable character storage area are allocated as specified. In this case, however, there is no PC save area.

(13) If the sum of TrueType font storage area and the bit map writable character storage area, specified by this command, exceeds the size of ‘3072 KB minus the BASIC file storage area size’, the TrueType font storage area is allocated as specified with the highest priority. Then, the remaining area is allocated to the bit map writable character storage area. There is no PC save area.

(14) When “00” (0 KB) is specified for each of the TrueType font storage area and the bit map writable character storage area, the storage area is not allocated.

(15) If the size of ‘3072 KB minus the BASIC file storage area size’ or more is specified for either the TrueType font storage area or the bit map writable character storage area, each area other than the BASIC file storage area is allocated as specified.
For example, when setting “20” or “21 or greater” for the size of the TrueType font storage area while the BASIC file storage area secures “4” (512KB), the entire storage areas except the BASIC file storage area are allocated to the TrueType font storage area. There is no bit map writable character storage area or PC save area.

Refer to

- Bit Map Writable Character Command ([ESC] XD)
- Save Start Command ([ESC] XO)
- Flash Memory Format Command ([ESC] J1)
- 2-byte Writable Character Code Range Command ([ESC] XE)

Example

The TrueType font storage area and bit map writable character storage area are set to 768 KB and 512 KB, respectively.
(PC save area: 3072 KB − 768KB − 512 KB = 1792 KB)

[ESC] XF; 05, 04, 00 [LF] [NUL]

6.3.19 FLASH MEMORY FORMAT COMMAND [ESC] J1

Function Formats (initializes) the flash ROM on the CPU board for storage.

Format [ESC] J1; a (, b) [LF] [NUL]

Term

a: Formatting (initializing) range
- A: Entire areas of the flash memory (PC save area + Writable character storage area)
- B: PC save area of the flash memory
- C: Writable character storage area of the flash memory

b: Drive (Omissible. When omitted, the flash ROM on the CPU board is selected.)
- 0: Flash ROM on the CPU board

Explanation

(1) When using a new flash memory, the area to be used must be formatted (initialized) before the PC interface command or writable characters are stored.

(2) After the flash memory is formatted, the remaining memory capacity is displayed on the LCD.

(3) When the already stored data (PC interface commands, writable characters, logos) is stored again, the memory is consumed every time data is stored, unless the Flash Memory Format Command ([ESC] J1) is transmitted.

(4) When a label issue operation is performed after the Flash Memory Format Command is sent, the image buffer is automatically cleared.

(5) In 10 seconds after the last writable characters, logos, or PC interface commands have been stored, the printer automatically enters the online mode (label issue operation). At this time, the image buffer is automatically cleared.

Refer to
- Bit Map Writable Character Command ([ESC] XD)
- Save Start Command ([ESC] XO)
- Save Terminate Command ([ESC] XP)

Example [ESC] J1; A, 0 [LF] [NUL]

6.3.20 2-BYTE WRITABLE CHARACTER CODE RANGE COMMAND [ESC] XE

Function Sets the code range when a 2-byte writable character code is stored in the flash ROM on the CPU board.

Format [ESC] XE; $a_1a_1a_1a_1$, $b_1b_1b_1b_1$, $a_2a_2a_2a_2$, $b_2b_2b_2b_2$ ------, $a_na_na_na_n$, $b_nb_nb_nb_n$ [LF] [NUL]

Term

aaaa: First character code for each range
2020 to FFFF (Indicates the hex. data in ASCII code.)

bbbb: No. of characters for each range
0001 to 4000 (Indicates the hex. data in ASCII code.)

xx: Type of font
51 to 55 (When omitted, 51 is selected.)

Explanation

(1) For a 2-byte character code such as Kanji, the character code range may be divided into two or more. As the control information area for the unnecessary codes can be deleted by designating the character code range, the capacity of flash memory can be used effectively.

(2) The total number of characters for each range must not exceed 0x4000 (16384 characters).

(3) Up to 2700 ranges can be designated.

(4) It is not possible to store the character codes which are not conforming to the setting for this command.

(5) The first character code for each area should be sent in the ascending order. The areas must not overlap. If these conditions are not satisfied, the operation is not guaranteed.

Refer to

- Flash Memory Format Command ([ESC] J1)
- Bit Map Writable Character Command ([ESC] XD)

Example In the case of Shift JIS 8140H to 83DFH:

Character data is present.
Character data is not present.

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
8140	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
:	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
81F0	■	■	■	■	■	■	■	■	■	■	■	■	■			
:																
8240	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
:	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
82F0	■	■	■	■	■	■	■									
:																
8340	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
:	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
83D0	■	■	■	■	■	■	■	■	■	■	■	■	■			

[ESC] XE; 8140, 00BD, 8240, 00B7, 8340, 00BD [LF] [NUL]

6.3.21 BIT MAP WRITABLE CHARACTER STORE COMMAND [ESC] XD

Function Stores writable characters and logos in the flash ROM on the CPU board.

Format [ESC] XD; (Sj,) aa, b, ccc, ddd, eee, fff, ggg, h, iii ------ iii [LF] [NUL]

Term

Sj: Drive in which writable characters or logos are stored
(Omissible. When omitted, the flash ROM on the CPU board is selected.)

j: Drive
0: Flash ROM on the CPU board

aa: Type of font
01 to 40
41: 16 x16 (dots)
42: 24 x 24 (dots)
43: 32 x 32 (dots)
44: 48 x 48 (dots)
51 to 55: 2-byte code character

b(b): Writable character code
20H to FFH (Set in hex code.)
2020H to FFFFH (When the writable character type is 51.)

ccc: Left offset
000 to 719 (in units of dots)

ddd: Top offset
000 to 719 (in units of dots)

eee: Character width
001 to 720 (in units of dots)

fff: Character height
001 to 720 (in units of dots)

ggg: Character-to-character spacing/proportional spacing
000 to 999 (in dots)

h: Type of writable character data
0: Nibble mode (4 bits/byte)
1: Hex. mode (8 bits/byte)

iii --- iii: Writable character data to be stored

* When the writable character type is 41 to 44, left offset, top offset, character width, character height, and character-to-character spacing/proportional spacing are fixed to “000”. Any settings are ignored.

Explanation

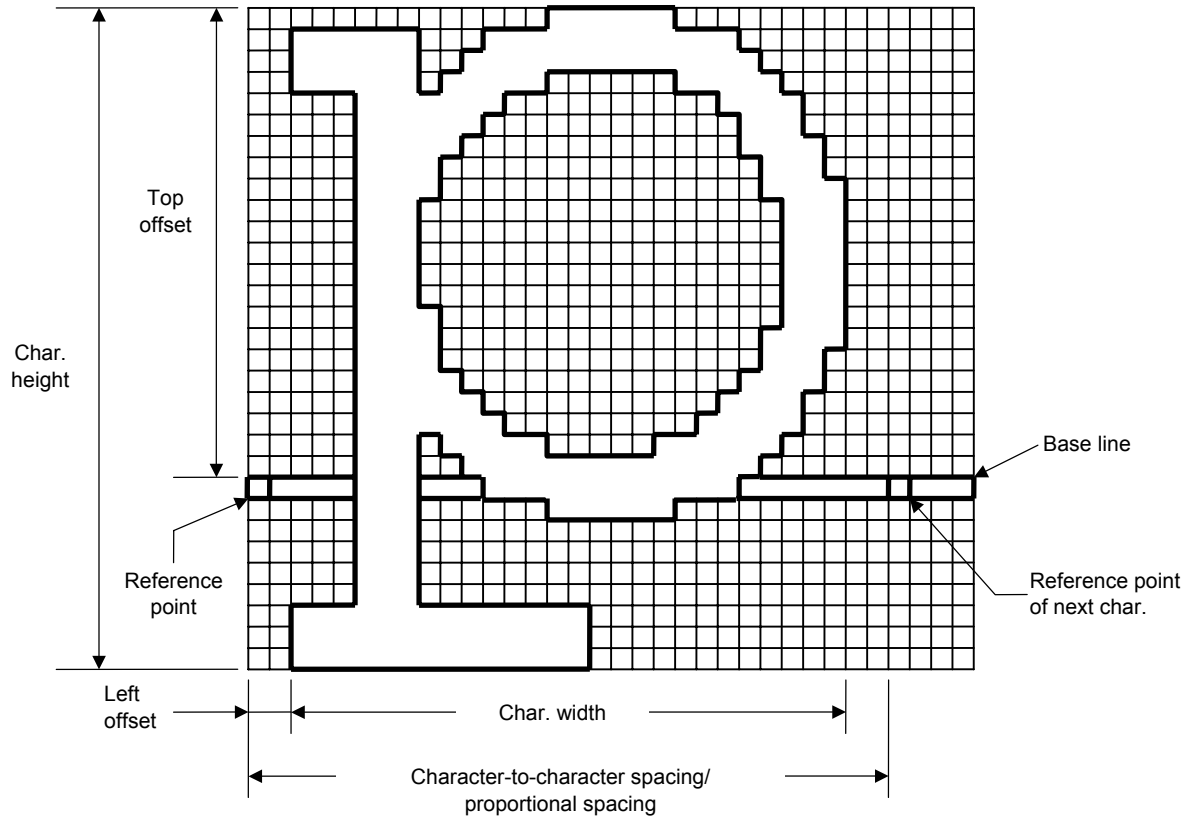
(1) Type of writable character

Up to 49 types of writable character sets can be stored. However, the maximum number of characters varies depending on the writable character size and number of characters because of the limited memory capacity. For writable character types 41 to 44, each writable character size is fixed.

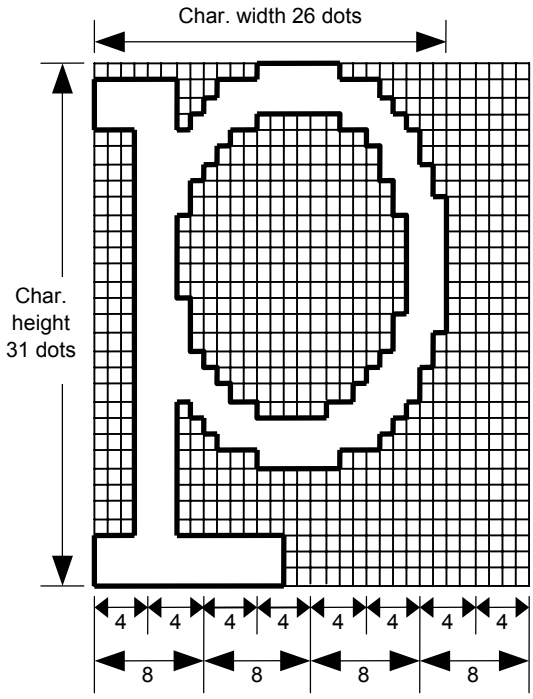
(2) Character code

Up to 224 characters can be stored per font type. The maximum number of characters are 40 types × 224 characters = 8960 characters. It varies depending on the writable character size and the number of characters because of the limited memory capacity. A character code of the character types 41 to 44 is stored in 1 byte. However, when it is called up, F0H is added to the upper digit, so a character code consists of 2 bytes. In this case, up to 188 characters can be stored per character type.

(3)



(4) Writable character type: 01 to 40, 51 to 55



Nibble mode

1	30H	***2***	30H	***3***	30H	***4***	3FH	***5***	3CH	***6***	30H	***7***	30H	***8***	30H
9	3FH	***10***	3CH	***11***	37H			•							
								•							
								•							
								•							
								•							
								•							
								•						***240***	30H
241	3FH	***242***	3FH	***243***	3FH	***244***	3CH	***245***	30H	***246***	30H	***247***	30H	***248***	30H

Hex. mode

1	00H	***2***	0FH	***3***	C0H	***4***	00H
5	FCH	***6***	7FH				
				•			
				•			
				•			
				•			
				•			
				•			
				•			
				•		***120***	00H
121	FFH	***122***	FCH	***123***	00H	***124***	00H

[Nibble mode]

(1) The writable character data to be stored is separated into four dot units and sent in above-mentioned order (***1*** → ***248***). (The upper digit: "3")

(2) The data of writable characters to be stored is 30H to 3FH.

(3) The minimum unit in the X direction is 8 dots. Dots with no data are transmitted as data 0.

(4) The data count of writable characters to be stored must be as follows:
Data count of writable characters to be stored =
{(No. of char. width dots + 7)/8} × No. of char. height dots × 2
* The value in the brackets is rounded down to the nearest whole number.

[Hex. mode]

(1) The writable character data to be stored is separated into eight dot units and sent in above-mentioned order (***1*** → ***124***).

(2) The data of writable characters to be stored is 00H to FFH.

(3) The minimum unit in the X direction is 8 dots. Dots with no data are transmitted as data 0.

(4) The data count of writable characters to be stored must be as follows:
Data count of writable characters to be stored =
{(No. of char. width dots + 7)/8} × No. of char. height dots
* The value in the brackets is rounded down to the nearest whole number.

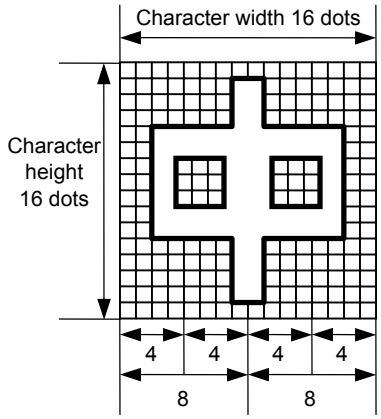
Notes

(1) Different character width and character height can be designated for the same writable character type, according to the writable character codes. In other words, character size can be changed by each character, thus memory can be saved.

(2) Proportional spacing and descending characters are possible depending on the parameters of character-to-character spacing/proportional spacing, left offset, and top offset.

(3) When top offset is 000, the reference coordinate is positioned at the upper left when drawing because the base line is at the top. (Coordinate setting is facilitated for logos.)

(5) Writable character type: 41 (16 dots ×16 dots)



Nibble mode							
1	30H	***2***	30H	***3***	30H	***4***	30H
5	30H	***6***	31H	***7***	38H		
				•			
				•			
				•			
		58	31H	***59***	38H	***60***	30H
61	30H	***62***	30H	***63***	30H	***64***	30H

Hex. mode							
1	00H	***2***	00H	***3***	01H	***4***	80H
5	01H	***6***	80H	***7***	01H		
				•			
				•			
				•			
		26	80H	***27***	01H	***28***	80H
29	01H	***30***	80H	***31***	00H	***32***	00H

[Nibble mode]

(1) The writable character data to be stored is separated into four dot units and sent in above-mentioned order (***1*** → ***64***). (Upper digit: “3”)

(2) The data of writable characters to be stored is 30H to 3FH.

(3) The data count of writable characters to be stored should be 64 bytes.

[Hex. mode]

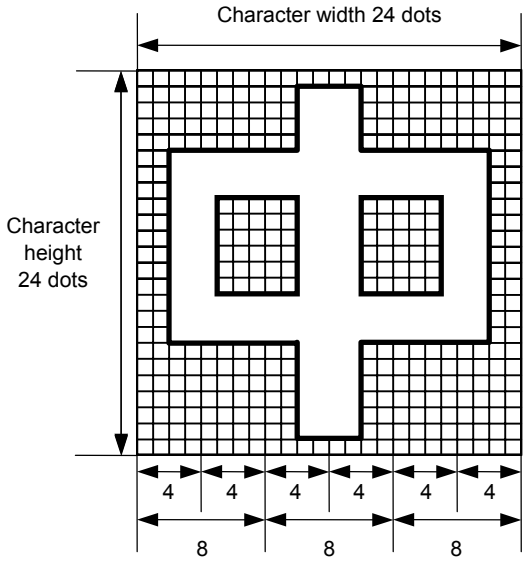
(1) The writable character data to be stored is separated into eight dot units and sent in above-mentioned order (***1*** → ***32***).

(2) The data of writable characters to be stored is 00H to FFH.

(3) The data count of writable characters to be stored should be 32 bytes.

* When writable character type 41 is designated, the width and height of the character are both 16 dots.

(6) Writable character type: 42 (24 dots ×24 dots)



Nibble mode										
1	30H	***2***	30H	***3***	30H	***4***	30H	***5***	30H	***6***	30H
7	30H	***8***	30H	***9***	33H						
						•					
						•					
						•					
						•					
						•		***137***	30H	***138***	30H
139	30H	***140***	30H	***141***	30H	***142***	30H	***143***	30H	***144***	30H

Hex. mode					
1	00H	***2***	00H	***3***	00H
4	00H	***5***	3CH	***6***	00H
			•		
			•		
			•		
			•		
67	00H	***68***	3CH	***69***	00H
70	00H	***71***	00H	***72***	00H

[Nibble mode]

(1) The writable character data to be stored is separated into four dot units and sent in above-mentioned order (***1*** → ***144***). (Upper digit: “3”)

(2) The data of writable characters to be stored is 30H to 3FH.

(3) The data count of writable characters to be stored should be 144 bytes.

[Hex. mode]

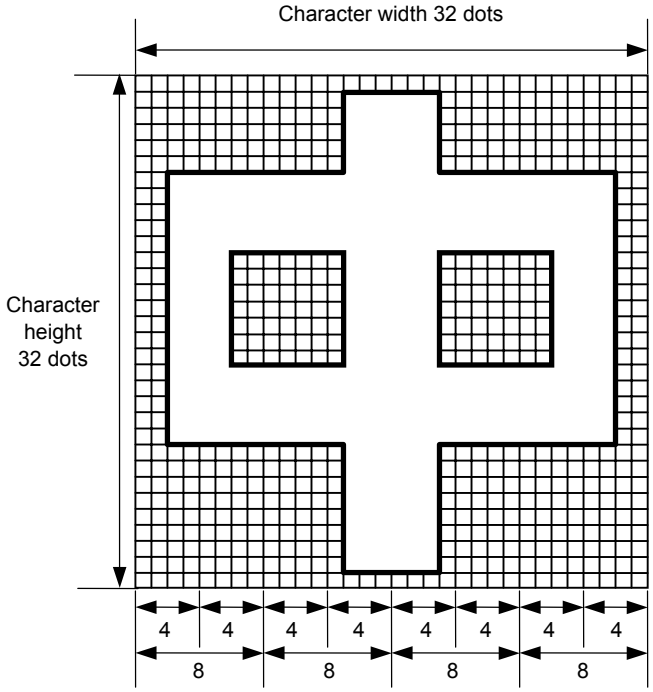
(1) The writable character data to be stored is separated into eight dot units and sent in above-mentioned order (***1*** → ***72***).

(2) The data of writable characters to be stored is 00H to FFH.

(3) The data count of writable characters to be stored should be 72 bytes.

* When writable character type 42 is designated, the width and height of the character are both 24 dots.

(7) Writable character type: 43 (32 dots ×32 dots)



Nibble mode												
1	30H	***2***	30H	***3***	30H	***4***	30H	***5***	30H	***6***	30H	***7***	30H
8	30H	***9***	30H	***10***	30H	***11***	30H	***12***	37H				
							•						
							•						
							•						
							•						
							•			***248***	30H	***249***	30H
250	30H	***251***	30H	***252***	30H	***253***	30H	***254***	30H	***255***	30H	***256***	30H

Hex. mode							
1	00H	***2***	00H	***3***	C0H	***4***	00H
5	00H	***6***	07H	***7***	C0H		
				•			
				•			
				•			
				•			
				123	C0H	***124***	00H
125	00H	***126***	00H	***127***	00H	***128***	00H

[Nibble mode]

(1) The writable character data to be stored is separated into four dot units and sent in above-mentioned order (***1*** → ***256***). (Upper digit: “3”)

(2) The data of writable characters to be stored is 30H to 3FH.

(3) The data count of writable characters to be stored should be 256 bytes.

[Hex. mode]

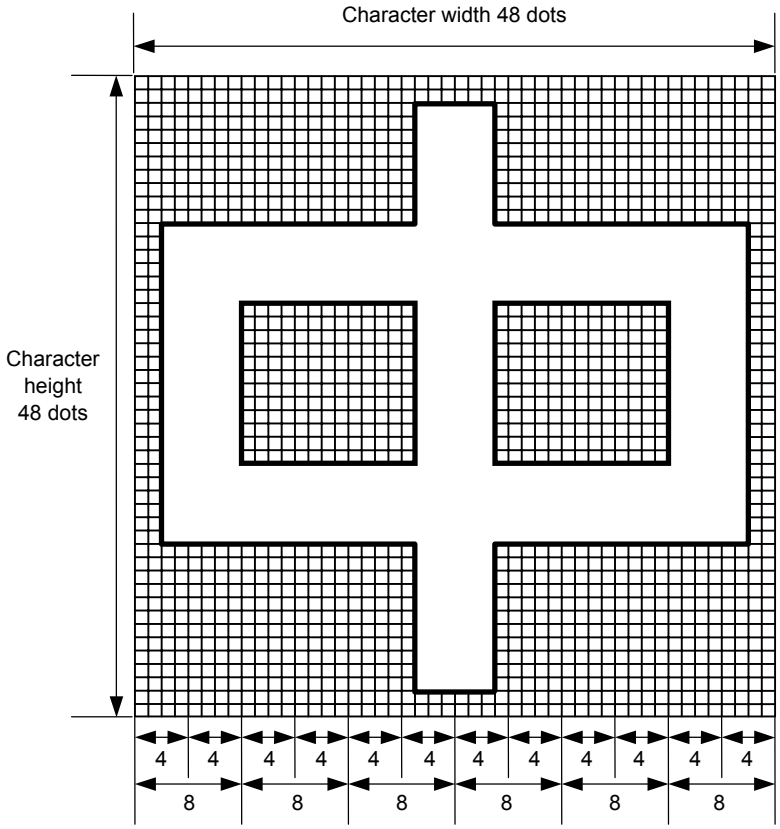
(1) The writable character data to be stored is separated into eight dot units and sent in above-mentioned order (***1*** → ***128***).

(2) The data of writable characters to be stored is 00H to FFH.

(3) The data count of writable characters to be stored should be 128 bytes.

* When writable character type 43 is designated, the width and height of the character are both 32 dots.

(8) Writable character type: 44 (48 dots ×48 dots)



Nibble mode												
1	30H	***2***	30H	***3***	30H	***4***	30H	***5***	30H	***6***	30H	
7	30H	***8***	30H	***9***	30H	***10***	30H					
						•						
						•						
						•						
						•						
						•		***569***	30H	***570***	30H	
571	30H	***572***	30H	***573***	30H	***574***	30H	***575***	30H	***576***	30H	

Nibble mode												
1	00H	***2***	00H	***3***	00H	***4***	00H	***5***	00H	***6***	00H	
7	00H	***8***	00H	***9***	07H	***10***	E0H					
						•						
						•						
						•						
						•						
						•		***281***	00H	***282***	00H	
283	00H	***284***	00H	***285***	00H	***286***	00H	***287***	00H	***288***	00H	

[Nibble mode]

(1) The writable character data to be stored is separated into four dot units and sent in above-mentioned order (***1*** → ***576***). (Upper digit: “3”)

(2) The data of writable characters to be stored is 30H to 3FH.

(3) The data count of writable characters to be stored should be 576 bytes.

[Hex. mode]

(1) The writable character data to be stored is separated into eight dot units and sent in above-mentioned order (***1*** → ***288***).

(2) The data of writable characters to be stored is 00H to FFH.

(3) The data count of writable characters to be stored should be 288 bytes.

* When writable character type 44 is designated, the width and height of the character are both 48 dots.

Supplement

(1) No matter what character type or character code is selected, no memory will be wasted.

(2) To store a new writable character, the Flash Memory Format Command ([ESC] J1) must be transmitted.

(3) A character code already stored can be stored in the flash memory again by sending the Bit Map Writable Character Store Command ([ESC] XD, but memory will be consumed each time the code is stored. The memory can be effectively used if the Flash Memory Format Command ([ESC] J1) is sent in advance.

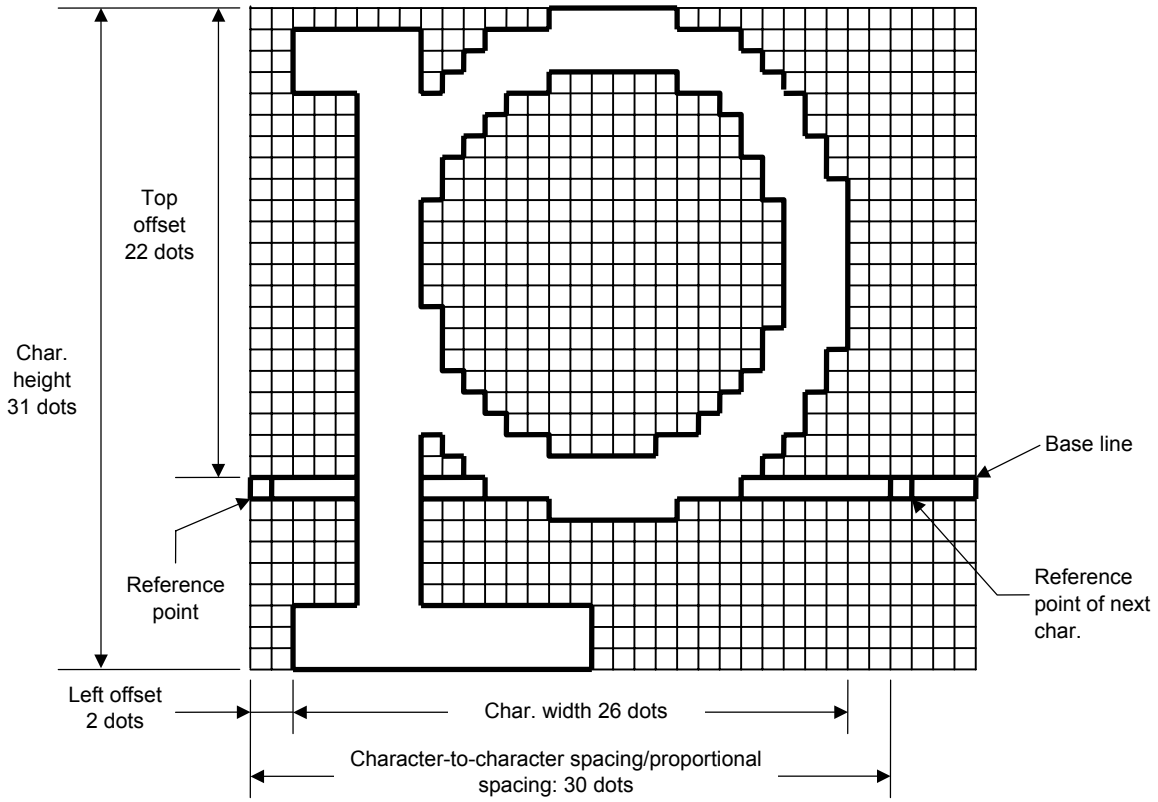
(4) When the flash memory is used and a label issue operation is performed after sending the Bit Map Writable Character Command ([ESC] XD), the image buffer is cleared automatically.

(5) When further storing operation is not continued for about 10 seconds after storing the writable character and logos, the printer automatically enters the online mode (label issue operation). In this case, when the flash memory is used, the image buffer will be cleared automatically.

Refer to Flash Memory Format Command ([ESC] J1)

Examples

Writable character type: 03
Writable character code: 70H



[ESC] J1; C [LF] [NUL]
[ESC] XD; 03, p, 002, 022, 026, 031, 030, 0, 000?<000?<7??800?<???<00?=?03>001?
<00?001?8007001?0007801>0003801>0003<01<0001<01<0001<01<0001<01<0001<01<0001<01>
0001<01>0003<01>0003801?0007801?800?001?<01?001=?07>001<???<001<7??8001<0?<
0001<0000001<0000001<0000001<000000???<0000???<0000???<0000 [LF] [NUL]

* 30H = ”0”
  31H = ”1”
  32H = ”2”
  33H = ”3”
  34H = ”4”
  35H = ”5”
  36H = ”6”
  37H = ”7”
  38H = ”8”
  39H = ”9”
  3AH = ”:”
  3BH = ”;”
  3CH = ”<”
  3DH = ”=”
  3EH = ”>”
  3FH = ”?”

6.3.22 GRAPHIC COMMAND [ESC] SG

Function Draws graphic data.

Format
[ESC] SG; aaaa(D), bbbb(D), cccc, dddd, e, ggg --- ggg [LF] [NUL]
or
[ESC] SG0; aaaa(D), bbbb(D), cccc, dddd, e, ffff, ggg --- ggg [LF] [NUL]

Term

aaaa(D): X-coordinate of the print origin for drawing graphic data
Fixed to 4 digits (in 0.1 mm units)
* If "D" is attached after a 4-digit value, the coordinate is specified in dots.
0000D or greater

bbbb(D): Y-coordinate of the print origin for drawing graphic data
4 digits or 5 digits (in 0.1 mm units)
* If "D" is attached after a 4- or 5-digit value, the coordinate is specified in dots.
0000D or greater

cccc: No. of graphic width dots
Fixed to 4 digits (in units of dots)
However, when the graphic data "2: BMP file" or "6: PCX file" is selected, this designation is ignored. (The information of the graphic width is contained in the graphic data.)

dddd: No. of graphic height dots
4 digits or 5 digits (in units of dots)
However, when the graphic data "2: BMP file" or "6: PCX file" is selected, this designation is ignored. (The information of the graphic width is contained in the graphic data.)
When "3: TOPIX compression mode" is selected for the type of graphic data:
Resolution of graphic data: *only two types
0150: 150 DPI (The data is drawn in double resolution.)
0300: 300 DPI (The data is drawn in single resolution.)

e: Type of graphic data
When the command starts with "[ESC] SG;":

0:	Nibble mode (4 dots/byte)	Overwrite drawing
1:	Hex. mode (8 dots/byte)	Overwrite drawing
2:	BMP file mode	Overwrite drawing
3:	TOPIX compression mode	Overwrite drawing
4:	Nibble mode (4 dots/byte)	OR drawing
5:	Hex. mode (8 dots/byte)	OR drawing
6:	PCX file mode	Overwrite drawing
7:	TOPIX compression mode	XOR drawing

When the command starts with "[ESC] SG0;":

A:	Printer driver compression mode	Overwrite drawing

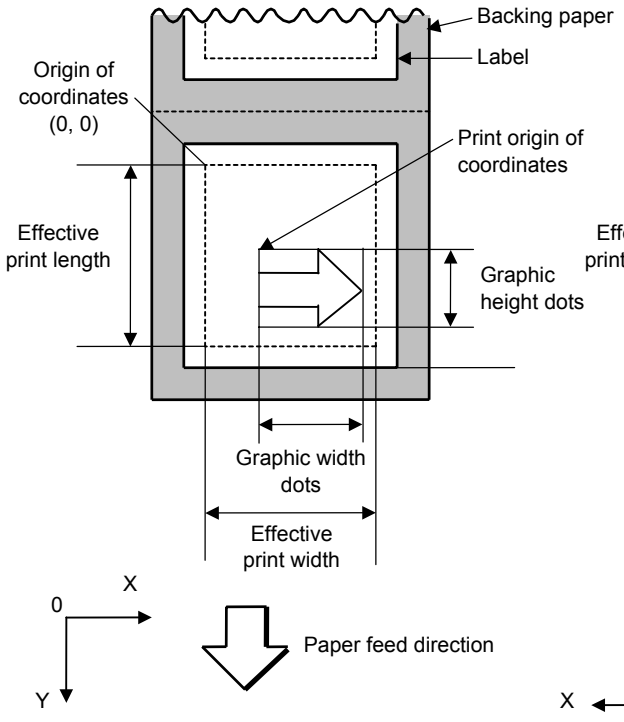
ffff: Data count (Effective only for the command starting with “[ESC] SG0;”)
Fixed to 4 digits
Tthe total number of bytes of the compressed graphic data is expressed by 32-bit hex. code.
Range: 0 to 4,294,967,295 bytes
(00H, 00H, 00H, 00H to FFH, FFH, FFH, FFH)

ggg --- ggg: Graphic data

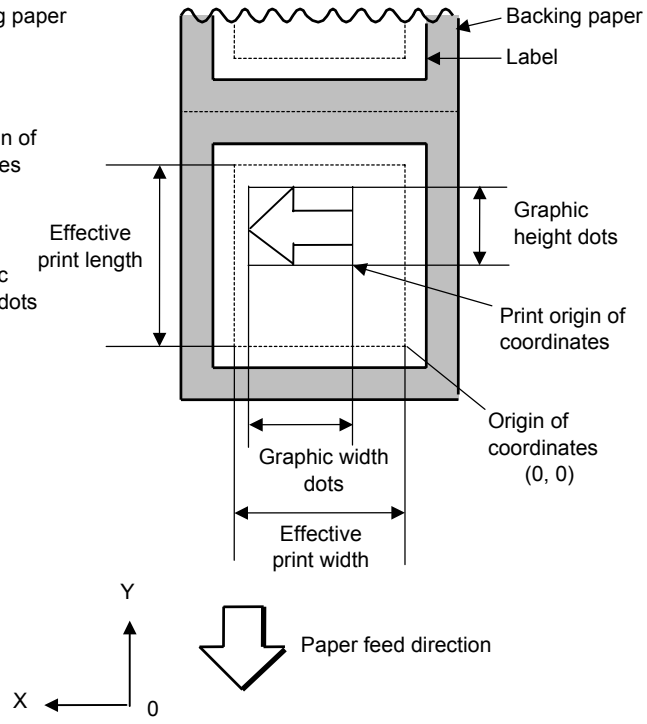
Explanation

(1) When the type of graphic data “0”, “1”, “2”, “3”, “6”, or “A” is selected, the graphic data is drawn by overwriting the image buffer.

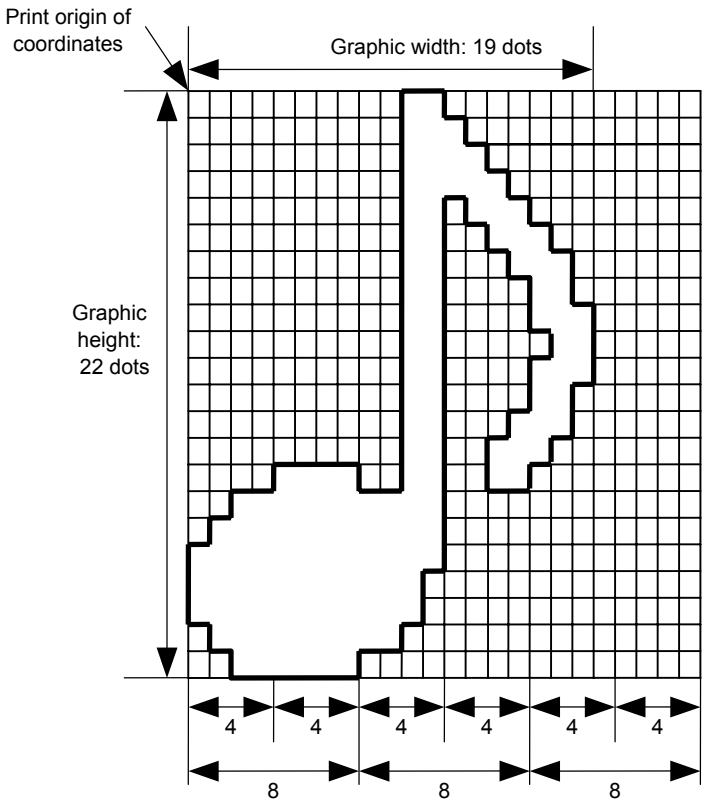
(2) When the type of graphic data “4” or “5” is selected, the graphic data is drawn by carrying out OR between the graphic data and the data in the image buffer.



[Print direction: Bottom first]



[Print direction: Top first]



Nibble mode												
1	30H	***2***	30H	***3***	33H	***4***	30H	***5***	30H	***6***	30H
7	30H	***8***	30H			•					
						•					
						•					
						•					
						•					
						•					
						•					
						•				***126***	30H
127	33H	***128***	3FH	***129***	30H	***130***	30H	***131***	30H	***132***	30H

Hex. mode					
1	00H	***2***	30H	***3***	00H
4	00H	***5***	38H		
			•		
			•		
			•		
			•		
			•		
				63	00H
64	3FH	***65***	00H	***66***	00H

[Nibble mode]

(1) The graphic data is separated into four dot units and sent in above-mentioned order (***1*** → ***132***). (Upper digit: “3”)

(2) The graphic data is 30H to 3FH.

(3) The minimum unit in the X direction is 8 dots. Dots with no data are transmitted as data 0.

(4) The graphic data count must be as follows:
Graphic data count = {(No. of graphic width dots + 7)/8} × No. of graphic height dots × 2

* The value in the brackets is rounded down to the nearest whole number.

[Hex. mode]

(1) The graphic data is separated into eight dot units and sent in above-mentioned order (***1*** → ***66***).

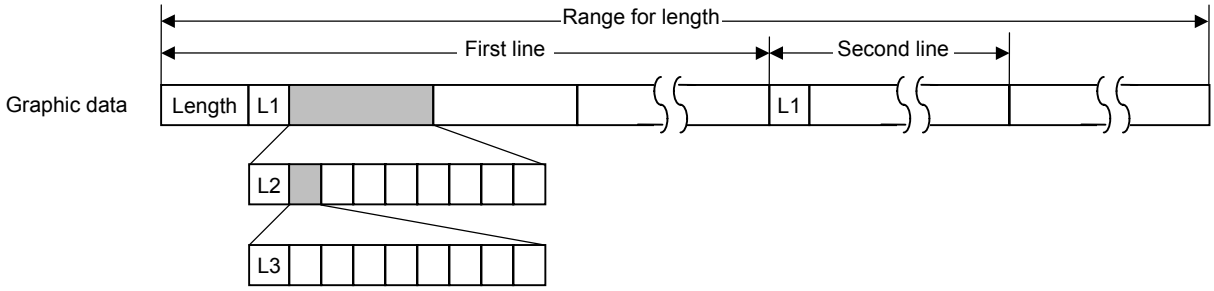
(2) The graphic data is 00H to FFH.

(3) The minimum unit in the X direction is 8 dots. Dots with no data are transmitted as data 0.

(4) The graphic data count must be as follows:
Graphic data count = {(No. of graphic width dots + 7)/8} × No. of graphic height dots

* The value in the brackets is rounded down to the nearest whole number.

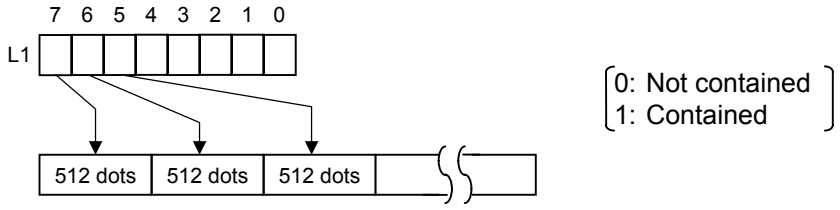
[When TOPIX compression mode is selected]



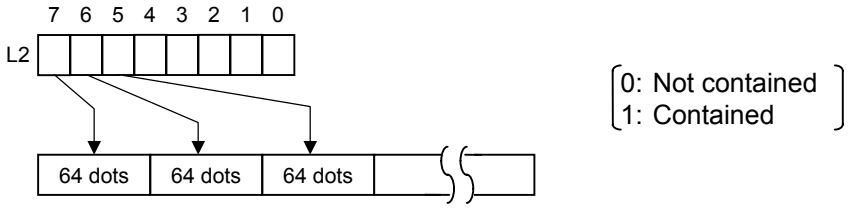
(1) Length: Total number of bytes of the graphic data (0001H or greater)

Example. Length = 20 bytes: 00 14

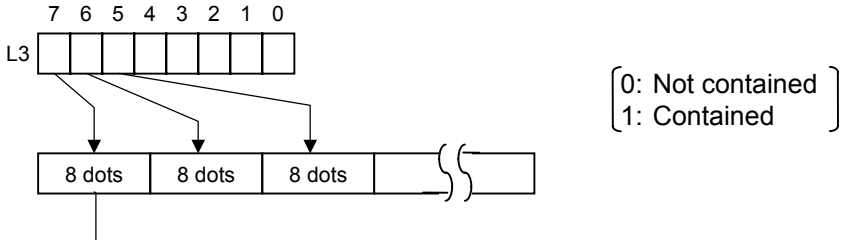
(2) L1 parameter: Shows in which large block (512 dots/block) the changed data is contained.



(3) L2 parameter: Shows in which medium block (64 dots/block) the changed data is contained (of the L1 large block).



(4) L3 parameter: Shows in which small block (8 dots/block) the changed data is contained (of the L2 medium block).



Exclusive-OR is carried out between the current image data and the image data of a previous line. Only the changed bit is set to ON (1). The alignment of dots is MSB (left dots) and LSB (right dots).

* The graphic width of one line is drawn only for the designated value or the max. buffer size (512 KB), whichever is smaller. The minimum unit of the drawing data is 8 dots (1 byte). If the graphic width is set to 3 dots, it will be reset to 8 dots (1 byte).

[When the printer driver compression mode is selected]

(1) For the command starting with ”[ESC] SG0;”, only “A: Printer driver compression mode” can be selected for the type of graphic data. In this case, the parameter to set the data count is attached after the type of graphic data parameter. When the total number of data cannot be provided by the printer driver, “00H, 00H, 00H, 00H” should be specified for the number of graphic data. However, in this case, the printer diver cannot support printing through a serial interface (RS-232C).

(2) How to compress data

Compression is performed by line specified for the number of graphic width dots.
The unit of data is 8 bits. A repeatedly appearing value is encoded in 2 bytes. The first byte is a numeric value “n” indicating that a value is repeated (-n + 1) times.
The range is between -127 and -1. The second byte is the repeated value.
For a value not repeated, the first byte is the numeric value “m”. The length of the values is indicated by (m+1). The range of “m” is between 0 and 126. The value of the length of the repetition “n” should not exceed 127, and the value ”m” should not exceed 126, respectively.
If it exceeds the specified value, it should be divided into blocks of repetition.
When a line of the same data appears repeatedly, the number of such lines is encoded in 2 bytes. The first byte is fixed to 127. The second byte indicates “N” times that the line of the same data is repeated. Its range is between 1 and 255. “N” should not exceed 255. If it exceeds 255, one-line data should be newly compressed, and the remaining number of repetitions should be encoded.

[Example]

Data before being compressed (Width: 120 dots, Height: 300 lines)

Line No.	Graphic data
1	AAh AAh AAh AAh AAh AAh AAh BBh CCh DDh EEh FFh FFh FFh FFh
2	AAh AAh AAh AAh AAh AAh AAh BBh CCh DDh EEh FFh FFh FFh FFh
⋮	⋮
299	AAh AAh AAh AAh AAh AAh AAh BBh CCh DDh EEh FFh FFh FFh FFh
300	AAh AAh AAh AAh AAh AAh AAh BBh CCh DDh EEh FFh FFh FFh FFh

Data after being compressed

Line No.	Graphic data
1	FAh AAh 03h BBh CCh DDh EEh FEh FFh
2 to 256	7FH FFH
257	FAh AAh 03h BBh CCh DDh EEh FEh FFh
258 to 300	7FH 2BH

FEh = -2
-(-2) + 1 = 3
FFh is repeated 3 times.

03h = 3
3 + 1 = 4
4-byte data (BBh CCh DDh EEh) without repetition

FAh = -6
-(-6) + 1 = 7
AAh is repeated 7 times.

Notes

(1) The print origin of coordinates must be set so that the result of drawing the graphic data will be within the effective print area set by the Label Size Set Command ([ESC] D).

(2) The number of graphic width dots and the number of graphic height dots must also be set so that the result of drawing the graphic data will be within the effective print area set by the Label Size Set Command ([ESC] D) in the same manner as the above.

(3) Both width and height are 12 dots/mm.

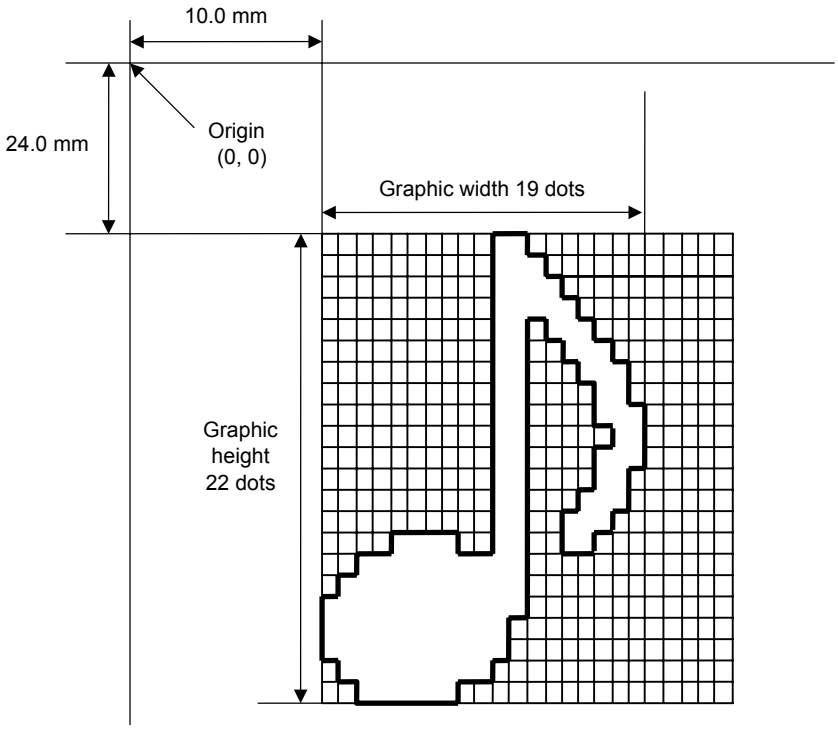
(4) The X coordinate of the actual drawing result may be different from the designated print origin of the X-coordinate by ±0.33 mm.

(To draw the received graphic data at high speed, the data is directly developed in the image buffer without applying correction to each bit with respect to the designated X-coordinate. Consequently, an error of up to 4 bits occurs.)

[Effective print area] [mm]

Item \ Model / Issue mode			B-SX6T			B-SX8T		
			Batch	Strip	Cut	Batch	Strip	Cut
Print head dot density			12 dots/mm (305 dpi)			12 dots/mm (305 dpi)		
Print head width			170.60 mm			213.3 mm		
G: Effective print width		Min.	10.0			10.0		
		Max.	170.7			213.3		
H: Effective print length	Label	Min.	5.5	20.9	23.0	5.5	20.9	23.0
		Max.	1705.0			1364.0		
	Tag	Min.	8.0	---	23.4	8.0	---	23.4
		Max.	1705.0	---	1705.0	1364.0	---	1364.0

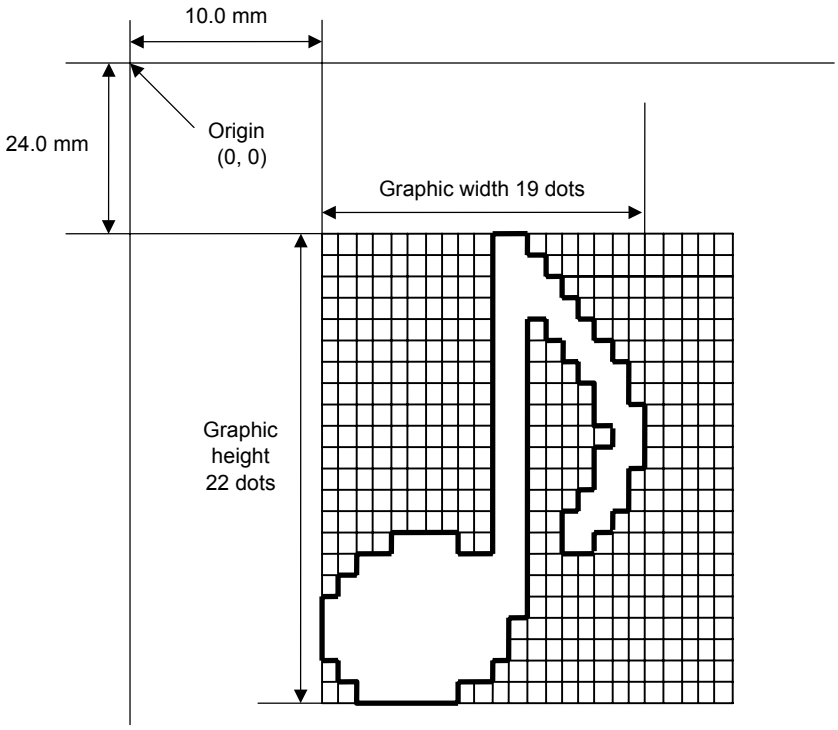
Examples



[ESC] C [LF] [NUL]
[ESC] SG; 0100, 0240, 0019, 0022, 0, 003000003800003<00003>000037000033800031
<00030<00030>00030600030>00030<00031<00033800?33003??0007??000???000??
>000??>0007? <0003?0000 [LF] [NUL]
[ESC] XS; I, 0001, 0002C3000 [LF] [NUL]

* 30H = “0”
  31H = “1”
  32H = “2”
  33H = “3”
  34H = “4”
  35H = “5”
  36H = “6”
  37H = “7”
  38H = “8”
  39H = “9”
  3AH = “:”
  3BH = “;”
  3CH = “<”
  3DH = “=”
  3EH = “>”
  3FH = “?”

[TOPIX compression mode]



[ESC] SG; 0100, 0240, 0019, 0300, 3, 00 5C 80 80 40 30
Length L1 L2 L3 Data (1st line)

80 80 40 08 80 80 40 04 80 80 40 02 80 80 40 09
(2nd line) (3rd line) (4th line) (5th line)

80 80 60 04 80 80 80 60 02 40 80 80 40 01 80 80 20 20
(6th line) (7th line) (8th line) (9th line)

80 80 20 80 80 80 20 80 80 80 20 20 80 80 40 01
(10th line) (11th line) (12th line) (13th line)

80 80 60 02 40 80 80 A0 0F 80 80 80 C0 30 C3 80 80 80 40
(14th line) (15th line) (16th line) (17th line)

80 80 80 80 80 80 40 10 00 80 80 C0 80 20 80 80 C0 40 C0 [LF] [NUL]
(18th line) (19th line)(20th line) (21st line) (22nd line)

6.3.23 SAVE START COMMAND [ESC] XO

Function

Declares the start of saving PC interface commands.
(Places the printer in the mode where PC interface commands are written in the flash memory.)

Format

[ESC] XO; aa, (Sb,) c [LF] [NUL]

Term

aa: Identification number to be used for saving in or calling from the flash memory
01 to 99

Sb: Drive in which the PC interface command is stored
(Omissible. When omitted, the flash ROM on the CPU board is selected.)

b: Drive

0: Flash ROM on the CPU board

c: Status response at save time

0: No status response

1: Status response is returned.

Notes

(1) After sending the Save Start Command ([ESC] XO), any command other than the following will be saved into flash memory without being analyzed.

- Save Start Command ([ESC] XO)
- Save Terminate Command ([ESC] XP)
- Saved Data Call Command ([ESC] XQ, [ESC] XT)
- Bit Map Writable Character Command ([ESC] XD, [ESC] XA)
- Reset Command ([ESC] WR)
- Status Request Command ([ESC] WS)
- Flash Memory Format Command ([ESC] J1, [ESC]JA)

(2) No error check is made for the commands when saving them.

(3) Up to 64 KB can be saved per save operation.

Refer to

- Save Terminate Command ([ESC] XP)
- Flash Memory Format Command ([ESC] J1)

Examples

[ESC] J1; B [LF] [NUL]
[ESC] XO; 01, 0 [LF] [NUL]
[ESC] D0508, 0760, 0468 [LF] [NUL]
[ESC] T20C30 [LF] [NUL]
[ESC] C [LF] [NUL]
[ESC] PC001; 0200, 0125, 1, 1, A, 00, B [LF] [NUL]
[ESC] PC002; 0650, 0550, 2, 2, G, 33, B, +0000000001 [LF] [NUL]
[ESC] XP [LF] [NUL]

6.3.24 SAVE TERMINATE COMMAND [ESC] XP

Function	Declares the termination of saving PC interface commands.
Format	[ESC] XP [LF] [NUL]
Note	If no storing operation occurs for about 10 seconds after the last PC interface command has been stored, the printer enters the online mode (label issue operation). In this case, the image buffer will be cleared automatically.
Refer to	Save Start Command ([ESC] XO)

6.3.25 SAVED DATA CALL COMMAND [ESC] XQ

Function Calls PC interface commands saved in the flash memory.

Format [ESC] XQ; aa, (Sb,) c, d [LF] [NUL]

Term

aa: Identification number of the file to be called from the flash memory
01 to 99

Sb: Drive from which the command is called
(Omissible. When omitted, the flash ROM on the CPU board is selected.)

b: Drive
0: Flash ROM on the CPU board

c: Status response when the data is called.
0: No status response
1: Status response is returned.

d: Automatic call at power on time
L: Automatic call
M: No automatic call

Notes

(1) If the corresponding save identification number is not found, an error will result.

(2) If no save identification number is found at power on time when the automatic call has been specified, the setting of the automatic call will be changed to 'No automatic call', and no error occurs.

(3) If a command error is found in the PC interface command that was called by the Saved Data Call Command or the automatic call at power on time, a command error will result. After an error has occurred, the power must be turned off. When the power is turned on again, the setting for the automatic call at power on time will be changed to 'No automatic call'.

(4) The printer enters the online mode (label issue operation) when the Save Data Call Command is sent after the Save Terminate Command.

Refer to

- Save Start Command ([ESC] XO)
- Save Terminate Command ([ESC] XP)

Examples

[ESC] XQ; 01, 0, L [LF] [NUL]
[ESC] RC001; Sample [LF] [NUL]
[ESC] RC002; 100 [LF] [NUL]
[ESC] XS; I, 0002, 0002C3000 [LF] [NUL]

6.3.26 HEAD BROKEN DOTS CHECK COMMAND [ESC] HD

Function Checks the thermal head for broken elements.

Format [ESC] HD001 (, a) [LF] [NUL]..... The all thermal elements are checked.

[ESC] HD003, $s_1s_1s_1s_1$, $e_1e_1e_1e_1$, $s_2s_2s_2s_2$, $e_2e_2e_2e_2$,--- $s_8s_8s_8s_8$, $e_8e_8e_8e_8$ (, a) [LF] [NUL]
..... The thermal elements are partially checked.

Term

a: Check result status response (Omissible)
A: Status is returned.
(When omitted, the check result status is not returned.)

$s_1s_1s_1s_1$ --- $s_8s_8s_8s_8$: Area start coordinate Fixed to 4 digits (in units of 0.1 mm)

$e_1e_1e_1e_1$ --- $e_8e_8e_8e_8$: Area end coordinate Fixed to 4 digits (in units of 0.1 mm)

Explanation

(1) The Head Broken Dots Check Command is subject to batch processing. If the Label Issue Command to issue 100 labels is transmitted before the Head Broken Dots Check Command, the head broken dots check will be executed after 100 labels have been issued.

(2) In the case of the all thermal elements check, the all thermal elements of the thermal head will be checked.

(3) When the check result is found to be normal under the condition that the check result status is not returned, the next command is processed. If the check result is found to be abnormal, an error occurs. Whether to return a status when an error occurs depends on the Issue Command setting.
When the check result is found to be normal under condition that the check result status is returned, a status indicating the normal end of the head broken elements check is sent. After that, the next command is processed. If the check result is found to be abnormal, a status indicating the head broken elements error is sent, and then the printer stops.

Status for normal end
[SOH] [STX] “0020000” [EXT] [EOT] [CR] [LF]

Status for head broken elements error
[SOH] [STX] “1720000” [EXT] [EOT] [CR] [LF]

(4) The all thermal elements check takes approximately 2 seconds.

(5) Partial thermal elements check:

- Up to 8 areas can be designated. If the number of designated areas is less than 8, the rest is omissible.
- When the value set for the start coordinate is larger than the value set for the end coordinate, the end coordinate is handled as the start coordinate, and the start coordinate is handled as the end coordinate.
- Areas can overlap each other.
- Even if a coordinate is specified beyond the print head width, it will be regarded as the maximum value, therefore, a command error does not occur.

Examples

[ESC] C [LF] [NUL]
[ESC] RC001; Sample [LF] [NUL]
[ESC] RC002; 001 [LF] [NUL]
[ESC] XS; I, 0002, 0002C3000 [LF] [NUL]
[ESC] HD001 [LF] [NUL]

6.3.27 MESSAGE DISPLAY COMMAND [ESC] XJ

Function Displays the message on the upper line of the LCD.

Format [ESC] XJ; aaa ------ aaa [LF] [NUL]

Term aaa ------ aaa: Display data (16 digits)

Explanation When the printer receives the Message Display Command, first it processes the already received data (or completes the label issue if the Issue Command has been sent). Then, it displays the message on the upper line of the LCD, and finally it enters a pause state.
When the [RESTART] key is pressed, the pause state is cleared and the LCD displays the normal message. After the pause state is cleared, the printer resumes processing the data received after the Message Display Command.

Notes

(1) The number of characters to be displayed is 16. When the display data is less than 16 characters, the blanks are filled with spaces. When the display data exceeds 16 characters, the excess data is discarded.

(2) During a pause state, a halt due to an error, or a head open state, the Message Display Command is not processed even if it is received. In this case, the command is processed after the above state is cleared.

(3) The following characters can be displayed on the LCD.

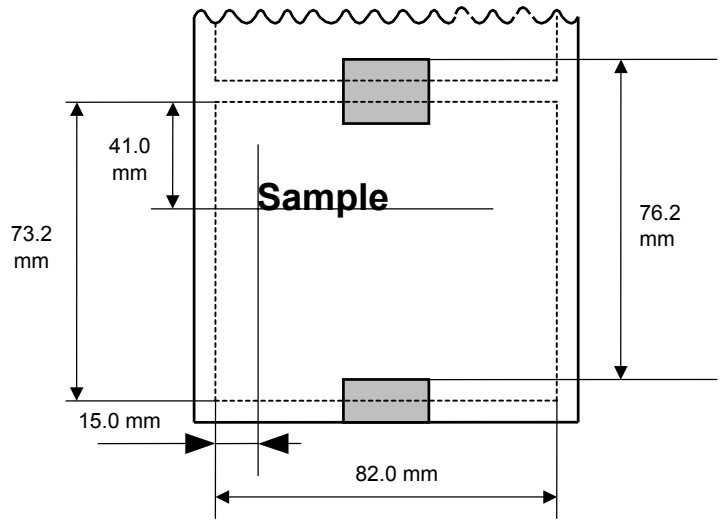
If a character other than the following is received, "?" is displayed or a command error results.

	2	3	4	5	6	7	A	B	C	D
0	SP	0	@	P	`	p				
1	!	1	A	Q	a	q				
2	”	2	B	R	b	r				
3	#	3	C	S	c	s				
4	$	4	D	T	d	t				
5	%	5	E	U	e	u				
6	&	6	F	V	f	v				
7	’	7	G	W	g	w				
8	(	8	H	X	h	x				
9	)	9	I	Y	i	y				
A	*	:	J	Z	j	z				
B	+	;	K	[	k	{				
C	,	<	L	\	l	|				
D	-	=	M	]	m	}				
E	.	>	N	^	n	→				
F	/	?	O	_	o	←				

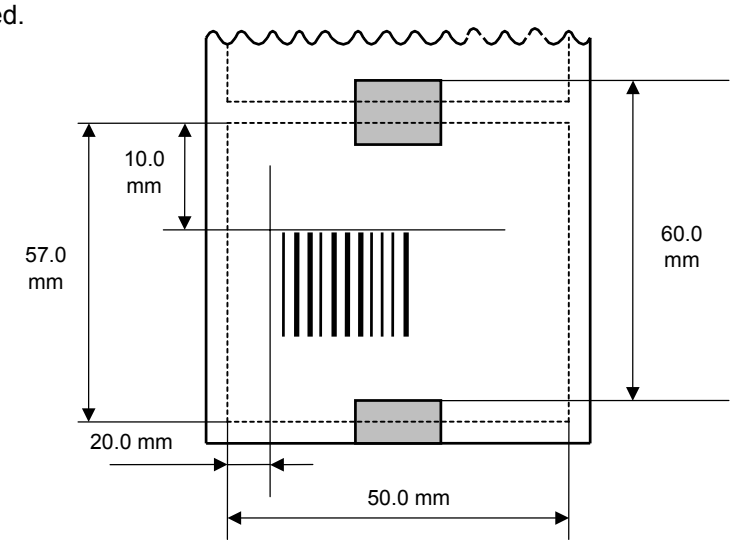
* The shaded parts are Japanese. They are omitted here.

Examples

① Load the paper.
② One piece of paper is fed.
③ 4 pieces are issued.



④ Message, “Please set [Tag]”, is displayed.
⑤ Change the paper.
⑥ Press the [RESTART] key.
⑦ One piece of paper is fed.
⑧ 2 pieces are issued.



[ESC] D0762, 0820, 0732 [LF] [NUL]
[ESC] T11C40 [LF] [NUL]
[ESC] C [LF] [NUL]
[ESC] PC001; 0150, 0410, 1, 1, A, 00, B [LF] [NUL]
[ESC] RC001; Sample [LF] [NUL]
[ESC] XS; I, 0004, 0011C4001 [LF] [NUL]
[ESC] XJ; Please set [Tag] [LF] [NUL]
[ESC] D0600, 0500, 0570 [LF] [NUL]
[ESC] T11C40 [LF] [NUL]
[ESC] C [LF] [NUL]
[ESC] XB01; 0200, 0100, 3, 1, 03, 03, 08, 08, 03, 0, 0150 [LF] [NUL]
[ESC] RB01; 12345 [LF] [NUL]
[ESC] XS; I, 0002, 0011C3001 [LF] [NUL]

6.3.28 RESET COMMAND [ESC] WR

Function Returns the printer to its initial state.

Format [ESC] WR [LF] [NUL]

Explanation The printer is returned to the same state as when the power is turned on. When the printer receives this command during printing, it returns to its initial state after issuing the label which is being printed. The next command must not be sent while the printer is performing initial processing.

Notes

(1) While the printer is in the system mode, any commands except the Reset Command cannot be processed.

(2) If a command error or communication error occurs when receiving the Reset Command, an error message is displayed in the online mode. However, it is not displayed in the system mode.

(3) After the code of the Bit Map Writable Character Command ([ESC] XD) or the Graphic Command ([ESC] SG) is received, the Reset Command is not processed until the printer receives the data specifying the type of data.

Example [ESC] WR [LF] [NUL]

6.3.29 RESET COMMAND [ESC] W@

Function Returns the printer to its initial state.

Format [ESC] W@ [LF] [NUL]

Explanation

(1) The printer is returned to the same state as when the power is turned on. When the printer receives this command during printing, it returns to its initial state after issuing the label which is being printed. The next command must not be sent while the printer is performing initial processing.

(2) While the Reset Command, [ESC]WR[LF][NUL], resets the printer to the initial state without initializing the OS to enable a quick reset, this command resets the printer from the beginning of the firmware.

Notes

(1) While the printer is in the system mode, any commands except the Reset Command cannot be processed.

(2) If a command error or communication error occurs when receiving the Reset Command, an error message is displayed in the online mode. However, it is not displayed in the system mode.

(3) After the code of the Bit Map Writable Character Command ([ESC] XD) or the Graphic Command ([ESC] SG) is received, the Reset Command is not processed until the printer receives the data specifying the type of data.

Example [ESC] W@ [LF] [NUL]

6.3.30 STATUS REQUEST COMMAND [ESC] WS

Function Sends the printer status to the host computer.

Format [ESC] WS [LF] [NUL]

Explanation This command makes the printer send its status regardless of the setting of the status response parameter. The status to be transmitted is the current printer status, and indicates the latest status only. The remaining count indicates the remaining print count of the batch currently being printed only. No remaining count of the batch waiting to be printed is transmitted.

Notes

(1) This command is available for the RS-232C, USB, Centronics interfaces, and socket communications. However, in case of the Centronics interface, the printer returns a status to the Nibble mode negotiation immediately after this command is received.

(2) The status is returned only to the interface which sent this command.

(3) After the code of the Bit Map Writable Character Command ([ESC] XD) or Graphic Command ([ESC] SG) is received, the Status Request Command is not processed until the printer receives the data specifying the type of data.

(4) After receiving the Status Request Command, there may be a maximum of 20-msec. delay until the printer sends a status.

(5) At least, a 20-msec. interval must be given between the transmissions of the Status Request Command. If the next Status Request Command is transmitted within 20 msec., the printer may fail to receive it.

Example [ESC] WS [LF] [NUL]

6.3.31 RECEIVE BUFFER FREE SPACE STATUS REQUEST COMMAND [ESC] WB

Function Sends information on the printer status and the free space of the receive buffer to the host.

Format [ESC] WB [LF] [NUL]

Explanation

(1) This command makes the printer send information on its status and free space of the receive buffer, regardless of the setting of the Status Response parameter. The status to be transmitted is the current printer status, and indicates the latest status only. The remaining count indicates the remaining print count of the batch currently being printed only. No remaining count of the batch waiting to be printed is transmitted. Regarding the free space of the receive buffer, the printer returns this information of the interface that was used for sending this command.

Notes

(1) This command is available for the RS-232C, USB, Centronics interfaces, and socket communications. However, in case of the Centronics interface, the printer returns a status to the Nibble mode negotiation immediately after this command is received.

(2) The printer returns the status only for the interface which sent this command.

(3) After the code of the Bit Map Writable Character Command ([ESC] XD) or Graphic Command ([ESC] SG) is received, the Status Request Command is not processed until the printer receives the data specifying the type of data.

(4) After receiving the Status Request Command, there may be a maximum of 20-msec. delay until the printer sends the status.

(5) At least, a 20-msec. interval must be given between the transmissions of the Status Request Command. If the next Status Request Command is transmitted within 20 msec, the printer may fail to receive it.

Example [ESC] WB [LF] [NUL]

6.3.32 VERSION INFORMATION ACQUIRE COMMAND [ESC] WV

Function Sends information such as the program version of the printer.

Format [ESC] WV [LF] [NUL]

Explanation (1) The format of the program version data (27-byte data in total: in case of the B-SX8T-TS12-QM-R) to be returned to the host is as follows.

SOH		01H
STX		02H
Creation date	"1"	31H
	"7"	37H
	"F"	46H
	"E"	45H
	"B"	42H
	"2"	32H
	"0"	30H
	"0"	30H
	"6"	36H
Model	"B"	42H
	"-"	2DH
	"S"	53H
	"X"	58H
	"8"	38H
	"T"	54H
	SP	20H
Version	"V"	56H
	"1"	31H
	"."	2EH
	"0"	30H
	"SP"	20H
ETX		03H
EOT		04H
CR		0DH
LF		0AH

Creation date of the program:
9-byte data indicated in order of Day-Month-Year

Model:
7-byte ASCII code indicating the model

Program version:
5-byte data: Vx.xx
Revision
Version

(2) This command is processed in order of receipt. This command is not processed until the processing of the commands sent prior to this command is completed. Therefore, if this command is sent while the printer is in the state other than idle, the program version data may not be returned immediately.

Notes (1) This command is effective only for the serial interface (RS-232C). When this command is sent using Centronics, USB, or LAN, a response is returned via the serial interface (RS-232C).

6.3.33 PRINTER OPTION STATUS ACQUIRE COMMAND [ESC] WN

Function Sends the information what optional devices are installed, to the host.

Format [ESC] WN [LF] [NUL]

Explanation (1) The format of information to be returned to the host is as follows:

SOH	STX	"E"	Option status									ETX	EOT	CR	LF
01H	02H	45H	30H	30H	30H	30H	30H	30H	30H	30H	30H	03H	04H	0DH	0AH

- Reserved A, B, and C
- Internal serial port
  - 30H: Not installed.
  - 31H: RFID module (H1)
  - 32H: RFID module (U1)
  - 33H: Reserved.
  - 34H: RFID module (U2)
- Cutter
  - 30H: Not installed.
  - 31H: Installed. (Swing cutter)
- USB board
  - 31H: Installed. (Fixed)
- 100Base LAN board
  - 31H: Installed. (Fixed)
- PCMCIA Slot2
  - 30H: Not installed. (Fixed)
- PCMCIA Slot1
  - 30H: Not installed. (Fixed)

6.3.34 IP ADDRESS SET COMMAND [ESC] IP

Function Sets the IP address to be required for the network connection.

Format [ESC] IP; a, bbb, ccc, ddd, eee [LF] [NUL]

Term

a: IP address to be set
- 1: Reserved.
- 2: Printer IP address (Initial value: 192.168.10.20)
- 3: Gateway IP address (Initial value: 0.0.0.0)
- 4: Subnet mask (Initial value: 255.255.255.0)

bbb: First 8 bits: 000 to 255

ccc: Second 8 bits: 000 to 255

ddd: Third 8 bits: 000 to 255

eee: Last 8 bits: 000 to 255

Explanation The IP address setting can also be made in the system mode. The setting which was last made takes effect.

Example To set the printer IP address to “157.69.9.78”.

[ESC] IP; 2, 157, 069, 009, 078 [LF] [NUL]

6.3.35 SOCKET COMMUNICATION PORT SET COMMAND [ESC] IS

Function Enables or disables the socket communication, and sets the communication port number to be used.

Format [ESC] IS; a, bbbbb [LF] [NUL]

Term

a: 0: Socket communication is disabled.
1: Socket communication is enabled.

bbbbb: Port number (It must be set in 5 digits.)
00000 to 65535

Explanation These settings can also be made in the system mode. The setting which was last made takes effect.

Example To enable the socket communication and set the port number to “8000”.

[ESC] IS; 1, 08000 [LF] [NUL]

6.3.36 DHCP FUNCTION SET COMMAND [ESC] IH

Function Enables or disables the DHCP function, and sets the DHCP client ID.

Format [ESC] IH; a, bbbbbbbbbbbbbbbbbbbbbbbbbbbbbbbb [LF] [NUL]

Term

a: 0: DHCP function is disabled.
1: DHCP function is enabled.

bbbbbbbbbbbbbbbbbbbbbbbbbbbbbbbb: DHCP client ID
(16-byte data is described in 32-byte hexadecimal.)

Explanation

- These settings can also be made in the system mode. The setting which was last made takes effect.
- "FFH" in the client ID is assumed as a terminator. Therefore, "FFH" must not be used in data.
- If "FFH" is specified as the first byte of the DHCP client ID, the printer assumes the DHCP client ID has not been specified. So the printer uses the MAC address of the LAN board installed on the printer as the DHCP client ID instead.

Example To enable the DHCP function and set the DHCP client ID to "12H56HCDH".

[ESC] IH; 1, 1256CDFFFFFFFFFFFFFFFFFFFFFFFFFF [LF] [NUL]

6.3.37 PASS-THROUGH COMMAND [ESC] @002

Function	Passes the serial interface or LAN interface data through the internal serial port.
Format	[ESC] @002; aaa, bbb --- bbb [LF] [NUL]
Term	aaa: Number of bytes to be passed through 001 to 999 bbb --- bbb: Binary data to be passed through
Explanation	This command is used to make a serial communication with the RF-ID module. The number of bytes of data specified by this command is output to the internal serial interface (CN6: RF-ID) without being processed. Data received from the internal serial interface (CN6: RF-ID) is output to the serial interface or the LAN interface.

6.3.38 INTERNAL SERIAL INTERFACE PARAMETER SET COMMAND [ESC] IZ

Function Sets communication parameters for the internal serial interface.

Format [ESC] IZ; a, b, c, d [LF] [NUL]

Term

a: Communication speed
- 0: 2400 bps
- 1: 4800 bps
- 2: 9600 bps
- 3: 19200 bps

b: Data length
- 0: 7 bits
- 1: 8 bits

c: Stop bit length
- 0: 1 bit
- 1: 2 bits

d: Parity
- 0: None
- 1: Even
- 2: Odd

Explanation The settings by this command take effect immediately after this command has been analyzed. (A restart of the printer is not required.) This command is stored into memory and is retained even if the power is turned OFF.

When a communication error occurs on the internal serial interface, the ON LINE LED goes off and the ERROR LED goes ON. A mMessage, “INTERNAL COM ERR”, is displayed on the upper line of the LCD, and then the printer stops due to an error.

Example To set the communication speed, the data length, the stop bit length, and the parity to 9600 bps, 8 bits, 1 bit, and even parity, respectively.

[ESC] IZ; 2, 1, 0, 1 [LF] [NUL]

6.4 COMMANDS FOR SYSTEM ADMINISTRATOR

6.4.1 PARAMETER SET COMMAND [ESC] Z2; 1

Function: Sets each parameter on the printer.

Format: [ESC] Z2; 1, abcdefghijkklmnooppqqrstuuvwxyzABCDEFGHIJKLM [LF] [NUL]

Term:

a: Character code selection
- 0: PC-850
- 1: PC-852
- 2: PC-857
- 3: PC-8
- 4: PC-851
- 5: PC-855
- 6: PC-1250
- 7: PC-1251
- 8: PC-1252
- 9: PC-1253
- A: PC-1254
- B: PC-1257
- C: LATIN9
- D: Arabic
- E: PC-866
- F: UTF-8

b: Character “0” selection
- 0: 0 (without slash)
- 1: Ø (with slash)

c: RS-232C communication speed
- 0: 2400 bps
- 1: 4800 bps
- 2: 9600 bps
- 3: 19200 bps
- 4: 38400 bps
- 5: 115200 bps

d: RS-232C data length
- 0: 7 bits
- 1: 8 bits

e: Stop bit length
- 0: 1 bit
- 1: 2 bits

f: RS-232C parity check
- 0: NONE
- 1: EVEN
- 2: ODD

g: RS-232C flow control

0: XON/XOFF protocol
(XON is not output at a power on time, and XOFF is not output at a power off time.)
1: READY/BUSY (DTR) protocol
(XON is not output at a power on time, and XOFF is not output at a power off time.)
2: XON/XOFF + READY/BUSY (DTR) protocol:
(XON is output at a power on time, and XOFF is output at a power off time.)
3: XON/XOFF protocol:
(XON is output at a power on time, and XOFF is output at a power off time.)
4: RTS protocol
(XON is not output at a power on time, and XOFF is not output at a power off time.)

h: Language for LCD messages

0: ENGLISH
1: GERMAN
2: FRENCH
3: DUTCH
4: SPANISH
5: JAPANESE
6: ITALIAN

i: Automatic forward feed standby after an issue

0: OFF (Not performed)
1: ON (Performed)

j: Fine adjustment direction for the stop position of the forward feed standby

+: Increases the amount of the forward feed
–: Decrease the amount of the forward feed

kk: Fine adjustment value for the stop position of the forward feed standby
00 to 50 (in units of 0.1 mm, in steps of 0.5 mm) (*1)

l: Head-up operation in the cut issue mode

0: OFF (Head-up operation is not performed.)
1: ON (Head-up operation is performed.)

m: Ribbon saving function

0: OFF (Not used)
1: ON (Head lever position is “TAG”)
2: ON (Head lever position is “LABEL”)

n: Type of control code

0: Automatic selection
1: ESC, LF, NUL mode
2: {, |, } mode
3: Any set code mode

oo: 1st byte code of the control code (*2)
“00” to “FF” (Specify the hex code in 2-byte ASCII code.) (*3)

pp: 2nd byte code of the control code (*2)
“00” to “FF” (Specify the hex code in 2-byte ASCII code.) (*3)

qq: 3rd byte code of the control code [*2]
"00" to "FF" (Specify the hex code in 2-byte ASCII code.) [*3]

r: Strip wait status selection
0: OFF (No selection)
1: ON (with selection)

s: [FEED] key function
0: FEED: Feeds one label.
1: PRINT: Prints data of the image buffer on one label.

t: Kanji code selection
0: TYPE1
1: TYPE2

uu: Euro code setting
"20" to "FF" (Specify the hexadecimal code in 2-byte ASCII code) [*3]

v: Automatic head broken dots check
0: OFF (An automatic broken dots check is not performed when the power is turned on.)
1: ON (An automatic broken dots check is performed when the power is turned on.)

w: Centronics ACK/BUSY timing setting
0: TYPE1
1: TYPE2

x: Web printer function setting
0: OFF (Web printer function is disabled.)
1: ON (Web printer function is enabled.)

y: Reset process when the nInit signal is ON
0: OFF (Reset process is not performed.)
1: ON (Reset process is performed.)

z: Ribbon near end detection setting
0: Not detected.
1: Reserved.
2: Reserved.

A: Expansion I/O operation mode setting
0: Standard mode
1: In-line mode

B: Centronics operation mode setting
0: SPP (Compatibility mode)
1: Reserved

C: Plug-and-play operation mode setting
0: OFF (Plug-and-play operation is disabled.)
1: ON (Plug-and-play operation is enabled.)

D: Label end/ribbon end process setting
0: TYPE1 (When the label end state is detected, the printer stops even if it is printing a label.)
1: TYPE2 (When the label end state is detected, the printer stops after it completes printing a label.)

E: Pre-strip process setting
0: OFF (The pre-strip process is not performed.)
1: Reserved.

F: Reverse feed speed setting
0: 3 ips
1: 2 ips

G: Installed solenoid type setting
0: TYPE 1
1: Reserved

H: MaxiCode specification setting
0: TYPE1 (Compatible with the current version)
1: TYPE2 (Special specification)

I: Reserved
0: Reserved.
1: Reserved

J: Ribbon type selection
0: Transparent ribbon
1: Non-transparent ribbon

K: Media sensor type selection
0: Center (Fixed sensor)
1: Edge (Movable sensor)

L: Strip motor torque setting
0: R0 Standard (For standard paper)

M: Stabilizer setting
0: OFF (Not activated.)
1: ON (Activated only when the direct thermal print method is selected. When the thermal transfer is selected, the stabilizer is not activated.)

Explanation

(1) This command is not executed until the printer enters an idle state.

(2) With some exceptions, the parameters set by this command take effect when the power is turned on or the printer is reset.

(*1): Fine adjustment value will be effective only when “Automatic forward feed standby after an issue” is set to ON (Performed). The value is discarded when this parameter is set to OFF (Not performed.

(*2) 1st to 3rd byte codes will be effective only when “Type of control code” is set to “3: Any set code mode”. They are discarded when any other setting (0, 1, or 2) is selected.

(*3) The hexadecimal codes are set in 2-byte ASCII code as shown below:

Example 1: To set 36H: ”36” (33H, 36H)
Example 2: To set 42H: ”42” (34H, 32H)
Example 3: To set FFH: ”FF” (46H, 46H)

6.4.2 FINE ADJUSTMENT VALUE SET COMMAND [ESC] Z2; 2

Function Sets various fine adjustment values on the printer.

Format [ESC] Z2; 2, abbbcdddeffghhhijjkllmnnoppqqrr [LF] [NUL]

Term

a: Indicates the direction, forward or backward, in which a feed stop position fine adjustment is to be made.
+: Backward
−: Forward

bbb: Feed amount fine adjustment value
000 to 500 (in units of 0.1 mm)

c: Indicates the direction, forward or backward, in which a cut position (or strip position) fine adjustment is to be made.
+: Backward
−: Forward

ddd: Fine adjustment value for the cut position (or strip position)
000 to 500 (in units of 0.1 mm)

e: Indicates whether the reverse feed is to be increased or decreased.
+: Increase
−: Decrease

ff: Reverse feed amount fine adjustment value
00 to 95 (in units of 0.1 mm)

g: Indicates the direction, left or right, in which the X-coordinate fine adjustment is to be made.
+: Positive direction (Right)
−: Negative direction (Left)

hhh: X-coordinate fine adjustment value
000 to 995 (in units of 0.1 mm)

i: Indicates whether to increase or decrease the print tone in the thermal transfer print mode.
+: Increase (darker)
−: Decrease (lighter)

jj: Print tone fine adjustment value (for the thermal transfer print mode)
00 to 10 (in units of 1 step)

k: Indicates whether to increase or decrease the print tone in the direct thermal print mode.
+: Increase (darker)
−: Decrease (lighter)

ll: Print tone fine adjustment value (for the direct thermal print mode)
00 to 10 (in units of 1 step)

m: Fine adjustment direction for the ribbon take-up motor voltage
−: Fixed as Negative (The voltage is lowered.)

nn: Fine adjustment value for the ribbon take-up motor voltage
00 to 15 (in units of 1 step)

o: Fine adjustment direction for the ribbon feed motor voltage
−: Negative (The voltage is lowered.)
+: Positive (The voltage is raised.)

pp: Fine adjustment value for the ribbon feed motor voltage
00 to 15 (Negative direction, in units of 1 step)
00 to 10 (Positive direction, in units of 1 step)

qq: Reflective sensor manual threshold fine adjustment value
00 to 40 (in units of 0.1 V)

rr: Transmissive sensor manual threshold fine adjustment value
00 to 40 (in units of 0.1 V)

Explanation

(1) This command is not executed until the printer enters an idle state.

(2) With some exceptions, the parameters set by this command take effect when the power is turned on or the printer is reset.

6.4.3 RFID PARAMETER SET COMMAND [ESC] Z2; 3

Function Sets RFID related parameters on the printer.

Format [ESC] Z2; 3, abbcdddeeeffggghhijjkkkllmnnooppq [LF] [NUL]

Term

a: RFID module type selection
- 0: Not installed.
- 1: Reserved.
- 2: Reserved.
- 3: Reserved.
- 4: U2 (B-SX708-RFID-U2-✶✶-R)
- 5: Reserved.

bb: Tag type
- 00: None
- 24: EPC Class 1 Generation 2

c: RFID error tag detection ((Invalid from firmware V1.4. This is programmed in the printer system mode)
- 0: Not detected.
- 1: Detected.

ddd: Max. number of RFID issue retries
000 to 255

eee: Max. number of RFID read retries
000 to 255

ff: RFID read retry time-out
00 to 99 (In units of 0.1 sec.: 0.0 sec. to 9.9 sec.)

ggg: Max. number of RFID write retries
000 to 255

hh: RFID write retry time-out
00 to 99 (In units of 0.1 sec.: 0.0 sec. to 9.9 sec.)

i: Feed direction of adjustment for retry
- +: Backward
- –: Forward

jj: Feed amount of adjustment for retry
00 to 99 (In units of 1 mm: 0 mm to 99 mm)
Only the value of –3 mm or less, or +3 mm or more becomes effective.

kkk: RFID wireless power level
009 to 018

ll: RFID AGC threshold setting
00 to 15

m: RFID channel setting (Reserved: Invalid for the B-SX708-RFID-U2-★★-R)
0: AUTO
1: 2CH
2: 3CH
3: 4CH
4: 5CH
5: 6CH
6: 7CH
7: 8CH

nn: Q value setting
00 to 15

oo: AGC threshold for data write
00 to 15

pp: AGC threshold lower limit for retry
00 to 15

q: Hibiki tag multi-word write setting
0: Disabled
1: Enabled

Explanation

(1) This command is not executed until the printer enters an idle state.

(2) The parameters set by this command take effect when the power is turned on or the printer is reset.

6.4.4 BATCH RESET COMMAND [ESC] Z0 (zero)

Function	Resets the printer.
Format	[ESC] Z0 [LF] [NUL]
Explanation	• This command is not executed until the printer enters an idle state.
	• Some values in the Parameter Set Command ([ESC] Z2;1) or the Fine Adjustment Value Set Command ([ESC] Z2;2), will take effect when the printer is initialized. This command should be sent after the Parameter Set Command ([ESC] Z2;1) or Fine Adjustment Value Set Command ([ESC] Z2;2) is sent.

6.5 EXPLANATION OF THE REAL TIME CLOCK (RTC)

Function

Counts the date (year-month-day) and time (hour-minute-second) (A function to automatically adjust a leap year is provided.)

As long as a battery is loaded, the date and time is retained and updated even after the power is turned off.

Note

(1) Be sure to load the battery whenever the real time clock is used.

(2) If the battery is not loaded or the battery voltage is low, the real time clock data is erased at the power off time.

(3) When the low battery check function is set to ON and if the battery voltage is 1.9V or less, the printer will stop at the power on time. In that case, a restart operation is not available. Hold down the **[RESTART]** key to enter the user system mode.

(4) The factory default setting for the low battery check function is OFF.

(5) Set the low battery check function to ON whenever the real time clock is used.

(6) While the low battery check function is OFF, the RTC is usable even in a low battery state. However, once the power is turned off, it is required to set the RTC settings again when the power is turned back to on.

(7) When the RTC renewal timing is set to “PAGE”, on-the-fly issue is disabled. Even if the print count is specified to more than one for a issue command, the printer stops one by one.

6.5.1 REAL TIME CLOCK SETTING COMMAND [ESC] JT

Function Sets the date and time for the real time clock.

Format [ESC] JT; aabbccddeeff [LF] [NUL]

Term

aa: Year (Lower two digits)
Fixed to 2 digits
00 to 99

bb: Month
Fixed to 2 digits
01 to 12

cc: Day
Fixed to 2 digits
01 to 31 (Setting a value which is not proper for year and month results in an error.)

dd: Hour
Fixed to 2 digits
00 to 23

ee: Minute
Fixed to 2 digits
00 to 59

ff: Second
Fixed to 2 digits
00 to 59

Explanation

(1) Right after setting the date and time by this command, the real time clock will be updated.

(2) The factory default date and time is not correct, be sure to set these data before using the real time clock.

(3) When the year is a multiple of 4, it is considered as a leap year, and a leap year day (29) is added to February.

(4) The date and time will not be cleared by a parameter clear.

Example To set the real time clock to February 8, 2001, 15:20:59.

[ESC] JT; 010208152059 [LF][NUL]

How to print the date and time

Date and time can be printed by specifying a link field in the following command.

In this case, do not enable the INC/DEC or Zero Suppression.

- Bit Map Font Format Command {PC
- Outline Font Format Command {PV
- Bar Code Format Command {PB

Format

[ESC]PCaaa; - - - (snip) - - -;$ss_1ss_2ss_3$, - - - - - - ss_{20}) [LF] [NUL]
[ESC]PVaaa; - - - (snip) - - -;$ss_1ss_2ss_3$, - - - - - - ss_{20}) [LF] [NUL]
[ESC]PBaaa; - - - (snip) - - -;$ss_1ss_2ss_3$, - - - - - - ss_{20}) [LF] [NUL]

ss: Month
D01: Day (DD)
D02: Month (MM)
D03: Year (YY)
T01: Hour (HH)
T02: Minute (MM)
T03: Second (SS)

It is possible to combine the date and time data with character strings when a link field format is used.

Example

When the real time clock data is February 28, 2001, 15:20:29.

[ESC]PC001;0100,0100,2,2,G,00,B;D01,02,D02,02,D03,01,T01,04,T02,04,T03 [LF][NUL]

[ESC]RC; [LF]/[LF} - [LF}:[LF}.[LF][NUL]

Print result: 28/02/01 15:20:29

6.6 EXPLANATION OF THE RFID RELATED COMMANDS

6.6.1 RFID TAG POSITION ADJUSTMENT COMMAND [ESC] @003

Function

Sets the feed amount to adjust the RFID tag position before writing data onto it.
If the RFID tag is not positioned just above the RFID antenna when the paper is at the print start position, the printer automatically feeds the paper forward or backward by the specified amount to write data onto the RFID tag prior to printing.
Also, specifies the offset printing function which enables printing and writing data on short-pitch tags at the same time.

Format

[ESC] @003; abbbb(, c) [LF] [NUL]

Term

a: Feed direction
- +: Backward
- −: Forward

bbbb: Feed amount
0000 to 9999 (In units of 0.1 mm)

c: Offset printing (Omissible)
- 0: Offset printing is not performed (normal operation). (Default)
- 1: Offset printing is performed without a reverse feed of the first label.
- 2: Offset printing is performed with a reverse feed of the first label.

Explanation

(1) The printer automatically feeds paper forward or backward before writing data onto the RFID tag as specified in this command. After that, the printer returns the paper to the print start position for printing.

(2) Only the value of −30 or less, or +30 or more becomes effective.

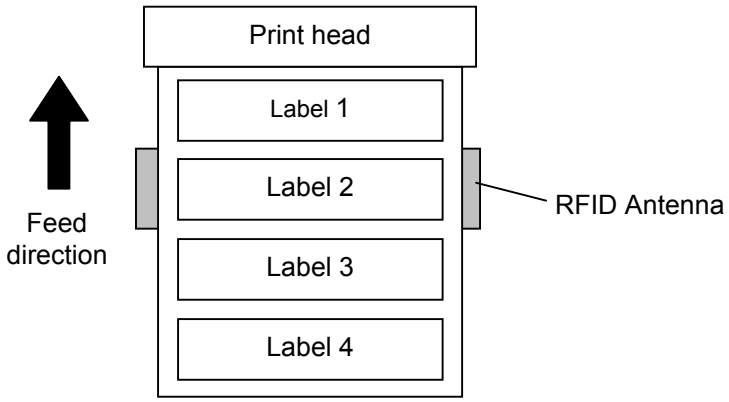
(3) When the head up function has been enabled, it will be performed when the feed amount is set to −50 or less, or +50 or more.

(4) Transmitting the Image Buffer Clear Command clears the settings of this command.

(5) This command is ignored for on-the-fly issues.

(6) When a tag position adjustment is executed by this command on a printer with an optional strip unit fitted, a reverse feed cannot be performed properly. The printer action on this condition does not meet the specification.

(7) The offset printing is a function that the printer prints on a label while writing data onto the tag of a next label. This is useful to continuously issue multiple RFID labels.
In the case of short-pitch labels, when a next label (Label 2) is supposed to be positioned just above the antenna while the previous label (Label 1) is at the print position, enabling the offset printing eliminates a need for a reverse feed to the tag write position, causing the total throughput to increase.



When print data for several labels is transmitted to the printer, how the printer performs printing and data write is explained for each of the offset printing parameter options using the above illustration, as follows.

[0:Offset printing is not performed. (Normal operation)] (When two labels are issued.)

(1) The printer feeds the labels in the reverse direction for the amount specified by @003 command. The feed amount should be the distance between the print start position and the antenna position.
(2) Data is written onto the tag of Label 1.
(3) The printer feeds the labels in the forward direction for the same amount as Step (1) to return Label 1 to the print start position.
(4) Label 1 is printed. If a data write to Label 1 failed, the void patter is printed on Label 1.
(5) The printer feeds the labels in the reverse direction for the amount specified by @003 command.
(6) Data is written onto the tag of Label 2.
(7) The printer feeds the labels in the forward direction for the same amount as Step (5) to return Label 2 to the print start position.
(8) Label 2 is printed. If a data write to Label 2 failed, the void pattern is printed on Label 2.

[1:Offset printing is performed without a reverse feed of the first label.] (When two labels are issued.)

(1) The printer feeds the labels in the forward/reverse direction for the amount specified by @003 command. This feed is to adjust the position of Label 2 so that it is positioned just above the antenna when Label 1 is at the print start position. When the feed amount is set to 0, the printer does not feed the labels.
(2) Data is written onto the tag of Label 2.
(3) The printer feeds one label in the forward direction.
(4) Data is written onto the tag of Label 3.
(5) The printer feeds the labels in the forward/reverse direction for the same amount as Step (1) to return Label 2 to the print start position.
(6) Label 2 is printed. If a data write to Label 2 failed, the void patter is printed on Label 2.
(7) Label 3 is printed. If a data write to Label 3 failed, the void pattern is printed on Label 3.

Note: This mode wastes Label 1.

[2:Offset printing is performed with a reverse feed of the first label.] (When two labels are issued.

(1) The printer feeds the labels in the reverse direction for the amount specified by @003 command plus one label pitch so that Label 1 is positioned just above the antenna.
(2) Data is written onto the tag of Label 1.
(3) The printer feeds one label in the forward direction.
(4) Data is written onto the tag of Label 2.
(5) The printer feeds the labels in the forward direction for the same amount as Step (1) to return Label 1 to the print start position.
(6) Label 1 is printed. If a data write to Label 1 failed, the void pattern is printed on Label 1.
(7) Label 2 is printed. If a data write to Label 2 failed, the void pattern is printed on Label 2.

6.6.2 RFID TAG READ COMMAND [ESC] WF

Function Reads the data stored on the RFID tag which is positioned just above the antenna.

Format [ESC] WF (; Naaaa) (, Abbb) (, Tcc) (, Id) (,Jeeeeeeee) (,Xfgggggggg…) [LF] [NUL]

Term

Naaaa: Number of bytes to be read (Omissible)
0001 to 4096
When omitted, the number of bytes specified for the tag to be used is set.

Abbb: Address of data to be read (Omissible)
000 to 999
The address where reading the RFID tag is started is specified.
When omitted, the value will be set to 0.

Tcc: Type of tag (Omissible)
00: None
24: EPC Class 1 Generation 2
Designates the type of RFID tag from which data is to be read.
When omitted, the tag type set in system mode will be designated.
In accordance with the tag type designated by this setting, the tag type set in system mode changes.
When “00: NONE” is designated, the backed up tag type will be set, and the system mode setting will not be changed.

Id: RFID read mode (Omissible)
1: TID bank and user bank are read.
2: Only EPC bank is read.
3: EPC bank, TID bank, and user data are read.
When omitted, TID bank and user data will be read. When the tag type is Gen2, user data equals to TID bank + user bank, and tag ID equals to EPC bank.

Jeeeeeeee: Access to the password-protected tags (Omissible)
Fixed to 8-digit hexadecimal number
00000000 to FFFFFFFF
Accesses the password-protected tags.

Xfgggggggg: User block access password execution setting (Effective only when the Hibiki tag is used.)
Designates a password to access and read a tag of which user block is read-locked.
Up to five user blocks can be specified continuously.
For example: X4AABBCCDD,X5BBCCDDEE,X6CCDDEEFF

f: Designates a user area bank. (4 to 8)
4: Bank4 (User block 1)
5: Bank5 (User block 2)
6: Bank6 (User block 3)
7: Bank7 (User block 4)
8: Bank8 (User block 5)

gggggggg: User block access password
Fixed to 8-digit hexadecimal number
00000000 to FFFFFFFF

Explanation

(1) The parameter, “Number of bytes to be read”, is effective only when RFID read mode is set to 1 or 3, as this parameter is intended for reading user data. When reading EPC bank, this parameter is ignored.

(2) When the value exceeding the maximum number of bytes storable in a tag is designated for “Number of bytes to be read”, a read error results.

(3) When the number of bytes to be read is omitted, the specified number of data bytes of the TID bank + user bank, and the EPC bank will be returned in accordance with the tag types, as shown in the table below.

Tag type	Number of TID bank + user bank bytes
EPC Class 1 Generation 2	8 bytes

Tag type	Number of EPC bank bytes
EPC Class 1 Generation 2	8 bytes or 12 bytes

As the TID & User area differs depending on the tag manufacturers, refer to the memory map of each tag.

(4) The format of information to be returned to the host is as follows.

SOH	01H	Start of the status block
STX	02H	
“F”	46H	
Tag type	30H	30H30H: Reading failed. 32H34H: EPC Class 1 Generation 2
	30H	
Data	---	Tag data (0 bytes to 9999 bytes)
ETX	03H	End of the status block
EOT	04H	
CR	ODH	
LF	OAH	

Example

Examples of the status to be returned are shown below. (The number of bytes to be read is omitted.)

[When a reading failed.]

Header		"F"	Tag type		Footer			
01H	02H	46H	30H	30H	03H	04H	0DH	0AH

Reading has failed.

[When a reading succeeded. (When RFID read mode=1 or omitted.)]

Header		"F"	Tag type		TID + User data (8 bytes)								Footer			
01H	02H	46H	32H	34H	41H	42H	43H	xxH	xxH	44H	45H	46H	03H	04H	0DH	0AH

Read data "ABC···DEF"

Tag type: EPC Class 1 Generation 2

[When a reading succeeded. (When RFID read mode=2.)]

Header		"F"	Tag type		EPC Data (8 or 12 bytes)								Footer			
01H	02H	46H	32H	34H	31H	32H	33H	34H	35H	36H	37H	38H	03H	04H	0DH	0AH

Read data "12345678"

Tag type: EPC Class 1 Generation 2

[When a reading succeeded. (When RFID read mode=3.)]

Header		"F"	Tag type		EPC + TID + User data (8 bytes + 8 bytes)								Footer			
01H	02H	46H	32H	34H	31H	32H	xxH	xxH	xxH	44H	45H	46H	03H	04H	0DH	0AH

Read data "123···678ABC···DEF"

Tag type: EPC Class 1 Generation 2

6.6.3 RFID VOID PATTERN PRINT COMMAND [ESC] @006

Function — Prints the void pattern to indicate an RFID tag error.

Format — [ESC] @006 [LF] [NUL]

Explanation

(1) The void pattern is printed according to the currently set label size.

(2) After the void pattern is printed, the print data image is still retained.

(3) This void pattern is printed when data cannot be written onto the RIFD tag properly due to breakage of RFID chip or some other reasons. The void pattern visually indicates that the RFID tag is faulty.

(4) Usually, the void pattern is automatically printed if writing data onto the RFID tag results in an error, therefore, this command does not need to be transmitted.
This command is intended to be used if writing data onto the RFID tag failed while the BASIC interpreter or the Pass Through Command is used and the RFID module is manually controlled to issue RFID labels.

(5) The paper printed by this command is cut one by one.

(6) The status indicating the end of the void pattern printing caused by this command is 60 (end of the void pattern printing).

(7) Even when an image buffer clear command is sent after this command, void pattern image is not cleared and the printer prints the void pattern.

6.6.4 RFID DATA WRITE COMMAND [ESC] @012

Function

Writes a specified data onto an RFID tag. No printing is performed.
The result of a data write is notified by returning a detailed status.

Format

[ESC]@012; a (,Abbb) (,Pd) (,Fe) (,Tff) (,Dgg) (,Gh) (,Riiiiiiii) (,kjjjjjjjj) (,Lkk) (,Jllllllll) (,Vm) (,Bnn) (,Hopppppppp · · ·) (,Qqrstuvw · · ·) (,Xxyyyyyyyy · · ·) (=ooo------ooo) [LF] [NUL]

Term

a: Data write parameter
w: Data is written onto an RFID tag.

Abbb: Address where the data is written (Omissible)
000 to 999
Designates the address where data starts to be written.
When omitted, this parameter will be set to 0.

Pd: Partition number (Omissible)
0 to 6
This parameter is effective only when EPC format is designated.
When omitted, 5 will be set.

Fe: Filter number (Omissible)
0 to 7
This parameter is effective only when EPC format is designated. When omitted, 0 will be set.

Tff: Tag type (Omissible)
00: None
24: EPC Class 1 Generation 2
Designates the type of RFID tag onto which data is to be written.
When omitted, the tag type set in the system mode will be designated.
In accordance with the tag type designated by this setting, the tag type set in the system mode changes.
When “00: NONE” is designated, the backed up tag type will be designated, and the system mode setting will not be changed.

Dgg: EPC format (Omissible)
00: No format (When omitted)
10: GID-96
11: SGTIN-64
12: SGTIN-96
13: SSCC-64
14: SSCC-96
15: SGLN-64
16: SGLN-96
17: GRAI-64
18: GRAI-96
19: GIAI-64
20: GIAI-96
21: DoD-64
22: DoD-96
23: SGTIN-198
24: SGLN-195
25: GRAI-170
26: GIAI-202

Gh: Data type (Omissible)
0: No conversion of data (Default)
1: Conversion to binary
2: Conversion to hexadecimal

Riiiiiiii: Access password setting (Omissible)
Fixed to 8-digit hexadecimal number
00000000 to FFFFFFFF
Sets a password to access tags.

Kjjjjjjjj: Kill password setting (Omissible)
Fixed to 8-digit hexadecimal number
00000000 to FFFFFFFF
Sets a kill password for tags.

Lkk: Lock/unlock setting (Omissible)

	Kill password	Access password	EPC code	TID	User data
00	Unlocked	Unlocked	Unlocked	Unlocked	Unlocked
01	Locked	Unlocked	Unlocked	Unlocked	Unlocked
02	Unlocked	Locked	Unlocked	Unlocked	Unlocked
03	Locked	Locked	Unlocked	Unlocked	Unlocked
04	Unlocked	Unlocked	Locked	Unlocked	Unlocked
05	Locked	Unlocked	Locked	Unlocked	Unlocked
06	Unlocked	Locked	Locked	Unlocked	Unlocked
07	Locked	Locked	Locked	Unlocked	Unlocked
08	Unlocked	Unlocked	Unlocked	Locked	Unlocked
09	Locked	Unlocked	Unlocked	Locked	Unlocked
10	Unlocked	Locked	Unlocked	Locked	Unlocked
11	Locked	Locked	Unlocked	Locked	Unlocked
12	Unlocked	Unlocked	Locked	Locked	Unlocked
13	Locked	Unlocked	Locked	Locked	Unlocked
14	Unlocked	Locked	Locked	Locked	Unlocked
15	Locked	Locked	Locked	Locked	Unlocked
16	Unlocked	Unlocked	Unlocked	Unlocked	Locked
17	Locked	Unlocked	Unlocked	Unlocked	Locked
18	Unlocked	Locked	Unlocked	Unlocked	Locked
19	Locked	Locked	Unlocked	Unlocked	Locked
20	Unlocked	Unlocked	Locked	Unlocked	Locked
21	Locked	Unlocked	Locked	Unlocked	Locked
22	Unlocked	Locked	Locked	Unlocked	Locked
23	Locked	Locked	Locked	Unlocked	Locked
24	Unlocked	Unlocked	Unlocked	Locked	Locked
25	Locked	Unlocked	Unlocked	Locked	Locked
26	Unlocked	Locked	Unlocked	Locked	Locked
27	Locked	Locked	Unlocked	Locked	Locked
28	Unlocked	Unlocked	Locked	Locked	Locked
29	Locked	Unlocked	Locked	Locked	Locked
30	Unlocked	Locked	Locked	Locked	Locked
31	Locked	Locked	Locked	Locked	Locked
32	Unlocked	Unlocked	Unlocked	Unlocked	Unlocked
33	Permanent lock	Unlocked	Unlocked	Unlocked	Unlocked
34	Unlocked	Permanent lock	Unlocked	Unlocked	Unlocked
35	Permanent lock	Permanent lock	Unlocked	Unlocked	Unlocked
36	Unlocked	Unlocked	Permanent lock	Unlocked	Unlocked
37	Permanent lock	Unlocked	Permanent lock	Unlocked	Unlocked
38	Unlocked	Permanent lock	Permanent lock	Unlocked	Unlocked
39	Permanent lock	Permanent lock	Permanent lock	Unlocked	Unlocked
40	Unlocked	Unlocked	Unlocked	Permanent lock	Unlocked
41	Permanent lock	Unlocked	Unlocked	Permanent lock	Unlocked
42	Unlocked	Permanent lock	Unlocked	Permanent lock	Unlocked
43	Permanent lock	Permanent lock	Unlocked	Permanent lock	Unlocked
44	Unlocked	Unlocked	Permanent lock	Permanent lock	Unlocked
45	Permanent lock	Unlocked	Permanent lock	Permanent lock	Unlocked

46	Unlocked	Permanent lock	Permanent lock	Permanent lock	Unlocked
47	Permanent lock	Permanent lock	Permanent lock	Permanent lock	Unlocked
48	Unlocked	Unlocked	Unlocked	Unlocked	Permanent lock
49	Permanent lock	Unlocked	Unlocked	Unlocked	Permanent lock
50	Unlocked	Permanent lock	Unlocked	Unlocked	Permanent lock
51	Permanent lock	Permanent lock	Unlocked	Unlocked	Permanent lock
52	Unlocked	Unlocked	Permanent lock	Unlocked	Permanent lock
53	Permanent lock	Unlocked	Permanent lock	Unlocked	Permanent lock
54	Unlocked	Permanent lock	Permanent lock	Unlocked	Permanent lock
55	Permanent lock	Permanent lock	Permanent lock	Unlocked	Permanent lock
56	Unlocked	Unlocked	Unlocked	Permanent lock	Permanent lock
57	Permanent lock	Unlocked	Unlocked	Permanent lock	Permanent lock
58	Unlocked	Permanent lock	Unlocked	Permanent lock	Permanent lock
59	Permanent lock	Permanent lock	Unlocked	Permanent lock	Permanent lock
60	Unlocked	Unlocked	Permanent lock	Permanent lock	Permanent lock
61	Permanent lock	Unlocked	Permanent lock	Permanent lock	Permanent lock
62	Unlocked	Permanent lock	Permanent lock	Permanent lock	Permanent lock
63	Permanent lock	Permanent lock	Permanent lock	Permanent lock	Permanent lock

Designates the areas to be locked. When omitted, no areas are locked.

JIIIIIIII: Access to the password-protected tags (Omissible)
Fixed to 8-digit hexadecimal number
00000000 to FFFFFFFF
Accesses the password-protected tags.

Vm: Write data verify designation (Omissible)
0: Verification disabled (When omitted.)
1: Verification enabled
This parameter verifies if data has been written successfully. Select “1” (Verification enabled) for tags which may generate a phenomenon that the written data may not be the same as actual data even when an issue has successfully completed. When “1” is selected, it takes more time than when “0” (Verification disabled) is selected.

Bnn: Designates the area where the data is written (Omissible)
00: Bank0 (Reserved area)
01: Bank1 (EPC area) (When omitted)
02: Bank2 (TID area)
03: Bank3 (User area)
04: Bank4 (User block 1)
05: Bank5 (User block 2)
06: Bank6 (User block 3)
07: Bank7 (User block 4)
08: Bank8 (User block 5)
} (Effective only when Hibiki tag is used.)

The area where data can be written differs depending on tag types.
When selecting the area other than Bank 1 (EPC area), designation of a format becomes invalid.

Hopppppppp: User block password setting (Effective only when Hibiki tag is used.)
Designates a password to lock certain user blocks.
Up to five user blocks can be specified continuously.
For example: H4AABBCCDD,H5BBCCDDEE,H6CCDDEEFF

o: Designates a user area bank (4 to 8)
4: Bank4 (User block 1)
5: Bank5 (User block 2)
6: Bank6 (User block 3)
7: Bank7 (User block 4)
8: Bank8 (User block 5)

pppppppp: User block password
Fixed to 8-digit hexadecimal number
00000000 to FFFFFFFF

Qqrstuvw: Area lock designation (Effective only when Hibiki tag is used.)
Designates an area lock type.
Area lock type can be specified for up to eight areas continuously.
For example: Q1100000,Q4101010,Q5100010, which indicates:
Bank1:Read lock, Bank4:Read lock, Write lock, Password read/write lock
Bank5:Read lock, Password read/write lock

q: Area bank designation (1 to 8)
1: Bank1 (EPCC/UII bank)
2: Bank2 (TID bank)
3: Bank3 (User area)
4: Bank4 (User block 1)
5: Bank5 (User block 2)
6: Bank6 (User block 3)
7: Bank7 (User block 4)
8: Bank8 (User block 5)

r: Read lock designation
0: Disabled
1: Enabled

s: Read permanent lock designation
0: Disabled
1: Enabled

t: Write lock designation (Effective to Bank4 to Bank8 only)
0: Disabled
1: Enabled

u: Write permanent lock designation (Effective to Bank4 to Bank8 only)
0: Disabled
1: Enabled

v: User block password read/write lock designation (Effective to Bank4 to Bank8 only)
0: Disabled
1: Enabled

w: User block password read/write permanent lock designation (Effective to Bank4 to Bank8 only)
0: Disabled
1: Enabled

NOTES:

1. *Once a permanent lock is enabled for parameter s, u, or w, any subsequent change is disabled.*
2. *When read/write permanent lock is selected, a read/write lock state is retained. To permanently prohibit reading/writing a tag, enable both the read/write lock and the read/write permanent lock. The setting which disables the read/write lock and enables the read/write permanent lock allows the tag to be read/written permanently.*

Xxyyyyyyyy: User block access password execution setting (Effective only when Hibiki tag is used.)
Designates a password to access and write a tag of which user block is write-locked.
Up to five user blocks can be specified continuously.
For example: X4AABBCCDD,X5BBCCDDEE,X6CCDDEEFF

x: Designates a user area bank. (4 to 8)
4: Bank4 (User block 1)
5: Bank5 (User block 2)
6: Bank6 (User block 3)
7: Bank7 (User block 4)
8: Bank8 (User block 5)

yyyyyyyy: User block access password
Fixed to 8-digit hexadecimal number
00000000 to FFFFFFFF

ooo---ooo: Print data string
Max. 512 digits, but the number of digits to be written is different depending on the tag types.

The result of a data write is returned in the following format.

SOH	01H	Indicates the start of the status block
STX	02H	
Status	30H	36H33H: Writing data succeeded. (“63”) 36H34H: Writing data failed. (“64”)
	30H	
	35H	Fixed to 5 (RFID status)
Remaining count	30H	Remaining issue count (0000 to 9999)
	30H	
	30H	
	30H	
ETX	03H	Indicates the end of the status block.
EOT	04H	
CR	0DH	
LF	0AH	

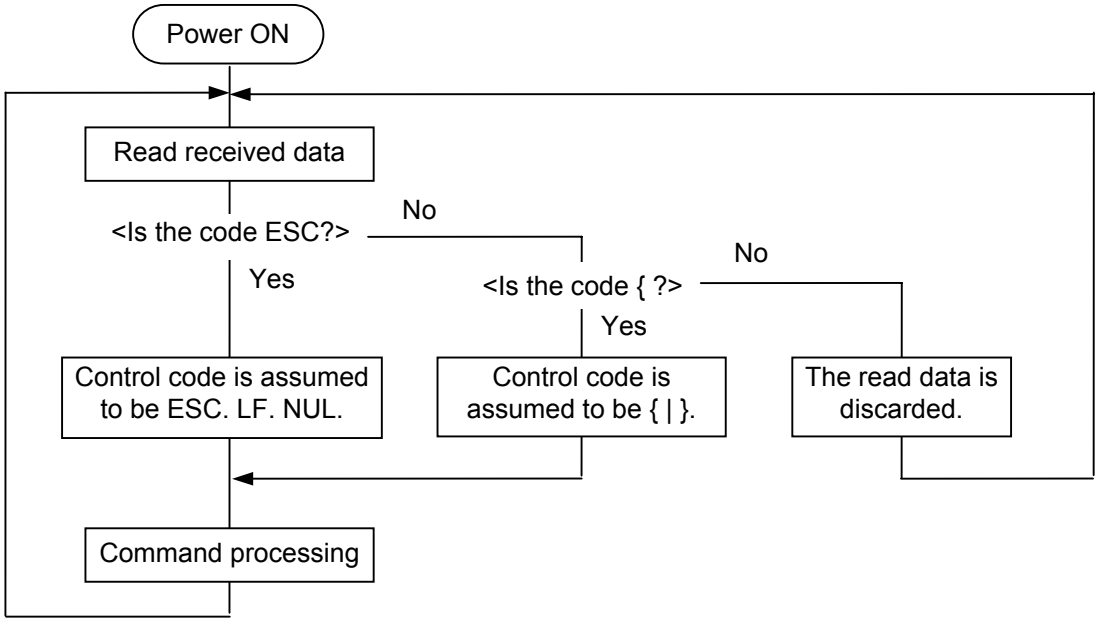
7. CONTROL CODE SELECTION

(1) Automatic Selection

This printer automatically selects [ESC](1BH), [LF](0AH). [NUL](00H) or {(7BH), |(7CH), }(7DH) as an interface command control code. After the power is turned on, the program checks the data from the host for [ESC] and { and assumes the code whichever has been sent first to be a control code.

For example, if [ESC] is sent first after the power is turned on, [ESC]. [LF]. [NUL] becomes a control code, and if { is sent first, { | } becomes a control code. Control code varies for every command. When [ESC] follows the first command with the control code of [ESC] ~ [LF] [NUL], the control code becomes [ESC]. [LF]. [NUL]. In the same way, when { follows, the control code for the next command becomes { | }.

When { | } is the control code, the data of 00H to 1FH between "{" and "| }" is ignored. However, the data of 00H to 1FH becomes valid while processing the Graphic Command or the Bit Map Writable Character Command in hexadecimal mode. Also, when { | } is the control code, { | } cannot be used in the data of the Data Command or the Message Display Command.



(2) Manual Selection (ESC. LF. NUL)

The control code of the command is [ESC](1BH), [LF](0AH), [NUL](00H), and the control code selection is not performed.

(3) Manual Selection ({ | })

The control code of the command is {(7BH), |(7CH), }(7DH), and the control code selection is not performed. Data of 00H to 1FH is ignored and discarded in this mode. However, data of 00H to 1FH becomes valid while processing the Graphic Command or the Bit Map Writable Character Command in hexadecimal mode. Also, when { | } is used as the control code, { | } cannot be used in the data of the Data Command or the Message Display Command.

(4) Manual Selection (Any set code)

The control code of the command is the code set in the system mode, and the control code selection is not performed. The code used in each command should not be set as the control code.

In the Data Command or the Message Display Command, the code set as the control code cannot be used.

8. ERROR PROCESSING

If the printer detects any of the following errors, it indicates the error message (LCD, LED), returns status response (serial interface, parallel interface), and stops its operation.

8.1 COMMUNICATION ERRORS

(1) Command Errors

An error results if a command length error, command transmission sequence error, command format error, or parameter designation error is found in analyzing the command. An error also results if a Data Command is transmitted for a filed No. which has not been formatted by the Format Command. An attempt to call a PC Save Command of an unsaved save identifier results in an error. An undefined command is not detected as an error, and data is discarded until [ESC] or [{] is received.

(2) Hardware Errors

A hardware error results if a framing error or parity error is found while receiving data through the serial interface (RS-232C).

* As soon as a command error or hardware error occurs, the printer shows the error message, returns a status response, and stops. Any commands except the Status Request Command and Reset Command are not processed. When the printer is restored by the [RESTART] key, the printer enters the initial state which is obtained after the power is turned on.

8.2 ERRORS IN ISSUING OR FEEDING PAPER

(1) Paper Jam

① When the relation between the programmed label (or tag) pitch (A) and the label (or tag) pitch detected by the sensor (B) is not applicable to the following formula, an error will result:
$(A) \times 50\% \leq (B) \leq (A) \times 150\%$

- A paper jam has occurred during paper feed.
- The paper has not been placed properly.
- The paper type used does not match the type of the sensor.
- The reflective sensor position is not aligned with the black marks.
- The actual label size does not meet the designated label length.
- Label-to-label gap cannot be detected due to preprints.
- The sensor has not been properly adjusted.
  (The sensor has not been adjusted using the label to be used.)

② If a label is not detected by the strip sensor after it is printed or fed in the strip mode, an error will result.

(2) Cutter Error

If the status of the cutter home position sensor has not changed for 1.5 sec. or more since the cutter motor was driven, an error will result.

- A paper jam has occurred in the cutter. (The cutter does not return to the home position.)
- The cutter does not move from the home position.

(3) Label End

Error processing differs depending on the setting of label end/ribbon end process in the system mode.

When TYP1 is selected (default):

① When the transmissive sensor or the reflective sensor detects a continuous 3-mm long label end state, an error will result.

② When an issue, a feed, or an ejection is attempted in a printer stop state while the transmissive sensor or the reflective sensor is detecting the label end state, an error will result.

When TYP2 is selected:

① When the transmissive sensor or the reflective sensor detects a continuous 3-mm long label end state, the printer completes the printing in progress, and then an error will result when the next label comes to the home position.

② When an issue, a feed, or an ejection is attempted in a printer stop state while the transmissive sensor or the reflective sensor is detecting the label end state, an error will result.

(4) Ribbon End

① When the ribbon is used and the ribbon end sensor detects a continuous 5-mm long ribbon end state, an error will result.

② When the ribbon is used and an issue, a feed, or an ejection is attempted in a printer stop state while the ribbon end sensor is detecting the ribbon end state, an error will result.

(5) Ribbon Error

If the status of the ribbon take-up motor sensor and the ribbon feed motor sensor has not changed for the period of time as twice as specified, or more, an error will result.

- An error occurred in the sensor which determines the torque for the ribbon motor.
- A ribbon jam occurred.
- The ribbon has been broken/torn.
- A ribbon is not installed.

The printer stops in accordance with the label end/ribbon error handling set in the system mode.

① When TYP1 is selected (default):
With the ribbon being selected, an error will result when a ribbon rotational speed deviates from specification.

② When TYP2 is selected:
With the ribbon being selected, when a ribbon rotational speed deviates from specification, an error will result under the following conditions:
If the unfinished label length is 30 mm or more, the printer prints the label for 20 mm before an error takes place.
If the unfinished label length is less than 30 mm, the printer completes the unfinished label and stops printing when the next label comes to the home position.

(6) Head Open Error

① If the head open sensor detects continuous 5-mm head open state, an error will result.

② If the head open sensor detects the open state when an issue, a feed, or an ejection is attempted in a printer stop state, an error will result.

③ If the head-up sensor detects the head-up state in 5 mm continuously, an error will result.

④ If the head-up sensor detects the head-up state when an issue, a feed, or an ejection is attempted in a printer stop state, an error will result.
However, a paper feed by the [FEED] key on the printer and an issue or feed by the expansion I/O are not included.

(7) Thermal Head Error

① A broken element error has occurred on the thermal head.

② An error has occurred on the thermal head driver.

(8) Thermal Head Excessive Temperature

① When the ambient temperature detection thermistor detects an excessively high temperature (61 °C or more), an error will result.

② When the thermal head temperature detection thermistor detects an excessively high temperature (80°C or more), an error will result.

* At the moment an error occurs, the printer displays an error message, sends a status response, and then stops. Only the Status Request Command and the Reset Command can be processed. Other commands are not processed. Restoration by the [RESTART] key is possible except in case of a thermal head excessive temperature error. (The printer resumes printing the label at which the error had occurred.)

8.3 ERRORS IN WRITABLE CHARACTER AND PC COMMAND SAVE MODES

(1) Write Error

• An error has occurred in writing data in the flash memory.

(2) Format Error

• An erase error has occurred in formatting the flash memory.

(3) Memory Full

• Further data storing is impossible because of insufficient space in the flash memory.

* At the moment when an error occurs, the printer displays an error message, sends status response, then stops. The Status Request Command and the Reset Command only can be processed and other commands are not processed. Restoration by the [RESTART] key is impossible.

8.4 SYSTEM ERRORS

(1) Momentary Power Interruption Error

• A momentary power interruption has occurred.

(2) Address error

• A command has been fetched from an odd address.
• Word data has been accessed from a place other than the boundary of the word data.
• Long word data has been accessed from a place other than the boundary of the long word data.

(3) General invalid command exception

• An undefined command in a place other than the delay slot has been decoded.

(4) Slot invalid exception

• An undefined command in the delay slot has been decoded.
• A command which rewrites the data in the delay slot has been decoded.

* At the moment when an error occurs, the printer shows an error message, then stops. (None of the commands and key operations will be processed.)

(5) EEPROM Error

• The back-up EEPROM cannot be read/written properly.

8.5 RTC LOW BATTERY ERROR

If the battery voltage is approximate 1.9V or less at the power on time when the low battery check is activated, an error result. In this case, a restoration by the [RESTART] key is impossible.

8.6 RESET PROCESSING

When the [RESTART] key is held down for more than 3 seconds during the error which is restorable by the [RESTART] key or during a pause, the printer returns to the initial status which is obtained after the power is turned on.

8.7 RFID ERROR

(1) RFID Write Error

• If writing data onto the RFID tag continuously failed for the maximum number of RFID write retries, an RFID write error will result. (The maximum number of RFID write retries can be set in the system mode.)

* At the moment an error occurs, the printer shows an error message, sends a status response, and then stops. Only the Status Request Command and the Reset Command can be processed. Other commands are not processed. Restoration using the [RESTART] key is possible. (The printer resumes printing the label at which the error had occurred.)

(2) RFID Error

If a problem has occurred when the printer communicates with the RFID module, an RFID error will result.

9. STATUS RESPONSE

9.1 FUNCTIONS

There are three kinds of status response functions.

(1) Status transmission at the end of a normal issue or the occurrence of an error (automatic status transmission)

This function is available for the RS-232C interface, and socket communication (during connection).

When the option “status response is returned.” has been selected, the printer sends the status to the host computer when the printer performs a feed or completes an issue normally. (For the batch/cut mode: after the designated number of labels has been printed. For the strip mode: after one label has been printed.) In the online mode, the head-up or head-down status is sent to the host computer.

When an error occurs, the status is sent to the host computer.

The remaining count included in the status response indicates the remaining print count of the batch currently in progress only. No remaining count of the batch waiting to be printed is transmitted.

(2) Status transmission in response to a status request (Status Request Command)

This function is available for the RS-232C, USB, Centronics interfaces, and socket communications.

Upon receipt of the Status Request Command, the printer sends the latest status indicating its current state to the host computer, regardless of the status response parameter setting. The remaining count indicates the remaining print count of the batch currently in progress only. No remaining count of the batch waiting to be printed is transmitted. This command is not stored in the receive buffer, but executed immediately after received.

(3) Receive buffer free space status transmission in response to a status request (Receive Buffer Free Space Status Request Command)

This function is available for the RS-232C, USB, Centronics interfaces, and socket communications.

Upon receipt of the Receive Buffer Free Space Status Request Command, the printer sends the latest status indicating its current state to the host computer, regardless of the status response parameter setting. The remaining count indicates the remaining print count of the batch currently in progress only. No remaining count of the batch waiting to be printed is transmitted. This command is not stored in the receive buffer, but executed immediately after received.

• Strip wait status

The strip wait status (05H) returned to the Status Request Command depends on the system mode setting.

When the strip wait status is set to “1 (OFF)” in the system mode:

If the Status Request Command is sent while a label is on the strip shaft (for example, while idling, after feeding a label, or after printing all specified number of labels), the printer returns (00H) to the host.

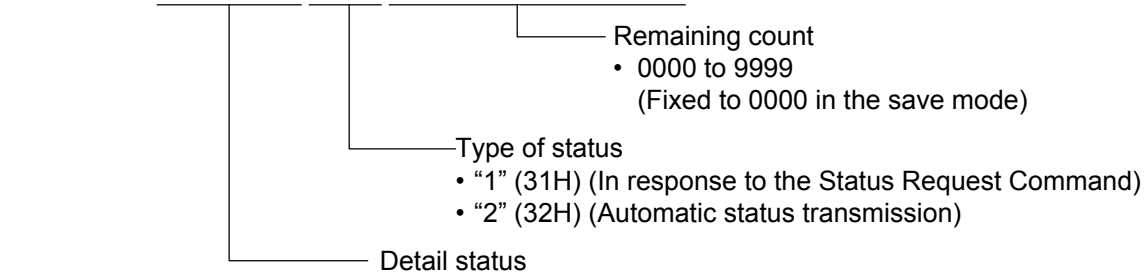
When the strip wait status is set to “2 (ON)” in the system mode:

If the Status Request Command is sent while a label is on the strip shaft (for example, while idling, after feeding a label, or after printing all specified number of labels), the printer returns (05H) to the host.

If the Status Request Command is sent while a label is being printed or issued, the strip wait status (05H) is returned regardless of the setting in the system mode.

9.1.1 STATUS FORMAT

SOH	STX	Status			Remaining count				ETX	EOT	CR	LF
01H	02H	3XH	3XH	3XH	3XH	3XH	3XH	3XH	03H	04H	0DH	0AH



Status to be returned in response to the Receive Buffer Free Space Status Request Command

SOH	01H	Header of the status block
STX	02H	
Status	3XH	Printer status * Details are described later.
	3XH	
Status type	33H	Reserved.
Remaining count	3XH	Remaining print count * Details are described later.
	3XH	
	3XH	
	3XH	
Length	3XH	Total number of bytes of this status block.
	3XH	
Free space of receive buffer	3XH	Free space of the receive buffer “00000” (0K byte) to “99999” (99999K bytes) However, the maximum value should be equal to the receive buffer capacity.
	3XH	
	3XH	
	3XH	
	3XH	
Receive buffer capacity	3XH	Receive buffer capacity “00000” (0K byte) to “99999” (99999K bytes) However, the maximum value differs depending on the models.
	3XH	
	3XH	
	3XH	
	3XH	
CR	0DH	End of the status block.
LF	0AH	

9.1.2 DETAIL STATUS

LCD Message of the Upper Line (English)	Printer Status	Detail Status	
		Auto Status Transmission	Status Request Command
ON LINE	The print head is closed in the head open state.	00	00
HEAD OPEN	The print head is opened in the online mode.	01	01
ON LINE	Operating (Analyzing command, drawing, printing, feeding)	–	02
PAUSE ****	In a pause state	–	04
ON LINE	A label is waiting to be stripped.	–	05
Display of error command (See ***NOTE* 1**.)	A command error has been found in analyzing the command.	06	06
COMMS ERROR	A parity error or framing error has occurred during communication by RS-232C	07	07
PAPER JAM ****	A paper jam has occurred during a paper feed.	11	11
CUTTER ERROR******	An abnormal condition has occurred at the cutter.	12	12
NO PAPER ******	The paper has run out.	13	13
NO RIBBON ******	The ribbon has run out.	14	14
HEAD OPEN ******	An attempt was made to feed or issue with the print head opened (except the [FEED] key).	15	15
HEAD ERROR ******	A broken element has been found on the print head.	17	17
EXCESS HEAD TEMP	The print head temperature has become excessively high.	18	18
RIBBON ERROR******	An abnormal condition has occurred in the sensor which determines the torque of the ribbon motor.	21	21
LOW BATTERY	RTC low battery (Approx. 1.9V or less)	36	36
ON LINE	A label issue has been completed normally.	40	–
ON LINE	A feed has been completed normally.	41	–
ON LINE	A head broken dots check has been completed normally.	00	–
SAVING #### &&&&	In writable character or PC command save mode	–	55
FLASH WRITE ERR.	An error has occurred in writing data into the flash memory.	50	50
FORMAT ERROR	An erase error has occurred in formatting the flash memory.	51	51
FLASH CARD FULL	Saving failed because of insufficient space in the flash memory.	54	54
INITIALIZING...	The flash memory is being initialized. (Initialization is carried out for approximately 15 seconds.)		
POWER FAILURE	A momentary power interruption has occurred.	–	–
EEPROM ERROR	A back-up EEPROM cannot be read/written properly.	–	–

LCD Message of Upper Line (English)	Printer Status	Detail Status	
		Auto Status Transmission	Status Request Command
SYSTEM ERROR	(a) A command has been fetched from an odd address. (b) Word data has been accessed from a place other than the boundary of the word data. (c) Long word data has been accessed from a place other than the boundary of the long word data. (d) An undefined command in a place other than the delay slot has been decoded. (e) An undefined command in the delay slot has been decoded. (f) A command which rewrites the data in the delay slot has been decoded.	–	–
–	Void pattern has been printed. When data cannot be written onto the RFID tag properly, the printer prints the void pattern to indicate that this tag is faulty, and then, automatically retries data write according to the setting for the maximum number of RFID write retries. When the void pattern printing is completed, the printer sends this status.	60	---
RFID WRITE ERROR	When writing data onto the RFID tag continuously failed for the maximum number of RFID write retries, the printer enters an error state and sends this status.	61	61
RFID ERROR	When the printer cannot communicate with the RFID module, due to a failure of the RFID module or some other reasons, this error occurs.	62	62
–	Writing data onto an RFID tag succeeded. When a data write, performed by an RFID Data Write Command (@012), succeeded, this status is returned.	63	---
–	Writing data onto an RFID tag failed. When a data write, performed by an RFID Data Write Command (@012), failed, this status is returned.	64	---
INPUT PASSWORD	The printer is waiting for a password to be entered.	---	---
PASSWORD INVALID	Wrong password was entered consecutively for three times.	---	---

9.1.3 SUMMARY OF STATUS RESPONSE

Interface	Status transmission timing	Status size
RS-232C	Automatic status transmission	13 bytes
	Reception of [ESC] WS [LF] [NUL]	13 bytes
	Reception of [ESC] WB [LF] [NUL]	23 bytes
Centronics	Automatic status transmission	N/A
	Nibble mode negotiation immediately after [ESC] WS [LF] [NUL] is received	13 bytes
	Nibble mode negotiation immediately after [ESC] WB [LF] [NUL] is received	23 bytes
USB	Automatic status transmission	N/A
	Reception of [ESC] WS [LF] [NUL]	13 bytes
	Reception of [ESC] WB [LF] [NUL]	23 bytes
Socket communications	Automatic status transmission	13 bytes
	Reception of [ESC] WS [LF] [NUL]	13 bytes
	Reception of [ESC] WB [LF] [NUL]	23 bytes

9.2 PARALLEL INTERFACE SIGNALS

9.2.1 COMPATIBILITY MODE

LCD Messages of Upper Line (English)	Printer Status	Output Signal			
		Busy	Select	nFault	PError
ON LINE	In the online mode	L	H	H	L
ON LINE	In the online mode (communicating)	Repeat -ing L and H	H	H	L
HEAD OPEN	The print head is opened in the online mode.	H	L	L	L
PAUSE ****	In a pause state	H	L	L	L
ON LINE	Data has been set from the host while the receive buffer is full.	H	H	H	L
ON LINE	After data was set from the host with the receive buffer full, some data was processed and the buffer has free space.	L	H	H	L
ON LINE	Initialize process is in progress. (After the power is turned on or the nInit signal is received.)	H	H	H	L
Display of error command	A command error has occurred in analyzing the command.	H	L	L	L
PAPER JAM ****	A paper jam has occurred during a paper feed.	H	L	L	L
CUTTER ERROR******	An abnormal condition has occurred at the cutter.	H	L	L	L
NO PAPER ******	The paper has run out.	H	L	L	H
NO RIBBON ******	The ribbon has run out.	H	L	L	H
HEAD OPEN ******	A feed or an issue was attempted with the print head opened (except the [FEED] key).	H	L	L	L
HEAD ERROR ******	A broken element has been found on the print head.	H	L	L	L
EXCESS HEAD TEMP	The print head temperature has become excessively high.	H	L	L	L
RIBBON ERROR******	An abnormal condition has occurred on the sensor which determines the torque of the ribbon motor.	H	L	L	L
LOW BATTERY	RTC low battery (Approx. 1.9V or less)	L	H	H	L
SAVING #### &&&&	In writable character or PC command save mode	L	H	H	L
FLASH WRITE ERR.	An error has occurred in writing data into the flash memory.	H	L	L	L
FORMAT ERROR	An erase error has occurred in formatting the flash memory.	H	L	L	L
FLASH CARD FULL	Saving failed because of insufficient space in the flash memory.	H	L	L	L
INITIALIZING...	The flash memory is being initialized. (Initialization is carried out for approximately 15 seconds.)				
POWER FAILURE	A momentary power interruption has occurred.	H	L	L	L
EEPROM ERROR	A back-up EEPROM cannot be read/written properly.	H	L	L	L

LCD Messages of Upper Line (English)	Printer Status	Output Signal			
		Busy	Select	nFault	PError
SYSTEM ERROR	(a) A command has been fetched from an odd address. (b) Word data has been accessed from a place other than the boundary of the word data. (c) Long word data has been accessed from a place other than the boundary of the long word data. (d) An undefined command in a place other than the delay slot has been decoded. (e) An undefined command in the delay slot has been decoded. (f) A command which rewrites the data in the delay slot has been decoded.	H	L	L	L
RFID WRITE ERROR	When writing data onto the RFID tag continuously failed for the maximum number of RFID write retries, the printer enters an error state and sends this status.	H	L	L	L
RFID ERROR	When the printer cannot communicate with the RFID module, due to a failure of the RFID module or some other reasons, this error occurs.	H	L	L	L
INPUT PASSWORD	The printer is waiting for a password to be entered.	H	L	L	L
PASSWORD INVALID	Wrong password was entered consecutively for three times.	H	L	L	L

10. LCD MESSAGES AND LED INDICATIONS

The model and the firmware version are displayed on the lower line of the LCD.

No.	LCD Messages of Upper line (English)	LED Indication			Printer Status	Restoration by the [RESTART] key Yes/No	Acceptance of Status Request and Reset Commands Yes/No
		POWER	ON LINE	ERROR			
1	**ON LINE**	○	○	●	In the online mode	-	Yes
	ON LINE	○	⊙	●	In the online mode (Communicating)	-	Yes
2	**HEAD OPEN**	○	●	●	The print head is opened in the online mode.	-	Yes
3	**PAUSE ******	○	●	●	In a pause state	Yes	Yes
4	**COMMS ERROR**	○	●	○	A parity error or framing error has occurred during communication by RS-232C.	Yes	Yes
5	**PAPER JAM ********	○	●	○	A paper jam has occurred during paper feed.	Yes	Yes
6	**CUTTER ERROR********	○	●	○	An abnormal condition has occurred at the cutter.	Yes	Yes
7	**NO PAPER ********	○	●	○	The paper has run out.	Yes	Yes
8	**NO RIBBON ********	○	●	○	The ribbon has run out.	Yes	Yes
9	**HEAD OPEN ********	○	●	○	A feed or an issue was attempted with the print head opened (except the [FEED] key).	Yes	Yes
10	**HEAD ERROR**	○	●	○	A broken element has been found on the thermal head.	Yes	Yes
11	**EXCESS HEAD TEMP**	○	●	○	The print head temperature has become excessively high.	No	Yes
12	**RIBBON ERROR********	○	●	○	An abnormal condition has occurred on the sensor which determines the torque of the ribbon motor.	Yes	Yes
13	**LOW BATTERY**	○	●	○	The voltage of the battery connected to the real time clock is approximately 1.9 V or less.	No	Yes
14	**SAVING #### &&&&**	○	○	●	In writable character or PC command save mode	-	Yes
15	**FLASH WRITE ERR.**	○	●	○	An error has occurred in writing data into the flash ROM on the CPU board.	No	Yes
16	**FORMAT ERROR**	○	●	○	An erase error has occurred in formatting the flash ROM on the CPU board.	No	Yes
17	**FLASH CARD FULL**	○	●	○	Saving failed because of the insufficient space in the flash ROM on the CPU board.	No	Yes
18	Display of error command *(See **NOTE 1**.)*	○	●	○	A command error has occurred in analyzing the command.	Yes	Yes

No.	LCD Messages of Upper line (English)	LED Indication			Printer Status	Restoration by the [RESTART] key Yes/No	Acceptance of Status Request Reset Command Yes/No
		POWER	ON LINE	ERROR			
19	**POWER FAILURE**	○	●	○	A momentary power interruption has occurred.	No	No
20	**INITIALIZING...**	○	●	●	The memory is being initialized. (Initialization is carried out for a max. of approximately 15 seconds)	–	–
21	**EEPROM ERROR**	○	●	○	A back-up EEPROM cannot be read/written properly.	No	No
22	**SYSTEM ERROR**	○	●	○	When any abnormal operations as below are performed, a system error occurs. (a) Command fetch from an odd address (b) Access to the word data from a place other than the boundary of the word data (c) Access to the long word data from a place other than the boundary of the long word data (d) Access to the area of 80000000H to FFFFFFFFH in the logic space in the user mode. (e) Undefined command placed in other than the delay slot has been decoded. (f) Undefined command in the delay slot has been decoded. (g) Command to rewrite the delay slot has been decoded.	No	No
23	**100BASE LAN INITIALIZING...**	○	●	●	The 100BASE LAN is being initialized.	–	–
24	**DHCP CLIENT INITIALIZING...**	○	●	●	The DHCP client is being initialized. * When the DHCP function is enabled.	–	–
25	**RFID WRITE ERROR**	○	●	○	Writing data onto the RFID tag continuously failed for the maximum number of RFID write retries.	Yes	Yes
26	**RFID ERROR**	○	●	○	The printer cannot communicate with the RFID module.	No	Yes
27	**INPUT PASSWORD**	○	●	●	The printer is waiting for a password to be entered.	No	No
28	**PASSWORD INVALID**	○	●	●	Wrong password was entered consecutively for three times..	No	No

NOTE 1: When a command error has been found in the sent command, 16-byte command code of the erroneous command is displayed on the upper line of the LCD. (However, [LF] and [NUL] are not displayed.)

[Example 1] [ESC] PC001; 0A00, 0300, 2, 2, A, 00, B [LF] [NUL]

Command error

LCD display (In the case of the B-SX8T)

```
PC001;0A00,0300,
B-SX8T     V1.0A
```

[Example 2] [ESC] T20 G30 [LF] [NUL]

Command error

LCD display (in the case of the B-SX8T)

```
T20G30
B-SX8T     V1.0A
```

[Example 3] [ESC] XR; 0200, 0300, 0450, 1200, 1 [LF] [NUL]

Command error

LCD display (in the case of the B-SX8T)

```
XR;0200,0300,045
B-SX8T     V1.0A
```

NOTE 2: When the command error is displayed, "? (3FH)" is displayed for codes other than 20H to 7FH and A0H to DFH.

NOTE 3: ○: ON
⊙: Blinking
●: OFF
****: Remaining number of labels to be printed ␣␣␣␣ to 9999 (in units of 1 label/tag)
####: Remaining memory capacity of PC save area in the flash memory:
0 to 3072 (in K bytes)
&&&&: Remaining memory capacity of writable character storage area in the flash memory
0 to 3072 (in K bytes)

11. LCD MESSAGES IN DIFFERENT LANGUAGES (UPPER LINE OF LCD)

No.	ENGLISH
1	ON LINE
2	HEAD OPEN
3	PAUSE ****.
4	COMMS ERROR
5	PAPER JAM ****
6	CUTTER ERROR****
7	NO PAPER ****
8	NO RIBBON ****
9	HEAD OPEN ****
10	HEAD ERROR
11	EXCESS HEAD TEMP
12	RIBBON ERROR****
13	LOW BATTERY
14	SAVING #### &&&&
15	FLASH WRITE ERR.
16	FORMAT ERROR
17	FLASH CARD FULL
18	INITIALIZING...
19	POWER FAILURE
20	EEPROM ERROR
21	SYSTEM ERROR
22	RFID WRITE ERROR
23	RFID ERROR
24	INPUT PASSWORD
25	PASSWORD INVALID

No.	GERMAN
1	ON LINE
2	KOPF OFFEN
3	PAUSE ****
4	UEBERTR.-FEHLER
5	PAPIERSTAU ****
6	MESSERFEHL. ****
7	PAPIERENDE ****
8	FARBB.-ENDE ****
9	KOPF OFFEN ****
10	KOPF DEFEKT
11	KOPF UEBERHITZT
12	FB-FEHLER ****
13	LOW BATTERY
14	SP.-MOD #### &&&&
15	FLASH FEHLER
16	FORMATFEHLER
17	FLASH ZU KLEIN
18	INITIALIZING...
19	POWER FAILURE
20	EEPROM ERROR
21	SYSTEM ERROR
22	RFID WRITE ERROR
23	RFID ERROR
24	INPUT PASSWORD
25	PASSWORD INVALID

No.	FRENCH
1	PRETE
2	TETE OUVERTE
3	PAUSE ****
4	ERR. COMMUNICAT.
5	PB. PAPIER ****
6	PB. CUTTER ****
7	FIN PAPIER ****
8	FIN RUBAN ****
9	TETE OUVERTE****
10	ERREUR TETE
11	TETE TROP CHAUDE
12	ERREUR RUBAN****
13	LOW BATTERY
14	MEM LIB #### &&&&
15	ERREUR MEM FLASH
16	ERREUR DE FORMAT
17	MEM INSUFFISANTE
18	INITIALIZING...
19	POWER FAILURE
20	EEPROM ERROR
21	SYSTEM ERROR
22	RFID WRITE ERROR
23	RFID ERROR
24	INPUT PASSWORD
25	PASSWORD INVALID

No.	DUTCH
1	IN LIJN
2	KOP OPEN
3	PAUZE ****
4	COMM. FOUT
5	PAPIER VAST ****
6	SNIJMES FOUT****
7	PAPIER OP ****
8	LINT OP ****
9	KOP OPEN ****
10	PRINTKOP DEFECT
11	TEMP. FOUT
12	LINT FOUT ****
13	LOW BATTERY
14	MEM #### &&&&
15	FLASH MEM FOUT
16	FORMAAT FOUT
17	GEHEUGEN VOL
18	INITIALIZING...
19	POWER FAILURE
20	EEPROM ERROR
21	SYSTEM ERROR
22	RFID WRITE ERROR
23	RFID ERROR
24	INPUT PASSWORD
25	PASSWORD INVALID

No.	SPANISH
1	ON LINE
2	CABEZAL ABIERTO
3	PAUSA ****
4	ERROR COMUNICACI
5	ATASCO PAPEL****
6	ERROR CORTAD****
7	SIN PAPEL ****
8	SIN CINTA ****
9	CABEZA ABIER****
10	ERROR DE CABEZAL
11	TEMP.CABEZA ALTA
12	ERROR CINTA ****
13	LOW BATTERY
14	SALVAR #### &&&&
15	ERROR ESCRITURA
16	ERROR DE FORMATO
17	MEMORIA INSUFICI
18	INITIALIZING...
19	POWER FAILURE
20	EEPROM ERROR
21	SYSTEM ERROR
22	RFID WRITE ERROR
23	RFID ERROR
24	INPUT PASSWORD
25	PASSWORD INVALID

No.	JAPANESE
1	
2	
3	
4	
5	
6	
7	
8	
9	
10	
11	
12	
13	
14	
15	
16	
17	
18	
19	
20	
21	
22	

* Japanese messages are omitted here.

No.	ITALIAN
1	PRONTA
2	TESTA APERTA
3	PAUSA ****
4	ERR. COMUNICAZ.
5	CARTA INCEP.****
6	ERR. TAGL. ****
7	NO CARTA ****
8	NO NASTRO ****
9	TESTA APERTA****
10	ERROR TESTA
11	TEMP. TESTA ALTA
12	ERR. NASTRO ****
13	LOW BATTERY
14	SALVA #### &&&&
15	ERR.SCRITT.CARD
16	ERR. FORMATTAZ.
17	MEM. CARD PIENA
18	INITIALIZING...
19	POWER FAILURE
20	EEPROM ERROR
21	SYSTEM ERROR
22	RFID WRITE ERROR
23	RFID ERROR
24	INPUT PASSWORD
25	PASSWORD INVALID

12. CHARACTER CODE TABLE

The followings are the character code tables. However, the characters which can be printed are different according to the character type.

12.1 TIMES ROMAN, HELVETICA, LETTER GOTHIC, PRESTIGE ELITE, COURIER, GOTHIC725 BLACK

(Bit map font type: A, B, C, D, E, F, G, H, I, J, K, L, N, O, P, Q, R, q)

(1) PC-850

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

When Japanese message is selected in the system mode, code 5CH indicates “¥”.
The Euro code (B0H) can be changed in the parameter setting in the system mode.

(2) PC-8

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0				0	@	P	`	p	Ç	É	á	€			α	≡
1			!	1	A	Q	a	q	ü	æ	í				β	±
2			"	2	B	R	b	r	é	Æ	ó				Γ	≥
3			#	3	C	S	c	s	â	ô	ú				π	≤
4			$	4	D	T	d	t	ä	ö	ñ				Σ	⌠
5			%	5	E	U	e	u	à	ò	Ñ				σ	⌡
6			&	6	F	V	f	v	å	û	ª				µ	÷
7			'	7	G	W	g	w	ç	ù	º				τ	≈
8			(	8	H	X	h	x	ê	ÿ	¿				Φ	°
9			)	9	I	Y	i	y	ë	Ö	⌐				Θ	•
A			*	:	J	Z	j	z	è	Ü	¬				Ω	•
B			+	;	K	[	k	{	ï	¢	½				δ	√
C			,	<	L	\	l	|	î	£	¼				∞	n
D			–	=	M	]	m	}	ì	¥	¡				∅	2
E			.	>	N	^	n	~	Ä	Pt	«				ε	■
F			/	?	O	_	o	▒	Å	∫	»				∩	

When Japanese message is selected in the system mode, code 5CH indicates “¥”.
The Euro code (B0H) can be changed in the parameter setting in the system mode.

(3) PC-852

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0				0	@	P	`	p	Ç	É	á	€			Ó	-
1			!	1	A	Q	a	q	ü		í			Đ	ß	
2			”	2	B	R	b	r	é		ó				Ô	
3			#	3	C	S	c	s	â	ô	ú			Ë		
4			$	4	D	T	d	t	ä	ö						
5			%	5	E	U	e	u				Á				§
6			&	6	F	V	f	v				Â		Í		÷
7			’	7	G	W	g	w	ç					Î		¸
8			(	8	H	X	h	x								°
9			)	9	I	Y	i	y	ë	Ö					Ú	¨
A			*	:	J	Z	j	z		Ü	¬					•
B			+	;	K	[	k	{								
C			,	<	L	\	l	|	î					ý	
D			–	=	M	]	m	}							Ý	
E			.	>	N	^	n	~	Ä	×	«					■
F			/	?	O	_	o	▒			»		¤			

When Japanese message is selected in the system mode, code 5CH indicates “¥”.
The Euro code (B0H) can be changed in the parameter setting in the system mode.

(4) PC-857

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

When Japanese message is selected in the system mode, code 5CH indicates “¥”.
The Euro code (B0H) can be changed in the parameter setting in the system mode.

(5) PC-851

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0				0	@	P	`	p	Ç			€				
1			!	1	A	Q	a	q	ü							±
2			”	2	B	R	b	r	é							
3			#	3	C	S	c	s	â	ô						
4			$	4	D	T	d	t	ä	ö						
5			%	5	E	U	e	u	à							§
6			&	6	F	V	f	v		û						
7			’	7	G	W	g	w	ç	ù						¸
8			(	8	H	X	h	x	ê							°
9			)	9	I	Y	i	y	ë	Ö						¨
A			*	:	J	Z	j	z	è	Ü						
B			+	;	K	[	k	{	Ï		½					
C			,	<	L	\	l	|	î	£					
D			–	=	M	]	m	}								
E			.	>	N	^	n	~	Ä		«					■
F			/	?	O	_	o	▒			»					

When Japanese message is selected in the system mode, code 5CH indicates “¥”.
The Euro code (B0H) can be changed in the parameter setting in the system mode.

(6) PC-855

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0				0	@	P	`	p				€				
1			!	1	A	Q	a	q								
2			"	2	B	R	b	r								
3			#	3	C	S	c	s								
4			$	4	D	T	d	t								
5			%	5	E	U	e	u								
6			&	6	F	V	f	v								
7			'	7	G	W	g	w								
8			(	8	H	X	h	x								
9			)	9	I	Y	i	y								
A			*	:	J	Z	j	z								
B			+	;	K	[	k	{								
C			,	<	L	\	l	|								
D			–	=	M	]	m	}								§
E			.	>	N	^	n	~			«					■
F			/	?	O	_	o	▒			»		¤			

When Japanese message is selected in the system mode, code 5CH indicates “¥”.
The Euro code (B0H) can be changed in the parameter setting in the system mode.

(7) PC-1250

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0				0	@	P	`	p				€				
1			!	1	A	Q	a	q				±	Á		á	
2			”	2	B	R	b	r					Â		â	
3			#	3	C	S	c	s						Ó		ó
4			$	4	D	T	d	t			¤	´	Ä	Ô	ä	ô
5			%	5	E	U	e	u				µ				
6			&	6	F	V	f	v			¦	¶		Ö		ö
7			’	7	G	W	g	w			§	·	Ç	×	ç	÷
8			(	8	H	X	h	x			¨	¸				
9			)	9	I	Y	i	y			©		É		é	
A			*	:	J	Z	j	z						Ú		ú
B			+	;	K	[	k	{			«	»	Ë		ë	
C			,	<	L	\	l	|			¬			Ü		ü
D			–	=	M	]	m	}					Í	Ý	í	ý
E			.	>	N	^	n	~			®		Î		î	
F			/	?	O	_	o	▒						ß		

When Japanese message is selected in the system mode, code 5CH indicates “¥”.
The Euro code (B0H) can be changed in the parameter setting in the system mode.

(8) PC-1251

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0				0	@	P	`	p				€				
1			!	1	A	Q	a	q				±				
2			"	2	B	R	b	r								
3			#	3	C	S	c	s								
4			$	4	D	T	d	t			¤					
5			%	5	E	U	e	u				µ				
6			&	6	F	V	f	v			¦	¶				
7			'	7	G	W	g	w			§	·				
8			(	8	H	X	h	x								
9			)	9	I	Y	i	y			©					
A			*	:	J	Z	j	z								
B			+	;	K	[	k	{			«	»				
C			,	<	L	\	l	|			¬					
D			–	=	M	]	m	}								
E			.	>	N	^	n	~			®					
F			/	?	O	_	o	▒								

When Japanese message is selected in the system mode, code 5CH indicates “¥”.
The Euro code (B0H) can be changed in the parameter setting in the system mode.

(9) PC-1252

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

When Japanese message is selected in the system mode, code 5CH indicates “¥”.
The Euro code (B0H) can be changed in the parameter setting in the system mode.

(10) PC-1253

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0				0	@	P	`	p				€				
1			!	1	A	Q	a	q				±				
2			"	2	B	R	b	r				²				
3			#	3	C	S	c	s	*ƒ*		£	³				
4			$	4	D	T	d	t			¤					
5			%	5	E	U	e	u			¥	µ				
6			&	6	F	V	f	v			¦	¶				
7			'	7	G	W	g	w			§	·				
8			(	8	H	X	h	x			¨					
9			)	9	I	Y	i	y			©					
A			*	:	J	Z	j	z			ª					
B			+	;	K	[	k	{			«	»				
C			,	<	L	\	l	|			¬					
D			–	=	M	]	m	}				½				
E			.	>	N	^	n	~			®					
F			/	?	O	_	o	▒								

When Japanese message is selected in the system mode, code 5CH indicates “¥”.
The Euro code (B0H) can be changed in the parameter setting in the system mode.

(11) PC-1254

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

When Japanese message is selected in the system mode, code 5CH indicates “¥”.
The Euro code (B0H) can be changed in the parameter setting in the system mode.

(12) PC-1257

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0				0	@	P	`	p				€				
1			!	1	A	Q	a	q				±				
2			"	2	B	R	b	r			¢	²				
3			#	3	C	S	c	s			£	³		Ó		ó
4			$	4	D	T	d	t			¤	´	Ä		ä	
5			%	5	E	U	e	u				µ	Å	Õ	å	õ
6			&	6	F	V	f	v			¦	¶		Ö		ö
7			'	7	G	W	g	w			§	·		×		÷
8			(	8	H	X	h	x			Ø	ø				
9			)	9	I	Y	i	y			©	¹	É		é	
A			*	:	J	Z	j	z								
B			+	;	K	[	k	{			«	»				
C			,	<	L	\	l	|			¬	¼		Ü		ü
D			–	=	M	]	m	}	¨	¯		½				
E			.	>	N	^	n	~			®	¾				
F			/	?	O	_	o	▒	¸		Æ	æ		ß		

When Japanese message is selected in the system mode, code 5CH indicates “¥”.
The Euro code (B0H) can be changed in the parameter setting in the system mode.

(13) LATIN9

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

When Japanese message is selected in the system mode, code 5CH indicates “¥”.
The Euro code (B0H) can be changed in the parameter setting in the system mode.

(14) Arabic

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0				0	@	P	`	p				€				
1			!	1	A	Q	a	q								
2			"	2	B	R	b	r								
3			#	3	C	S	c	s								
4			$	4	D	T	d	t								
5			%	5	E	U	e	u								
6			&	6	F	V	f	v								
7			'	7	G	W	g	w								
8			(	8	H	X	h	x								
9			)	9	I	Y	i	y								
A			*	:	J	Z	j	z								
B			+	;	K	[	k	{								
C			,	<	L	\	l	|								
D			–	=	M	]	m	}								
E			.	>	N	^	n	~								
F			/	?	O	_	o	▒								

When Japanese message is selected in the system mode, code 5CH indicates “¥”.
The Euro code (B0H) can be changed in the parameter setting in the system mode.

12.2 PRESENTATION (Bit map font type: M)

(1) PC-850, PC-857

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0				0	@	P	`	P				€				-
1			!	1	A	Q	A	Q								
2			"	2	B	R	B	R								
3			#	3	C	S	C	S								
4			$	4	D	T	D	T								
5			%	5	E	U	E	U								
6			&	6	F	V	F	V								
7			'	7	G	W	G	W								
8			(	8	H	X	H	X								
9			)	9	I	Y	I	Y								
A			*	:	J	Z	J	Z								
B			+	;	K	[	K	{								
C			,	<	L	\	L	|								
D			–	=	M	]	M	}								
E			.	>	N	^	N	~				¥				
F			/	?	O	_	O	▩								

When Japanese message is selected in the system mode, code 5CH indicates "¥".
The Euro code (B0H) can be changed in the parameter setting in the system mode.

(2) PC-8

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0				0	@	P	`	P				€				
1			!	1	A	Q	A	Q								
2			"	2	B	R	B	R								
3			#	3	C	S	C	S								
4			$	4	D	T	D	T								
5			%	5	E	U	E	U								
6			&	6	F	V	F	V								
7			'	7	G	W	G	W								
8			(	8	H	X	H	X								
9			)	9	I	Y	I	Y								
A			*	:	J	Z	J	Z								
B			+	;	K	[	K	{								
C			,	<	L	\	L	|								
D			–	=	M	]	M	}		¥						
E			.	>	N	^	N	~								
F			/	?	O	_	O									

When Japanese message is selected in the system mode, code 5CH indicates "¥".
The Euro code (B0H) can be changed in the parameter setting in the system mode.

(3) PC-852

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0				0	@	P	`	P				€				-
1			!	1	A	Q	A	Q								
2			"	2	B	R	B	R								
3			#	3	C	S	C	S								
4			$	4	D	T	D	T								
5			%	5	E	U	E	U								
6			&	6	F	V	F	V								
7			'	7	G	W	G	W								
8			(	8	H	X	H	X								
9			)	9	I	Y	I	Y								
A			*	:	J	Z	J	Z								
B			+	;	K	[	K	{								
C			,	<	L	\	L	|								
D			–	=	M	]	M	}								
E			.	>	N	^	N	~								
F			/	?	O	_	O									

When Japanese message is selected in the system mode, code 5CH indicates "¥".
The Euro code (B0H) can be changed in the parameter setting in the system mode.

(4) PC-851, PC-855, PC-1250, PC-1251, PC-1257, Arabic

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0				0	@	P	`	P				€				
1			!	1	A	Q	A	Q								
2			"	2	B	R	B	R								
3			#	3	C	S	C	S								
4			$	4	D	T	D	T								
5			%	5	E	U	E	U								
6			&	6	F	V	F	V								
7			'	7	G	W	G	W								
8			(	8	H	X	H	X								
9			)	9	I	Y	I	Y								
A			*	:	J	Z	J	Z								
B			+	;	K	[	K	{								
C			,	<	L	\	L	|								
D			–	=	M	]	M	}								
E			.	>	N	^	N	~								
F			/	?	O	_	O	▌								

When Japanese message is selected in the system mode, code 5CH indicates "¥".
The Euro code (B0H) can be changed in the parameter setting in the system mode.

(5) PC-1252, PC-1254

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0				0	@	P	`	P				€				
1			!	1	A	Q	A	Q								
2			"	2	B	R	B	R								
3			#	3	C	S	C	S								
4			$	4	D	T	D	T								
5			%	5	E	U	E	U			¥					
6			&	6	F	V	F	V								
7			'	7	G	W	G	W								
8			(	8	H	X	H	X	^	~						
9			)	9	I	Y	I	Y								
A			*	:	J	Z	J	Z								
B			+	;	K	[	K	{								
C			,	<	L	\	L	|								
D			–	=	M	]	M	}								
E			.	>	N	^	N	~								
F			/	?	O	_	O	▌								

When Japanese message is selected in the system mode, code 5CH indicates "¥".
The Euro code (B0H) can be changed in the parameter setting in the system mode.

(6) PC-1253

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0				0	@	P	`	P				€				-
1			!	1	A	Q	A	Q								
2			"	2	B	R	B	R								
3			#	3	C	S	C	S								
4			$	4	D	T	D	T								
5			%	5	E	U	E	U			¥					
6			&	6	F	V	F	V								
7			'	7	G	W	G	W								
8			(	8	H	X	H	X								
9			)	9	I	Y	I	Y								
A			*	:	J	Z	J	Z								
B			+	;	K	[	K	{								
C			,	<	L	\	L	|								
D			–	=	M	]	M	}								
E			.	>	N	^	N	~								
F			/	?	O	_	O	▌								

When Japanese message is selected in the system mode, code 5CH indicates "¥".
The Euro code (B0H) can be changed in the parameter setting in the system mode.

(7) LATIN9

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0				0	@	P	`	P				€				
1			!	1	A	Q	A	Q								
2			"	2	B	R	B	R								
3			#	3	C	S	C	S								
4			$	4	D	T	D	T			€					
5			%	5	E	U	E	U			¥					
6			&	6	F	V	F	V								
7			'	7	G	W	G	W								
8			(	8	H	X	H	X								
9			)	9	I	Y	I	Y								
A			*	:	J	Z	J	Z								
B			+	;	K	[	K	{								
C			,	<	L	\	L	|								
D			–	=	M	]	M	}								
E			.	>	N	^	N	~								
F			/	?	O	_	O	▮								

When Japanese message is selected in the system mode, code 5CH indicates “¥”.
The Euro code (B0H) can be changed in the parameter setting in the system mode.

12.3 OCR-A (Bit map font type: S)

(1) PC-850, PC-857

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0				0	@	P	｢	p								-
1			!	1	A	Q	a	q								
2			"	2	B	R	b	r								
3			#	3	C	S	c	s								
4			$	4	D	T	d	t								
5			%	5	E	U	e	u								
6			&	6	F	V	f	v								
7			'	7	G	W	g	w								
8			(	8	H	X	h	x								
9			)	9	I	Y	i	y								
A			*	:	J	Z	j	z								
B			+	;	K	[	k	{								
C			,	<	L	\	l	|								
D			-	=	M	]	m	}								
E			.	>	N	^	n	｣				¥				
F			/	?	O	_	o	▌								

When Japanese message is selected in the system mode, code 5CH indicates "¥".

(2) PC-8

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0				0	@	P	｢	p								
1			!	1	A	Q	a	q								
2			"	2	B	R	b	r								
3			#	3	C	S	c	s								
4			$	4	D	T	d	t								
5			%	5	E	U	e	u								
6			&	6	F	V	f	v								
7			'	7	G	W	g	w								
8			(	8	H	X	h	x								
9			)	9	I	Y	i	y								
A			*	:	J	Z	j	z								
B			+	;	K	[	k	{								
C			,	<	L	\	l	|								
D			-	=	M	]	m	}		¥						
E			.	>	N	^	n	｣								
F			/	?	O	_	o	▌								

When Japanese message is selected in the system mode, code 5CH indicates "¥".

(3) PC-852

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0				0	@	P	｢	p								-
1			!	1	A	Q	a	q								
2			"	2	B	R	b	r								
3			#	3	C	S	c	s								
4			$	4	D	T	d	t								
5			%	5	E	U	e	u								
6			&	6	F	V	f	v								
7			'	7	G	W	g	w								
8			(	8	H	X	h	x								
9			)	9	I	Y	i	y								
A			*	:	J	Z	j	z								
B			+	;	K	[	k	{								
C			,	<	L	\	l	|								
D			-	=	M	]	m	}								
E			.	>	N	^	n	｣								
F			/	?	O	_	o	▉								

When Japanese message is selected in the system mode, code 5CH indicates “¥”.

(4) PC-851, PC-855, PC-1250, PC-1251, PC-1257, Arabic

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0				0	@	P	｢	p								
1			!	1	A	Q	a	q								
2			"	2	B	R	b	r								
3			#	3	C	S	c	s								
4			$	4	D	T	d	t								
5			%	5	E	U	e	u								
6			&	6	F	V	f	v								
7			'	7	G	W	g	w								
8			(	8	H	X	h	x								
9			)	9	I	Y	i	y								
A			*	:	J	Z	j	z								
B			+	;	K	[	k	{								
C			,	<	L	\	l	|								
D			-	=	M	]	m	}								
E			.	>	N	^	n	｣								
F			/	?	O	_	o	▉								

When Japanese message is selected in the system mode, code 5CH indicates “¥”.

(5) PC-1252, PC-1254

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0				0	@	P	｢	p								-
1			!	1	A	Q	a	q								
2			"	2	B	R	b	r								
3			#	3	C	S	c	s								
4			$	4	D	T	d	t								
5			%	5	E	U	e	u			¥					
6			&	6	F	V	f	v								
7			'	7	G	W	g	w								
8			(	8	H	X	h	x	^	~						
9			)	9	I	Y	i	y								
A			*	:	J	Z	j	z								
B			+	;	K	[	k	{								
C			,	<	L	\	l	|								
D			-	=	M	]	m	}								
E			.	>	N	^	n	｣								
F			/	?	O	ｳ	o	▌								

When Japanese message is selected in the system mode, code 5CH indicates "¥".

(6) PC-1253

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0				0	@	P	｢	p								-
1			!	1	A	Q	a	q								
2			"	2	B	R	b	r								
3			#	3	C	S	c	s								
4			$	4	D	T	d	t								
5			%	5	E	U	e	u			¥					
6			&	6	F	V	f	v								
7			'	7	G	W	g	w								
8			(	8	H	X	h	x								
9			)	9	I	Y	i	y								
A			*	:	J	Z	j	z								
B			+	;	K	[	k	{								
C			,	<	L	\	l	|								
D			-	=	M	]	m	}								
E			.	>	N	^	n	｣								
F			/	?	O	ｳ	o	▌								

When Japanese message is selected in the system mode, code 5CH indicates "¥".

(7) LATIN9

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0				0	@	P	｢	p								
1			!	1	A	Q	a	q								
2			"	2	B	R	b	r								
3			#	3	C	S	c	s								
4			$	4	D	T	d	t								
5			%	5	E	U	e	u			¥					
6			&	6	F	V	f	v								
7			'	7	G	W	g	w								
8			(	8	H	X	h	x								
9			)	9	I	Y	i	y								
A			*	:	J	Z	j	z								
B			+	;	K	[	k	{								
C			,	<	L	\	l	|								
D			-	=	M	]	m	}								
E			.	>	N	^	n	｣								
F			/	?	O	ｳ	o	▮								

When Japanese message is selected in the system mode, code 5CH indicates "¥".

12.4 OCR-B (Bit map font type: T)

(1) PC-850, PC-857

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0				0	@	P	`	p	0							-
1			!	1	A	Q	a	q	1							
2			"	2	B	R	b	r	2							
3			#	3	C	S	c	s	3							
4			$	4	D	T	d	t	4							
5			%	5	E	U	e	u	5							
6			&	6	F	V	f	v	6							
7			'	7	G	W	g	w	7							
8			(	8	H	X	h	x	8							
9			)	9	I	Y	i	y	9							
A			*	:	J	Z	j	z								
B			+	;	K	[	k	{								
C			,	<	L	\	l	|								
D			-	=	M	]	m	}								
E			.	>	N	^	n	~				¥				
F			/	?	O	_	o	▌								

The size of the numerals of codes 80h to 89h are reduced to 80%.
When Japanese message is selected in the system mode, code 5CH indicates "¥".

(2) PC-8

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0				0	@	P	`	p	0							
1			!	1	A	Q	a	q	1							
2			"	2	B	R	b	r	2							
3			#	3	C	S	c	s	3							
4			$	4	D	T	d	t	4							
5			%	5	E	U	e	u	5							
6			&	6	F	V	f	v	6							
7			'	7	G	W	g	w	7							
8			(	8	H	X	h	x	8							
9			)	9	I	Y	i	y	9							
A			*	:	J	Z	j	z								
B			+	;	K	[	k	{								
C			,	<	L	\	l	|								
D			-	=	M	]	m	}		¥						
E			.	>	N	^	n	~								
F			/	?	O	_	o	▌								

The size of the numerals of codes 80h to 89h are reduced to 80%.
When Japanese message is selected in the system mode, code 5CH indicates "¥".

(3) PC-852

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0				0	@	P	`	p	0							-
1			!	1	A	Q	a	q	1							
2			"	2	B	R	b	r	2							
3			#	3	C	S	c	s	3							
4			$	4	D	T	d	t	4							
5			%	5	E	U	e	u	5							
6			&	6	F	V	f	v	6							
7			'	7	G	W	g	w	7							
8			(	8	H	X	h	x	8							
9			)	9	I	Y	i	y	9							
A			*	:	J	Z	j	z								
B			+	;	K	[	k	{								
C			,	<	L	\	l	|								
D			-	=	M	]	m	}								
E			.	>	N	^	n	~								
F			/	?	O	_	o	▉								

The size of the numerals of codes 80h to 89h are reduced to 80%.
When Japanese message is selected in the system mode, code 5CH indicates “¥”.

(4) PC-851, PC-855, PC-1250, PC-1251, PC-1257, Arabic

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0				0	@	P	`	p	0							
1			!	1	A	Q	a	q	1							
2			"	2	B	R	b	r	2							
3			#	3	C	S	c	s	3							
4			$	4	D	T	d	t	4							
5			%	5	E	U	e	u	5							
6			&	6	F	V	f	v	6							
7			'	7	G	W	g	w	7							
8			(	8	H	X	h	x	8							
9			)	9	I	Y	i	y	9							
A			*	:	J	Z	j	z								
B			+	;	K	[	k	{								
C			,	<	L	\	l	|								
D			-	=	M	]	m	}								
E			.	>	N	^	n	~								
F			/	?	O	_	o									

The size of the numerals of codes 80h to 89h are reduced to 80%.
When Japanese message is selected in the system mode, code 5CH indicates “¥”.

(5) PC-1252, PC-1254, LATIN9

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0				0	@	P	`	p	0							
1			!	1	A	Q	a	q	1							
2			"	2	B	R	b	r	2							
3			#	3	C	S	c	s	3							
4			$	4	D	T	d	t	4							
5			%	5	E	U	e	u	5		¥					
6			&	6	F	V	f	v	6							
7			'	7	G	W	g	w	7							
8			(	8	H	X	h	x	8	~						
9			)	9	I	Y	i	y	9							
A			*	:	J	Z	j	z								
B			+	;	K	[	k	{								
C			,	<	L	\	l	|								
D			-	=	M	]	m	}								
E			.	>	N	^	n	~								
F			/	?	O	_	o	▉								

The size of the numerals of codes 80h to 89h are reduced to 80%.
When Japanese message is selected in the system mode, code 5CH indicates “¥”.

(6) PC-1253

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0				0	@	P	`	p	0							
1			!	1	A	Q	a	q	1							
2			"	2	B	R	b	r	2							
3			#	3	C	S	c	s	3							
4			$	4	D	T	d	t	4							
5			%	5	E	U	e	u	5		¥					
6			&	6	F	V	f	v	6							
7			'	7	G	W	g	w	7							
8			(	8	H	X	h	x	8							
9			)	9	I	Y	i	y	9							
A			*	:	J	Z	j	z								
B			+	;	K	[	k	{								
C			,	<	L	\	l	|								
D			-	=	M	]	m	}								
E			.	>	N	^	n	~								
F			/	?	O	_	o									

The size of the numerals of codes 80h to 89h are reduced to 80%.
When Japanese message is selected in the system mode, code 5CH indicates “¥”.

12.5 TEC OUTLINE FONT 1 (Outline font type: A, B)

(1) PC-850

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0				0	@	P	`	p	Ç	É	á	€				-
1			!	1	A	Q	a	q	ü	æ	í	€			ß	±
2			”	2	B	R	b	r	é	Æ	ó					
3			#	3	C	S	c	s	â	ô	ú					
4			$	4	D	T	d	t	ä	ö	ñ				õ	
5			%	5	E	U	e	u	à	ò	Ñ					§
6			&	6	F	V	f	v	å	û	ª		ã		µ	÷
7			’	7	G	W	g	w	ç	ù	º					
8			(	8	H	X	h	x	ê	ÿ	¿					°
9			)	9	I	Y	i	y	ë	Ö						
A			*	:	J	Z	j	z	è	Ü	¬					•
B			+	;	K	[	k	{	ï	ø	½					
C			,	<	L	\	l	|	î	£	¼				
D			–	=	M	]	m	}	ì	Ø	¡	¢				²
E			.	>	N	^	n	~	Ä		«	¥				■
F			/	?	O	_	o	△	Å	ƒ	»		¤			

The Euro code (B0H) can be changed in the parameter setting in the system mode.

(2) PC-8

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0				0	@	P	`	p	Ç	É	á	€			α	≡
1			!	1	A	Q	a	q	ü	æ	í	€			β	±
2			"	2	B	R	b	r	é	Æ	ó				Γ	≥
3			#	3	C	S	c	s	â	ô	ú				π	≤
4			$	4	D	T	d	t	ä	ö	ñ				Σ	⌠
5			%	5	E	U	e	u	à	ò	Ñ				σ	⌡
6			&	6	F	V	f	v	å	û	ª				µ	÷
7			'	7	G	W	g	w	ç	ù	º				τ	≈
8			(	8	H	X	h	x	ê	ÿ	¿				Φ	°
9			)	9	I	Y	i	y	ë	Ö					Θ	•
A			*	:	J	Z	j	z	è	Ü	¬				Ω	•
B			+	;	K	[	k	{	ï	¢	½				δ	√
C			,	<	L	\	l	|	î	£	¼				∞	n
D			–	=	M	]	m	}	ì	¥	¡				∅	2
E			.	>	N	^	n	~	Ä	Pt	«				ε	■
F			/	?	O	_	o	△	Å	∫	»				∩	

The Euro code (B0H) can be changed in the parameter setting in the system mode.

(3) PC-852

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0				0	@	P	`	p	Ç	É	á	€				-
1			!	1	A	Q	a	q	ü		í	€			ß	
2			”	2	B	R	b	r	é		ó					
3			#	3	C	S	c	s	â	ô	ú					
4			$	4	D	T	d	t	ä	ö						
5			%	5	E	U	e	u								§
6			&	6	F	V	f	v								÷
7			’	7	G	W	g	w	ç							
8			(	8	H	X	h	x								°
9			)	9	I	Y	i	y	ë	Ö						
A			*	:	J	Z	j	z		Ü	¬					•
B			+	;	K	[	k	{								
C			,	<	L	\	l	|	î							
D			–	=	M	]	m	}								
E			.	>	N	^	n	~	Ä		«					■
F			/	?	O	_	o	△			»		¤			

The Euro code (B0H) can be changed in the parameter setting in the system mode.

(4) PC-857

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0				0	@	P	`	p	Ç	É	á	€		º		-
1			!	1	A	Q	a	q	ü	æ	í	€		ª	ß	±
2			"	2	B	R	b	r	é	Æ	ó					
3			#	3	C	S	c	s	â	ô	ú					
4			$	4	D	T	d	t	ä	ö	ñ				õ	
5			%	5	E	U	e	u	à	ò	Ñ					§
6			&	6	F	V	f	v	å	û			ã		µ	÷
7			'	7	G	W	g	w	ç	ù						
8			(	8	H	X	h	x	ê		¿					°
9			)	9	I	Y	i	y	ë	Ö						
A			*	:	J	Z	j	z	è	Ü	¬					•
B			+	;	K	[	k	{	ï	ø	½					
C			,	<	L	\	l	|	î	£	¼			ì	
D			–	=	M	]	m	}		Ø	¡	¢			ÿ	²
E			.	>	N	^	n	~	Ä		«	¥				■
F			/	?	O	_	o		Å		»		¤			

The Euro code (B0H) can be changed in the parameter setting in the system mode.

(5) PC-851

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0				0	@	P	`	p	Ç			€				
1			!	1	A	Q	a	q	ü			€				±
2			"	2	B	R	b	r	é							
3			#	3	C	S	c	s	â	ô						
4			$	4	D	T	d	t	ä	ö						
5			%	5	E	U	e	u	à							§
6			&	6	F	V	f	v		û						
7			'	7	G	W	g	w	ç	ù						
8			(	8	H	X	h	x	ê							°
9			)	9	I	Y	i	y	ë	Ö						
A			*	:	J	Z	j	z	è	Ü						
B			+	;	K	[	k	{	Ï		½					
C			,	<	L	\	l	|	î	£						
D			–	=	M	]	m	}								
E			.	>	N	^	n	~	Ä		«					■
F			/	?	O	_	o	△			»					

The Euro code (B0H) can be changed in the parameter setting in the system mode.

(6) PC-855

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0				0	@	P	`	p				€				
1			!	1	A	Q	a	q				€				
2			"	2	B	R	b	r								
3			#	3	C	S	c	s								
4			$	4	D	T	d	t								
5			%	5	E	U	e	u								
6			&	6	F	V	f	v								
7			'	7	G	W	g	w								
8			(	8	H	X	h	x								
9			)	9	I	Y	i	y								
A			*	:	J	Z	j	z								
B			+	;	K	[	k	{								
C			,	<	L	\	l	|								
D			–	=	M	]	m	}								§
E			.	>	N	^	n	~			«					■
F			/	?	O	_	o	△			»		¤			

The Euro code (B0H) can be changed in the parameter setting in the system mode.

(7) PC-1250

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0				0	@	P	`	p				€				
1			!	1	A	Q	a	q				€			á	
2			"	2	B	R	b	r							â	
3			#	3	C	S	c	s								ó
4			$	4	D	T	d	t			¤		Ä		ä	ô
5			%	5	E	U	e	u				µ				
6			&	6	F	V	f	v						Ö		ö
7			'	7	G	W	g	w			§	·	Ç		ç	÷
8			(	8	H	X	h	x								
9			)	9	I	Y	i	y					É		é	
A			*	:	J	Z	j	z								ú
B			+	;	K	[	k	{			«	»			ë	
C			,	<	L	\	l	|			¬			Ü		ü
D			–	=	M	]	m	}							í	
E			.	>	N	^	n	~							Î	
F			/	?	O	_	o	△						ß		

The Euro code (B0H) can be changed in the parameter setting in the system mode.

(8) PC-1251

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0				0	@	P	`	p				€				
1			!	1	A	Q	a	q				€				
2			"	2	B	R	b	r								
3			#	3	C	S	c	s								
4			$	4	D	T	d	t			¤					
5			%	5	E	U	e	u				µ				
6			&	6	F	V	f	v								
7			'	7	G	W	g	w			§	·				
8			(	8	H	X	h	x								
9			)	9	I	Y	i	y								
A			*	:	J	Z	j	z								
B			+	;	K	[	k	{			«	»				
C			,	<	L	\	l	|			¬					
D			–	=	M	]	m	}								
E			.	>	N	^	n	~								
F			/	?	O	_	o	△								

The Euro code (B0H) can be changed in the parameter setting in the system mode.

(9) PC-1252

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0				0	@	P	`	p				€			à	
1			!	1	A	Q	a	q			¡	€		Ñ	á	ñ
2			"	2	B	R	b	r			¢	²			â	ò
3			#	3	C	S	c	s	ƒ		£				ã	ó
4			$	4	D	T	d	t			¤		Ä		ä	ô
5			%	5	E	U	e	u			¥	µ	Å		å	õ
6			&	6	F	V	f	v					Æ	Ö	æ	ö
7			'	7	G	W	g	w			§	·	Ç		ç	÷
8			(	8	H	X	h	x	^	˜				Ø	è	ø
9			)	9	I	Y	i	y							é	ù
A			*	:	J	Z	j	z			ª				ê	ú
B			+	;	K	[	k	{			«	»			ë	û
C			,	<	L	\	l	|			¬	¼		Ü	ì	ü
D			–	=	M	]	m	}				½			í	
E			.	>	N	^	n	~							î	
F			/	?	O	_	o	△				¿		ß	ï	ÿ

The Euro code (B0H) can be changed in the parameter setting in the system mode.

(10) PC-1253

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0				0	@	P	`	p				€				
1			!	1	A	Q	a	q				€				
2			"	2	B	R	b	r				²				
3			#	3	C	S	c	s	ƒ		£					
4			$	4	D	T	d	t			¤					
5			%	5	E	U	e	u			¥	µ				
6			&	6	F	V	f	v								
7			'	7	G	W	g	w			§	·				
8			(	8	H	X	h	x								
9			)	9	I	Y	i	y								
A			*	:	J	Z	j	z			ª					
B			+	;	K	[	k	{			«	»				
C			,	<	L	\	l	|			¬					
D			–	=	M	]	m	}				½				
E			.	>	N	^	n	~								
F			/	?	O	_	o	△								

The Euro code (B0H) can be changed in the parameter setting in the system mode.

(11) PC-1254

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0				0	@	P	`	p				€			à	
1			!	1	A	Q	a	q			¡	€		Ñ	á	ñ
2			"	2	B	R	b	r			¢	²			â	ò
3			#	3	C	S	c	s	ƒ		£				ã	ó
4			$	4	D	T	d	t			¤		Ä		ä	ô
5			%	5	E	U	e	u			¥	µ	Å		å	õ
6			&	6	F	V	f	v					Æ	Ö	æ	ö
7			'	7	G	W	g	w			§	·	Ç		ç	÷
8			(	8	H	X	h	x	^	˜				Ø	è	ø
9			)	9	I	Y	i	y					É		é	ù
A			*	:	J	Z	j	z			ª	º			ê	ú
B			+	;	K	[	k	{			«	»			ë	û
C			,	<	L	\	l	|			¬	¼		Ü	ì	ü
D			–	=	M	]	m	}				½			í	
E			.	>	N	^	n	~							î	
F			/	?	O	_	o	△				¿		ß	Ï	ÿ

The Euro code (B0H) can be changed in the parameter setting in the system mode.

(12) PC-1257

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0				0	@	P	`	p				€				
1			!	1	A	Q	a	q				€				
2			"	2	B	R	b	r			¢	²				
3			#	3	C	S	c	s			£					ó
4			$	4	D	T	d	t			¤		Ä		ä	
5			%	5	E	U	e	u				µ	Å		å	õ
6			&	6	F	V	f	v						Ö		ö
7			'	7	G	W	g	w			§	·				÷
8			(	8	H	X	h	x			Ø	ø				
9			)	9	I	Y	i	y					É		é	
A			*	:	J	Z	j	z								
B			+	;	K	[	k	{			«	»				
C			,	<	L	\	l	|			¬	¼		Ü		ü
D			–	=	M	]	m	}				½				
E			.	>	N	^	n	~								
F			/	?	O	_	o	△			Æ	æ		ß		

The Euro code (B0H) can be changed in the parameter setting in the system mode.

(13) LATIN9

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0				0	@	P	`	p				€			à	
1			!	1	A	Q	a	q			¡	€		Ñ	á	ñ
2			"	2	B	R	b	r			¢	²			â	ò
3			#	3	C	S	c	s			£				ã	ó
4			$	4	D	T	d	t			¤		Ä		ä	ô
5			%	5	E	U	e	u			¥	µ	Å		å	õ
6			&	6	F	V	f	v					Æ	Ö	æ	ö
7			'	7	G	W	g	w			§	·	Ç		ç	÷
8			(	8	H	X	h	x						Ø	è	ø
9			)	9	I	Y	i	y					É		é	ù
A			*	:	J	Z	j	z			ª	º			ê	ú
B			+	;	K	[	k	{			«	»			ë	û
C			,	<	L	\	l	|			¬			Ü	ì	ü
D			–	=	M	]	m	}							í	
E			.	>	N	^	n	~							î	
F			/	?	O	_	o					¿		ß	Ï	ÿ

The Euro code (B0H) can be changed in the parameter setting in the system mode.

(14) Arabic

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0				0	@	P	`	p				€				
1			!	1	A	Q	a	q				€				
2			"	2	B	R	b	r								
3			#	3	C	S	c	s								
4			$	4	D	T	d	t								
5			%	5	E	U	e	u								
6			&	6	F	V	f	v								
7			'	7	G	W	g	w								
8			(	8	H	X	h	x								
9			)	9	I	Y	i	y								
A			*	:	J	Z	j	z								
B			+	;	K	[	k	{								
C			,	<	L	\	l	|								
D			–	=	M	]	m	}								
E			.	>	N	^	n	~								
F			/	?	O	_	o	△								

The Euro code (B0H) can be changed in the parameter setting in the system mode.

12.6 PRICE FONT 1, 2, 3 (Outline font type: E, F, G)

(1) All types of character codes

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0				0	円											-
1				1												
2				2												
3				3												
4			$	4												
5			%	5												
6				6												
7				7												
8				8												
9				9												
A																
B																
C			,			¥										
D			–													
E			.					~								
F			/													

12.7 TEC OUTLINE FONT 2, 3, GOTHIC725 BLACK (Outline font type: H, I, J)

(1) PC-850

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

When Japanese message is selected in the system mode, code 5CH indicates “¥”.
The Euro code (B0H) can be changed in the parameter setting in the system mode.

(2) PC-8

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0				0	@	P	`	p	Ç	É	á	€				
1			!	1	A	Q	a	q	ü	æ	í					±
2			”	2	B	R	b	r	é	Æ	ó					
3			#	3	C	S	c	s	â	ô	ú					
4			$	4	D	T	d	t	ä	ö	ñ					
5			%	5	E	U	e	u	à	ò	Ñ					
6			&	6	F	V	f	v	å	û	ª				µ	÷
7			’	7	G	W	g	w	ç	ù	º					
8			(	8	H	X	h	x	ê	ÿ	¿					°
9			)	9	I	Y	i	y	ë	Ö						
A			*	:	J	Z	j	z	è	Ü	¬					•
B			+	;	K	[	k	{	ï	¢	½					
C			,	<	L	\	l	|	î	£	¼				
D			–	=	M	]	m	}	ì	¥	¡					²
E			.	>	N	^	n	~	Ä		«					■
F			/	?	O	_	o		Å	ƒ	»					

When Japanese message is selected in the system mode, code 5CH indicates “¥”.
The Euro code (B0H) can be changed in the parameter setting in the system mode.

(3) PC-852

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0				0	@	P	`	p	Ç	É	á	€		đ	Ó	-
1			!	1	A	Q	a	q	ü	Ĺ	í			Đ	ß	˝
2			”	2	B	R	b	r	é	Í	ó			Ď	Ô	˛
3			#	3	C	S	c	s	â	ô	ú			Ë	Ń	ˇ
4			$	4	D	T	d	t	ä	ö	Ą			ď	ń	˘
5			%	5	E	U	e	u	ů	Ľ	ą	Á		Ň	ň	§
6			&	6	F	V	f	v	ć	Ľ	Ž	Â	Ă	Í	Š	÷
7			’	7	G	W	g	w	ç	Ś	ž	Ě	ă	Î	š	¸
8			(	8	H	X	h	x	ł	ś	Ę	Ş		ě	Ŕ	°
9			)	9	I	Y	i	y	ë	Ö	ę				Ú	¨
A			*	:	J	Z	j	z	Ő	Ü	¬				ŕ	•
B			+	;	K	[	k	{	ő	Ť	ź				Ű	ű
C			,	<	L	\	l	|	î	ť	Č				ý	Ř
D			–	=	M	]	m	}	Ź	Ł	ş	Ż		Ţ	Ý	ř
E			.	>	N	^	n	~	Ä	×	«	ż		Ů	ţ	■
F			/	?	O	_	o		Ć	č	»		¤			

When Japanese message is selected in the system mode, code 5CH indicates “¥”.
The Euro code (B0H) can be changed in the parameter setting in the system mode.

(4) PC-857

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

When Japanese message is selected in the system mode, code 5CH indicates “¥”.
The Euro code (B0H) can be changed in the parameter setting in the system mode.

(5) PC-851

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0				0	@	P	`	p	Ç			€				
1			!	1	A	Q	a	q	ü							±
2			”	2	B	R	b	r	é							
3			#	3	C	S	c	s	â	ô						
4			$	4	D	T	d	t	ä	ö						
5			%	5	E	U	e	u	à							§
6			&	6	F	V	f	v		û						
7			’	7	G	W	g	w	ç	ù						¸
8			(	8	H	X	h	x	ê							°
9			)	9	I	Y	i	y	ë	Ö						¨
A			*	:	J	Z	j	z	è	Ü						
B			+	;	K	[	k	{	ï		½					
C			,	<	L	\	l	|	î	£					
D			–	=	M	]	m	}								
E			.	>	N	^	n	~	Ä		«					■
F			/	?	O	_	o				»					

When Japanese message is selected in the system mode, code 5CH indicates “¥”.
The Euro code (B0H) can be changed in the parameter setting in the system mode.

(6) PC-855

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0				0	@	P	`	p				€				
1			!	1	A	Q	a	q								
2			”	2	B	R	b	r								
3			#	3	C	S	c	s								
4			$	4	D	T	d	t								
5			%	5	E	U	e	u								
6			&	6	F	V	f	v								
7			’	7	G	W	g	w								
8			(	8	H	X	h	x								
9			)	9	I	Y	i	y								
A			*	:	J	Z	j	z								
B			+	;	K	[	k	{								
C			,	<	L	\	l	|								
D			–	=	M	]	m	}								§
E			.	>	N	^	n	~			«					■
F			/	?	O	_	o				»		¤			

When Japanese message is selected in the system mode, code 5CH indicates “¥”.
The Euro code (B0H) can be changed in the parameter setting in the system mode.

(7) PC-1250

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0				0	@	P	`	p				€	Ŕ	Đ	ŕ	ð
1			!	1	A	Q	a	q			ˇ	±	Á	Ń	á	ń
2			”	2	B	R	b	r			˘	˛		Ň	â	ň
3			#	3	C	S	c	s			Ł	ł		Ó		ó
4			$	4	D	T	d	t			¤	´	Ä	Ô	ä	ô
5			%	5	E	U	e	u			Ą	µ	Ĺ	Ő	Í	ő
6			&	6	F	V	f	v			¦	¶	Ć	Ö	ć	ö
7			’	7	G	W	g	w			§	·	Ç	×	ç	÷
8			(	8	H	X	h	x			¨	¸	Č	Ř	č	ř
9			)	9	I	Y	i	y				ą	É	Ů	é	ů
A			*	:	J	Z	j	z	Š	š	Ş	ş	Ę	Ú	ę	ú
B			+	;	K	[	k	{	Ś	ś	«	»	Ë	Ű	ë	ű
C			,	<	L	\	l	|	Ť	ť	¬	Ľ	Ě	Ü	ě	ü
D			–	=	M	]	m	}			-	˝	Í	Ý	í	ý
E			.	>	N	^	n	~	Ž	ž	®	Ǐ	Î	Ţ	î	ţ
F			/	?	O	_	o	Ż	Ź	ź		ż	Ď	ß		

When Japanese message is selected in the system mode, code 5CH indicates “¥”.
The Euro code (B0H) can be changed in the parameter setting in the system mode.

(8) PC-1251

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0				0	@	P	`	p				€				
1			!	1	A	Q	a	q				±				
2			”	2	B	R	b	r								
3			#	3	C	S	c	s								
4			$	4	D	T	d	t			¤					
5			%	5	E	U	e	u				µ				
6			&	6	F	V	f	v			¦	¶				
7			’	7	G	W	g	w			§	·				
8			(	8	H	X	h	x								
9			)	9	I	Y	i	y								
A			*	:	J	Z	j	z								
B			+	;	K	[	k	{			«	»				
C			,	<	L	\	l	|			¬					
D			–	=	M	]	m	}			-					
E			.	>	N	^	n	~			®					
F			/	?	O	_	o									

When Japanese message is selected in the system mode, code 5CH indicates “¥”.
The Euro code (B0H) can be changed in the parameter setting in the system mode.

(9) PC-1252

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

When Japanese message is selected in the system mode, code 5CH indicates “¥”.
The Euro code (B0H) can be changed in the parameter setting in the system mode.

(10) PC-1253

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0				0	@	P	`	p				€				
1			!	1	A	Q	a	q				±				
2			”	2	B	R	b	r				²				
3			#	3	C	S	c	s	ƒ		£	³				
4			$	4	D	T	d	t			¤					
5			%	5	E	U	e	u				µ				
6			&	6	F	V	f	v			¦	¶				
7			’	7	G	W	g	w			§	·				
8			(	8	H	X	h	x			¨					
9			)	9	I	Y	i	y								
A			*	:	J	Z	j	z			ª					
B			+	;	K	[	k	{			«	»				
C			,	<	L	\	l	|			¬					
D			–	=	M	]	m	}			-	½				
E			.	>	N	^	n	~			®					
F			/	?	O	_	o									

When Japanese message is selected in the system mode, code 5CH indicates “¥”.
The Euro code (B0H) can be changed in the parameter setting in the system mode.

(11) PC-1254

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

When Japanese message is selected in the system mode, code 5CH indicates “¥”.
The Euro code (B0H) can be changed in the parameter setting in the system mode.

(12) PC-1257

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0				0	@	P	`	p				€	Ą	Š	ą	š
1			!	1	A	Q	a	q				±		Ń		ń
2			”	2	B	R	b	r				²				
3			#	3	C	S	c	s			£	³	Ć	Ó	ć	ó
4			$	4	D	T	d	t			¤	´	Ä		ä	
5			%	5	E	U	e	u				µ	Å	Õ	å	õ
6			&	6	F	V	f	v			¦	¶	Ę	Ö	ę	ö
7			’	7	G	W	g	w			§	·		×		÷
8			(	8	H	X	h	x			Ø	ø	Č		č	
9			)	9	I	Y	i	y				¹	É	Ť	é	ť
A			*	:	J	Z	j	z					Ź	Ś	ź	ś
B			+	;	K	[	k	{			«	»				
C			,	<	L	\	l	|			¬	¼		Ü		ü
D			–	=	M	]	m	}	¨	¯	-	½		Ž		ž
E			.	>	N	^	n	~	ˇ	¸	®			Ž		ž
F			/	?	O	_	o		˛		Æ	æ		ß		

When Japanese message is selected in the system mode, code 5CH indicates “¥”.
The Euro code (B0H) can be changed in the parameter setting in the system mode.

(13) LATIN9

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

When Japanese message is selected in the system mode, code 5CH indicates “¥”.
The Euro code (B0H) can be changed in the parameter setting in the system mode.

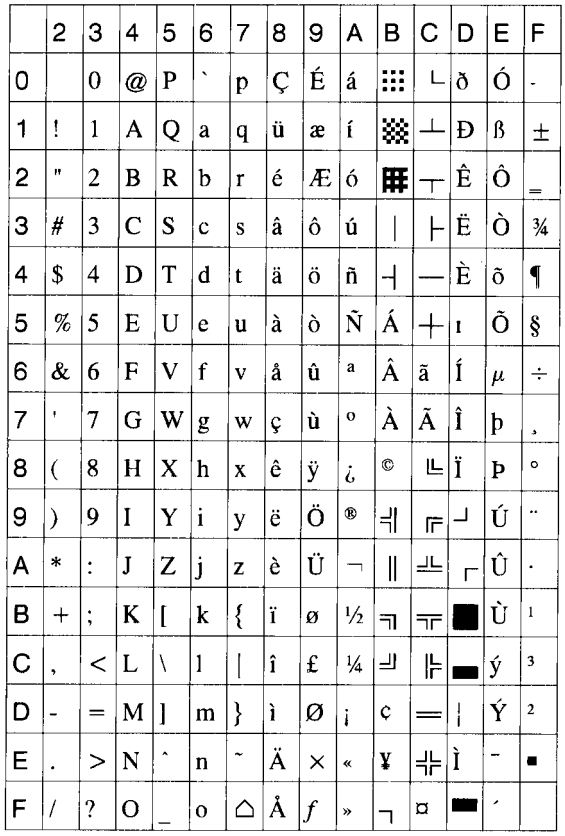
(14) Arabic

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0				0	@	P	`	p				€				
1			!	1	A	Q	a	q								
2			”	2	B	R	b	r								
3			#	3	C	S	c	s								
4			$	4	D	T	d	t								
5			%	5	E	U	e	u								
6			&	6	F	V	f	v								
7			’	7	G	W	g	w								
8			(	8	H	X	h	x								
9			)	9	I	Y	i	y								
A			*	:	J	Z	j	z								
B			+	;	K	[	k	{								
C			,	<	L	\	l	|								
D			–	=	M	]	m	}								
E			.	>	N	^	n	~								
F			/	?	O	_	o									

When Japanese message is selected in the system mode, code 5CH indicates “¥”.
The Euro code (B0H) can be changed in the parameter setting in the system mode.

12.8 TrueType FONT

(1) PC-850



	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0		0	@	P	`	p	Ç	É	á	▒	└	ð	Ó	-
1	!	1	A	Q	a	q	ü	æ	í	▓	┴	Ð	ß	±
2	"	2	B	R	b	r	é	Æ	ó	▓	┬	Ê	Ô	‗
3	#	3	C	S	c	s	â	ô	ú	│	├	Ë	Ò	¾
4	$	4	D	T	d	t	ä	ö	ñ	┤	—	È	õ	¶
5	%	5	E	U	e	u	à	ò	Ñ	Á	┼	ı	Õ	§
6	&	6	F	V	f	v	å	û	ª	Â	ã	Í	µ	÷
7	'	7	G	W	g	w	ç	ù	º	À	Ã	Î	þ	¸
8	(	8	H	X	h	x	ê	ÿ	¿	©	╚	Ï	Þ	°
9	)	9	I	Y	i	y	ë	Ö	®	╣	╔	┘	Ú	¨
A	*	:	J	Z	j	z	è	Ü	¬	‖	╩	┌	Û	·
B	+	;	K	[	k	{	ï	ø	½	╗	╦	▓	Ù	¹
C	,	<	L	\	l	|	î	£	¼	╝	╠	▬	ý	³
D	-	=	M	]	m	}	ì	Ø	¡	¢	═	¦	Ý	²
E	.	>	N	^	n	~	Ä	×	«	¥	╬	Ì	¯	■
F	/	?	O	_	o	⌂	Å	ƒ	»	┐	¤	▓	´	

(2) PC-8

	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0		0	@	P	`	p	Ç	É	á	▒	└	╨	α	≡
1	!	1	A	Q	a	q	ü	æ	í	▓	┴	╤	ß	±
2	"	2	B	R	b	r	é	Æ	ó	▓	┬	╥	Γ	≥
3	#	3	C	S	c	s	â	ô	ú	│	├	╙	π	≤
4	$	4	D	T	d	t	ä	ö	ñ	┤	—	╘	Σ	⌠
5	%	5	E	U	e	u	à	ò	Ñ	╡	┼	╒	σ	⌡
6	&	6	F	V	f	v	å	û	ª	╢	╞	╓	µ	÷
7	'	7	G	W	g	w	ç	ù	º	╖	╟	╫	τ	≈
8	(	8	H	X	h	x	ê	ÿ	¿	╕	╚	╪	Φ	°
9	)	9	I	Y	i	y	ë	Ö	⌐	╣	╔	┘	Θ	·
A	*	:	J	Z	j	z	è	Ü	¬	‖	╩	┌	Ω	·
B	+	;	K	[	k	{	ï	¢	½	╗	╦	▓	δ	√
C	,	<	L	\	l	|	î	£	¼	╝	╠	▬	∞	n
D	-	=	M	]	m	}	ì	¥	¡	╜	═	▌	φ	²
E	.	>	N	^	n	~	Ä	Pt	«	╛	╬	▐	ϵ	■
F	/	?	O	_	o	⌂	Å	ƒ	»	┐	╧	▓	∩	

(3) PC-852

	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0		0	@	P	`	p	Ç	É	á	▒	└	đ	Ó	-
1	!	1	A	Q	a	q	ü	Ĺ	í	▓	┴	Đ	ß	˝
2	"	2	B	R	b	r	é	Í	ó	▓	┬	Ď	Ô	˛
3	#	3	C	S	c	s	â	ô	ú	|	├	Ë	Ń	ˇ
4	$	4	D	T	d	t	ä	ö	Ą	┤	—	ď	ń	˘
5	%	5	E	U	e	u	ů	Ľ	ą	Á	┼	Ň	ň	§
6	&	6	F	V	f	v	ć	ľ	Ž	Â	Ă	Í	Š	÷
7	'	7	G	W	g	w	ç	Ś	ž	Ě	ă	Î	š	¸
8	(	8	H	X	h	x	ł	ś	Ę	Ş	╚	č	Ř	°
9	)	9	I	Y	i	y	ë	Ö	ę	╣	╔	┘	Ú	¨
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(4) PC-857

	2	3	4	5	6	7	8	9	A	B	C	D	E	F
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1	!	1	A	Q	a	q	ü	æ	í	▓	┴	ª	ß	±
2	"	2	B	R	b	r	é	Æ	ó	▓	┬	Ê	Ô	
3	#	3	C	S	c	s	â	ô	ú	|	├	Ë	Ò	¾
4	$	4	D	T	d	t	ä	ö	ñ	┤	—	È	õ	¶
5	%	5	E	U	e	u	à	ò	Ñ	Á	┼		Õ	§
6	&	6	F	V	f	v	å	û	Ğ	Â	ã	Í	µ	÷
7	'	7	G	W	g	w	ç	ù	ğ	À	Ã	Î		¸
8	(	8	H	X	h	x	ê	İ	¿	©	╚	Ï	×	°
9	)	9	I	Y	i	y	ë	Ö	®	╣	╔	┘	Ú	¨
A	*	:	J	Z	j	z	è	Ü	¬	‖	╩	┌	Û	·
B	+	;	K	[	k	{	ï	ø	½	╗	╦	▒	Ù	¹
C	,	<	L	\	l	|	î	£	¼	╝	╠	▄	ì	³
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(5) PC-851

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2	"	2	B	R	b	r	é	Ό	ό	▀	┬	Φ	θ	υ
3	#	3	C	S	c	s	â	ô	ύ	|	├	X	ι	φ
4	$	4	D	T	d	t	ä	ö	A	┤	—	Ψ	κ	χ
5	%	5	E	U	e	u	à	Ύ	B	K	┼	Ω	λ	§
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(6) PC-855

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2	"	2	B	R	b	r	ѓ	њ	б	▀	┬	м	Р	Ы
3	#	3	C	S	c	s	Ѓ	Њ	Б	|	├	М	с	з
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5	%	5	E	U	e	u	Ё	Ћ	Ц	х	┼	Н	т	ш
6	&	6	F	V	f	v	є	ќ	д	Х	к	о	Т	Ш
7	'	7	G	W	g	w	Є	Ќ	Д	и	К	О	у	э
8	(	8	H	X	h	x	s	ў	е	И	╚	п	У	Э
9	)	9	I	Y	i	y	S	Ў	Е	╣	╔	┘	ж	щ
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(7) PC-1250

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9	)	9	I	Y	i	y	‰	™	©	ą	É	Ů	é	ů
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(8) PC-1251

	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0		0	@	P	`	p	Ђ	ђ		°	А	Р	а	р
1	!	1	A	Q	a	q	Ѓ	‘	Ў	±	Б	С	б	с
2	"	2	B	R	b	r	,	’	ў	І	В	Т	в	т
3	#	3	C	S	c	s	ѓ	“	Ј	і	Г	У	г	у
4	$	4	D	T	d	t	„	”	¤	Ґ	Д	Ф	д	ф
5	%	5	E	U	e	u	…	•	Ґ	µ	Е	Х	е	х
6	&	6	F	V	f	v	†	–	¦	¶	Ж	Ц	ж	ц
7	'	7	G	W	g	w	‡	—	§	·	З	Ч	з	ч
8	(	8	H	X	h	x	€		Ё	ё	И	Ш	и	ш
9	)	9	I	Y	i	y	‰	™	©	№	Й	Щ	й	щ
A	*	:	J	Z	j	z	Љ	љ	Є	є	К	Ъ	к	ъ
B	+	;	K	[	k	{	‹	›	«	»	Л	Ы	л	ы
C	,	<	L	\	l	|	Њ	њ	¬	j	М	Ь	м	ь
D	-	=	M	]	m	}	Ќ	ќ	-	S	Н	Э	н	э
E	.	>	N	^	n	~	Ћ	ћ	®	s	О	Ю	о	ю
F	/	?	O	_	o	▩	Џ	џ	Ї	ї	П	Я	п	я

(9) PC-1252

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

(10) PC-1253

	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0		0	@	P	`	p	€			°	ΐ	Π	ΰ	π
1	!	1	A	Q	a	q		‘	΅	±	Α	Ρ	α	ρ
2	"	2	B	R	b	r	,	’	Ά	²	Β		β	ς
3	#	3	C	S	c	s	*f*	“	£	³	Γ	Σ	γ	σ
4	$	4	D	T	d	t	„	”	¤	΄	Δ	Τ	δ	τ
5	%	5	E	U	e	u	…	•	¥	µ	Ε	Υ	ε	υ
6	&	6	F	V	f	v	†	–	¦	¶	Ζ	Φ	ζ	φ
7	'	7	G	W	g	w	‡	—	§	·	Η	Χ	η	χ
8	(	8	H	X	h	x			¨	Έ	Θ	Ψ	θ	ψ
9	)	9	I	Y	i	y	‰	™	©	Ή	Ι	Ω	ι	ω
A	*	:	J	Z	j	z			ª	Ί	Κ	Ϊ	κ	ϊ
B	+	;	K	[	k	{	‹	›	«	»	Λ	Ϋ	λ	ϋ
C	,	<	L	\	l	|			¬	Ό	Μ	ά	μ	ό
D	-	=	M	]	m	}			-	½	Ν	έ	ν	ύ
E	.	>	N	^	n	~			®	Ύ	Ξ	ή	ξ	ώ
F	/	?	O	_	o	▒			—	Ώ	Ο	ί	ο	

(11) PC-1254

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

(12) PC-1257

	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0		0	@	P	`	p	€			°	Ą	Š	ą	š
1	!	1	A	Q	a	q		‘		±	Į	Ń	į	ń
2	"	2	B	R	b	r	,	’	ç	²	Ā	Ņ	ā	ņ
3	#	3	C	S	c	s		“	£	³	Ć	Ó	ć	ó
4	$	4	D	T	d	t	„	”	¤	´	Ä	Ō	ä	ō
5	%	5	E	U	e	u	…	•		µ	Å	Õ	å	õ
6	&	6	F	V	f	v	†	–	¦	¶	Ę	Ö	ę	ö
7	'	7	G	W	g	w	‡	—	§	·	Ē	×	ē	÷
8	(	8	H	X	h	x			Ø	ø	Č	Ų	č	ų
9	)	9	I	Y	i	y	‰	™	©	¹	É	Ł	é	ł
A	*	:	J	Z	j	z			Ŗ	ŗ	Ź	Ś	ź	ś
B	+	;	K	[	k	{	‹	›	«	»	Ė	Ū	ė	ū
C	,	<	L	\	l	|			¬	¼	Ģ	Ü	ģ	ü
D	-	=	M	]	m	}	¨	¯	-	½	Ķ	Ż	ķ	ż
E	.	>	N	^	n	~	ˇ	˛	®	¾	Ī	Ž	ī	ž
F	/	?	O	_	o	▩	˙		Æ	æ	Ļ	ß	ļ	˙

(13) LATIN9

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

(14) Arabic

	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0		،	٠	ت	١	ه				ى	ؤ	ً	ٌ	
1	‎	-	=	ث	ل	ع			ﻟ	ى	ﻻ	ٍ	ٔ	
2	‎	.	٠	ث	,	غ			ل	ء	ﻻ	ٌ	ّ	
3	‎	/	؟	ج	ـ	غ			م	ئ	ﻷ	ٍ	ٕ	
4		٠	ـ	ج	ز	ﻏ			م	ئ	ﻷ	ٌ	ٖ	
5	!	١	ا	ج	س	غ			ن	0	ﻵ	ٍ		
6	"	٢	ا	ح	س	غ			ه	1	ﻵ	ٌ	ٗ	
7	«	٣	أ	ح	ش	ف			ﻫ	2	ﻹ	ٍ	٘	
8	»	٤	أ	ح	ش	ف			ه	3	ﻹ	ٌ		
9	٪	٥	آ	خ	ص	ف			ه	4	ـٔ	ٍ		
A	×	٦	آ	خ	ص	ق			و	5	ـٕ	ً		
B	÷	٧	إ	خ	ض	ق			ﻭ	6	ـٖ	ٌ		
C	(	٨	إ	د	ض	ق			ي	7	ـٗ	ً		
D	)	٩	ب	ذ	ط	ك			ي	8	ـ٘	ٌ		
E	*	:	ب	ر	ظ	ك			ة	9	ـٙ	ٍ		
F	+	؛	ت	ز	ع				ة	ئ	ـٚ	ً		

13. BAR CODE TABLE

(1) WPC (JAN, EAN, UPC)
ITF, MSI, UCC/EAN128, Industrial 2 of 5
GS1 DataBar Omnidirectional/GS1 DataBar Truncated
GS1 DataBar Stacked
GS1 DataBar Stacked Omnidirectional
GS1 DataBar Limited

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

(2) CODE39 (Standard)

	2	3	4	5	6	7
0	SP	0		P		
1		1	A	Q		
2		2	B	R		
3		3	C	S		
4	$	4	D	T		
5	%	5	E	U		
6		6	F	V		
7		7	G	W		
8		8	H	X		
9		9	I	Y		
A	*		J	Z		
B	+		K			
C			L			
D	–		M			
E	•		N			
F	/		O			

(3) CODE39 (Full ASCII)

[Transfer code]

	2	3	4	5	6	7
0	SP	0	@	P	`	p
1	!	1	A	Q	a	q
2	"	2	B	R	b	r
3	#	3	C	S	c	s
4	$	4	D	T	d	t
5	%	5	E	U	e	u
6	&	6	F	V	f	v
7	'	7	G	W	g	w
8	(	8	H	X	h	x
9	)	9	I	Y	i	y
A	*	:	J	Z	j	z
B	+	;	K	[	k	{
C	,	<	L	\	l	|
D	–	=	M	]	m	}
E	.	>	N	^	n	~
F	/	?	O	_	o	△

[Drawing code]

	2	3	4	5	6	7
0	SP	0	%V	P	%W	+P
1	/A	1	A	Q	+A	+Q
2	/B	2	B	R	+B	+R
3	/C	3	C	S	+C	+S
4	/D	4	D	T	+D	+T
5	/E	5	E	U	+E	+U
6	/F	6	F	V	+F	+V
7	/G	7	G	W	+G	+W
8	/H	8	H	X	+H	+X
9	/I	9	I	Y	+I	+Y
A	/J	/Z	J	Z	+J	+Z
B	/K	%F	K	%K	+K	%P
C	/L	%G	L	%L	+L	%Q
D	–	%H	M	%M	+M	%R
E	.	%I	N	%N	+N	%S
F	/O	%J	O	%O	+O	%T

(4) NW-7

	2	3	4	5	6	7
0	SP	0				
1		1	A		a	
2		2	B		b	
3		3	C		c	
4	$	4	D		d	t
5		5			e	
6		6				
7		7				
8		8				
9		9				
A	*	:				
B	+					
C						
D	–					
E	•				n	
F	/					

(5) CODE93

[Transfer code]

	2	3	4	5	6	7
0	SP	0	@	P	`	p
1	!	1	A	Q	a	q
2	"	2	B	R	b	r
3	#	3	C	S	c	s
4	$	4	D	T	d	t
5	%	5	E	U	e	u
6	&	6	F	V	f	v
7	'	7	G	W	g	w
8	(	8	H	X	h	x
9	)	9	I	Y	i	y
A	*	:	J	Z	j	z
B	+	;	K	[	k	{
C	,	<	L	\	l	|
D	–	=	M	]	m	}
E	.	>	N	^	n	~
F	/	?	O	_	o	△

[Drawing code]

	2	3	4	5	6	7
0	SP	0	%V	P	%W	+P
1	/A	1	A	Q	+A	+Q
2	/B	2	B	R	+B	+R
3	/C	3	C	S	+C	+S
4	/D	4	D	T	+D	+T
5	/E	5	E	U	+E	+U
6	/F	6	F	V	+F	+V
7	/G	7	G	W	+G	+W
8	/H	8	H	X	+H	+X
9	/I	9	I	Y	+I	+Y
A	/J	/Z	J	Z	+J	+Z
B	+	%F	K	%K	+K	%P
C	/L	%G	L	%L	+L	%Q
D	–	%H	M	%M	+M	%R
E	.	%I	N	%N	+N	%S
F	/	%J	O	%O	+O	%T

(6) CODE128

[Transfer code]

	–	–	2	3	4	5	6	7
0	NUL	DLE	SP	0	@	P	`	p
1	SOH	DC1	!	1	A	Q	a	q
2	STX	DC2	"	2	B	R	b	r
3	ETX	DC3	#	3	C	S	c	s
4	EOT	DC4	$	4	D	T	d	t
5	ENQ	NAK	%	5	E	U	e	u
6	ACK	SYN	&	6	F	V	f	v
7	BEL	ETB	'	7	G	W	g	w
8	BS	CAN	(	8	H	X	h	x
9	HT	EM	)	9	I	Y	i	y
A	LF	SUB	*	:	J	Z	j	z
B	VT	ESC	+	;	K	[	k	{
C	FF	FS	,	<	L	\	l	|
D	CR	GS	–	=	M	]	m	}
E	SO	RS	.	>	N	^	n	~
F	SI	US	/	?	O	_	o	△

[Drawing code]

Value Code Table

① How to transmit control code data:

NUL (00H)	→	>@ (3EH, 40H)
SOH (01H)	→	>A (3EH, 41H)
STX (02H)	→	>B (3EH, 42H)
to		
GS (1DH)	→	>] (3EH, 5DH)
RS (1EH)	→	> ^ (3EH, 5EH)
US (1FH)	→	>_ (3EH, 5FH)

② How to transmit special codes:

Value		
30 (Character >)	→	>0
95	→	>1
96	→	>2
97	→	>3
98	→	>4
99	→	>5
100	→	>6
101	→	>7
102	→	>8

③ Designation of start code:

START (CODE A)	→	>7
START (CODE B)	→	>6
START (CODE C)	→	>5

Value Code Table

VALUE	CODE A	CODE B	CODE C
0	SP	SP	00
1	!	!	01
2	"	"	02
3	#	#	03
4	$	$	04
5	%	%	05
6	&	&	06
7	'	'	07
8	(	(	08
9	)	)	09
10	*	*	10
11	+	+	11
12	,	,	12
13	–	–	13
14	.	.	14
15	/	/	15
16	0	0	16
17	1	1	17
18	2	2	18
19	3	3	19
20	4	4	20
21	5	5	21
22	6	6	22
23	7	7	23
24	8	8	24
25	9	9	25
26	:	:	26
27	;	;	27
28	<	<	28
29	=	=	29
30	>	>	30
31	?	?	31
32	@	@	32
33	A	A	33
34	B	B	34
35	C	C	35

VALUE	CODE A	CODE B	CODE C
36	D	D	36
37	E	E	37
38	F	F	38
39	G	G	39
40	H	H	40
41	I	I	41
42	J	J	42
43	K	K	43
44	L	L	44
45	M	M	45
46	N	N	46
47	O	O	47
48	P	P	48
49	Q	Q	49
50	R	R	50
51	S	S	51
52	T	T	52
53	U	U	53
54	V	V	54
55	W	W	55
56	X	X	56
57	Y	Y	57
58	Z	Z	58
59	[	[	59
60	\	\	60
61	]	]	61
62	^	^	62
63	_	_	63
64	NUL	`	64
65	SOH	a	65
66	STX	b	66
67	ETX	c	67
68	EOT	d	68
69	ENQ	e	69
70	ACK	f	70
71	BEL	g	71

VALUE	CODE A	CODE B	CODE C
72	BS	h	72
73	HT	i	73
74	LF	j	74
75	VT	k	75
76	FF	l	76
77	CR	m	77
78	SO	n	78
79	SI	o	79
80	DLE	p	80
81	DC1	q	81
82	DC2	r	82
83	DC3	s	83
84	DC4	t	84
85	NAK	u	85
86	SYN	v	86
87	ETB	w	87
88	CAN	x	88
89	EM	y	89
90	SUB	z	90
91	ESC	{	91
92	FS	¦	92
93	GS	}	93
94	RS	~	94
95	US	DEL	95
96	FNC3	FNC3	96
97	FNC2	FNC2	97
98	SHIFT	SHIFT	98
99	CODE C	CODE C	99
100	CODE B	FNC4	CODE B
101	FNC4	CODE A	CODE A
102	FNC1	FNC1	FNC1

103	START CODE A
104	START CODE B
105	START CODE C

(7) Data Matrix

The code to be used is designated using the format ID.

Format ID	Code	Details
1	Number	0 to 9 space
2	Letters	A to Z space
3	Alphanumeric, symbols	0 to 9 A to Z space . , - /
4	Alphanumeric	0 to 9 A to Z space
5	ASCII (7-bit)	00H to 7FH
6	ISO (8-bit)	00H to FFH

[Transfer Code]

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0	NUL	DLE	SP	0	@	P	`	p								
1	SOH	DC1	!	1	A	Q	a	q								
2	STX	DC2	”	2	B	R	b	r								
3	ETX	DC3	#	3	C	S	c	s								
4	EOT	DC4	$	4	D	T	d	t								
5	ENQ	NAK	%	5	E	U	e	u								
6	ACK	SYN	&	6	F	V	f	v								
7	BEL	ETB	’	7	G	W	g	w								
8	BS	CAN	(	8	H	X	h	x								
9	HT	EM	)	9	I	Y	i	y								
A	LF	SUB	*	:	J	Z	j	z								
B	VT	ESC	+	;	K	[	k	{								
C	FF	FS	,	<	L	\	l	|							
D	CR	GS	–	=	M	]	m	}								
E	SO	RS	.	>	N	^	n	~								
F	SI	US	/	?	O	_	o	△								

① How to send control code data:

NUL (00H) → >@ (3EH, 40H)
SOH (01H) → >A (3EH, 41H)
STX (02H) → >B (3EH, 42H)
to
GS (1DH) → >] (3EH, 5DH)
RS (1EH) → >^ (3EH, 5EH)
US (1FH) → >_ (3EH, 5FH)

② How to send a special code:

> (3EH) → >0 (3EH, 30H)

(8) PDF417

The following modes are automatically selected according to the code used.

Mode	Code	Details
EXC mode	Alphanumeric, symbol	0 to 9 A to Z a to z space ! ” # $ % & ’ ( ) * + , - . / : ; < = > ? @ [\ ] ^ _ ` { | } ~ △ CR HT
Binary/ASCII Plus mode	Binary International Character Set	00H to FFH
Numeric Compaction mode	Number	0 to 9

[Transfer Code]

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0	NUL	DLE	SP	0	@	P	`	p								
1	SOH	DC1	!	1	A	Q	a	q								
2	STX	DC2	”	2	B	R	b	r								
3	ETX	DC3	#	3	C	S	c	s								
4	EOT	DC4	$	4	D	T	d	t								
5	ENQ	NAK	%	5	E	U	e	u								
6	ACK	SYN	&	6	F	V	f	v								
7	BEL	ETB	’	7	G	W	g	w								
8	BS	CAN	(	8	H	X	h	x								
9	HT	EM	)	9	I	Y	i	y								
A	LF	SUB	*	:	J	Z	j	z								
B	VT	ESC	+	;	K	[	k	{								
C	FF	FS	,	<	L	\	l	|							
D	CR	GS	–	=	M	]	m	}								
E	SO	RS	.	>	N	^	n	~								
F	SI	US	/	?	O	_	o	△								

① How to send control code data:

NUL (00H) → >@ (3EH, 40H)
SOH (01H) → >A (3EH, 41H)
STX (02H) → >B (3EH, 42H)
to
GS (1DH) → >] (3EH, 5DH)
RS (1EH) → >^ (3EH, 5EH)
US (1FH) → >_ (3EH, 5FH)

② How to send a special code:

> (3EH) → >0 (3EH, 30H)

(9) MicroPDF417

The following modes are automatically selected according to the code used.

Mode	Details
Upper case letters, space	A to Z, space
Binary International Character Set	00H to FFH
Number	0 to 9

[Transfer Code]

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0	NUL	DLE	SP	0	@	P	`	p								
1	SOH	DC1	!	1	A	Q	a	q								
2	STX	DC2	”	2	B	R	b	r								
3	ETX	DC3	#	3	C	S	c	s								
4	EOT	DC4	$	4	D	T	d	t								
5	ENQ	NAK	%	5	E	U	e	u								
6	ACK	SYN	&	6	F	V	f	v								
7	BEL	ETB	’	7	G	W	g	w								
8	BS	CAN	(	8	H	X	h	x								
9	HT	EM	)	9	I	Y	i	y								
A	LF	SUB	*	:	J	Z	j	z								
B	VT	ESC	+	;	K	[	k	{								
C	FF	FS	,	<	L	\	l	|							
D	CR	GS	–	=	M	]	m	}								
E	SO	RS	.	>	N	^	n	~								
F	SI	US	/	?	O	_	o	△								

① How to send control code data:

NUL (00H) → >@ (3EH, 40H)
SOH (01H) → >A (3EH, 41H)
STX (02H) → >B (3EH, 42H)
to
GS (1DH) → >] (3EH, 5DH)
RS (1EH) → >^ (3EH, 5EH)
US (1FH) → >_ (3EH, 5FH)

② How to send a special code:

> (3EH) → >0 (3EH, 30H)

(10) QR code

When manual mode is selected in the Format Command

• Numeric mode, alphanumeric and symbol mode, Kanji mode

Mode selection	Data to be printed

• Binary mode

Mode selection	No. of data strings (4 digits)	Data to be printed

• Mixed mode

Data	"," (comma)	Data	"," (comma)	Data

The QR code can handle all codes including alphanumeric, symbols, and Kanji. However, since the data compression rate varies according to codes, the code to be used should be designated by selecting the mode.

Mode	Code	Details
N	Number	0 to 9
A	Alphanumeric, symbols	A to Z 0 to 9 space $ % * + - . / :
B	Binary (8-bit)	00H to FFH
K	Kanji	Shift JIS, JIS hexadecimal

If mixed mode is selected, up to 200 modes can be selected in a QR code.

When the automatic mode is selected in the Format Command for a QR code:

Data to be printed

[Transfer code for QR code]

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0	NUL	DLE	SP	0	@	P	`	p								
1	SOH	DC1	!	1	A	Q	a	q								
2	STX	DC2	”	2	B	R	b	r								
3	ETX	DC3	#	3	C	S	c	s								
4	EOT	DC4	$	4	D	T	d	t								
5	ENQ	NAK	%	5	E	U	e	u								
6	ACK	SYN	&	6	F	V	f	v								
7	BEL	ETB	’	7	G	W	g	w								
8	BS	CAN	(	8	H	X	h	x								
9	HT	EM	)	9	I	Y	i	y								
A	LF	SUB	*	:	J	Z	j	z								
B	VT	ESC	+	;	K	[	k	{								
C	FF	FS	,	<	L	\	l	|								
D	CR	GS	-	=	M	]	m	}								
E	SO	RS	•	>	N	^	n	~								
F	SI	US	/	?	O	_	o	DEL								

* The shaded parts are Japanese. They are omitted here.

① How to send control code data:

NUL (00H) → >@ (3EH, 40H)
SOH (01H) → >A (3EH, 41H)
STX (02H) → >B (3EH, 42H)
to
GS (1DH) → >] (3EH, 5DH)
RS (1EH) → >^ (3EH, 5EH)
US (1FH) → >_ (3EH, 5FH)

② How to send a special code:

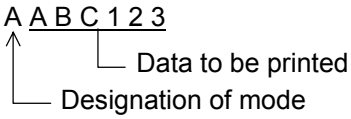
> (3EH) → >0 (3EH, 30H)

③ How to send a Kanji code:

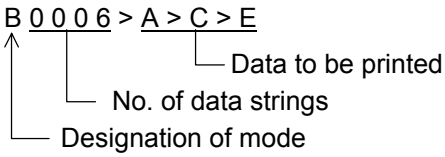
Shift JIS
JIS hexadecimal
(For details, refer to the section for the Bar Code Data Command.)

Examples of data designation for QR code

① Alphanumeric mode: ABC123

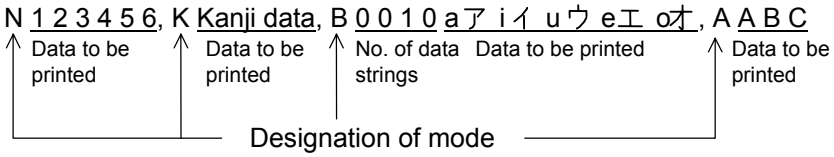


② Binary mode: 01H, 03H, 05H



③ Mixed mode

Numeric mode : 123456
Kanji mode : Kanji data
Binary mode : a ア i イ u ウ e エ o オ
Alphanumeric and symbol mode : ABC



④ Automatic mode

When the same data as ③ above is designated in automatic mode:

1 2 3 4 5 6 Kanji data aア iイ uウ eエ oオ A B C
Data to be printed

(11) Postal code

Customer bar code

	2	3	4	5	6	7
0		0		P		
1		1	A	Q		
2		2	B	R		
3		3	C	S		
4		4	D	T		
5		5	E	U		
6		6	F	V		
7		7	G	W		
8		8	H	X		
9		9	I	Y		
A			J	Z		
B			K			
C			L			
D	–		M			
E			N			
F			O			

POSTNET

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

RM4SCC

	2	3	4	5	6	7
0		0		P		
1		1	A	Q		
2		2	B	R		
3		3	C	S		
4		4	D	T		
5		5	E	U		
6		6	F	V		
7		7	G	W		
8	(	8	H	X		
9	)	9	I	Y		
A			J	Z		
B			K			
C			L			
D			M			
E			N			
F			O			

KIX CODE

	2	3	4	5	6	7
0		0		P		p
1		1	A	Q	a	q
2		2	B	R	b	r
3		3	C	S	c	s
4		4	D	T	d	t
5		5	E	U	e	u
6		6	F	V	f	v
7		7	G	W	g	w
8		8	H	X	h	x
9		9	I	Y	i	y
A			J	Z	j	z
B			K		k	
C			L		l	
D			M		m	
E			N		n	
F			O		o	

* “(” , “)” can be designated only as a start/stop code.
  These should not be entered in data.
  If these are entered between data, no bar code is drawn.

(12) MaxiCode

Symbol Character Value		Code Set A		Code Set B		Code Set C		Code Set D		Code Set E	
Decimal	Binary	Character	Decimal	Character	Decimal	Character	Decimal	Character	Decimal	Character	Decimal
0	000000	CR	13	‘	96	À	192	à	224	NUL	0
1	000001	A	65	a	97	Á	193	á	225	SOH	1
2	000010	B	66	b	98	Â	194	â	226	STX	2
3	000011	C	67	c	99	Ã	195	ã	227	ETX	3
4	000100	D	68	d	100	Ä	196	ä	228	EOT	4
5	000101	E	69	e	101	Å	197	å	229	ENQ	5
6	000110	F	70	f	102	Æ	198	æ	230	ACK	6
7	000111	G	71	g	103	Ç	199	ç	231	BEL	7
8	001000	H	72	h	104	È	200	è	232	BS	8
9	001001	I	73	i	105	É	201	é	233	HT	9
10	001010	J	74	j	106	Ê	202	ê	234	LF	10
11	001011	K	75	k	107	Ë	203	ë	235	VT	11
12	001100	L	76	l	108	Ì	204	ì	236	FF	12
13	001101	M	77	m	109	Í	205	í	237	CR	13
14	001110	N	78	n	110	Î	206	î	238	SO	14
15	001111	O	79	o	111	Ï	207	ï	239	SI	15
16	010000	P	80	p	112	Đ	208	ð	240	DLE	16
17	010001	Q	81	q	113	Ñ	209	ñ	241	DC1	17
18	010010	R	82	r	114	Ò	210	ò	242	DC2	18
19	010011	S	83	s	115	Ó	211	ó	243	DC3	19
20	010100	T	84	t	116	Ô	212	ô	244	DC4	20
21	010101	U	85	u	117	Õ	213	õ	245	NAK	21
22	010110	V	86	v	118	Ö	214	ö	246	SYN	22
23	010111	W	87	w	119	×	215	÷	247	ETB	23
24	011000	X	88	x	120	Ø	216	ø	248	CAN	24
25	011001	Y	89	y	121	Ù	217	ù	249	EM	25
26	011010	Z	90	z	122	Ú	218	ú	250	SUB	26
27	011011	[EC]		[EC]		[EC]		[EC]		[EC]	
28	011100	FS	28	FS	28	FS	28	FS	28	[Pad]	
29	011101	GS	29	GS	29	GS	29	GS	29	[Pad]	
30	011110	RS	30	RS	30	RS	30	RS	30	ESC	27
31	011111	[NS]		[NS]		[NS]		[NS]		[NS]	
32	100000	Space	32	(	123	Û	219	û	251	FS	28
33	100001	[Pad]		[Pad]		Ü	220	ü	252	GS	29
34	100010	“	34	)	125	Ý	221	ý	253	RS	30
35	100011	#	35	~	126	Þ	222	þ	254	US	31
36	100100	$	36	DEL	127	ß	223	ÿ	255	{C159}	159
37	100101	%	37	;	59	ª	170	¡	161	NBSP	160
38	100110	&	38	<	60	¬	172	¨	168	¢	162
39	100111	‘	39	=	61	±	177	«	171	£	163
40	101000	(	40	>	62	²	178	¯	175	¤	164
41	101001	)	41	?	63	³	179	°	176	¥	165
42	101010	”	42	[	91		181	'	180		166
43	101011	+	43	\	92	¹	185	•	183	§	167
44	101100	,	44	]	93	º	186		184	©	169
45	101101	-	45	^	94	¼	188	»	187	SHY	173
46	101110	.	46	_	95	½	189	¿	191	®	174
47	101111	/	47	Space	32	¾	190	{C138}	138	¶	182
48	110000	0	48	,	44	{C128}	128	{C139}	139	{C149}	149
49	110001	1	49	.	46	{C129}	129	{C140}	140	{C150}	150
50	110010	2	50	/	47	{C130}	130	{C141}	141	{C151}	151
51	110011	3	51	:	58	{C131}	131	{C142}	142	{C152}	152
52	110100	4	52	@	64	{C132}	132	{C143}	143	{C153}	153
53	110101	5	53	!	33	{C133}	133	{C144}	144	{C154}	154
54	110110	6	54	|	124	{C134}	134	{C145}	145	{C155}	155
55	110111	7	55	[Pad]		{C135}	135	{C146}	146	{C156}	156
56	111000	8	56	[2 Shift A]		{C136}	136	{C147}	147	{C157}	157
57	111001	9	57	[3 Shift A]		{C137}	137	{C148}	148	{C158}	158
58	111010	:	58	[Pad]		[Latch A]		[Latch A]		[Latch A]	
59	111011	[Shift B]		[Shift A]		Space	32	Space	32	Space	32
60	111100	[Shift C]		[Shift C]		[Lock In C]		[Shift C]		[Shift C]	
61	111101	[Shift D]		[Shift D]		[Shift D]		[Lock In D]		[Shift D]	
62	111110	[Shift E]		[Shift E]		[Shift E]		[Shift E]		[Lock In E]	
63	111111	[Latch B]		[Latch A]		[Latch B]		[Latch B]		[Latch B]	

When the MaxiCode specification setting is set to “TYPE1: Compatible with the current version” in the system mode:

① How to send control code data:

SOH (01H) → >A (3EH, 41H)
STX (02H) → >B (3EH, 42H)
to
GS (1DH) → >] (3EH, 5DH)
RS (1EH) → >^ (3EH, 5EH)
US (1FH) → >_ (3EH, 5FH)

② How to send a special code:

> (3EH) → >0 (3EH, 30H)

NOTE: *“NUL” code in the table can be designated, but cannot be used. If it is designated, data following “NUL” code is not printed.*

When the MaxiCode specification setting is set to “TYPE2: Special specification” in the system mode:

[Transfer code for MaxiCode]

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0	NUL	DLE	SP	0	@	P	`	p								
1	SOH	DC1	!	1	A	Q	a	q								
2	STX	DC2	”	2	B	R	b	r								
3	ETX	DC3	#	3	C	S	c	s								
4	EOT	DC4	$	4	D	T	d	t								
5	ENQ	NAK	%	5	E	U	e	u								
6	ACK	SYN	&	6	F	V	f	v								
7	BEL	ETB	’	7	G	W	g	w								
8	BS	CAN	(	8	H	X	h	x								
9	HT	EM	)	9	I	Y	i	y								
A	LF (Note1)	SUB	*	:	J	Z	j	z								
B	VT	ESC	+	;	K	[	k	{								
C	FF	FS	,	<	L	\	l	|							
D	CR	GS	-	=	M	]	m	}								
E	SO	RS	•	>	N	^	n	~								
F	SI	US	/	?	O	_	o	DEL								(Note2)

The all codes (00H to FFH) can be used. In the following cases, however, the codes will become special codes. For the transfer method, refer to the following.

(Note 1) In case of LF (0AH) data:

LF (0AH) → □ J (FFH, 4AH)

(Note 2) In case of □ (FFH) data:

□ (FFH) → □ □ (FFH, FFH)

ESC (1BH) and NUL (00H) can be used as they are.

(13) CP code

[Transfer Code]

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0	NUL	DLE	SP	0	@	P	`	p								
1	SOH	DC1	!	1	A	Q	a	q								
2	STX	DC2	”	2	B	R	b	r								
3	ETX	DC3	#	3	C	S	c	s								
4	EOT	DC4	$	4	D	T	d	t								
5	ENQ	NAK	%	5	E	U	e	u								
6	ACK	SYN	&	6	F	V	f	v								
7	BEL	ETB	’	7	G	W	g	w								
8	BS	CAN	(	8	H	X	h	x								
9	HT	EM	)	9	I	Y	i	y								
A	LF	SUB	*	:	J	Z	j	z								
B	VT	ESC	+	;	K	[	k	{								
C	FF	FS	,	<	L	\	l	|							
D	CR	GS	–	=	M	]	m	}								
E	SO	RS	.	>	N	^	n	~								
F	SI	US	/	?	O	_	o	△								

① How to send control code data:

NUL (00H) → >@ (3EH, 40H)
SOH (01H) → >A (3EH, 41H)
STX (02H) → >B (3EH, 42H)
to
GS (1DH) → >] (3EH, 5DH)
RS (1EH) → >^ (3EH, 5EH)
US (1FH) → >_ (3EH, 5FH)

② How to send a special code:

> (3EH) → >0 (3EH, 30H)

(14) GS1 DataBar Expanded

[Transfer Code]

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0			SP	0		P		p								
1			!	1	A	Q	a	q								
2			”	2	B	R	b	r								
3			FNC1	3	C	S	c	s								
4				4	D	T	d	t								
5			%	5	E	U	e	u								
6			&	6	F	V	f	v								
7			’	7	G	W	g	w								
8			(	8	H	X	h	x								
9			)	9	I	Y	i	y								
A			*	:	J	Z	j	z								
B			+	;	K		k									
C			,	<	L		l									
D			–	=	M		m									
E			.	>	N		n									
F			/	?	O	_	o									

14. DRAWING OF BAR CODE DATA

——— : Field to be incremented/decremented
(The absence of a solid line invalidates incrementing/decrementing.)

——— : Field subject to printing numerals under bars.

Type of Bar Code: JAN8, EAN8

(1) No affix

No. of Input Digits		
8 digits	Input Data	D_1 D_2 D_3 D_4 D_5 D_6 D_7 D_8 — To be checked as modulus 10 C/D
	Drawing Data	D_1 D_2 D_3 D_4 D_5 D_6 D_7 D_8
Other than 8 digits		Not to be drawn

(2) Modulus 10 check

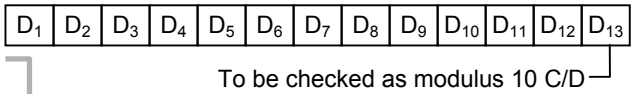
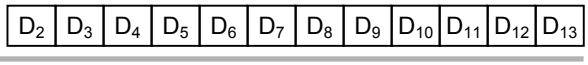
No. of Input Digits		
8 digits	Input Data	D_1 D_2 D_3 D_4 D_5 D_6 D_7 D_8 — To be checked as modulus 10 C/D
	Drawing Data	D_1 D_2 D_3 D_4 D_5 D_6 D_7 D_8
Other than 8 digits		Not to be drawn

(3) Auto affix of modulus 10

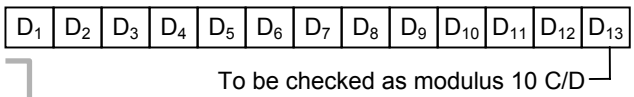
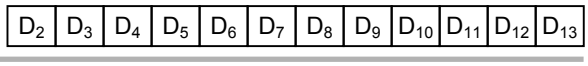
No. of Input Digits		
7 digits	Input Data	D_1 D_2 D_3 D_4 D_5 D_6 D_7
	Drawing Data	D_1 D_2 D_3 D_4 D_5 D_6 D_7 C/D — Affix a modulus 10 C/D.
Other than 7 digits		Not to be drawn

Type of Bar Code: JAN13, EAN13

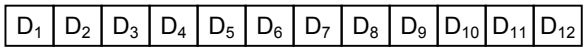
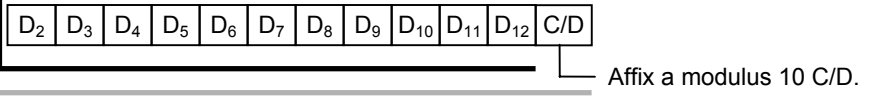
(1) No affix

No. of Input Digits		
13 digits	Input Data	
	Drawing Data	
Other than 13 digits		Not to be drawn

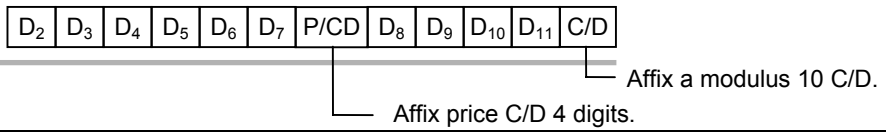
(2) Modulus 10 check

No. of Input Digits		
13 digits	Input Data	
	Drawing Data	
Other than 13 digits		Not to be drawn

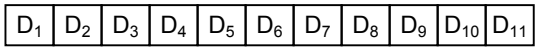
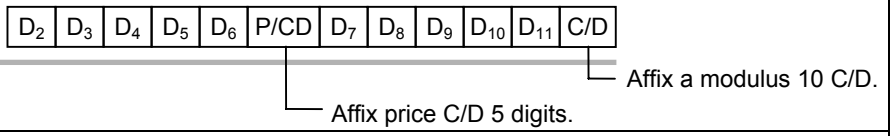
(3) Auto affix of modulus 10

No. of Input Digits		
12 digits	Input Data	
	Drawing Data	
Other than 12 digits		Not to be drawn

(4) Auto affix of modulus 10 + Price C/D 4 digits

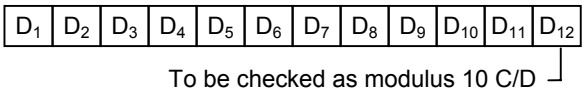
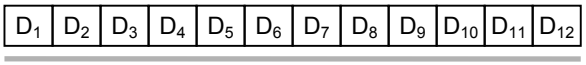
No. of Input Digits		
11 digits	Input Data	
	Drawing Data	
Other than 11 digits		Not to be drawn

(5) Auto affix of modulus 10 + Price C/D 5 digits

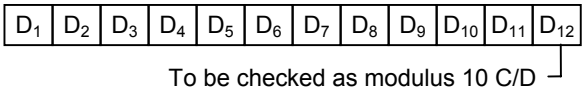
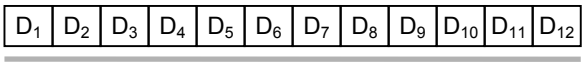
No. of Input Digits		
11 digits	Input Data	
	Drawing Data	
Other than 11 digits		Not to be drawn

Type of Bar Code: UPC-A

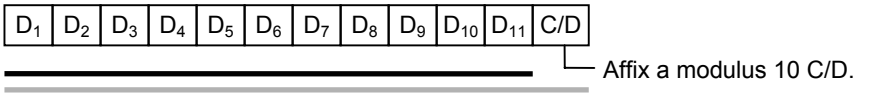
(1) No affix

No. of Input Digits		
12 digits	Input Data	
	Drawing Data	
Other than 12 digits		Not to be drawn

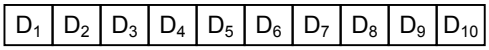
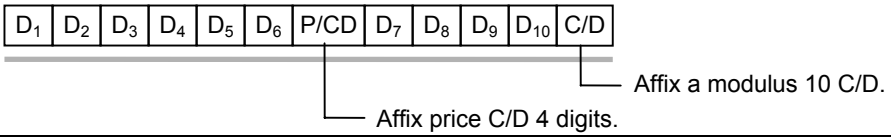
(2) Modulus 10 check

No. of Input Digits		
12 digits	Input Data	
	Drawing Data	
Other than 12 digits		Not to be drawn

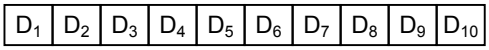
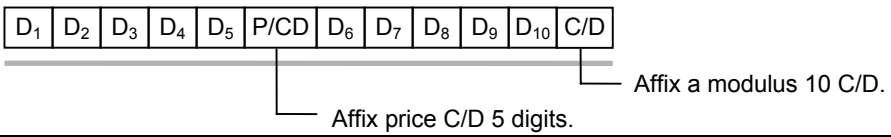
(3) Auto affix of modulus 10

No. of Input Digits		
11 digits	Input Data	
	Drawing Data	
Other than 11 digits		Not to be drawn

(4) Auto affix of modulus 10 + Price C/D 4 digits

No. of Input Digits		
10 digits	Input Data	
	Drawing Data	
Other than 10 digits		Not to be drawn

(5) Auto affix of modulus 10 + Price C/D 5 digits

No. of Input Digits		
10 digits	Input Data	
	Drawing Data	
Other than 10 digits		Not to be drawn

Type of Bar Code: UPC-E

(1) No affix

No. of Input Digits		
7 digits	Input Data	D_1 D_2 D_3 D_4 D_5 D_6 D_7 — To be checked as modulus 10 C/D
	Drawing Data	0 D_1 D_2 D_3 D_4 D_5 D_6 D_7
Other than 7 digits		Not to be drawn

(2) Modulus 10 check

No. of Input Digits		
7 digits	Input Data	D_1 D_2 D_3 D_4 D_5 D_6 D_7 — To be checked as modulus 10 C/D
	Drawing Data	0 D_1 D_2 D_3 D_4 D_5 D_6 D_7
Other than 7 digits		Not to be drawn

(3) Auto affix of modulus 10

No. of Input Digits		
6 digits	Input Data	D_1 D_2 D_3 D_4 D_5 D_6 Calculate and reflect modulus 10 in the bar code.
	Drawing Data	0 D_1 D_2 D_3 D_4 D_5 D_6 C/D
Other than 6 digits		Not to be drawn

Type of Bar Code: JAN8 + 2 digits, EAN8 + 2 digits

(1) No affix

No. of Input Digits		
10 digits	Input Data	D_1 D_2 D_3 D_4 D_5 D_6 D_7 D_8 D_9 D_{10} └ To be checked as modulus 10 C/D
	Drawing Data	D_1 D_2 D_3 D_4 D_5 D_6 D_7 D_8 D_9 D_{10}
Other than 10 digits		Not to be drawn

(2) Modulus 10 check

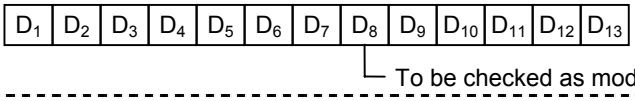
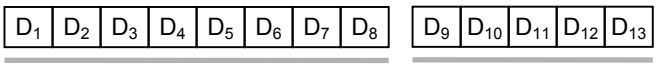
No. of Input Digits		
10 digits	Input Data	D_1 D_2 D_3 D_4 D_5 D_6 D_7 D_8 D_9 D_{10} └ To be checked as modulus 10 C/D
	Drawing Data	D_1 D_2 D_3 D_4 D_5 D_6 D_7 D_8 D_9 D_{10}
Other than 10 digits		Not to be drawn

(3) Auto affix of modulus 10

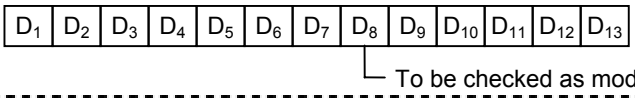
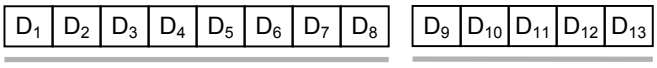
No. of Input Digits		
9 digits	Input Data	D_1 D_2 D_3 D_4 D_5 D_6 D_7 D_8 D_9
	Drawing Data	D_1 D_2 D_3 D_4 D_5 D_6 D_7 C/D D_8 D_9 Affix a modulus 10 C/D.
Other than 9 digits		Not to be drawn

Type of Bar Code: JAN8 + 5 digits, EAN8 + 5 digits

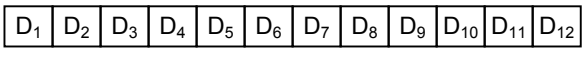
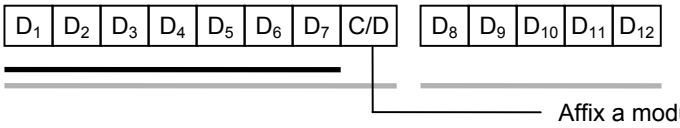
(1) No affix

No. of Input Digits		
13 digits	Input Data	
	Drawing Data	
Other than 13 digits		Not to be drawn

(2) Modulus 10 check

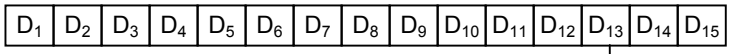
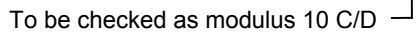
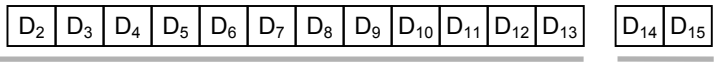
No. of Input Digits		
13 digits	Input Data	
	Drawing Data	
Other than 13 digits		Not to be drawn

(3) Auto affix of modulus 10

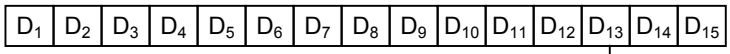
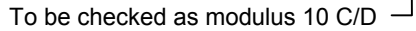
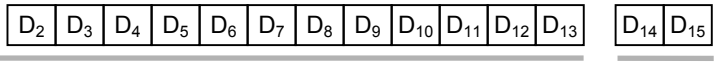
No. of Input Digits		
12 digits	Input Data	
	Drawing Data	
Other than 12 digits		Not to be drawn

Type of Bar Code: JAN13 + 2 digits, EAN13 + 2 digits

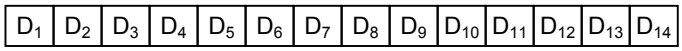
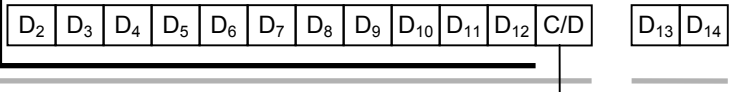
(1) No affix

No. of Input Digits		
15 digits	Input Data	 
	Drawing Data	
Other than 15 digits		Not to be drawn

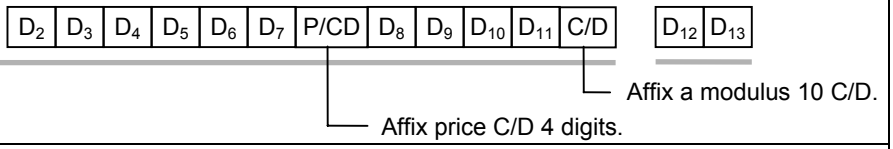
(2) Modulus 10 check

No. of Input Digits		
15 digits	Input Data	 
	Drawing Data	
Other than 15 digits		Not to be drawn

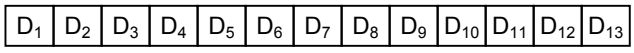
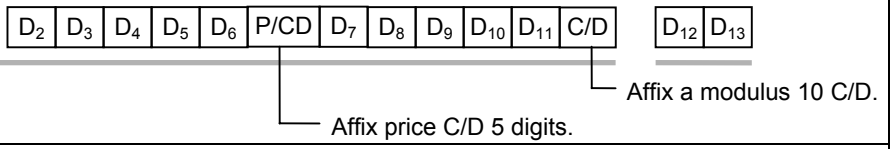
(3) Auto affix of modulus 10

No. of Input Digits		
14 digits	Input Data	
	Drawing Data	
Other than 14 digits		Not to be drawn

(4) Auto affix of modulus 10 + Price C/D 4 digits

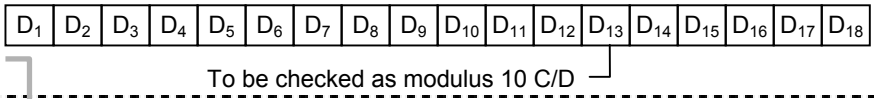
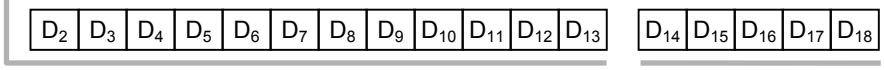
No. of Input Digits		
13 digits	Input Data	
	Drawing Data	
Other than 13 digits		Not to be drawn

(5) Auto affix of modulus 10 + Price C/D 5 digits

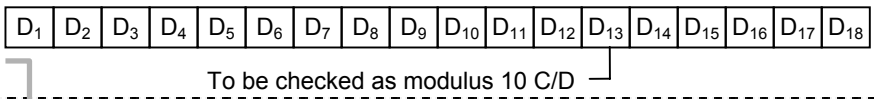
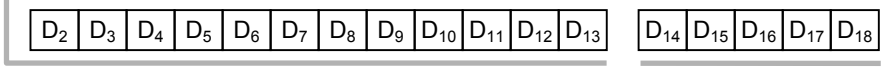
No. of Input Digits		
13 digits	Input Data	
	Drawing Data	
Other than 13 digits		Not to be drawn

Type of Bar Code: JAN13 + 5 digits, EAN13 + 5 digits

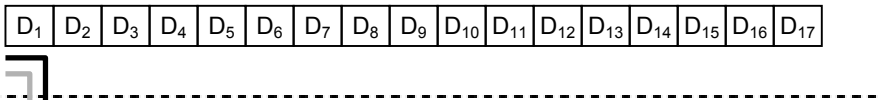
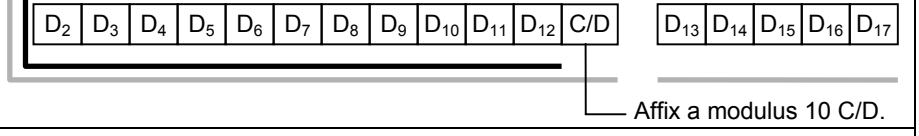
(1) No affix

No. of Input Digits		
18 digits	Input Data	
	Drawing Data	
Other than 18 digits		Not to be drawn

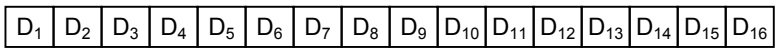
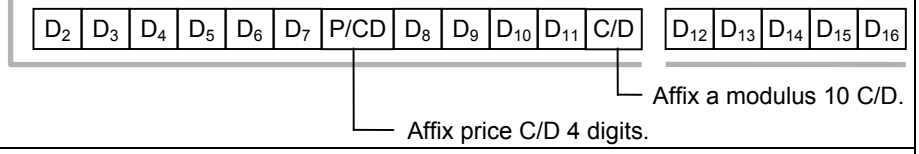
(2) Modulus 10 check

No. of Input Digits		
18 digits	Input Data	
	Drawing Data	
Other than 18 digits		Not to be drawn

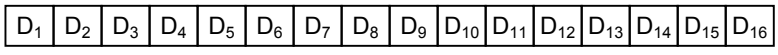
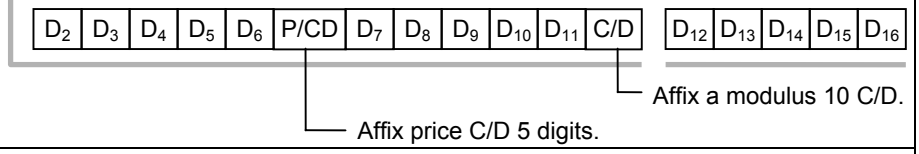
(3) Auto affix of modulus 10

No. of Input Digits		
17 digits	Input Data	
	Drawing Data	
Other than 17 digits		Not to be drawn

(4) Auto affix of modulus 10 + Price C/D 4 digits

No. of Input Digits		
16 digits	Input Data	
	Drawing Data	
Other than 16 digits		Not to be drawn

(5) Auto affix of modulus 10 + Price C/D 5 digits

No. of Input Digits		
16 digits	Input Data	
	Drawing Data	
Other than 16 digits		Not to be drawn

Type of Bar Code: UPC-A + 2 digits

(1) No affix

No. of Input Digits		
14 digits	Input Data	D_1 D_2 D_3 D_4 D_5 D_6 D_7 D_8 D_9 D_{10} D_{11} D_{12} D_{13} D_{14} To be checked as modulus 10 C/D
	Drawing Data	D_1 D_2 D_3 D_4 D_5 D_6 D_7 D_8 D_9 D_{10} D_{11} D_{12} D_{13} D_{14}
Other than 14 digits		Not to be drawn

(2) Modulus 10 check

No. of Input Digits		
14 digits	Input Data	D_1 D_2 D_3 D_4 D_5 D_6 D_7 D_8 D_9 D_{10} D_{11} D_{12} D_{13} D_{14} To be checked as modulus 10 C/D
	Drawing Data	D_1 D_2 D_3 D_4 D_5 D_6 D_7 D_8 D_9 D_{10} D_{11} D_{12} D_{13} D_{14}
Other than 14 digits		Not to be drawn

(3) Auto affix of modulus 10

No. of Input Digits		
13 digits	Input Data	D_1 D_2 D_3 D_4 D_5 D_6 D_7 D_8 D_9 D_{10} D_{11} D_{12} D_{13}
	Drawing Data	D_1 D_2 D_3 D_4 D_5 D_6 D_7 D_8 D_9 D_{10} D_{11} C/D D_{12} D_{13} Affix a modulus 10 C/D.
Other than 13 digits		Not to be drawn

(4) Auto affix of modulus 10 + Price C/D 4 digits

No. of Input Digits		
12 digits	Input Data	D_1 D_2 D_3 D_4 D_5 D_6 D_7 D_8 D_9 D_{10} D_{11} D_{12}
	Drawing Data	D_1 D_2 D_3 D_4 D_5 D_6 P/CD D_7 D_8 D_9 D_{10} C/D D_{11} D_{12} Affix a modulus 10 C/D. Affix price C/D 4 digits.
Other than 12 digits		Not to be drawn

(5) Auto affix of modulus 10 + Price C/D 5 digits

No. of Input Digits		
12 digits	Input Data	D_1 D_2 D_3 D_4 D_5 D_6 D_7 D_8 D_9 D_{10} D_{11} D_{12}
	Drawing Data	D_1 D_2 D_3 D_4 D_5 P/CD D_6 D_7 D_8 D_9 D_{10} C/D D_{11} D_{12} Affix a modulus 10 C/D. Affix price C/D 5 digits.
Other than 12 digits		Not to be drawn

Type of Bar Code: UPC-A + 5 digits

(1) No affix

No. of Input Digits		
17 digits	Input Data	D_1 D_2 D_3 D_4 D_5 D_6 D_7 D_8 D_9 D_{10} D_{11} D_{12} D_{13} D_{14} D_{15} D_{16} D_{17} To be checked as modulus 10 C/D
	Drawing Data	D_1 D_2 D_3 D_4 D_5 D_6 D_7 D_8 D_9 D_{10} D_{11} D_{12} D_{13} D_{14} D_{15} D_{16} D_{17}
Other than 17 digits		Not to be drawn

(2) Modulus 10 check

No. of Input Digits		
17 digits	Input Data	D_1 D_2 D_3 D_4 D_5 D_6 D_7 D_8 D_9 D_{10} D_{11} D_{12} D_{13} D_{14} D_{15} D_{16} D_{17} To be checked as modulus 10 C/D
	Drawing Data	D_1 D_2 D_3 D_4 D_5 D_6 D_7 D_8 D_9 D_{10} D_{11} D_{12} D_{13} D_{14} D_{15} D_{16} D_{17}
Other than 17 digits		Not to be drawn

(3) Auto affix of modulus 10

No. of Input Digits		
16 digits	Input Data	D_1 D_2 D_3 D_4 D_5 D_6 D_7 D_8 D_9 D_{10} D_{11} D_{12} D_{13} D_{14} D_{15} D_{16}
	Drawing Data	D_1 D_2 D_3 D_4 D_5 D_6 D_7 D_8 D_9 D_{10} D_{11} C/D D_{12} D_{13} D_{14} D_{15} D_{16} Affix a modulus 10 C/D.
Other than 16 digits		Not to be drawn

(4) Auto affix of modulus 10 + Price C/D 4 digits

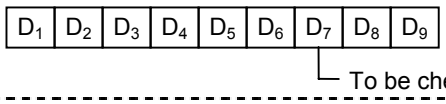
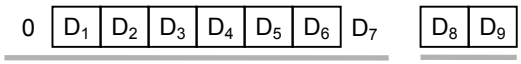
No. of Input Digits		
15 digits	Input Data	D_1 D_2 D_3 D_4 D_5 D_6 D_7 D_8 D_9 D_{10} D_{11} D_{12} D_{13} D_{14} D_{15}
	Drawing Data	D_1 D_2 D_3 D_4 D_5 D_6 P/CD D_7 D_8 D_9 D_{10} C/D D_{11} D_{12} D_{13} D_{14} D_{15} Affix a modulus 10 C/D. Affix price C/D 4 digits.
Other than 15 digits		Not to be drawn

(5) Auto affix of modulus 10 + Price C/D 5 digits

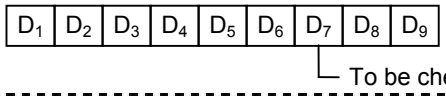
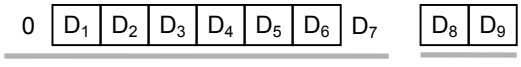
No. of Input Digits		
15 digits	Input Data	D_1 D_2 D_3 D_4 D_5 D_6 D_7 D_8 D_9 D_{10} D_{11} D_{12} D_{13} D_{14} D_{15}
	Drawing Data	D_1 D_2 D_3 D_4 D_5 P/CD D_6 D_7 D_8 D_9 D_{10} C/D D_{11} D_{12} D_{13} D_{14} D_{15} Affix a modulus 10 C/D. Affix price C/D 5 digits.
Other than 15 digits		Not to be drawn

Type of Bar Code: UPC-E + 2 digits

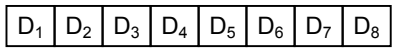
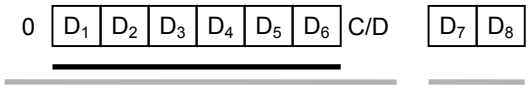
(1) No affix

No. of Input Digits		
9 digits	Input Data	
	Drawing Data	
Other than 9 digits		Not to be drawn

(2) Modulus 10 check

No. of Input Digits		
9 digits	Input Data	
	Drawing Data	
Other than 9 digits		Not to be drawn

(3) Auto affix of modulus 10

No. of Input Digits		
8 digits	Input Data	 Calculate and reflect modulus 10 C/D in the bar code.
	Drawing Data	
Other than 8 digits		Not to be drawn

Type of Bar Code: UPC-E + 5 digits

(1) No affix

No. of Input Digits		
12 digits	Input Data	D_1 D_2 D_3 D_4 D_5 D_6 D_7 D_8 D_9 D_{10} D_{11} D_{12} └ To be checked as modulus 10 C/D
	Drawing Data	0 D_1 D_2 D_3 D_4 D_5 D_6 D_7 D_8 D_9 D_{10} D_{11} D_{12}
Other than 12 digits		Not to be drawn

(2) Modulus 10 check

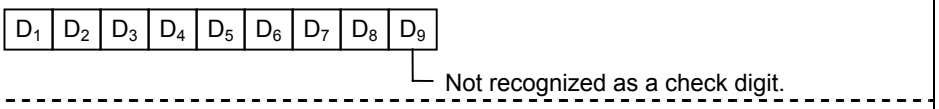
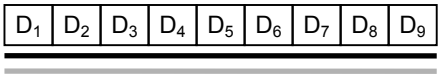
No. of Input Digits		
12 digits	Input Data	D_1 D_2 D_3 D_4 D_5 D_6 D_7 D_8 D_9 D_{10} D_{11} D_{12} └ To be checked as modulus 10 C/D
	Drawing Data	0 D_1 D_2 D_3 D_4 D_5 D_6 D_7 D_8 D_9 D_{10} D_{11} D_{12}
Other than 12 digits		Not to be drawn

(3) Auto affix of modulus 10

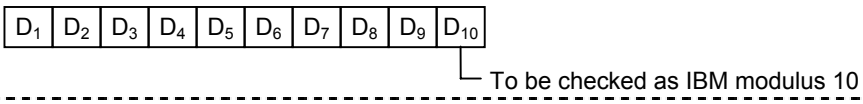
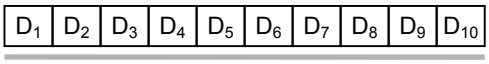
No. of Input Digits		
11 digits	Input Data	D_1 D_2 D_3 D_4 D_5 D_6 D_7 D_8 D_9 D_{10} D_{11} Calculate and reflect modulus 10 C/D in the bar code.
	Drawing Data	0 D_1 D_2 D_3 D_4 D_5 D_6 C/D D_7 D_8 D_9 D_{10} D_{11}
Other than 11 digits		Not to be drawn

Type of Bar Code: MSI

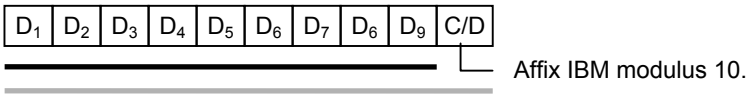
(1) No affix

No. of Input Digits		
Max. 15 digits	Input Data	
	Drawing Data	
16 digits or more		Not to be drawn

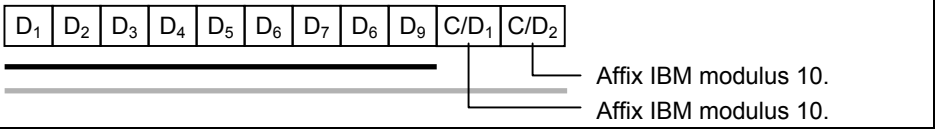
(2) IBM modulus 10 check

No. of Input Digits		
Min. 2 digits Max. 15 digits (including C/D)	Input Data	
	Drawing Data	
1 digit 16 digits or more		Not to be drawn

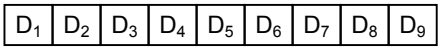
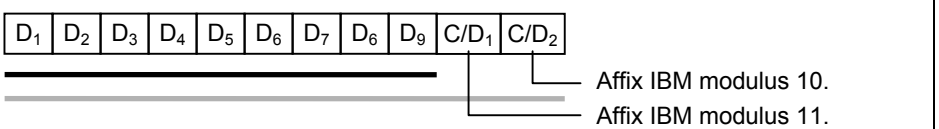
(3) Auto affix of IBM modulus 10

No. of Input Digits		
Max. 14 digits	Input Data	
	Drawing Data	
15 digits or more		Not to be drawn

(4) IBM modulus 10 + Auto affix of IBM modulus 10

No. of Input Digits		
Max. 13 digits	Input Data	
	Drawing Data	
14 digits or more		Not to be drawn

(5) IBM modulus 11 + Auto affix of IBM modulus 10

No. of Input Digits		
Max. 13 digits	Input Data	
	Drawing Data	
14 digits or more		Not to be drawn

Type of Bar Code: Interleaved 2 of 5

(1) No affix

No. of Input Digits		
Max. 126 digits	Input Data	D_1 D_2 D_3 D_4 D_5 D_6 D_7 D_8 D_9 — Not recognized as a check digit.
	Drawing Data	0 D_1 D_2 D_3 D_4 D_5 D_6 D_7 D_8 D_9
127 digits or more		Not to be drawn

(2) Modulus 10 check

No. of Input Digits		
Min. 2 digits Max. 126 digits (including C/D)	Input Data	D_1 D_2 D_3 D_4 D_5 D_6 D_7 D_8 D_9 — To be checked as modulus 10 C/D
	Drawing Data	0 D_1 D_2 D_3 D_4 D_5 D_6 D_7 D_8 D_9
1 digit 127 digits or more		Not to be drawn

(3) Auto affix of modulus 10

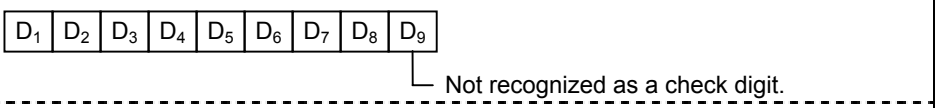
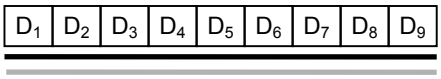
No. of Input Digits		
Max. 125 digits	Input Data	D_1 D_2 D_3 D_4 D_5 D_6 D_7 D_8 D_9
	Drawing Data	D_1 D_2 D_3 D_4 D_5 D_6 D_7 D_6 D_9 C/D — Affix a modulus 10 C/D.
126 digits or more		Not to be drawn

(4) Auto affix of DBP modulus 10

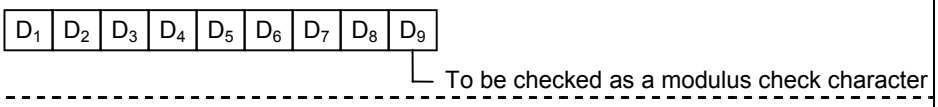
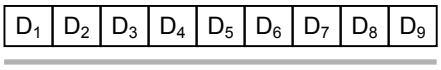
No. of Input Digits		
Max. 125 digits	Input Data	D_1 D_2 D_3 D_4 D_5 D_6 D_7 D_8 D_9
	Drawing Data	D_1 D_2 D_3 D_4 D_5 D_6 D_7 D_6 D_9 C/D — Affix a DBP modulus 10 C/D.
126 digits or more		Not to be drawn

Type of Bar Code: Industrial 2 of 5

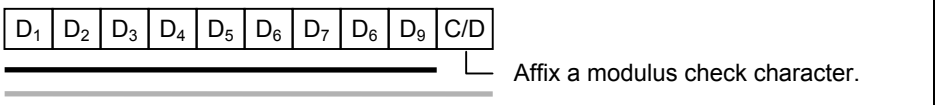
(1) No affix

No. of Input Digits		
Max. 126 digits	Input Data	
	Drawing Data	
127 digits or more		Not to be drawn

(2) Modulus check character check

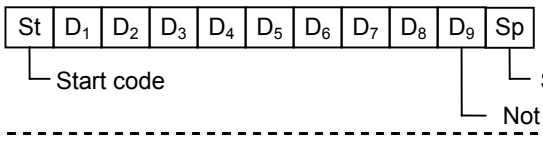
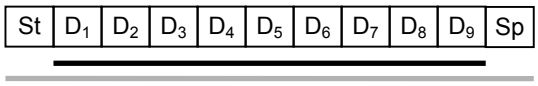
No. of Input Digits		
Min. 2 digits Max. 126 digits (including C/D)	Input Data	
	Drawing Data	
1 digit 127 digits or more		Not to be drawn

(3) Auto affix of modulus check character

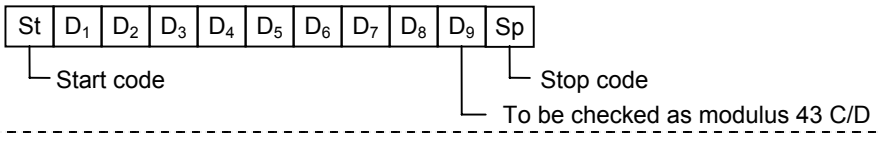
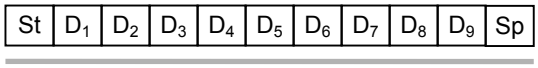
No. of Input Digits		
Max. 125 digits	Input Data	
	Drawing Data	
126 digits or more		Not to be drawn

Type of Bar Code: CODE39 (Standard)

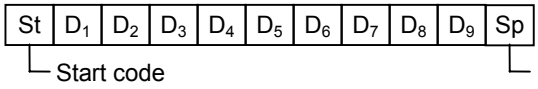
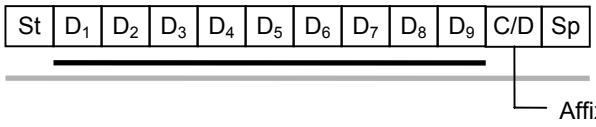
(1) No affix

No. of Input Digits		
Max. 123 digits	Input Data	
	Drawing Data	
124 digits or more		Not to be drawn

(2) Modulus 43 check

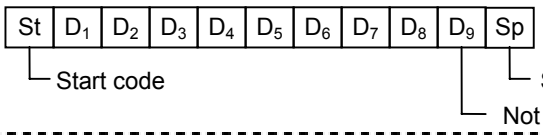
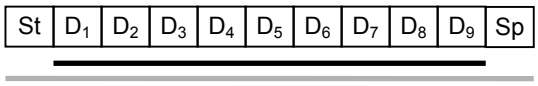
No. of Input Digits		
Min. 2 digits Max. 123 digits (including C/D)	Input Data	
	Drawing Data	
1 digit 124 digits or more		Not to be drawn

(3) Auto affix of modulus 43

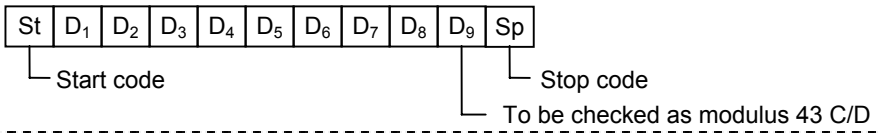
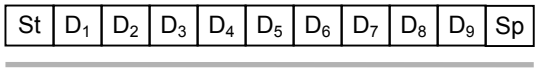
No. of Input Digits		
Max. 122 digits	Input Data	
	Drawing Data	
123 digits or more		Not to be drawn

Type of Bar Code: CODE39 (Full ASCII)

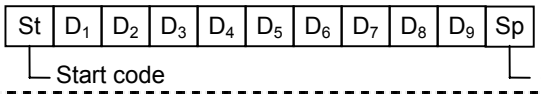
(1) No affix

No. of Input Digits		
Max. 60 digits	Input Data	
	Drawing Data	
61 digits or more		Not to be drawn

(2) Modulus 43 check

No. of Input Digits		
Min. 2 digits Max. 60 digits (including C/D)	Input Data	
	Drawing Data	
1 digit 61 digits or more		Not to be drawn

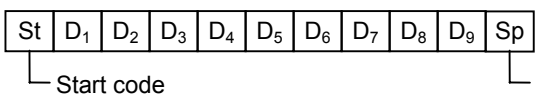
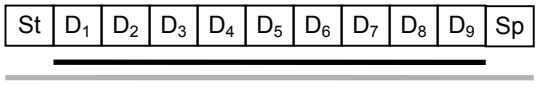
(3) Auto affix of modulus 43

No. of Input Digits		
Max. 60 digits	Input Data	
	Drawing Data	
61 digits or more		Not to be drawn

NOTE: *Numerals under bars are not characters corresponding to the bars but the characters of the codes received are drawn.*

Type of Bar Code: NW7

(1) No affix
C/D check
Auto affix

No. of Input Digits		
Max. 125 digits	Input Data	
	Drawing Data	
126 digits or more		Not to be drawn

Type of Bar Code: No auto selection of CODE128 (Character ">" to be also counted as a digit)

(1) No affix
PSEUDO103 check
Auto affix of PSEUDO103

No. of Input Digits		
Min. 3 digits Max. 125 digits (including start code)	Input Data	St D_1 D_2 D_3 D_4 D_5 D_6 D_7 D_8 D_9 D_{10} D_{11}
	Drawing Data	St D_1 D_2 D_3 D_4 D_5 D_6 D_7 D_8 D_9 D_{10} D_{11} C/D Sp Affix PSEUDO103 C/D.
2 digits or less 126 digits or more		Not to be drawn

NOTE: *The following characters are not drawn as numerals under bars.*
NUL (00H) to US (1FH), FNC1, FNC2, FNC3, SHIFT, CODE A, CODE B, CODE C

Type of Bar Code: Auto selection of CODE128

(1) No affix
C/D check
Auto affix of C/D

No. of Input Digits		
Max. 60 digits	Input Data	D_1 D_2 D_3 D_4 D_5 D_6 D_7 D_8 D_9 D_{10} D_{11}
	Drawing Data	St D_1 D_2 D_3 D_4 AD D_5 D_6 D_7 AD D_8 D_9 D_{10} D_{11} C/D Sp Start code Selection code Affix PSEUDO103 C/D. Stop code
61 digits or more		Not to be drawn

NOTE: *The following characters are not drawn as numerals under bars.*
NUL (00H) to US (1FH), FNC1, FNC2, FNC3, SHIFT, CODE A, CODE B, CODE C

Type of Bar Code: CODE93

(1) No affix
C/D check
Auto affix of C/D

No. of Input Digits		
Max. 60 digits	Input Data	D_1 D_2 D_3 D_4 D_5 D_6 D_7 D_8 D_9
	Drawing Data	St D_1 D_2 D_3 D_4 D_5 D_6 D_7 D_8 D_9 C/D_1 C/D_2 Sp Stop code Affix a modulus 47 “K” C/D. Start code Affix a modulus 47 “C” C/D.
61 digits or more		Not to be drawn

NOTE: *Numerals under bars are not characters corresponding to the bars but the characters of the codes received are drawn.*

Type of Bar Code: UCC/EAN128

(1) No affix
C/D check
Auto affix of C/D

No. of Input Digits		
19 digits	Input Data	D_1 D_2 D_3 D_4 D_5 D_6 --- D_{14} D_{15} D_{16} D_{17} D_{18} D_{19}
	Drawing Data	St FNC1 D_1 D_2 D_3 D_4 D_5 D_6 --- D_{14} D_{15} D_{16} D_{17} D_{18} D_{19} C/D_1 C/D_2 Sp Start code Affix a modulus 10 C/D. Affix a modulus 11 C/D. Stop code
Other than 19 digits		Not to be drawn

Type of Bar Code: POSTNET

(1) Auto affix of dedicated C/D

No. of Input Digits		
5 digits	Input Data	D_1 D_2 D_3 D_4 D_5
	Drawing Data	St D_1 D_2 D_3 D_4 D_5 C/D Sp Start code / Stop code / Dedicated check digit
9 digits	Input Data	D_1 D_2 D_3 D_4 D_5 D_6 D_7 D_8 D_9
	Drawing Data	St D_1 D_2 D_3 D_4 D_5 D_6 D_7 D_8 D_9 C/D Sp Start code / Stop code / Dedicated check digit
11 digits	Input Data	D_1 D_2 D_3 D_4 D_5 D_6 D_7 D_8 D_9 D_{10} D_{11}
	Drawing Data	St D_1 D_2 D_3 D_4 D_5 D_6 D_7 D_8 D_9 D_{10} D_{11} C/D FR Start code / Frame / Dedicated check digit
Other than 5, 9, and 11 digits		Not to be drawn

Type of Bar Code: RM4SCC

(1) Auto affix of dedicated C/D

No. of Input Digits		
12 digits	Input Data	(St) D_1 D_2 D_3 D_4 D_5 D_6 D_7 D_8 D_9 D_{10} D_{11} D_{12} (Sp) Start code / Stop code
	Drawing Data	St D_1 D_2 D_3 D_4 D_5 D_6 D_7 D_8 D_9 D_{10} D_{11} D_{12} C/D Sp Start code / Stop code / Dedicated check digit
13 digits or more		Not to be drawn

Type of Bar Code: KIX CODE

(1) No affix

No. of Input Digits		
18 digits	Input Data	D_1 D_2 D_3 D_4 D_5 D_6 D_7 D_8 D_9 D_{10} D_{11} D_{12} D_{13} D_{14} D_{15} D_{16} D_{17} D_{18}
	Drawing Data	D_1 D_2 D_3 D_4 D_5 D_6 D_7 D_8 D_9 D_{10} D_{11} D_{12} D_{13} D_{14} D_{15} D_{16} D_{17} D_{18}
19 digits or more		Not to be drawn

Type of Bar Code: Customer bar code

(1) Auto affix of dedicated C/D

No. of Input Digits		
20 digits	Input Data	D_1 D_2 D_3 D_4 D_5 D_6 D_7 D_8 D_9 D_{10} D_{11} D_{12} D_{13} D_{14} D_{15} D_{16} D_{17} D_{18} D_{19} D_{20}
	Drawing Data	St D_1 D_2 D_3 D_4 D_5 D_6 D_7 D_8 D_9 D_{10} D_{11} D_{12} D_{13} D_{14} D_{15} D_{16} D_{17} D_{18} D_{19} D_{20} C/D Sp Start code Dedicated check digit Stop code
21 digits or more		Data of up to 20 digits is drawn. Data of 21 digits or more is discarded.

Type of Bar Code: Highest priority customer bar code

(1) Auto affix of dedicated C/D

No. of Input Digits		
19 digits	Input Data	D_1 D_2 D_3 D_4 D_5 D_6 D_7 D_8 D_9 D_{10} D_{11} D_{12} D_{13} D_{14} D_{15} D_{16} D_{17} D_{18} D_{19}
	Drawing Data	St D_1 D_2 D_3 D_4 D_5 D_6 D_7 D_8 D_9 D_{10} D_{11} D_{12} D_{13} D_{14} D_{15} D_{16} D_{17} D_{18} D_{19} CC7 C/D Sp Start code CC7 Dedicated check digit Stop code
20 digits or more		Data of up to 19 digits is drawn. Data of 20 digits or more is discarded.

Type of Bar Code: GS1 DataBar Omnidirectional/GS1 DataBar Truncated, GS1 DataBar Stacked, GS1 DataBar Stacked Omnidirectional, GS1 DataBar Limited

(1) Auto affix of dedicated C/D

No. of Input Digits		
13 digits	Input Data	D_1 D_2 D_3 D_4 D_5 D_6 D_7 D_8 D_9 D_{10} D_{11} D_{12} D_{13}
	Drawing Data	D_1 D_2 D_3 D_4 D_5 D_6 D_7 D_8 D_9 D_{10} D_{11} D_{12} D_{13} C/D Dedicated check digit
14 digits or more		Not to be drawn

Type of Bar Code: GS1 DataBar Expanded

(1) Auto affix of dedicated C/D

No. of Input Digits		
70 digits	Input Data	D_1 D_2 D_3 D_4 D_5 D_6 D_7 D_8 D_9 D_{10} D_{11} D_{12} D_{13}
	Drawing Data	D_1 D_2 D_3 D_4 D_5 D_6 D_7 D_8 D_9 D_{10} D_{11} D_{12} D_{13} C/D Dedicated check digit
71 digits or more		Not to be drawn ***NOTE:*** *Some data cannot be drawn even if the number of input digits is less than 70.*

15. AUTOMATIC ADDITION OF START/STOP CODES

Type of Bar Code	Designation of Start/Stop Codes	Input Data	Drawing Data	
CODE 39	Omit (No designation)	12345ABC	Standard	*12345ABC*
			Full ASCII	*12345ABC*
		*12345ABC	Standard	*12345ABC*
			Full ASCII	*12345ABC*
		12345ABC*	Standard	*12345ABC*
			Full ASCII	*12345ABC*
		12345ABC	Standard	*12345ABC*
			Full ASCII	*12345ABC*
		12345*ABC	Standard	*12345*ABC*
			Full ASCII	*12345/JABC*
		**12345ABC	Standard	**12345ABC*
			Full ASCII	*/J12345ABC*
		*12345ABC**	Standard	*12345ABC**
			Full ASCII	*12345ABC/J*
		*12345*ABC*	Standard	*12345*ABC*
			Full ASCII	*12345/JABC*
	Add start code	12345ABC	Standard	*12345ABC
			Full ASCII	*12345ABC
		*12345ABC	Standard	**12345ABC
			Full ASCII	*/J12345ABC
		12345ABC*	Standard	*12345ABC*
			Full ASCII	*12345ABC*
		12345ABC	Standard	**12345ABC*
			Full ASCII	*/J12345ABC*
		12345*ABC	Standard	*12345*ABC
			Full ASCII	*12345/JABC
		**12345ABC	Standard	***12345ABC
			Full ASCII	*/J/J12345ABC
		*12345ABC**	Standard	**12345ABC**
			Full ASCII	*/J12345ABC/J*
		*12345*ABC*	Standard	**12345*ABC*
			Full ASCII	*/J12345/JABC*
	Add stop code	12345ABC	Standard	12345ABC*
			Full ASCII	12345ABC*
		*12345ABC	Standard	*12345ABC*
			Full ASCII	*12345ABC*
		12345ABC*	Standard	12345ABC**
			Full ASCII	12345ABC/J*
		12345ABC	Standard	*12345ABC**
			Full ASCII	*12345ABC/J*
		12345*ABC	Standard	12345*ABC*
			Full ASCII	12345/JABC*
		**12345ABC	Standard	**12345ABC*
			Full ASCII	*/J12345ABC*
		*12345ABC**	Standard	*12345ABC***
			Full ASCII	*12345ABC/J/J*
		*12345*ABC*	Standard	*12345*ABC**
			Full ASCII	*12345/JABC/J*

Type of Bar Code	Designation of Start/Stop Codes	Input Data	Drawing Data	
CODE 39	Start/stop code not added	12345ABC	Standard	12345ABC
			Full ASCII	12345ABC
		*12345ABC	Standard	*12345ABC
			Full ASCII	*12345ABC
		12345ABC*	Standard	12345ABC*
			Full ASCII	12345ABC*
		12345ABC	Standard	*12345ABC*
			Full ASCII	*12345ABC*
		12345*ABC	Standard	12345*ABC
			Full ASCII	12345/JABC
		**12345ABC	Standard	**12345ABC
			Full ASCII	*/J12345ABC
		*12345ABC**	Standard	*12345ABC**
			Full ASCII	*12345ABC/J*
		*12345*ABC*	Standard	*12345*ABC*
			Full ASCII	*12345/JABC*

Type of Bar Code	Designation of Start/Stop Codes	Input Data	Drawing Data
NW7	Omit (No designation)	12345678	a12345678a
		a12345678	a12345678
		12345678c	12345678c
		b12345678d	b12345678d
		12345a678	a12345a678a
		ab12345678	ab12345678
		a12345678bc	a12345678bc
		d12345b678c	d12345b678c
	Add start code	12345678	a12345678
		a12345678	aa12345678
		12345678c	a12345678c
		b12345678d	ab12345678d
		12345a678	a12345a678
		ab12345678	aab12345678
		a12345678bc	aa12345678bc
		d12345b678c	ad12345b678c
	Add stop code	12345678	12345678a
		a12345678	a12345678a
		12345678c	12345678ca
		b12345678d	b12345678da
		12345a678	12345a678a
		ab12345678	ab12345678a
		a12345678bc	a12345678bca
		d12345b678c	d12345b678ca
	Start/stop code not added	12345678	12345678
		a12345678	a12345678
		12345678c	12345678c
		b12345678d	b12345678d
		12345a678	12345a678
		ab12345678	ab12345678
		a12345678bc	a12345678bc
		d12345b678c	d12345b678c