TOSHIBA

TOSHIBA Bar Code Printer

B-EX Series

External Equipment Interface Specification

First Edition:	April 1, 2011
2nd Edition:	August 31, 2011
3rd Edition:	December 26, 2011
4th Edition:	March 27, 2012
5th Edition:	June 22, 2012
6th Edition:	October 15, 2012
7th Edition:	December 27, 2012
8th Edition:	March 4, 2013
9th edition:	September 24, 2013
10th edition:	December 6, 2013
11th edition:	December 25, 2014
12th edition:	May 25, 2016
13th edition:	September 16, 2016

TOSHIBA TEC CORPORATION

TABLE OF CONTENTS

Page

1. SCOPE AND GENERAL DESCRIPTION

1.1 SCOPE

This specification applies to the software for the B-EX series industrial high-performance class general-purpose bar code printers.

1.2 GENERAL DESCRIPTION

The external equipment interface connects a 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.

This specification consists of the following chapters.

1.2.1 Contents of the Specification

Chapter 1: Scope and General Description

Chapter 2: Outline of the Specification

Chapter 3: Interface

Chapter 4: Transmission Sequence

Chapter 5 Interface Command

Chapter 6: Control Code Selection

Chapter 7: Error Processing

Chapter 8: Status Response

Chapter 9: LCD Message and LED Indications

Chapter 10: Character Code Table

Chapter 11 Bar Code Table

2. OUTLINE OF THE SPECIFICATION

2.1 MODEL CONFIGURATION AND DIFFERENCES BETWEEN THE MODELS

2.1.1 B-EX4T1 203 dpi/305 dpi

<table>
<tr><td colspan="2" rowspan="2">Model</td><td>203 dpi</td><td>B-EX4T1-GS12-QM-R</td><td>B-EX4T1-GS12-CN-R</td></tr>
<tr><td>305 dpi</td><td>B-EX4T1-TS12-QM-R</td><td>B-EX4T1-TS12-CN-R</td></tr>
<tr><td rowspan="4">Memory</td><td rowspan="2">Flash ROM</td><td>Main</td><td colspan="2">8 MB × 2 = 16 MB</td></tr>
<tr><td>Font</td><td>None</td><td>Kanji font
8 MB x 1 = 8 MB</td></tr>
<tr><td rowspan="2">SDRAM</td><td>Whole</td><td colspan="2">32 MB × 1 = 32 MB</td></tr>
<tr><td>Image buffer of whole SDRAM</td><td colspan="2">203 dpi: 1.2 MB (Label length: 1500 mm)
305 dpi: 2.7 MB (Label length: 1500 mm)</td></tr>
<tr><td colspan="3">Bitmap Kanji (Gothic)</td><td>None</td><td>Standard</td></tr>
<tr><td colspan="3">Bitmap Kanji (Mincho)</td><td>None</td><td>None</td></tr>
<tr><td colspan="3">Chinese</td><td>None</td><td>Standard</td></tr>
<tr><td colspan="3">RS-232C</td><td colspan="2">Option</td></tr>
<tr><td colspan="3">Centronics</td><td colspan="2">Option</td></tr>
<tr><td colspan="3">USB device (Function)</td><td colspan="2">Standard</td></tr>
<tr><td colspan="3">100BASE wired LAN</td><td colspan="2">Standard</td></tr>
<tr><td colspan="3">Wireless LAN Board</td><td colspan="2">Option</td></tr>
<tr><td colspan="3">Ribbon save module</td><td colspan="2">Option</td></tr>
<tr><td colspan="3">Disc cutter module</td><td colspan="2">Option</td></tr>
<tr><td colspan="3">Rotary cutter module</td><td colspan="2">Option
(Print speeds of 10 ips, 12 ips and 14 ips are not supported.)</td></tr>
<tr><td colspan="3">Strip module</td><td colspan="2">Option</td></tr>
<tr><td colspan="3">External rewinder</td><td colspan="2">None</td></tr>
<tr><td colspan="3">Platen for narrow media</td><td colspan="2">Option</td></tr>
<tr><td colspan="3">Expansion I/O board</td><td colspan="2">Option</td></tr>
<tr><td colspan="3">RTC+USB host Interface board</td><td colspan="2">Option</td></tr>
<tr><td colspan="3">RFID module (UHF band for US)</td><td>Option</td><td>None</td></tr>
<tr><td colspan="3">RFID module (UHF band for EU)</td><td>Option</td><td>None</td></tr>
<tr><td colspan="3">RFID module (UHF band for CN)</td><td>None</td><td>Option</td></tr>
<tr><td colspan="3">RFID module (HF band for QM)</td><td>Option</td><td>Option</td></tr>
</table>

2.1.2 B-EX4T2 203 dpi/300 dpi

Model		203 dpi	B-EX4T2-GS12-QM-R	B-EX4T2-GS12-CN-R
		300 dpi	B-EX4T2-TS12-QM-R	B-EX4T2-TS12-CN-R
Memory	Flash ROM	Main	8 MB × 2 = 16 MB	
		Font	None	8 MB x 1 = 8 MB
	SDRAM	Whole	32 MB × 1 = 32 MB	
		Image buffer of whole SDRAM	203 dpi: 1.2 MB (Label length: 1500 mm) 300 dpi: 2.6 MB (Label length: 1500 mm)	
Bitmap Kanji (Gothic)			None	Standard
Bitmap Kanji (Mincho)			None	None
Chinese			None	Standard
RS-232C			Option	
Centronics			Option	
USB device (Function)			Standard	
100BASE wired LAN			Standard	
Wireless LAN Board			Option	
Ribbon save module			None	
Disc cutter module			Option	
Rotary cutter module			None	
Strip module			Option	
External rewinder			None	
Platen for narrow media			None	
Expansion I/O board			Option	
RTC+USB host Interface board			Option	
RFID module (UHF band for US)			Option	None
RFID module (UHF band for EU)			Option	None
RFID module (UHF band for CN)			None	Option
RFID module (HF band for QM)			Option	Option

2.1.3 B-EX4T2 600 dpi

Model		600 dpi	B-EX4T2-HS12-QM-R	B-EX4T2-HS12-CN-R
Memory	Flash ROM	Main	8 MB × 2 = 16 MB	
		Font	None	8 MB x 1 = 8 MB
	SDRAM	Whole	32 MB × 1 = 32 MB	
		Image buffer of whole SDRAM	600 dpi: 3.4 MB (Label length: 1500 mm)	
Bitmap Kanji (Gothic)			Non	Standard
Bitmap Kanji (Mincho)			None	None
Chinese			None	Standard
RS-232C			Option	
Centronics			Option	
USB device (Function)			Standard	
100BASE wired LAN			Standard	
Wireless LAN Board			Option	
Ribbon save module			None	
Disc cutter module			Option	
Rotary cutter module			None	
Strip module			Option	
External rewinder			None	
Platen for narrow media			None	
Expansion I/O board			Option	
RTC+USB host Interface board			Option	
RFID module (UHF band for US)			Option	None
RFID module (UHF band for EU)			Option	None
RFID module (UHF band for CN)			None	Option
RFID module (HF band for QM)			Option	Option

2.1.4 B-EX4D2 203 dpi/300 dpi

Model		203 dpi	B-EX4D2-GS12-QQ-R	B-EX4D2-GS12-QM-R	B-EX4D2-GS12-CN-R
		300 dpi		B-EX4D2-TS12-QM-R	B-EX4D2-TS12-CN-R
Memory	Flash ROM	Main	8 MB × 2 = 16 MB		
		Font	None		8 MB x 1 = 8 MB
	SDRAM	Whole	32 MB × 1 = 32 MB		
		Image buffer of whole SDRAM	1.2MB (Label length: 1500 mm)		
Bitmap Kanji (Gothic)			None		Standard
Bitmap Kanji (Mincho)			None		None
Chinese			None		Standard
RS-232C			Option		
Centronics			Option		
USB device (Function)			Standard		
100BASE wired LAN			Standard		
Wireless LAN Board			Option		
Ribbon save module			None		
Disc cutter module			Option		
Rotary cutter module			None		
Strip module			Option		
External rewinder			None		
Platen for narrow media			None		
Expansion I/O board			Option		
RTC+USB host Interface board			Option		
RFID module (UHF band for US)			Option		
RFID module (UHF band for EU)			Option		
RFID module (UHF band for CN)			None		
RFID module (HF band for QM)			Option		

2.1.5 B-EX6T1 203 dpi/305 dpi

Model		203 dpi	B-EX6T1-GS12-QM-R	B-EX6T1-GS12-CN-R	B-EX6T1-GS16-CN-R	B-EX6T1-GS18-CN-R
		305 dpi	B-EX6T1-TS12-QM-R	B-EX6T1-TS12-CN-R	B-EX6T1-TS16-CN-R	B-EX6T1-TS18-CN-R
Memory	Flash ROM	Main, font, storage	64MB			
	SDRAM	Whole	32MB			
		Image buffer of whole SDRAM	203 dpi: 1.8MB (Label length: 1500 mm) 305 dpi: 4.1MB (Label length: 1500 mm)			
Bitmap Kanji (Gothic)			Non	Standard		
Bitmap Kanji (Mincho)			None	None		
Chinese			None	Standard		
RS-232C			Option			
Centronics			Option			
USB device (Function)			Standard			
100BASE wired LAN			Standard			
Wireless LAN Board			Option		Standard	Option
Ribbon save module			Standard			
Disc cutter module			Option			
Strip module			Option			
External media guide			Option			
Expansion I/O board			Option			
RTC+USB host Interface board			Option			
RFID module (UHF band for US)			Option	None		
RFID module (UHF band for EU)			Option	None		
RFID module (UHF band for AU)			Option	None		
RFID module (UHF band for CN)			None			Option

2.1.6 B-EX6T3 203 dpi/305 dpi

Model		203 dpi	B-EX6T3-GS12-QM-R	B-EX6T3-GS12-CN-R
		305 dpi	B-EX6T3-TS12-QM-R	B-EX6T3-TS12-CN-R
Memory	Flash ROM	Main, font, storage	64MB	
	SDRAM	Whole	32 MB	
		Image buffer of whole SDRAM	203 dpi: 1.8 MB (Label length: 1500 mm) 305 dpi: 4.1 MB (Label length: 1500 mm)	
Bitmap Kanji (Gothic)			Non	Standard
Bitmap Kanji (Mincho)			None	None
Chinese			None	Standard
RS-232C			Option	
Centronics			Option	
USB device (Function)			Standard	
100BASE wired LAN			Standard	
Wireless LAN Board			Option	
Ribbon save module			None	
Disc cutter module			Option	
Strip module			Option	
External media guide			Option	
Expansion I/O board			Option	
RTC+USB host Interface board			Standard	
RFID module (UHF band for US)			None	
RFID module (UHF band for EU)			None	
RFID module (UHF band for AU)			None	
RFID module (UHF band for CN)			None	

2.1.7 B-EX4T3 600 dpi

Model		600 dpi	B-EX4T3-HS12-QM/CN-R
Memory	Flash ROM	Main	16 MB × 2 = 32 MB
		Font	8 MB x 1 = 8 MB
	SDRAM	Whole	32 MB × 1 = 32 MB
		Image buffer of whole SDRAM	600 dpi: 3.4 MB (Label length: 1500 mm)
Bitmap Kanji (Gothic)			Standard
Bitmap Kanji (Mincho)			None
Chinese			Standard
RS-232C			Standard
Centronics			Option
USB device (Function)			Standard
100BASE wired LAN			Standard
Wireless LAN Board			None
Ribbon save module			None
Disc cutter module			Option
Rotary cutter module			None
Strip module			Option
External rewinder			Option
Platen for narrow media			None
Expansion I/O board			Option
RTC+USB host Interface board			Option
RFID module (UHF band for US)			None
RFID module (UHF band for EU)			None
RFID module (UHF band for CN)			None
RFID module (HF band for QM)			None

2.2 PRINT METHOD

Thermal transfer method
Direct thermal method

2.3 PRINT HEAD SPECIFICATION

Model	Print head type	Resolution			
		203dpi	300dpi	305dpi	600dpi
		8 dots/mm	11.8 dots/mm	12 dots/mm	23.6 dots/mm
B-EX4T1 (4 inches)	Edge	✓		✓	
B-EX4T2 (4 inches)	Flat	✓	✓		✓
B-EX4D2 (4 inches)	Flat	✓	✓		
B-EX6T1 (6 inches)	Near edge	✓		✓	
B-EX6T3 (6 inches)	Near edge	✓		✓	
B-EX4T3 (4 inches)	Flat				✓

2.4 PAPER ALIGNMENT

Model		Resolution	Print head type	Paper alignment	Destination
B-EX4T1 (4 inches)		203 dpi/ 305 dpi	Edge	Center	Global
B-EX4T2 (4 inches)		203 dpi/ 300 dpi	Flat	Side	Global
		600 dpi	Flat	Side	Global
B-EX4D2 (4 inches)	D1.0	203 dpi	Flat	Side	North America
	D1.1 or later	203 dpi/ 300 dpi			Global
B-EX6T1 (6 inches)		203 dpi/ 305 dpi	Near edge	Center	Global
B-EX6T3 (6 inches)		203 dpi/ 305 dpi	Near edge	Center	Global
B-EX4T3 (4 inches)		600 dpi	Flat	Center	Global

2.5 PRINT SPEED

Mode	Resolution	Print speed								
		2”/s	3”/s	4”/s	5”/s	6”/s	8”/s	10”/s	12”/s	14”/s
B-EX4T1	203 dpi		✓			✓		✓	✓	✓
	305 dpi		✓		✓		✓	✓	✓	✓
B-EX4T2	203 dpi		✓			✓		✓	✓	
	300 dpi		✓		✓		✓	✓	✓	
	600 dpi	✓	✓	✓	✓	✓				
B-EX4D2	203 dpi		✓			✓		✓	✓	
	300 dpi		✓		✓		✓	✓	✓	
B-EX6T1/T3	203 dpi		✓		✓		✓	✓	✓	
	305 dpi		✓		✓		✓	✓	✓	
B-EX4T3	600 dpi		✓	✓	✓	✓				

2.6 CHARACTERS

<Bitmap font>	203 dpi	300/305 dpi	600 dpi
Times Roman (Medium)	12 point	8 point	4 point
Times Roman (Medium)	15 point	10 point	5 point
Times Roman (Bold)	15 point	10 point	5 point
Times Roman (Bold)	18 point	12 point	6 point
Times Roman (Bold)	21 point	14 point	7 point
Times Roman (Italic)	18 point	12 point	6 point
Helvetica (Medium)	9 point	6 point	3 point
Helvetica (Medium)	15 point	10 point	5 point
Helvetica (Medium)	18 point	12 point	6 point
Helvetica (Bold)	18 point	12 point	6 point
Helvetica (Bold)	21 point	14 point	7 point
Helvetica (Italic)	18 point	12 point	6 point
Presentation (Bold)	27 point	18 point	9 point
Letter Gothic (Medium)	14.3 point	9.5 point	4.8 point
Prestige Elite (Medium)	10.5 point	7 point	3.5 point
Prestige Elite (Bold)	15 point	10 point	5 point
Courier (Medium)	15 point	10 point	5 point
Courier (Bold)	18 point	12 point	6 point
OCR-A	12 point	12 point	6 point
OCR-B	12 point	12 point	12 point
Gothic725 Black	6 pint	4 point	4 point
Kanji/External character (Gothic)	16 x 16 dots	16 x 16 dots	16 x 16 dots
Kanji/External character (Gothic)	24 x 24 dots	24 x 24 dots	24 x 24 dots
Kanji/External character (Gothic)	32 x 32 dots	32 x 32 dots	32 x 32 dots
Kanji/External character (Gothic)	48 x 48 dots	48 x 48 dots	48 x 48 dots
Kanji (Mincho)	24 x 24 dots	24 x 24 dots	24 x 24 dots
Kanji (Mincho)	32 x 32 dots	32 x 32 dots	32 x 32 dots
Chinese*1	24 x 24 dots	24 x 24 dots	24 x 24 dots

*1: Chinese fonts need to be installed.

<Outline font>

Fonts other than TrueType font	TEC FONT 1, TEC FONT 2, Price Fonts 1, 2 and 3, DUTCH801 Bold, BRUSH738 Regular, Gothic 725 Black
TrueType font	BalloonPExtBol, BlacklightD, BrushScrD, CG Times, CG Times Bold, CG Times Italic, Clarendon Condensed Bold, FlashPBol, Garamond Kursiv Halbfett, GoudyHeaP, GilliesGotDBol, GilliesGotDLig, NimbusSanNovTUltLigCon, Ryahd, Ryahd Bold, CG Triumvirate, CG Triumvirate Condensed Bold, Univers Medium, Univers Bold, Univers Medium Ilalic, add_on TrueTypeFont 1, add_on TrueTypeFont 2, add_on TrueTypeFont 3, add_on TrueTypeFont 4, add_on TrueTypeFont 5, Kanji add_on TrueTypeFont 1, Kanji add_on TrueTypeFont 2, Kanji add_on TrueTypeFont 3, Kanji add_on TrueTypeFont 4, Kanji add_on TrueTypeFont 5 **NOTE**: TrueType fonts need to be installed separately.

2.7 BAR CODES/TWO-DIMENSIONAL CODES

<Bar codes>	JAN8/EAN8, JAN13/EAN13, UPC-A, UPC-E, Interleaved 2 of 5, NW7, CODE39, CODE93, CODE128, EAN128, MSI, GS1 DataBar, Customer Barcode, POSTNET, RM4SCC, KIX CODE, Industrial 2 of 5, MATRIX 2 of 5 for NEC
<Two-dimensional codes>	QR CODE, MicroQR CODE, PDF417, DataMatrix, Maxicode, MicroPDF417, CP CODE

2.8 STORABLE FORMATS

Max. 99 types

2.9 WRITABLE CHARACTERS

Free size:	224 characters x 40 types
16 x 16 dots:	188 characters
24 x 24 dots:	188 characters
32 x 32 dots:	188 characters
48 x 48 dots:	188 characters

2.10 INTERFACE

RS-232C
Centronics (IEEE1284 compatible mode, Nibble mode)
LAN (100base)
Wireless LAN (IEEE802.11b/g) Note: IEEE802.11b/g/n for the B-EX6T1/T3
USB V2.0

2.11 USB MEMORY (USB HOST)

Recommended USB memories

Size	Manufacturer	Type	Function
1GB	SILICON POWER	SP001GBUF2M01V1K	Readable and writable
2GB		SP002GBUF2M01V1K	
8GB		SP008GBUF2M01V1K	

2.12 SENSOR

Head open sensor
Head up sensor (Head lock sensor)
Transmissive sensor
Reflective sensor
Ribbon take-up motor sensor
Ribbon feed (back tension) motor sensor
Rewinder overflow sensor
Backing paper overflow sensor
Peel-off sensor
Head thermistor
Ambient temperature sensor

2.13 KEYS

FEED key
PAUSE key
RESTART key
MODE key
CANCEL key
ENTER key
Up (↑) key
Down (↓) key
Left (←) key
Right (→) key

2.14 LED

ONLINE LED: Green
ERROR LED: Red

2.15 LCD

Type:	Graphic LCD
Size:	128 dots (W) x64 dots (H)
Max. No. of characters displayed:	21 digits x 5 lines

2.16 ISSUE MODE

Batch: The specified number of labels is continuously issued in a batch.

Cut: The specified number of labels is issued while being cut at the specified cut interval. Cut issue will be ignored if the cut issue is specified while the printer is in the peel-off mode.

Peel-off: Next label will not be printed until the current label is removed from the strip shaft. However, when the application is programmed so that the applicator of a labeler ignores the peel-off sensor, subsequent labels are printed regardless of whether the current label is removed or not.

2.17 MEDIA

Size / Mode	Label width	Gap between labels	Black mark length	Backing paper width
B-EX4T1 203/305dpi	27 to 117mm	2 to 20mm	2 to 10mm	30 to 120mm
B-EX4T2 203/300dpi	22 to 111mm	2 to 20mm	2 to 10mm	25 to 114mm
B-EX4T2 600dpi	12 to 111mm	2 to 20mm	2 to 10mm	15 to 114mm
B-EX4D2 203/300dpi	22 to 111 mm	2 to 20 mm	2 to 10 mm	25 to 114 mm
B-EX6T1/T3 203/305dpi	47 to 162 mm	2 to 20 mm	2 to 10 mm	50 to 165 mm
B-EX4T3 600dpi	13 to 108mm	2 to 20mm	2 to 10mm	15 to 110mm

2.18 CUT

Stop and cut with the disc cutter
Non-stop cut with the rotary cutter

2.19 RIBBON SAVING FUNCTION

When the ribbon saving function is enabled, the print head is raised when non-print area is detected during printing. While the print head is raised, only the media is fed, causing ribbon loss to be reduced.

Model	Ribbon saving function
B-EX4T1	✓
B-EX4T2	---
B-EX4D2	---
B-EX6T1	✓
B-EX6T3	---
B-EX4T3	---

2.20 AUTO CALIBRATION

When the auto calibration function is enabled, the printer performs an auto calibration at a power on time and the open/close of the print head. During the auto calibration, the threshold value, gap length, label pitch, effective print length and whether the ribbon is used or not are automatically detected. The printer performs subsequent printing based on the detected settings.

2.21 MANUAL HOME POSITION DETECTION

When the manual home position detection function is enabled, the printer feeds media to the print start position after a power on, a batch reset (cause by Z0 command or W@ command), depression of the FEED key which follows the closing of the print head block.

3. INTERFACE

3.1 GENERAL DESCRIPTION

This chapter provides the detailed explanations of each interface between the host and the printer.

Interface types available to the B-EX series are as follows:

Standard: USB (FUNCTION) + LAN

Option: Wireless LAN
USB (HOST)
RS-232C
Centronics (IEEE1284)

***NOTES**: 1. When using RS-232C interface, the RS-232C cable shall be connected to the printer before turning on the printer power.*

2. The wireless LAN and the wired LAN cannot be used at the same time.

3.2 USB INTERFACE

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

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

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

(4) Transfer Control Method: A status is sent along with the receive buffer free space information in response to a read request immediately after [ESC]WB[LF][NUL], as described below. Based on this status response, the host computer can transmit data so that the receive buffer does not become full.

Status with the receive buffer free space information

SOH	01H	Indicates the header of the status block
STX	02H	
Status	3XH	Printer status
	3XH	*Details are described later
Status type	33H	Indicates that this status includes the receive buffer free space information.
Remaining count	3XH	Remaining number of labels to be printed
	3XH	"0000" (0 labels) to "9999" (9999 labels)
	3XH	
	3XH	
Length	32H	Total number of bytes of this status block
	33H	"23" (23 bytes)
Free space of receive buffer	3XH	Free space of the receive buffer
	3XH	"00000" (0K bytes) to "00512" (512K bytes)
	3XH	However, the maximum value shall be the receive buffer capacity.
	3XH	
	3XH	
Receive buffer capacity	30H	Receive buffer capacity
	30H	"00512" (512K bytes)
	35H	
	31H	
	32H	
CR	0DH	Indicates the terminator of the status block.
LF	0AH	

3.3 NETWORK INTERFACE

(1) Configuration

On board

(2) Protocol: TCP/IP

(3) Network Specifications

① LPR server function
② WEB printer function
③ Socket communication function
④ FTP server function
⑤ Mail transmission/reception function

* For more details on the network, refer to the Network Specification.

3.4 SERIAL INTERFACE

(1)	Type:	Conforming to RS-232C
(2)	Mode of Communication:	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 receive buffer is shared with other interfaces.

(13) Transmission 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 in the receive buffer become 10 Kbytes or less.
- The printer sends an XON code (11H) when the free space in the receive buffer become 512 Kbytes or more.
- When there are no free space in the receive buffer, the printer discards data received exceeding the receive buffer capacity, 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 in the receive buffer become 10 Kbytes or less.
- The printer turns the DTR signal to “High” level (READY) when the free space in the receive buffer become 512 Kbytes or more.
- When there are no free space in the receive buffer, the printer discards data received exceeding the receive buffer capacity, 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 in the receive buffer become 10 Kbytes or less, the printer turns the DTR signal to “Low” level (BUSY) and sends an XOFF code (13H).
- When the free space in the receive buffer become 512 Kbytes or more, the printer turns the DTR signal to “High” level (READY) and sends an XON code (11H).
- When there are no free space in the receive buffer, the printer discards data received exceeding the receive buffer capacity, 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”.

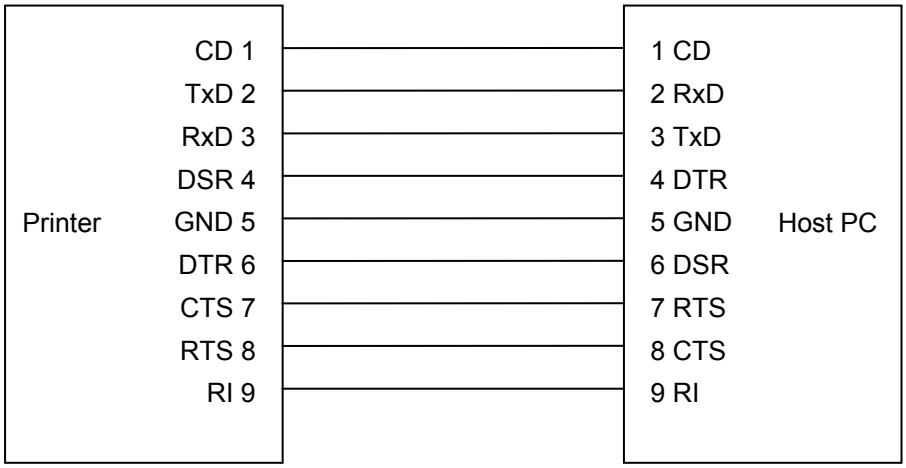
④ READY/BUSY (RTS) Protocol

- 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 in the receive buffer become 10 Kbytes or less.
- The printer turns the RTS signal to “High” (READY) when the free space in the receive buffer become 512 Kbytes or more.
- When there are no free space in the receive buffer, the printer discards data received exceeding the receive buffer capacity, 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 shall be always “High”.

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

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

(14) Input/Output Signals

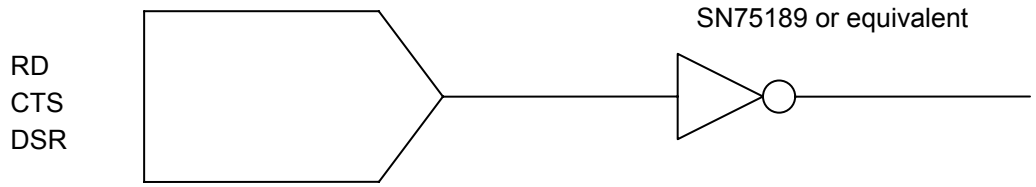


(15) Connector Pin Assignment and Signal Description

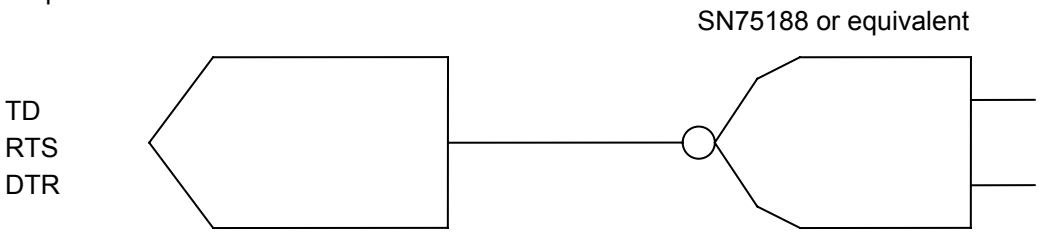
Pin No.	Signal Name	Function	Signal Direction
1	CD	Open	---
2	TXD	• Data line from the printer to the host • Logic 1 is a Low level, while logic 0 is a High level. • It is in the Low (Mark) state when no transmission is in progress.	Printer →
3	RXD	• Data line from the host to the printer • Logic 1 is 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	GND	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	• It is an input signal indicating whether or not the data transmission to the host is possible. However, this printer does not detect this signal.	← 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	RI	Open	---

(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

3.5 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:

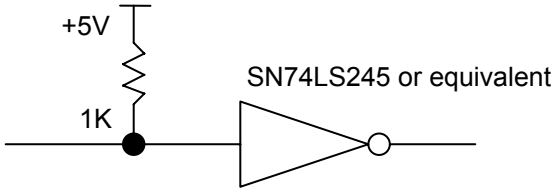
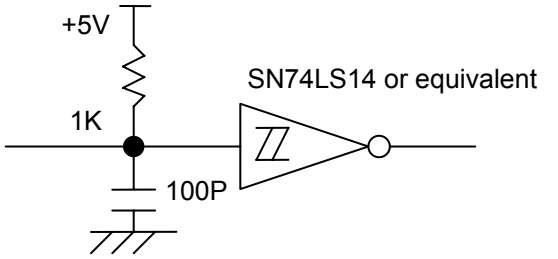
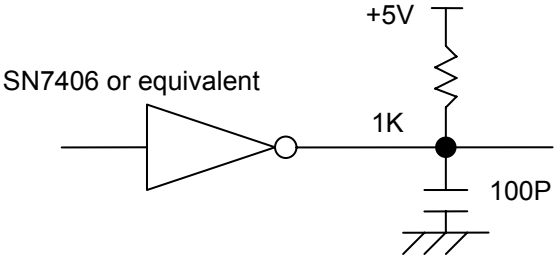
Compatibility mode	Nibble mode
nStrobe	HostClk
nAck	PrtClk
Busy	PtrBusy
PError	AckDataReq
Select	Xflag
nAutoFd	HostBusy
nInit	nInit
nFault	nDataAvail
nSelectIn	IEEE1284Active

(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 receive buffer is shared with other 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/HostClk nInit/nInit/ nReverseRequest nAutoFd/HostBusy/ HostAck nSelectIn/IEEE1284Active/ IEEE1284Active		
Output	Busy/PtrBusy/PeriphAck nFault/nDataAvail/ nPeriphRequest nAck/PtrClk/PeriphClk Select/Xflag/XFlag PError/AckDataReq/ nAckReverse		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

NOTE: *The signal name starting with a lower case "n" indicates that it is a low active signal.*

(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 in the receive buffer become 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 there are no free space in the receive buffer, the printer stops reading data. Then, it keeps the signal at “High” level (in a Busy state) until there are free space in the receive buffer when data is set from the host.
- The signal is kept at “High” level (in a Busy state) until the current state (one of the following states) is reset.
  - 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. A low on this input 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 a low signal.
- 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 the current state (one of the following states) is reset.
  - 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 the current state (one of the following states) is reset.
  - 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 reset.

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 the 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)

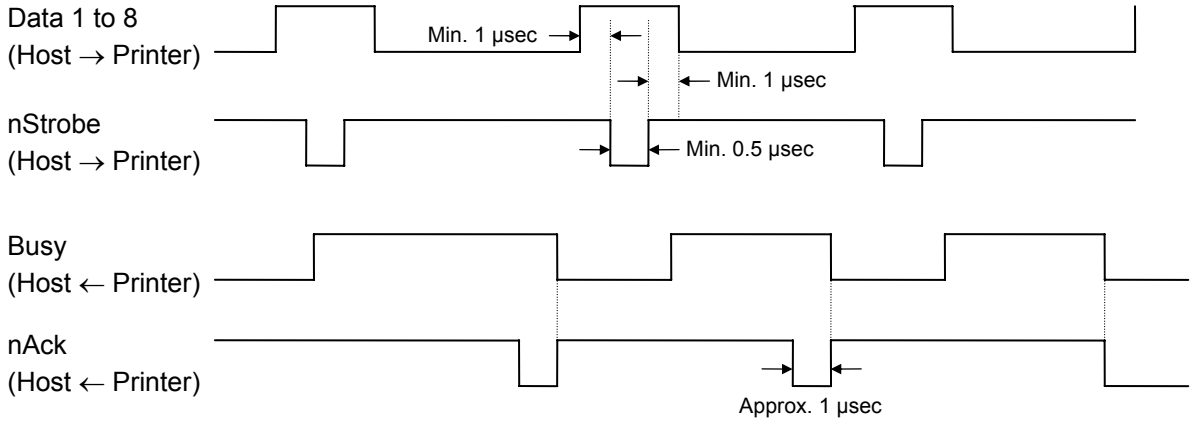
- Reverse data transfer phase: When the signal is low, it indicates the printer has data to be sent to the host. And it is used for sending data bits 0 and 4.
- Reverse idle phase: It is used for indicating that the data is available.

(11) Timing Chart

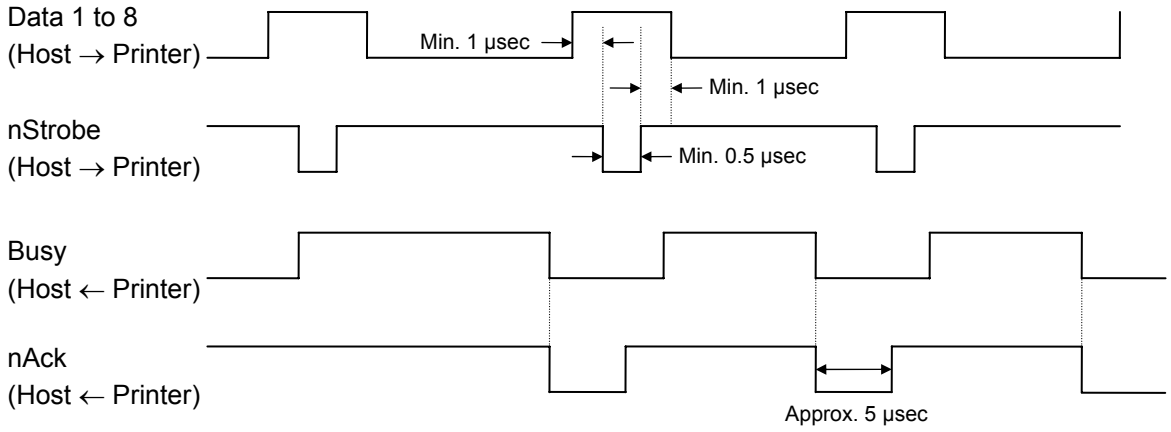
① When receiving normal data:

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

a) Timing 1 (Default)

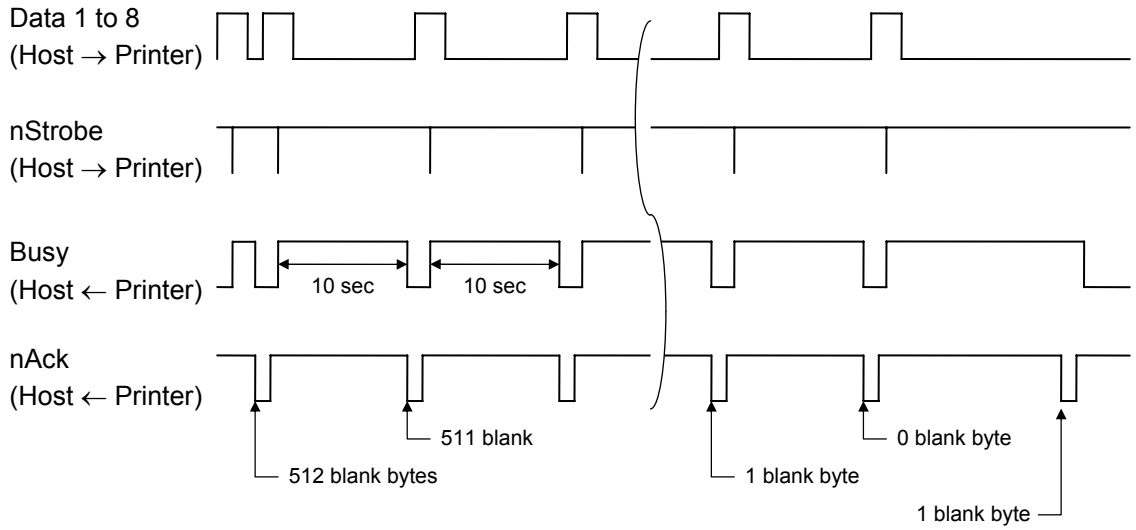


b) Timing 2



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

- When the free space in the receive buffer becomes 512 bytes or less, the printer stores all of the already received data in the receive buffer, stays 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 the data read, 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. Then, it stays in a Busy state (Busy signal at "High" level) until a free space is generated in the receive buffer after data is set from the host.



(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 of the Nibble mode.

* When SPP mode is selected for the printer setting, the printer returns a 13-byte status (described at the top of the next page) to the Nibble mode negotiation immediately after [ESC] WS [LF] [NUL] is received. The printer returns a 23-byte status with the receive buffer free space information (described in (13) on the next page) to the Nibble mode negotiation immediately after [ESC] WB [LF] [NUL] is received.

Status to be returned immediately after [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 returns a status along with the receive buffer free space information to the Nibble mode negotiation immediately after [ESC] WB [LF] [NUL] is received, as described blow.

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
	3XH	* Details are to be hereinafter described.
Status type	33H	Indicates that the status includes the receive buffer free space information.
Remaining count	3XH	Remaining number of labels to be printed
	3XH	* Details are to be hereinafter described.
	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
	3XH	"00000" (0 Kbyte) to "99999" (99999 Kbytes)
	3XH	However, the maximum value shall be the receive buffer
	3XH	capacity.
	3XH	
Receive buffer capacity	3XH	Receive buffer capacity
	3XH	"00000" (0 Kbyte) to "99999" (99999 Kbytes)
	3XH	However, the maximum value differs depending on the models.
	3XH	
	3XH	
CR	0DH	Indicates the terminator of the status block.
LF	0AH	

3.6 USB HOST INTERFACE

(1)	Applicable standard:	Universal Serial Bus V1.1
(2)	Transfer Rate:	Low speed (1.5 Mbps) and Full speed (12 Mbps)
(3)	Others:	Conforming to OpenHCI version 1.0 register set Root hub

3.7 WIRELESS LAN

3.7.1 Specification of Wireless LAN Module

Applicable standard	IEEE802.11b/g	
Communication distance	100 m/360° (Depending on conditions)	
Client protocol:	Physical layer	802.11b/g
	Data link layer	CSMA/CA
	Network layer	IP, ICMP, ARP
	Transport layer	TCP, UDP
	Application layer	SOCKET, LPR, SNMP agent, DHCP client, Web server, WINS client
Flow control	TCP/IP flow control	
Antenna	Built-in	
Parameter setting	Via USB	
Parameter status monitoring	Via HTTP	

In the case of the B-EX6T1/T3

Applicable standard	IEEE802.11b/g/n	
Communication distance	100 m/360° (Depending on conditions)	
Client protocol:	Physical layer	802.11b/g/n
	Data link layer	CSMA/CA
	Network layer	IP, ICMP, ARP
	Transport layer	TCP, UDP
	Application layer	SOCKET, LPR, DHCP client, Web server
Flow control	TCP/IP flow control	
Antenna	Built-in	
Parameter setting	Via USB	
Parameter status monitoring	Via HTTP	

3.7.2 MAC address

When the wireless LAN module has been installed on the printer, the printer prints the MAC address and wireless LAN module's parameter settings.

[MAC address]

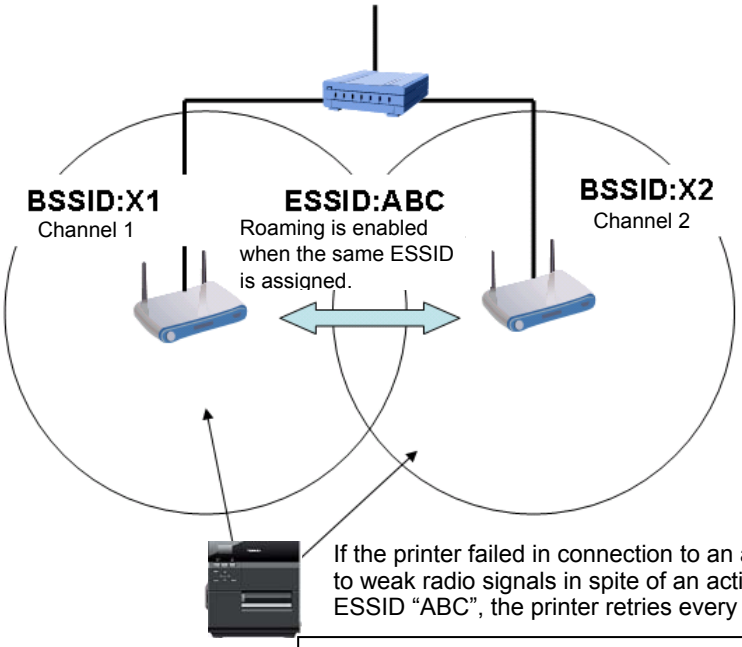
The MAC address is printed on the self-test result in the system mode.
For details, refer to the Key Operation Specification for the B-EX Series.
For details of the B-EX6T1/T3, refer to the Key Operation Specification version 2 for the B-EX Series.

3.7.3 Connection sequence

The connection sequence varies depending on the wireless LAN mode.

(1) Infrastructure Mode

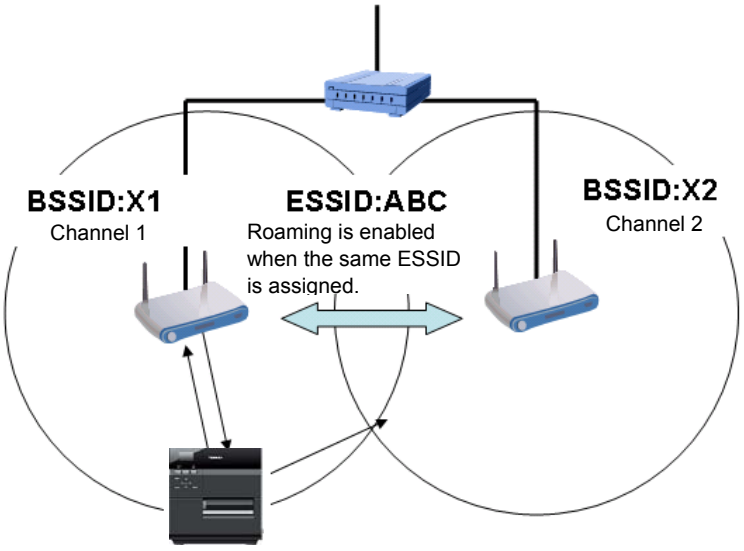
The printer performs active scanning for all the supported channels at a power ON time using the ESSID specified in advance. When the printer receives a valid active scanning response from the access point, it enters the connection state.
The channel to be used is the one set on the access point.
The printer which is out of the connection state repeats the active scanning every 40 seconds until it enters the connection state.
If the printer comes into a situation where it cannot receive the beacon from the access point for a specified period of time after the connection due to weaker radio signals or other factors, the printer goes out of the connection state. In this case, just as at a power ON time, the printer waits for 40 seconds and then performs active scanning every 40 seconds until it is connected again. This operation continues up to two hours.
When Supplicant is used, the 802.1x authentication is performed when the access point needs to authenticate the printer which tries to connect to the access point (the timing differs depending on the authentication method and access point specification.)



If the printer failed in connection to an access point due to weak radio signals in spite of an active scanning with ESSID “ABC”, the printer retries every 40 seconds.

ESSID (Extended Service Set ID): One of the identifiers identifying a name of a wireless access point. It is named by a user.
BSSID (Basic Service Set ID): One of the identifiers, generally identifying the MAC address of an access point in the case of BSS networks. It is not changeable by a user.
Note: Direct communication with wireless device is not allowed when BSSID is different.

(a) Example: Active scanning retry



The printer tries an active scanning, and connects to the network of BSSID: X1 when it receives a valid response from the access point assigned with BSSID: X1.” The channel to be used is the one used by the connected access point.

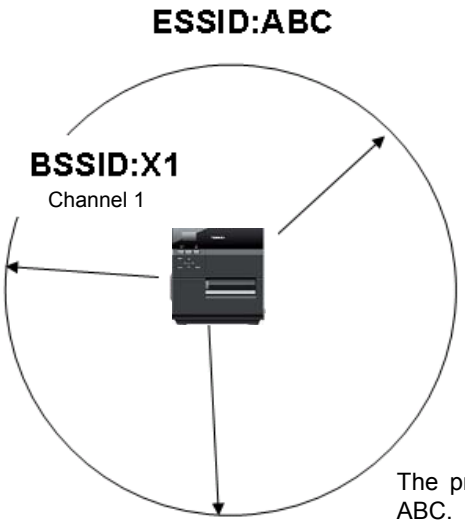
(b) Example: Successful connection

(2) Adhoc Mode

The printer performs active scanning for all the supported channels at a power ON time using the ESSID set by a user in advance. When the printer receives a valid active scanning response from the IBSS creator, the printer connects to the network as a joiner. The channel set on the IBSS creator is used.
If the printer can receive no valid response after an approximately 3.5-second active scanning for all the channels for , the printer becomes the IBSS creator and creates own BSS (a network having a unique BSSID) for the channel specified for the printer.

The above operation enables a group of remotely-located wireless LAN clients (printers, handy terminals, etc.) to share the same ESSID as well as each client of the group to become a different network having unique BSSID. Since a communication is not allowed with the network having different BSSID, wireless devices used in pairs are required to try connection within a near area to avoid joining the network with different BSSID.

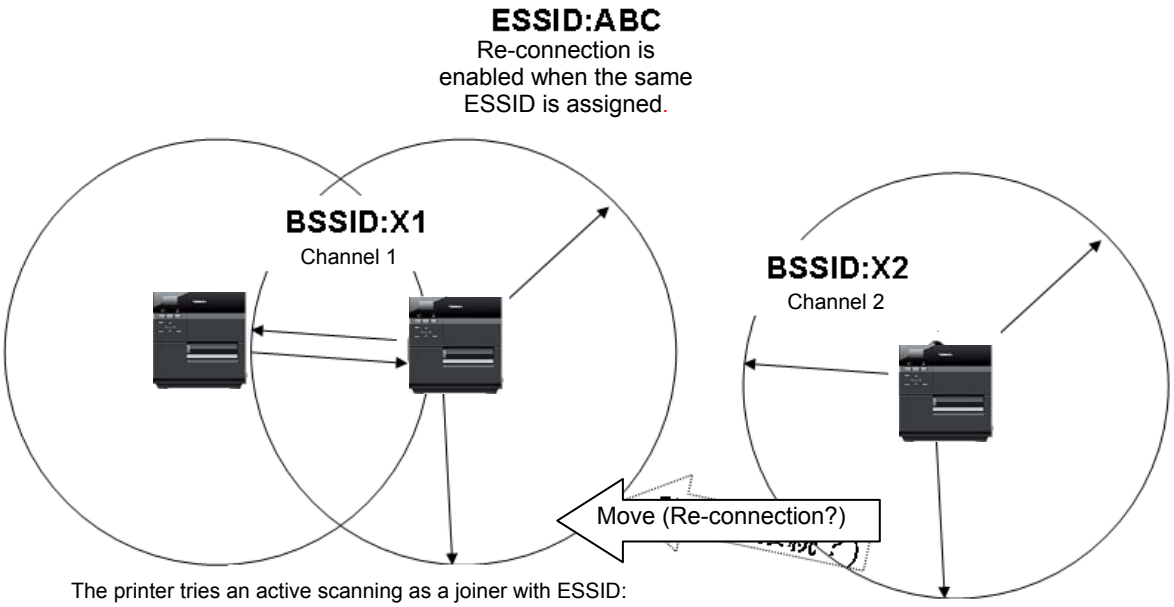
When the printer detects that there is a network having different BSSID but the same ESSID or the IBSS creator exited from the network during periodic IBSS network monitoring, it tries re-connection to an optimum IBSS network. At this time, a connection may become unstable temporarily.



ESSID (Extended Service Set ID): One of the identifiers, identifying a name of a wireless access point. It is named by a user.
BSSID (Basic Service Set ID): One of the identifiers, identifying a wireless network. In the case of IBSS networks, it is named by the creator.
Note: Direct communication with wireless device is not allowed when BSSID is different.

The printer tries an active scanning as a joiner with ESSID: ABC. When the printer cannot receive a valid response from the creator, it becomes a creator and creates an IBSS network. At this time, the printer refers to its own setup data for the channel to be used.

(a) Example: Joiner becomes creator



The printer tries an active scanning as a joiner with ESSID: ABC. When the printer receives a valid response from the creator, it connects to the IBSS created by the creator.

If the printer cannot receive a valid response from the creator after performing an active scanning as a joiner with ESSID "ABC", the printer itself becomes a creator and creates an IBSS network. At this time, the printer refers to its own setup data for the channel to be used.
After that, moving this new network into the cell of BSSID: X1 network may cause the BSSID to change to BSSID: X1.
Note: It depends on the device type.

ESSID (Extended Service Set ID): One of the identifiers, identifying a name of a wireless access point. It is named by a user.
BSSID (Basic Service Set ID): One of the identifiers, identifying a wireless network. In the case of IBSS networks, it is named by the creator.
Note: Direct communication with wireless device is not allowed when BSSID is different.

(a) Example: Dynamic change of IBSS network

3.7.4 Received data handling when the printer enters the power save mode

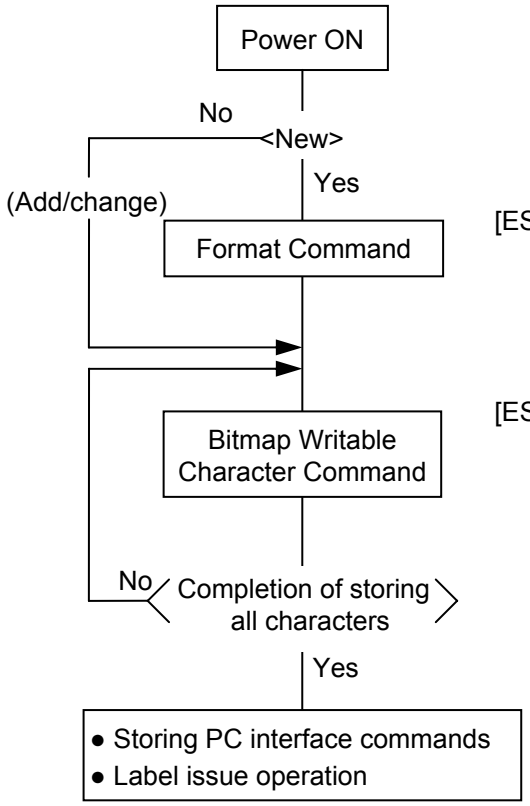
Since the receive buffer has not been initialized, data sent before a timeout (power save mode) remains in the receive buffer.

4. TRANSMISSION SEQUENCE

4.1 PREPARATORY SETTING

External characters, logos, and PC interface commands need be stored in the printer before performing label issue operations.

(1) Storing writable characters and logos



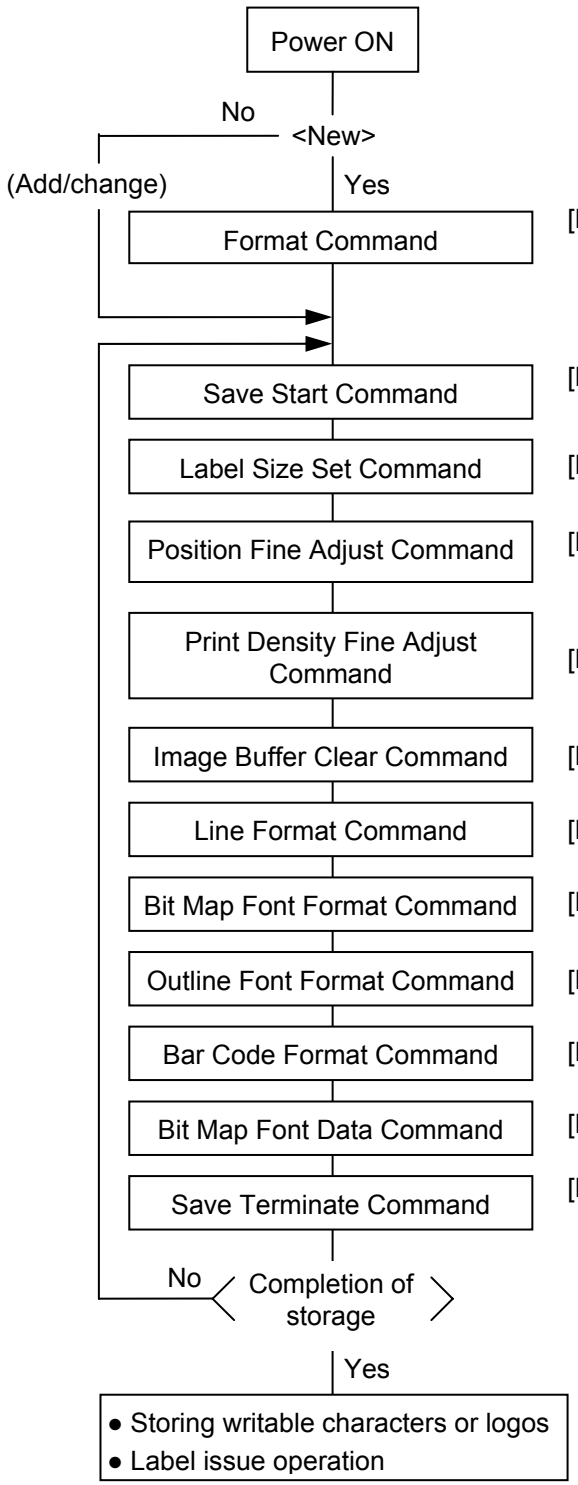
NOTES: *(1) The storage of writable characters or logos is unnecessary when they are not used.*

(2) When the on-board flash ROM is used for storage, the memory will be consumed each time already stored writable characters or logos are saved unless the Format Command is sent in advance.

(3) When 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 a subsequent storage of writable characters or logos does not take place, the printer automatically enters the online mode (label issue operation) in about 10 seconds. At this time, the image buffer will be cleared automatically.

(2) Storing PC interface commands



[ESC] J1/[ESC] JA: Formats the on-board flash ROM or USB memory.

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

[ESC] D: Sets the label size.

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

[ESC] AY: Adjusts the print density.

[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: Specifies the data for the bit map font.

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

NOTES: *(1) The storage of writable characters or logos is unnecessary when they are not used.*

(2) When the on-board flash ROM is used for storage, the memory will be consumed each time already stored PC interface commands are saved, unless the Format Command is sent in advance.

(3) When a different operation (storing writable characters or logos or label issue operation) is performed after storing PC interface commands, the image buffer will be cleared automatically.

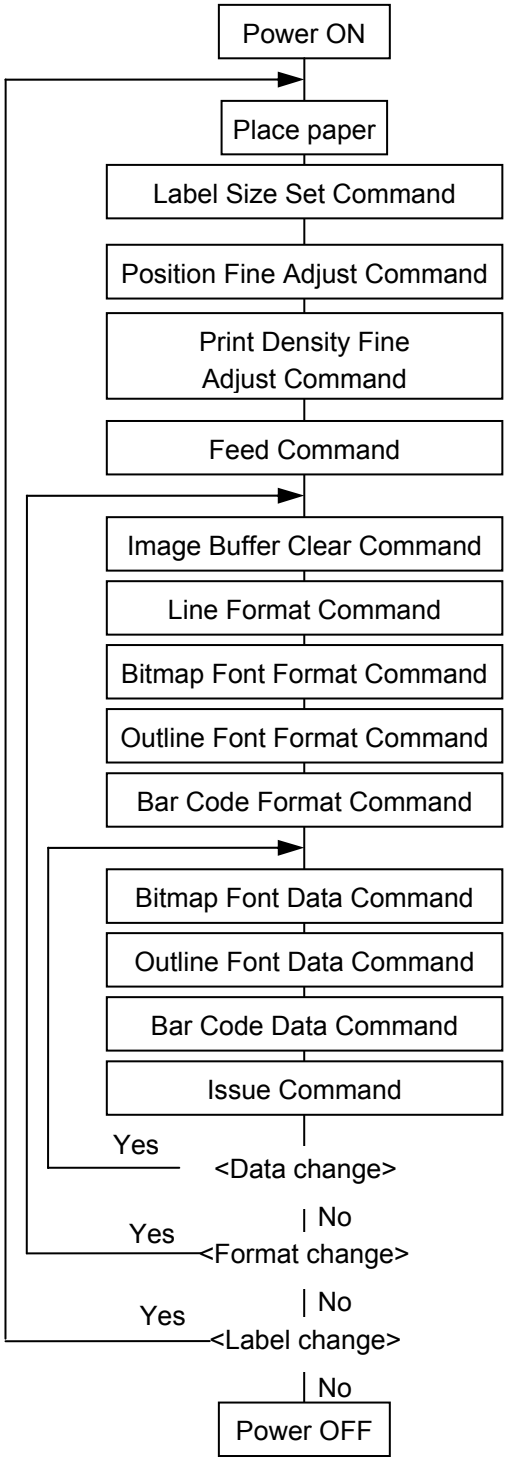
(4) Stored commands shall be selected as needed.

(5) If a subsequent storage of PC interface commands does not take place, the printer automatically enters the online mode (label issue operation) in about 10 seconds. At this time, the image buffer will be cleared automatically.

4.2 LABEL ISSUE OPERATION

An example of the label issue operation is shown below.

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



[ESC] D: Sets the label size.

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

[ESC] AY: Adjusts the print tone.

[ESC] T: Feeds one label and aligns it 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 bitmap font data.

[ESC] RV: Draws outline font data.

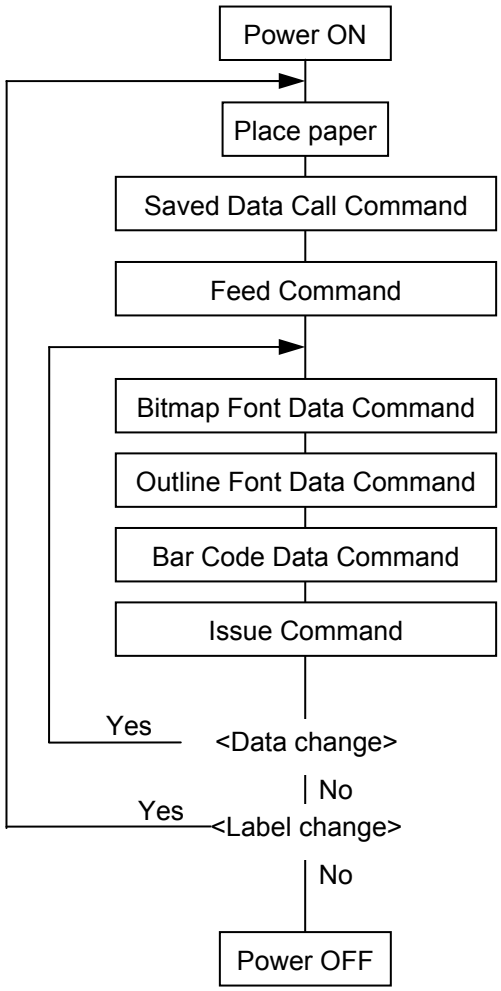
[ESC] RB: Draws bar code data.

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

NOTES: *(1) Whenever a paper type is changed, the Label Size Set Command and the Feed Command must be sent. When the same paper continues to be used 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 shall be sent as occasion demands because they are not backed up in the memory.

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



[ESC] XQ/[ESC]XT: Calls the label format stored in the on-board flash ROM or USB memory.

[ESC] T: Feeds one label and aligns it with the print start position.

[ESC] RC: Draws bitmap font data.

[ESC] RV: Draws outline font data.

[ESC] RB: Draws bar code data.

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

NOTES: *(1) Whenever a paper type is changed, the Feed Command must be sent. When the same paper continues to be used after the power is turned off and on, the Feed Command may be omitted.*

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

(3) When XML data is used, print data in XML format can be sent to the printer. For details, refer to the XML Data Print Specification.

5. INTERFACE COMMANDS

5.1 GENERAL DESCRIPTION

5.1.1 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

5.1.2 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 shall conform to the following rules:

- Each set of small letters (such as aa, bbbb) indicates parameters.
- 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 before being 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 as 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]

5.1.3 Precautions

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

NOTES:

(1) When a command cannot be recognized as a command, it will be ignored.
(Example) [ESC]H, [ESC]AA, etc.

(2) When an entered value does not meet the specified number of digits, a command error occurs.
(Example) A 5-digit value is entered for the parameter fixed to 4 digits.

(3) When an improper type of value was entered for a parameter, a command error occurs.
(Example 1) “000A” is entered though “0001” must be set.
(Example 2) “1” is entered though “A” must be set.
(Example 3) “3” is entered though a number must be selected from “0”, “1” and “2”.

(4) When an entered value exceeds the specified range, a command error occurs.
However, this is not applicable to the Label Size Set Command. See the section describing the Label Size Set Command ([ESC]D.)

(5) When no data is set for non-omissible parameter, a command error occurs.

5.1.4 List of Commands

5.2 COMMANDS RELATED TO SETTING

5.2.1 LABEL SIZE SET COMMAND [ESC]D

Function Sets the size of a label or tag.

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

Term

aaaa: Pitch length of the label or tag
4 or 5 digits (in 0.1 mm units)
B-EX4T1-G/T, B-EX4T2-G/T, B-EX4D2-G/T, B-EX6T1/T3-G/T
4 digits: 0100 (10.0 mm) to 9999 (999.9 mm)
5 digits: 00100 (10.0 mm) to 15000 (1500.0 mm)

B-EX4T2-H, B-EX4T3-H
4 digits: 0050 (5.0 mm) to 5000 (500.0 mm)
5 digits: 00050 (5.0 mm) to 05000 (0500.0 mm)

bbbb: Effective print width
Fixed to 4 digits (in 0.1 mm units)
B-EX4: 0100 (10.0 mm) to 1040 (104.0 mm)
B-EX6: 0100 (10.0 mm) to 1600 (160.0 mm)

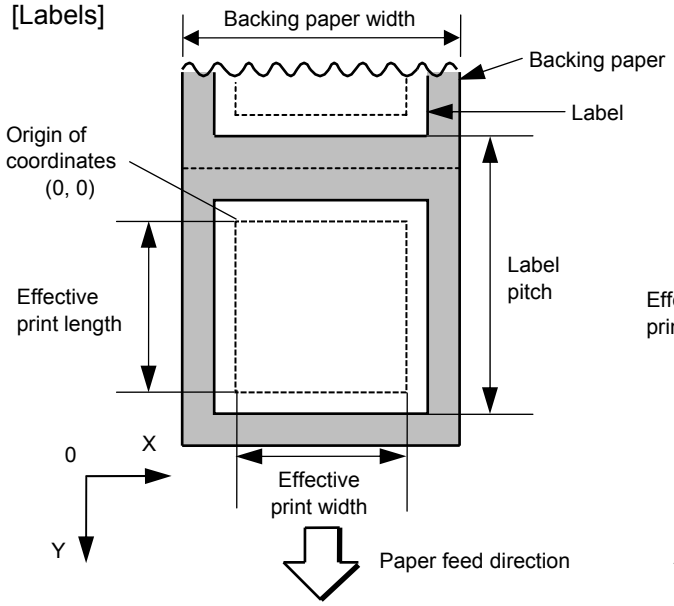
cccc: Effective print length
4 or 5 digits (in 0.1 mm units)
B-EX4T1-G/T, B-EX4T2-G/T, B-EX4D2-G/T, B-EX6T1/T3-G/T
4 digits: 0060 (6.0 mm) to 9999 (999.9 mm)
5 digits: 00060 (6.0 mm) to 14980 (1498.0 mm)

B-EX4T2-H, B-EX4T3-H
4 digits: 0010 (1.0 mm) to 4980 (498.0 mm)
5 digits: 00010 (1.0 mm) to 04980 (0498.0 mm)

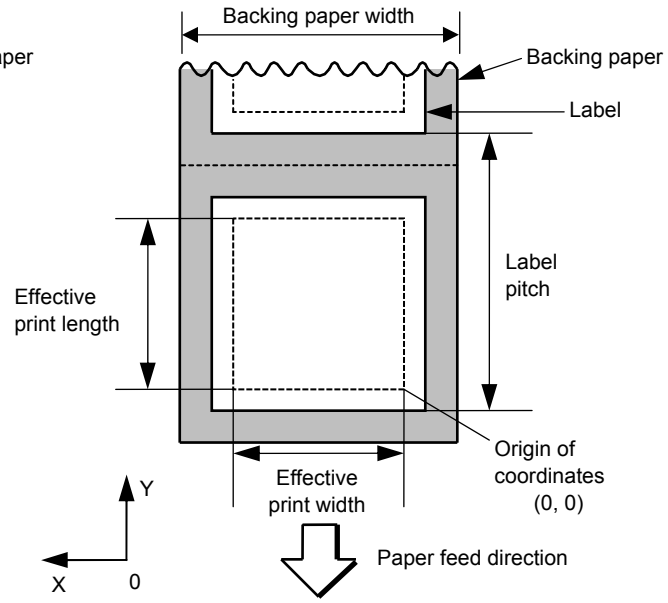
dddd: Backing paper width (Omissible. When omitted, the initial value is used as the effective print width.)
Fixed to 4 digits (in 0.1 mm units)
B-EX4: 0300 (30.0 mm) to 1120 (112.0 mm)
B-EX6: 0300 (30.0 mm) to 1600 (160.0 mm)

Explanation

[Labels]

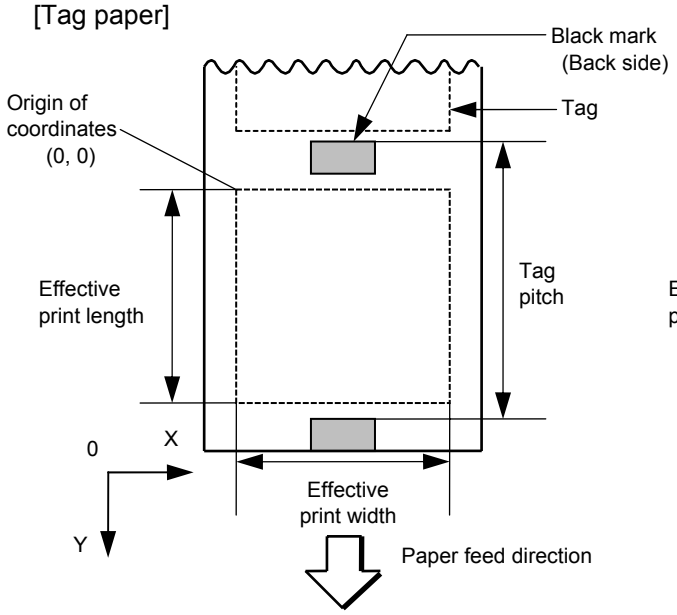


[Print direction: Bottom first]

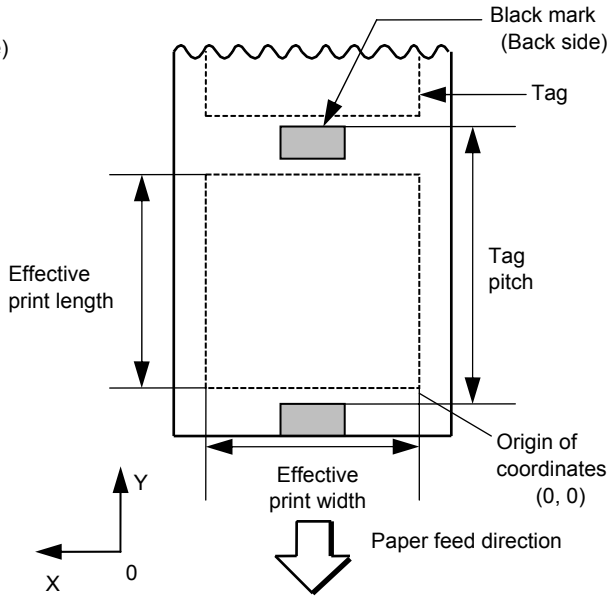


[Print direction: Top first]

[Tag paper]



[Print direction: Bottom first]



[Print direction: Top first]

Determination of the origin of coordinates (0, 0)

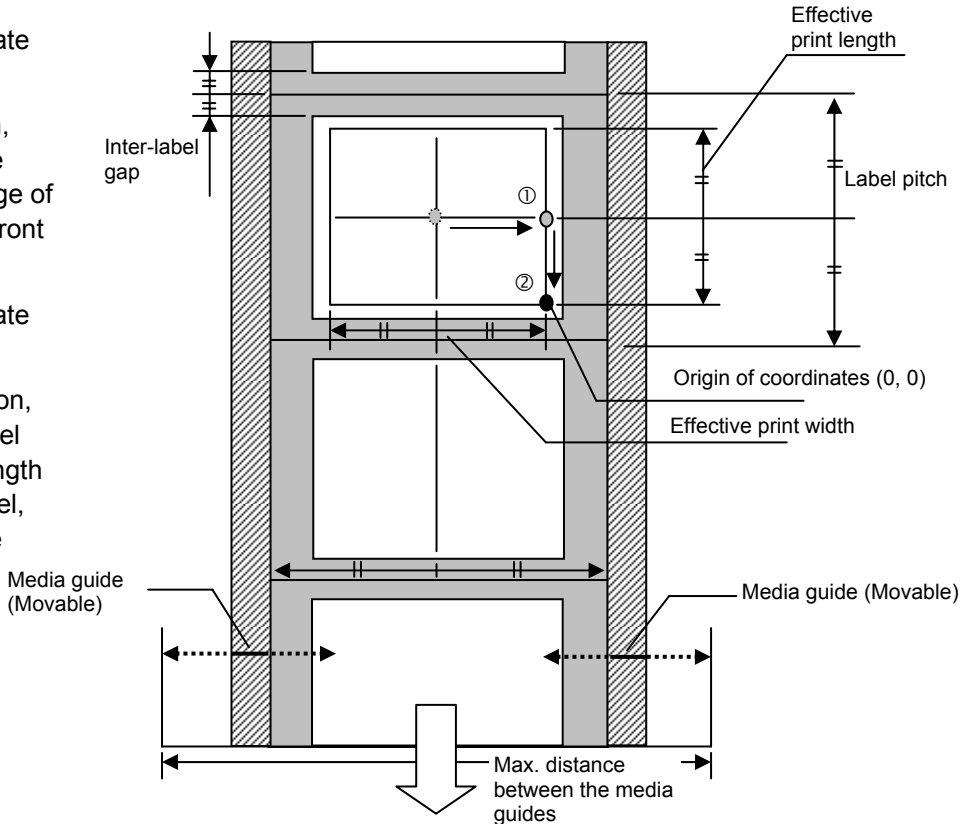
Type 1 [Top first printing]

① How to determine the coordinate origin in the X direction

Move a point in the X direction, from the center of the effective print width toward the right edge of the label, as viewed from the front of the printer.

② How to determine the coordinate origin in the Y direction

Move the point in the Y direction, from the center of both the label pitch and the effective print length toward the top edge of the label, as viewed from the front of the printer.



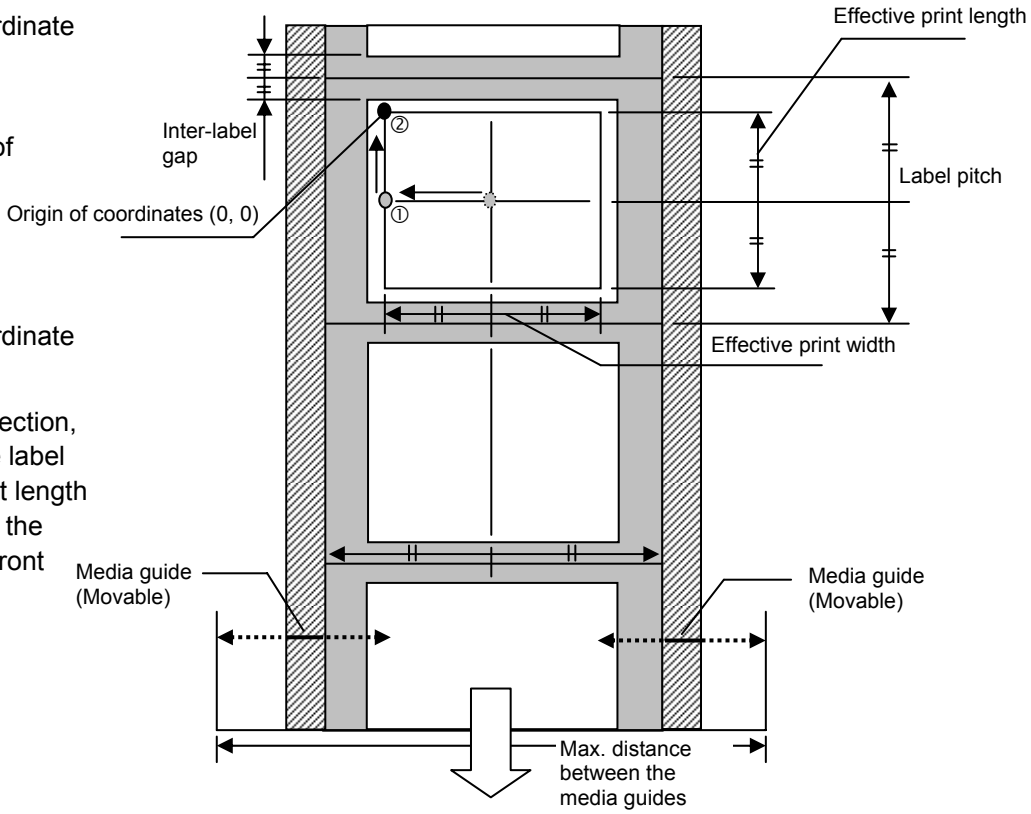
Type 1 [Bottom first printing]

① How to determine the coordinate origin in the X direction

Move a point in the X direction, from the center of the effective print width toward the left edge of the label, as viewed from the front of the printer.

② How to determine the coordinate origin in the Y direction

Move the point in the Y direction, from the center of both the label pitch and the effective print length toward the bottom edge of the label, as viewed from the front of the printer.



Type 2 [Top first printing]

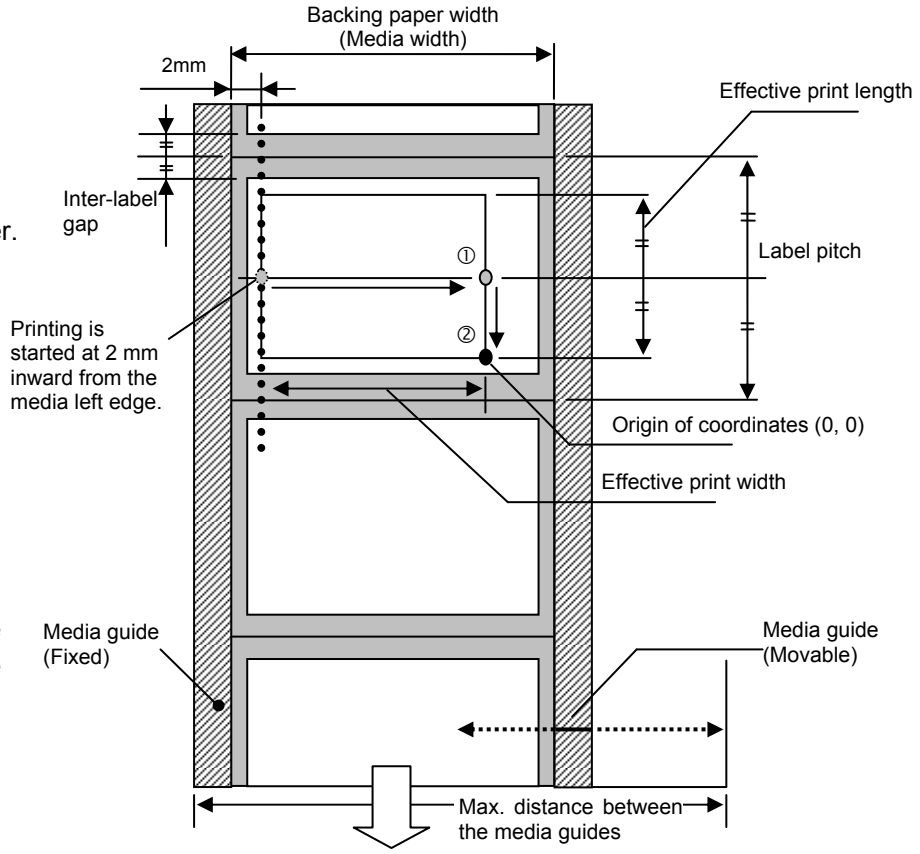
① How to determine the coordinate origin in the X direction

Move a point in the X direction, from the position 2 mm inward from the media left edge toward the right edge of the label, as viewed from the front of the printer.

② How to determine the coordinate origin in the Y direction

Move the point in the Y direction, from the center of both the label pitch and the effective print length toward the top edge of the label, as viewed from the front of the printer.

Note: When the Media Load feature is enabled, the X coordinate of origin differs depending on the media size.



Type 2 [Bottom first printing]

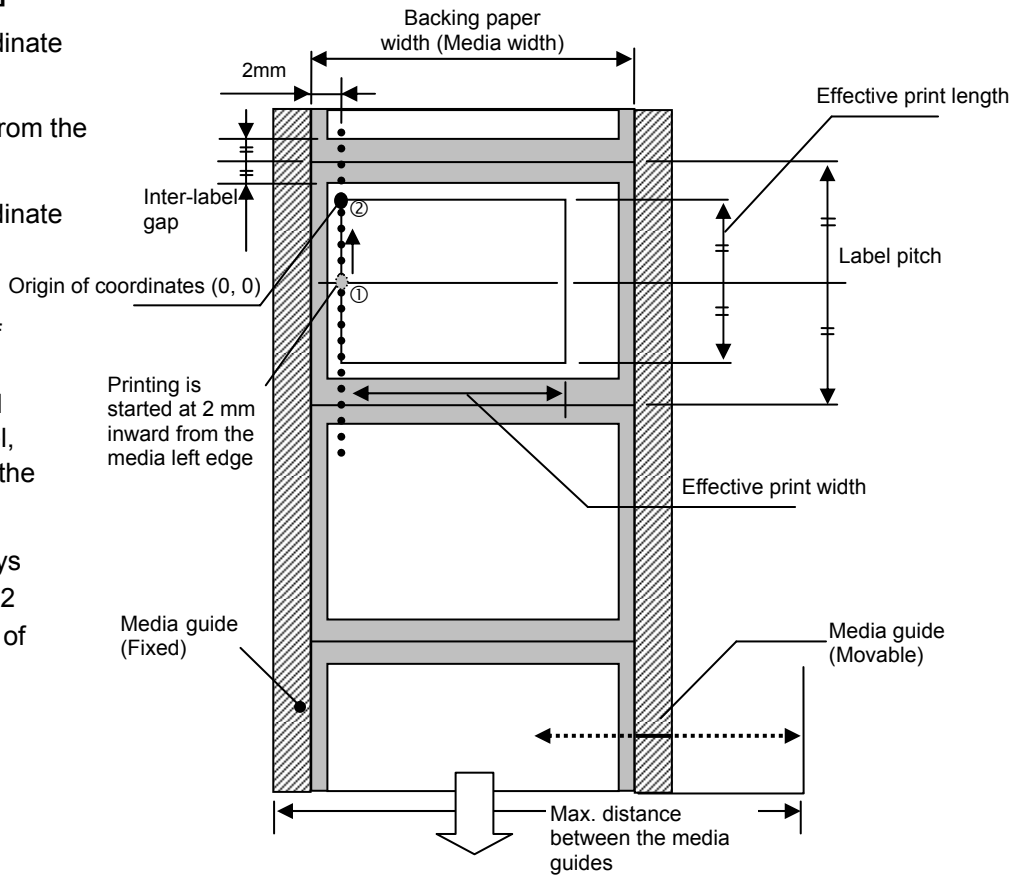
① How to determine the coordinate origin in the Y direction

The position 2 mm inward from the media edge

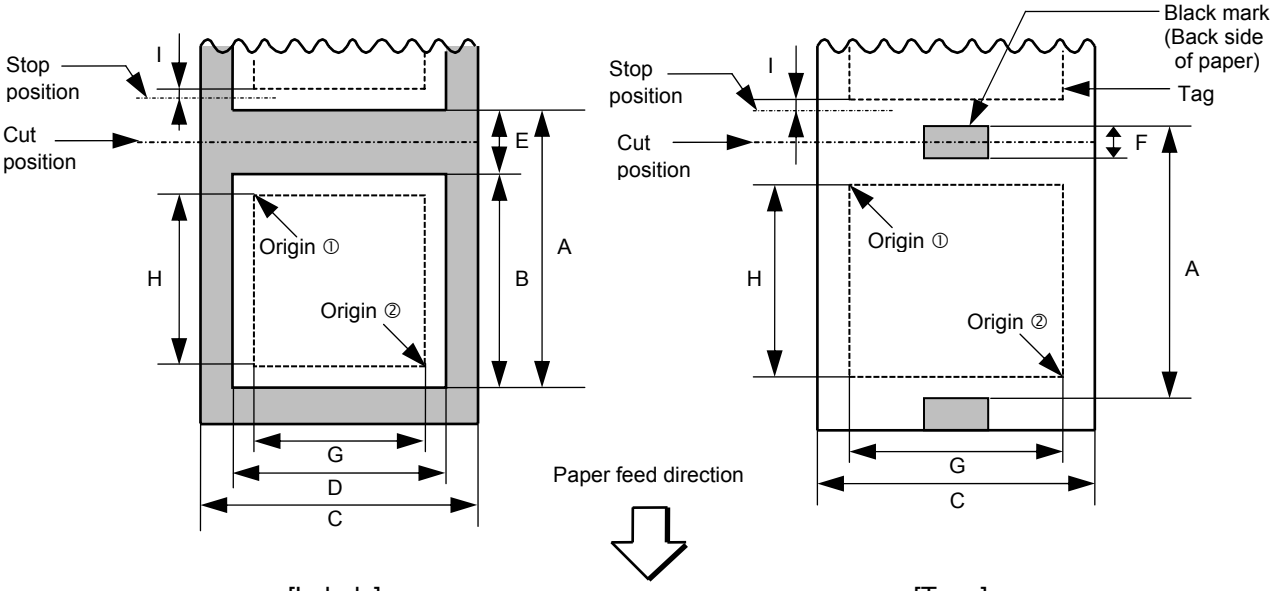
② How to determine the coordinate origin in the Y direction

Move the point in the Y direction, from the center of both the label pitch and the effective print length toward the bottom edge of the label, as viewed from the front of the printer.

Note: Since the media is always left-aligned on the Type 2 model, the X coordinate of origin is unchanged.



[Setting range]



[Labels] [Tags]

■ Programmable media size range

[mm]

Model		B-EX4T1 203/305 dpi	
Print head	Resolution	203 dpi	305 dpi
		8 dots/mm	12 dots/mm
	Width	104.0mm	106.7mm

Item			Issue mode	Batch	Strip	Cut				
						Disc cutter	Rotary cutter (Note 4)			
							203 dpi		305 dpi	
							Head up not performed	Head up performed	Head up not performed	Head up performed
A	Media pitch	Label	Min.	10.0	25.4	25.4	3 ips: 87.0	3 ips: 38.0	3 ips: 94.0	3 ips: 38.0
							6 ips: 99.0	6 ips: 38.0	5 ips: 102.0	5 ips: 38.0
							10 ips: -- (Note 1)	10 ips: -- (Note 1)	8 ips: 113.0	8 ips: 38.0
							12 ips: -- (Note 1)	12 ips: -- (Note 1)	10 ips: -- (Note 1)	10 ips: -- (Note 1)
							14 ips: -- (Notes 1&3)	14 ips: -- (Notes 1&3)	12 ips: -- (Note 1)	12 ips: -- (Note 1)
									14 ips: -- (Notes 1&3)	14 ips: -- (Notes 1&3)
			Max.	1500.0	256.0	1500.0				
		Tag	Min.	10.0	---	25.4	3 ips: 30.0		3 ips: 30.0	
							6 ips: 30.0		5 ips: 30.0	
							10 ips: --(Note 1)		8 ips: 38.0	
							12 ips: -- (Note 1)		10 ips: -- (Note 1)	
							14 ips: -- (Notes 1&3)		12 ips: --(Note 1)	
									14 ips: -- (Notes 1&3)	
			Max.	1500.0	---	1500.0				
B	Label length		Min.	8.0	23.4	23.4	3 ips: 81.0 (*1)	3 ips: 25.0	3 ips: 81.0(*1)	3 ips: 25.0
							6 ips: 93.0(*3)	6 ips: 25.0	5 ips: 89.0(*3)	5 ips: 25.0
							10 ips: -- (Note 1)	10 ips: -- (Note 1)	8 ips: 100.0(*4)	8 ips: 25.0
							12 ips: -- (Note 1)	12 ips: -- (Note 1)	10 ips: -- (Note 1)	10 ips: -- (Note 1)
							14 ips: -- (Notes 1&3)	14 ips: -- (Notes 1&3)	12 ips: - (Note 1)	12 ips:-- (Note 1)
									14 ips: -- (Notes 1&3)	14 ips:-- (Notes 1&3)
			Max.	1498.0	254.0	1494.0				
C	Backing paper/Tag width		Min.	30.0	50.0	30.0				
			Max.	120.0		112.0				
D	Label width		Min.	27.0	47.0	27.0				
			Max.	117.0		109.0				
E	Gap length		Min.	2.0		6.0				
			Max.	20.0						
F	Black mark length		Min.	2.0						
			Max.	10.0						
G	Effective print width		Min.	10.0						
			Max.	104.0 ±0.2						

Item		Issue mode		Batch	Strip	Cut				
						Disc cutter	Rotary cutter (Note 4)			
							203 dpi		300/305 dpi	
							Head up not performed	Head up performed	Head up not performed	Head up performed
H	Effective print length	Label	Min.	6.0	21.4	21.4	3 ips: 79.0	3 ips: 23.0	3 ips: 79.0	3 ips: 23.0
							6 ips: 91.0	6 ips: 23.0	5 ips: 87.0	5 ips: 23.0
							10 ips:-- (Note 1)	10 ips:-- (Note 1)	8 ips: 98.0	8 ips: 23.0
							12 ips: -- (Note 1)	12 ips: -- (Note 1)	10 ips: -- (Note 1)	10 ips: -- (Note 1)
							14 ips: -- (Notes 1&3)	14 ips: -- (Notes 1&3)	12 ips: -- (Note 1)	12 ips: -- (Note 1)
									14 ips: -- (Notes 1&3)	14 ips.: -- (Notes 1&3)
			Max.	1496.0	252.0	1492.0				
		Tag	Min.	8.0	---	21.4	3 ips: 28.0		3 ips: 28.0	
							6 ips: 28.0		5 ips: 28.0	
							10 ips: -- (Note 1)		8 ips: 36.0	
							12 ips:-- (Note 1)		10 ips: -- (Note 1)	
							14 ips: -- (Notes 1&3)		12 ips: -- (Note 1)	
									14 ips: -- (Notes 1&3)	
			Max.	1498.0	---	1498.0				
I	Non-print area within the speed up/slow down zones	Speed up		1.0						
		Slow down		1.0 (1.5 when the print speed is 14 ips. (Note 3))						
Max. effective print length for on-the-fly issuing				749.0						

NOTES: *1. The use of the rotary cutter at 10 ips or faster is not supported.*

2. When the media thickness exceeds 200μm, the print head mounting position may need to be adjusted.

3. Only the B-EX4T1 supports the print speed of 14 ips.

4. Only the B-EX4T1 enables the use of the rotary cutter.

(*1): When a cut issue is performed at 3 ips by using the rotary cutter, label length B shall be as follows:

$$\text{Label length } B \geq 91.0 \text{ mm} - \left(\frac{\text{Gap length}}{2}\right)$$

(*2): When a cut issue is performed at 5 ips by using the rotary cutter, label length B shall be as follows:

$$\text{Label length } B \geq 99.0 \text{ mm} - \left(\frac{\text{Gap length}}{2}\right)$$

(*3): When a cut issue is performed at 6 ips by using the rotary cutter, label length B shall be as follows:

$$\text{Label length } B \geq 103.0 \text{ mm} - \left(\frac{\text{Gap length}}{2}\right)$$

(*4): When a cut issue is performed at 8 ips by using the rotary cutter, label length B shall be as follows:

$$\text{Label length } B \geq 110.0 \text{ mm} - \left(\frac{\text{Gap length}}{2}\right)$$

(*5): When a cut issue is performed by using the disc cutter, label length B shall be as follows:

$$\text{Label length } B \geq 18.0 \text{ mm} - \left(\frac{\text{Gap length}}{2}\right)$$

* Refer to the Supply Specification for the latest values.

[mm]

Model		B-EX4T2 203/300 dpi	
Print head	Resolution	203 dpi	300 dpi
		8 dots/mm	11.8 dots/mm
	Width	104.0mm	108.4mm

Item \ Issue mode				Batch	Strip	Cut (Disc cutter)
A:	Media pitch	Label	Min.	10.0	15.0	25.0
			Max.	1500.0	1500.0	1500.0
		Tag	Min.	10.0	---	25.0
			Max.	1500.0	---	1500.0
B:	Label length		Min.	8.0	13.0	19.0 (Note)
			Max.	1498.0	1498.0	1494.0
C:	Backing paper/Tag width		Min.	25.0	25.0	25.0
			Max. DT	114.0		
			Max. TT	108.0		
D:	Label width		Min.	22.0		
			Max. DT	111.0		
			Max. TT	105.0		
E:	Gap length		Min.	2.0		6.0
			Max.	20.0		
F:	Black mark length		Min.	2.0		
			Max.	10.0		
G:	Effective print width		Min.	10.0		
			Max.	104.2+-0.2		
H:	Effective print length	Label	Min.	6.0	15.0	17.0
			Max.	1496.0	1496.0	1492.0
		Tag	Min.	8.0	---	19.0
			Max.	1498.0	---	1498.0
I:	Non-print area within the speed up/slow down zones		Speed up	1.0		
			Slow down	1.0		
Max. effective print length for on-the-fly issuing				749		

***NOTE**:* In the cut issue mode, label length B shall be as follows:

$$\text{Label length } B \geq 18.0 \text{ mm} - \left(\frac{\text{Gap length}}{2}\right)$$

* Refer to the Supply Specification for the latest values.

[mm]

Model		B-EX4T2 600 dpi
Print head	Resolution	600 dpi 23.6 dots/mm
	Width	105.6 mm

Item \ Issue mode				Batch	Strip	Cut (Disc cutter)
A:	Media pitch	Label	Min.	7.0	12.0	25.0
			Max.	500.0	500.0	500.0
		Tag	Min.	10.0	---	25.0
			Max.	500.0	---	500.0
B:	Label length		Min.	5.0	10.0	19.0 (Note)
			Max.	498.0	498.0	494.0
C:	Backing paper/Tag width		Min.	15.0	15.0	15.0
			Max. DT	114.0		
			Max. TT	108.0		
D:	Label width		Min.	22.0		
			Max. DT	111.0		
			Max. TT	105.0		
E:	Gap length		Min.	2.0		6.0
			Max.	20.0		
F:	Black mark length		Min.	2.0		
			Max.	10.0		
G:	Effective print width		Min.	10.0		
			Max.	104.2+-0.2		
H:	Effective print length	Label	Min.	3.0	8.0	17.0
			Max.	496.0	496.0	492.0
		Tag	Min.	5.0	---	19.0
			Max.	498.0	---	498.0
I:	Non-print area within the speed up/slow down zones		Speed up	1.0		
			Slow down	1.0		
Max. effective print length for on-the-fly issuing				249.0		

***NOTE**:* In the cut issue mode, label length B shall be as follows:

$$\text{Label length } B \geq 18.0 \text{ mm} - \left(\frac{\text{Gap length}}{2}\right)$$

* Refer to the Supply Specification for the latest values.

[mm]

Model		B-EX4D2 203/300 dpi	
Print head	Resolution	203 dpi	300 dpi
		8 dots/mm	11.8 dots/mm
	Width	104.0mm	108.4mm

Item \ Issue mode				Batch	Strip	Cut (Disc cutter)
A:	Media pitch	Label	Min.	10.0	15.0	25.0
			Max.	1500.0	1500.0	1500.0
		Tag	Min.	10.0	---	25.0
			Max.	1500.0	---	1500.0
B:	Label length		Min.	8.0	13.0	19.0 (Note)
			Max.	1498.0	1498.0	1494.0
C:	Backing paper/Tag width		Min.	25.0	25.0	25.0
			Max.	114.0		
D:	Label width		Min.	22.0		
			Max.	111.0		
E:	Gap length		Min.	2.0		6.0
			Max.	20.0		
F:	Black mark length		Min.	2.0		
			Max.	10.0		
G:	Effective print width		Min.	10.0		
			Max.	104.2 ±0.2		
H:	Effective print length	Label	Min.	6.0	15.0	17.0
			Max.	1496.0	1496.0	1492.0
		Tag	Min.	8.0	---	19.0
			Max.	1498.0	---	1498.0
I:	Non-print area within the speed up/slow down zones		Speed up	1.0		
			Slow down	1.0		
Max. effective print length for on-the-fly issuing				749.0		

***NOTE**:* In the cut issue mode, label length B shall be as follows:

$$\text{Label length } B \geq 18.0 \text{ mm} - \left(\frac{\text{Gap length}}{2}\right)$$

* Refer to the Supply Specification for the latest values.

[mm]

Model		B-EX6T1/3 203/305 dpi	
Print head	Resolution	203 dpi	305 dpi
		8 dots/mm	12 dots/mm
	Width	160.0mm	159.9mm

Item \ Issue mode				Batch	Strip	Cut (Disc cutter)
A:	Media pitch	Label	Min.	10.0	25.4	25.4
			Max.	1500.0	256.0	1500.0
		Tag	Min.	10.0	---	25.4
			Max.	1500.0	---	1500.0
B:	Label length		Min.	8.0	23.4	23.4 (Note)
			Max.	1498.0	254.0	1494.0
C:	Backing paper/Tag width		Min.	30.0	50.0	30.0
			Max.	165.0		
D:	Label width		Min.	27.0		
			Max.	162.0		
E:	Gap length		Min.	2.0		6.0
			Max.	20.0		
F:	Black mark length		Min.	2.0		
			Max.	10.0		
G:	Effective print width		Min.	10.0		
			Max.	160.0		
H:	Effective print length	Label	Min.	6.0	21.4	21.4
			Max.	1498.0	252.0	1492.0
		Tag	Min.	8.0	---	21.4
			Max.	1498.0	---	1498.0
I:	Non-print area within the speed up/slow down zones		Speed up	1.0		
			Slow down	1.0		
Max. effective print length for on-the-fly issuing				749.0		

***NOTE**:* In the cut issue mode, label length B shall be as follows:

$$\text{Label length } B \geq 20.0 \text{ mm} - \left(\frac{\text{Gap length}}{2}\right)$$

* Refer to the Supply Specification for the latest values.

[mm]

Model		B-EX4T3 600 dpi
Print head	Resolution	600 dpi 23.6 dots/mm
	Width	104 mm

Item \ Issue mode				Batch	Strip	Cut (Disc cutter)
A:	Media pitch	Label	Min.	5.0	5.0	10.0
			Max.	500.0	256.0	500.0
		Tag	Min.	5.0	---	10.0
			Max.	500.0	---	500.0
B:	Label length		Min.	3.0	3.0	3.0
			Max.	498.0	254.0	497.0
C:	Backing paper/Tag width		Min.	15.0	15.0	15.0
			Max. DT	---		
			Max. TT	110.0		
D:	Label width		Min.	13.0		
			Max. DT	---		
			Max. TT	108.0		
E:	Gap length		Min.	2.0		3.0
			Max.	20.0		
F:	Black mark length		Min.	2.0		
			Max.	10.0		
G:	Effective print width		Min.	10.0		
			Max.	104.0		
H:	Effective print length	Label	Min.	3.0	3.0	3.0
			Max.	498.0	254.0	497.0
		Tag	Min.	5.0	---	19.0
			Max.	498.0	---	497.0
I:	Non-print area within the speed up/slow down zones		Speed up	1.0		
			Slow down	1.0		
Max. effective print length for on-the-fly issuing				249.0		

* Refer to the Supply Specification for the latest values.

Notes

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

(2) The Label Size Set Command is backed up in the memory (retained even after the power is turned off.)

(3) After sending the Label Size Set Command to change the label size, one label must be fed by the Feed Command ([ESC] T) and must be aligned with the print start position prior to printing. Without sending the Feed Command, the label may not be set at the print start position correctly.

(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 Explanation 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 speed-up (1 mm) and slow-down (1 mm) areas. Consequently, [A: Label pitch/Tag pitch] minus [H: Effective print length] must be equal to or greater than 2 mm. However, in the case of the print speed of 14 ips, [A: Label pitch/Tag pitch] minus [H: Effective print length] must be equal to or greater than 2.5 mm.

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

(7) Depending on the tag rotation designated by the Issue Command ([ESC] XS), the origin of drawing coordinates for the bottom first printing will be origin ① and that of the top first printing will be origin ②, as shown in the Explanation.

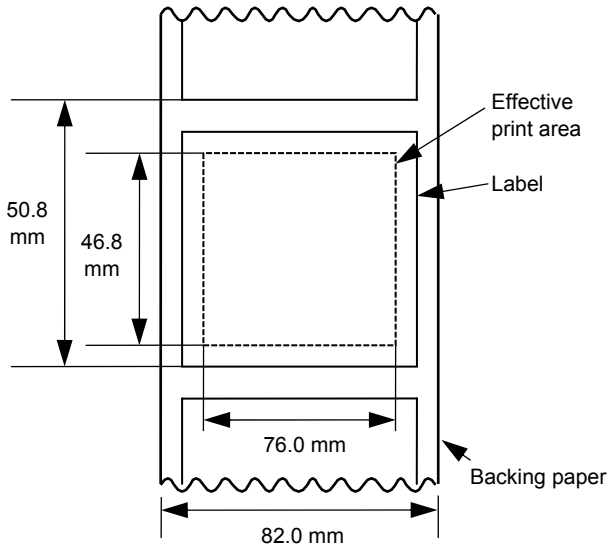
(8) The parameters must follow the figures and table. Any value or paper outside the specified range results in a failure of printing or an error.

(9) Where an effective print length within “max. effective print length for on-the-fly” is specified, labels can be printed continuously without stopping even if print head changes for every label because printing and drawing of the next label are processed at the same time. [On-the-fly issue]
However, printing may stop at each label depending on the quantity of drawing data.

(10) The setting value for the backing paper width is used for the control of the backing paper take-up motor for strip issue. Therefore, this setting is useless for any mode other than strip issue mode.

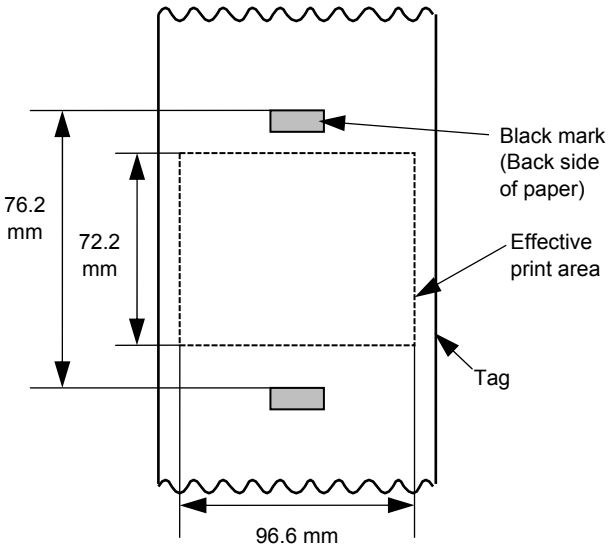
Examples

(1) Labels



[ESC] D0508, 0760, 0468, 0820 [LF] [NUL]
[ESC] T20C30 [LF] [NUL]

(2) Tags



[ESC] D0762, 0996, 0722 [LF] [NUL]
[ESC] T10C30 [LF] [NUL]

5.3 COMMANDS RELATED TO FINE ADJUSTMENT

5.3.1 POSITION FINE ADJUST COMMAND [ESC]AX

Function

① Fine adjusts the feed amount so that the label stops before or behind the automatically set print start position.

② Fine adjusts the feed amount so that the label is cut or stripped from the backing paper before or behind the automatically set cut or strip position.

③ Fine adjusts the backward feed amount to return the label to the home position after cut or strip operation.

Format

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

Term

a: Whether the print start position is shifted forward or backward
- +: Forward
- –: Backword

bbb: Feed amount fine adjustment value
000 to 500 (in 0.1 mm units)

c: Whether the cut position/strip position is shifted forward or backward
- +: Forward
- –: Backward

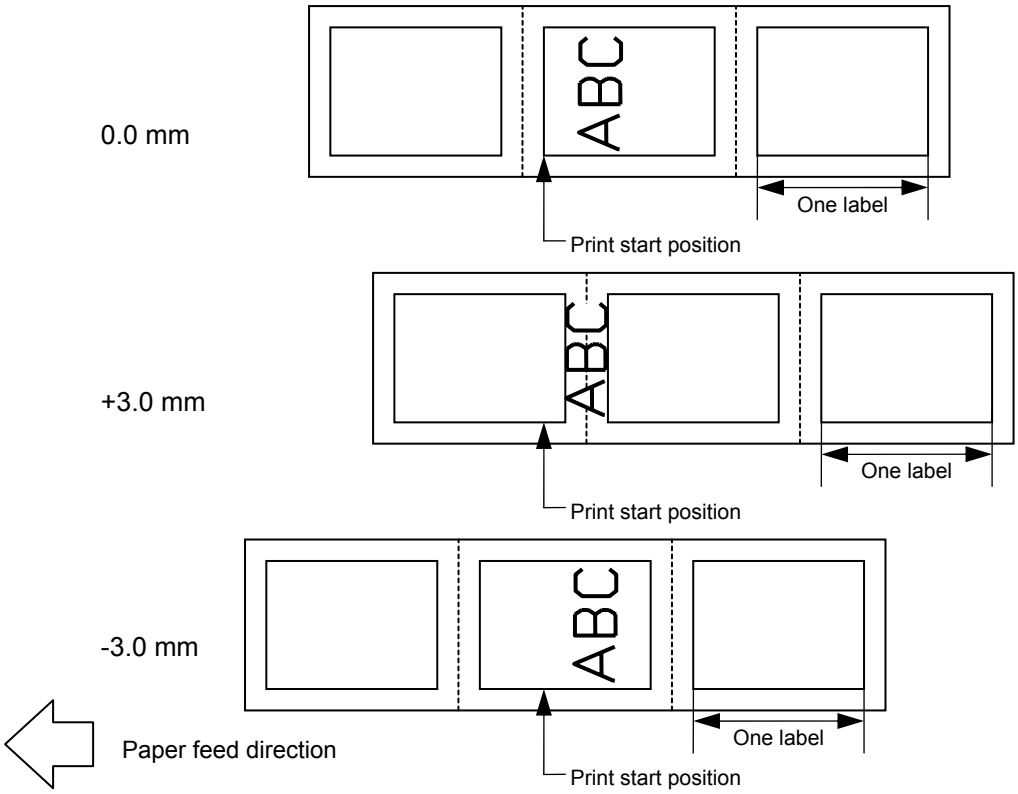
ddd: Fine adjustment value for the cut position/strip position
000 to 500 (in 0.1 mm units)

e: Whether the back feed amount is increased or decreased.
- +: Increase
- –: Decrease

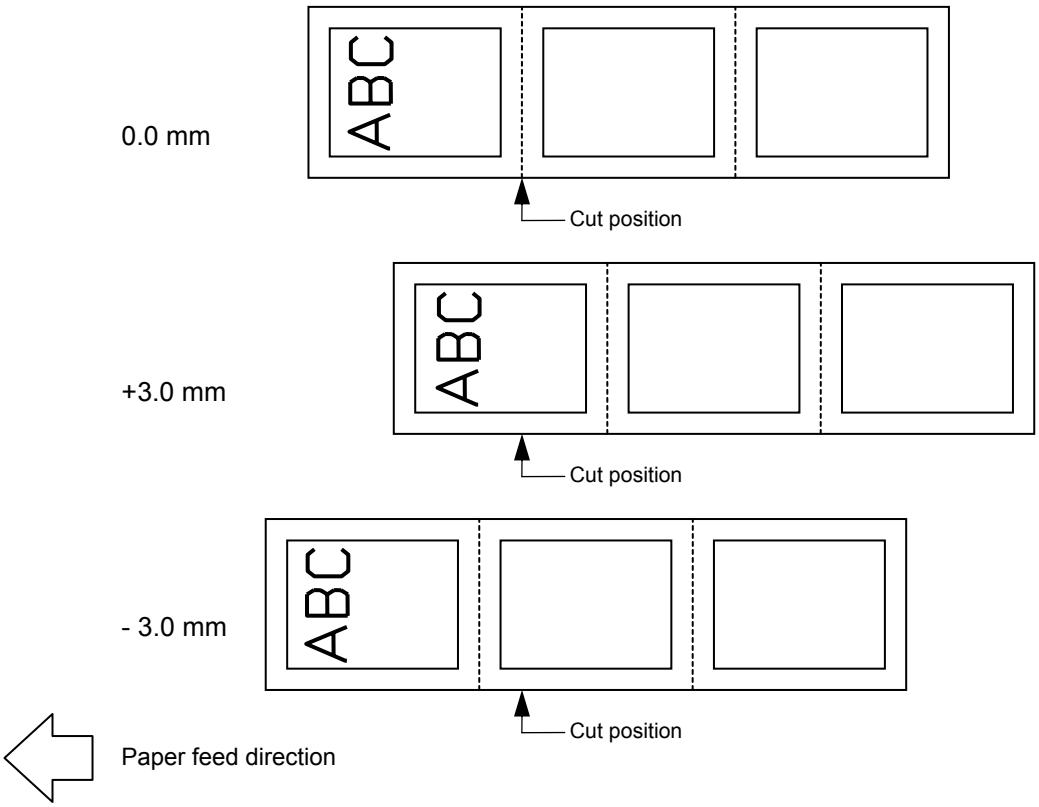
ff: Back feed amount fine adjustment value
00 to 99 (in 0.1 mm units)

Explanation

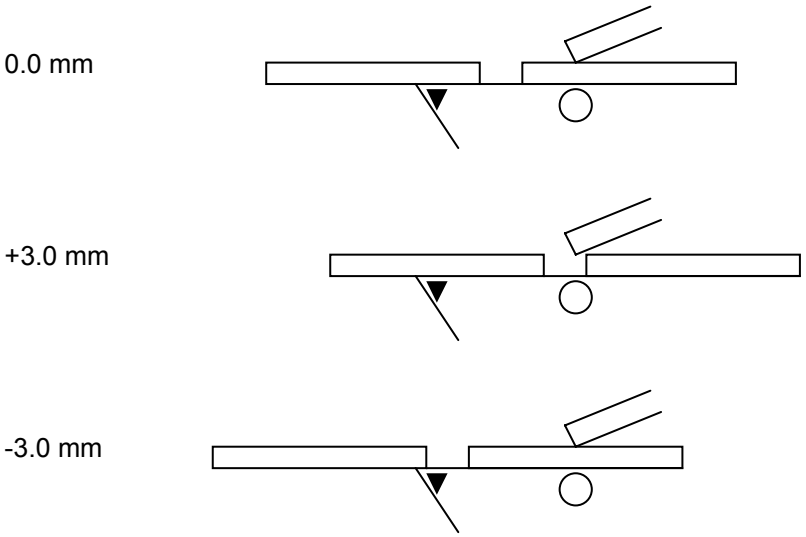
[Feed Amount Fine Adjustment] (To shift the feed stop position backward or forward)

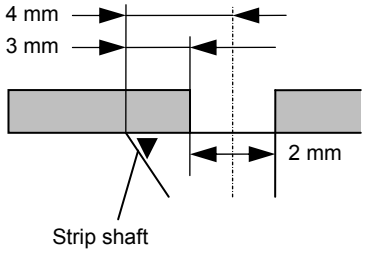


[Cut Position Fine Adjustment] (To shift the cut position backward or forward)



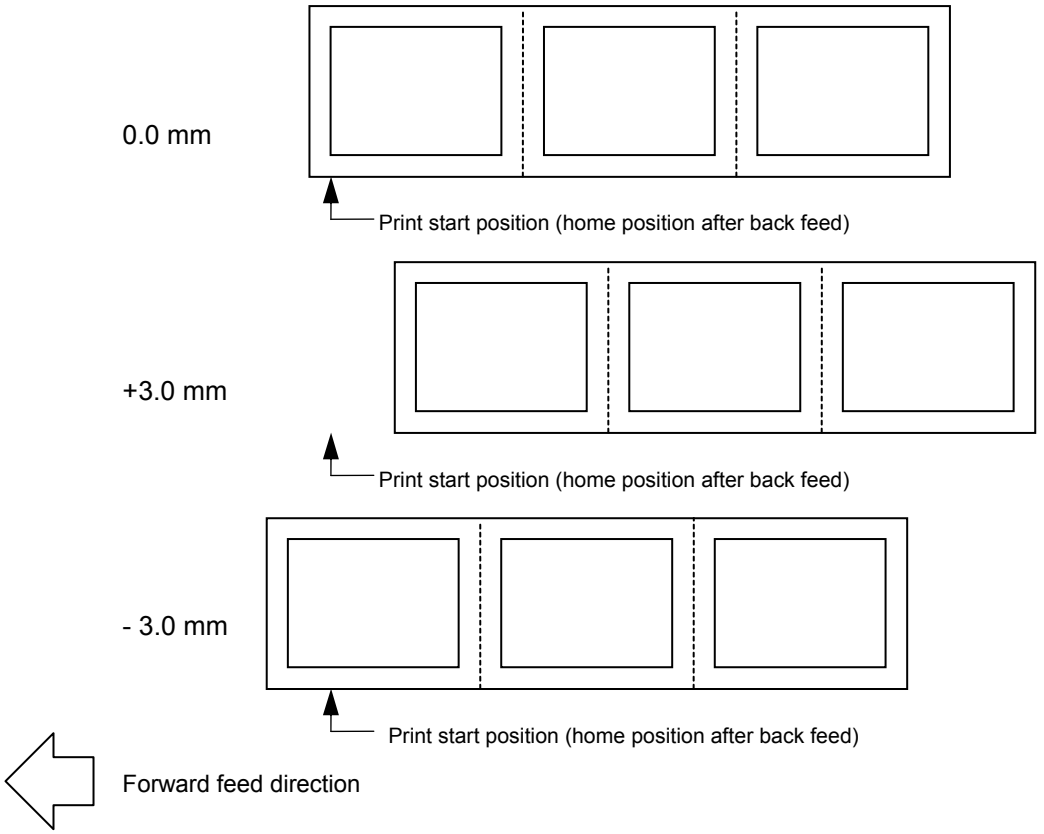
[Strip Position Fine Adjustment] (To shift the strip position backward or forward)





Printing in strip issue mode is stopped at the position where the distance from the middle point of the label-to-label gap to the end of the strip shaft is 4 mm, since the label-to-label gap is assumed to be 2 mm.
When the print stop position is not proper, the print stop position shall be adjusted using the strip position fine adjust function. When the label-to-label gap is 5 mm or more, the effective print length shall be set to the maximum (label pitch -2 mm) with the Label Size Set Command ([ESC]D.) Then, the print stop position shall be adjusted by fine adjusting the strip position.

[Back Feed Amount Fine Adjustment] (To increase or decrease the back feed amount)



Notes

(1) When the feed amount fine adjustment, cut position (or strip position) fine adjustment or back feed amount fine adjustment has been set in the system mode (key operation on the printer), the fine adjustment value will be the sum of the value set by this command and the value set in the system mode. The max. fine adjustment values are as follows. However, the max. feed amount fine adjustment value shall be within the label pitch.

Feed amount fine adjustment.....±50.0 mm
Cut position (or strip position) fine adjustment.....±50.0 mm
Back feed amount fine adjustment.....±9.9 mm

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

(3) Each fine adjustment value is backed up in the memory (retained even after the power is turned off.)

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

For example, if an improper back feed fine adjustment value is set, the print positions will misalign after a cut. Also, an excessive back feed disables proper media feed during printing.
In the strip issue mode, the print position may differ between the first label and the second label. In such case, the back feed amount fine adjustment can be used to adjust the amount so that the label is correctly returned to the original position.

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

(6) In the case label pitch is 25.4 mm or less when the disc cutter is used:

The minimum label pitch acceptable for the normal cut operation is 25.4 mm. When a label of which label pitch is less than 25.4mm is used (although it is out of specifications), the edge of the label is caught by the edge of the thermal head while the label is fed back to the home position after a cut operation. Therefore, the label may be unable to return to the proper home position. By performing either method below, the problem will be solved.

[Method 1] Raising the print head

When the following preconditions are all met and the printer satisfies a certain condition at the time a command including a cut issue instruction is issued, the problem is avoidable by raising the print head during a media feed.

<Preconditions>

- The ribbon saving module has been installed in the printer.
  Note: When the ribbon saving module has not been installed, see Method 2.
- The ribbon saving function has been enabled in the system mode.
- The cut position fine adjustment value is ±10 mm or less.
  Note: The cut position fine adjustment value means the sum of the values set by the command and in the system mode, respectively.
- The label pitch is 25.4 mm or less.

<Command>

Issue Command, Feed Command, and Eject Command

<Condition>

(1) Cut issue: Specified.

(2) Sensor: Transmissive sensor

(3) Issue mode: Batch

Note: In the case of the Issue and Feed Commands, the above conditions are set by the command parameters. As the Eject Command makes the printer behave according to the latest printer information (the Eject Command does not have parameters), the printer needs to meet the conditions prior to receiving an Eject Command.

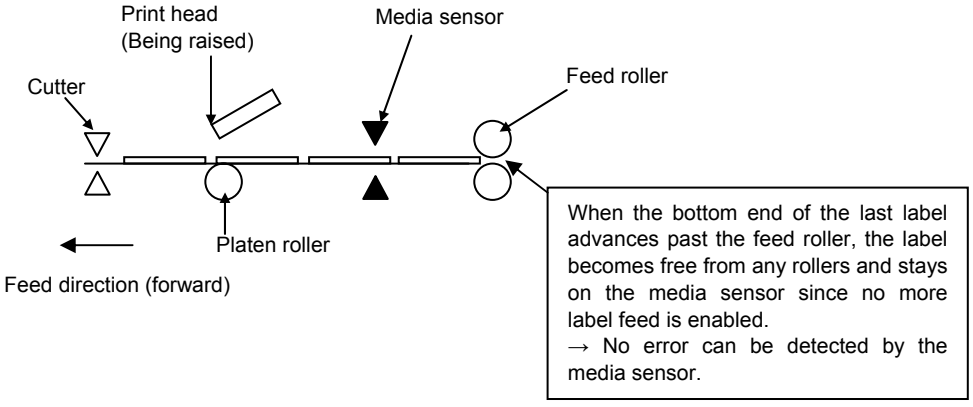
<Printer behavior>

Raising the print head → Forward feed to the cut position → Lowering the print head → Cut → Raising the print head → Reverse feed to the home position → Lowering the print head

<Precautions>

(1) If the bottom end of the last label advances past the feed roller before the top label reaches the cut position while the printer feeds the label to the cut position with the print head raised, the label becomes free from any retainer (feed roller and platen roller), causing media feed to be disabled. At this time, the label is left on the media sensor, and eventually no error can be detected by the media sensor.

- Printer status where the bottom end of the last label advances past the feed roller while feeding the label to the cut position



(2) While a cut issue is performed with the print head raised, raising the print head may become disabled due to temperature rise of the solenoid.

[Method 2]　Adjusting the cut position fine adjustment value

When the ribbon saving module has not been installed, use Method 2 to avoid the above-mentioned problem.
Calculate the amount of a feed to the cut position performed after printing, from the total length of labels fit in the distance between the print head and the cutter (15.8 mm), then set this value to fine adjust the cut position in the positive direction.

When this procedure is used, one or more printed labels are left between the print head and the cutter.　Therefore, these labels need to be ejected by issuing or feeding label.

<How to calculate the cut position fine adjustment value>

The cut position fine adjustment value can be calculated using the following method.　If the label cannot be fed back to the proper home position with this value, the cut position needs to be adjusted with any value.

Cut position fine adjustment value = (The number of labels left between print head and cutter) × (Label pitch)

● In the case the label pitch is 12 mm, for example:

The number of labels left between print head and cutter: 1 (15.8/12)
Label pitch: 12 mm
Cut position fine adjustment value = 1 x 12 = 12

● In the case the label pitch is 7 mm, for example:

The number of labels left between print head and cutter: 2 (15.8/7)
Label pitch: 7 mm
Cut position fine adjustment value = 2 x 7 = 14

Note: Calculated fine adjustment value shall be set in the Position Fine Adjust Command or in the printer system mode.　Note that the cut position fine adjustment value is equal to the sum of the values set by the Position Fine Adjust Command and in the system mode, respectively.

<Printer behavior example>

Label pitch: 12 mm, Cut position fine adjustment value: +12 mm

* Feed amount to the cut position

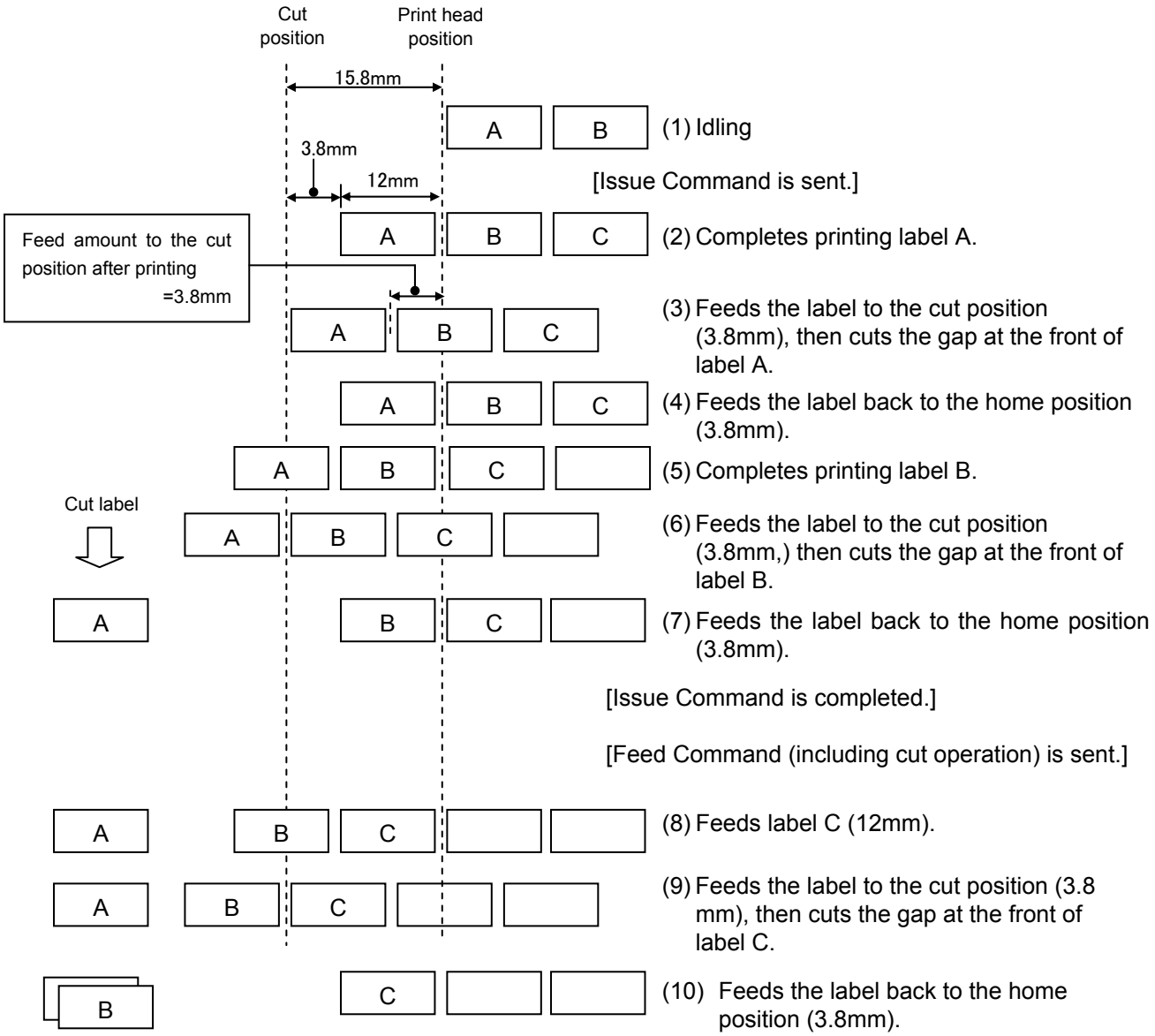
= (Distance between the cut position and the print head) – Cut position fine adjustment value

= 15.8 mm – 12 mm

=3.8 mm

Command: 1. Issue Command to issue 2 labels (Only the first one is ejected.)

2. Feed Command to eject the other label



Note: Distance between the print head and the disc cutter: 15.8 mm

(7) In the case label pitch is the minimum pitch or less when the rotary cutter is used:

When a label of which label pitch is less than the minimum pitch is used (although it is out of specifications), the edge of the label is caught by the edge of the thermal head while the label is fed back to the home position after a cut operation. Therefore, the label may be unable to return to the proper home position.

When the following preconditions are all met and the printer satisfies a certain condition at the time a command including a cut issue instruction is issued, the problem is avoidable by raising the print head during a media feed.

<Preconditions>

- The ribbon saving module has been installed in the printer.
  Note: Print head cannot be raised without the ribbon saving module, the problem is unavoidable with this method.
- The ribbon saving function has been enabled in the system mode.
- The cut position fine adjustment value is ±10 mm or less.
  Note: The cut position fine adjustment value means the sum of the values set by the command and in the system mode, respectively.
- The label pitch is the minimum pitch or less.

<Command>

Issue Command, Feed Command, and Eject Command

<Condition>

(1) Cut issue: Specified.

(2) Sensor: Transmissive sensor

(3) Issue mode: Batch

Note: In the case of the Issue and Feed Commands, the above conditions are set by the command parameters. As the Eject command makes the printer behave according to the latest printer information (the Eject Command does not have parameters), the printer needs to meet the conditions prior to receiving an Eject Command.

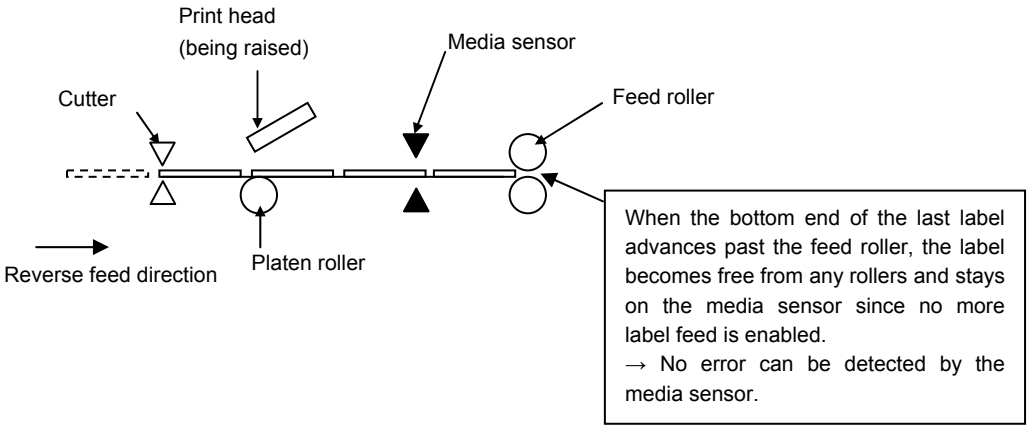
<Printer behavior>

Forward feed to the cut position → Cut while feeding the label → Stopping the feed → Raising the print head → Reverse feed to the home position → Lowering the print head

<Precautions>

(1) If the bottom end of the last label is positioned in front of the feed roller when the printer feeds the label back to the print start position after a cut with the print head raised, the label becomes free from any retainer (feed roller and platen roller), causing media feed to be disabled. At this time, the label is left on the media sensor, and eventually no error can be detected by the media sensor.

■ Printer status where the printer attempts to feed the label backward with the print head raised after a cut operation while the bottom end of the last label is positioned in front of the feed roller



(2) In the case the printer has received a next issue command and the last label is to be printed by this command, the above-mentioned printer behavior does not occur (because the next issue command is processed successively.)

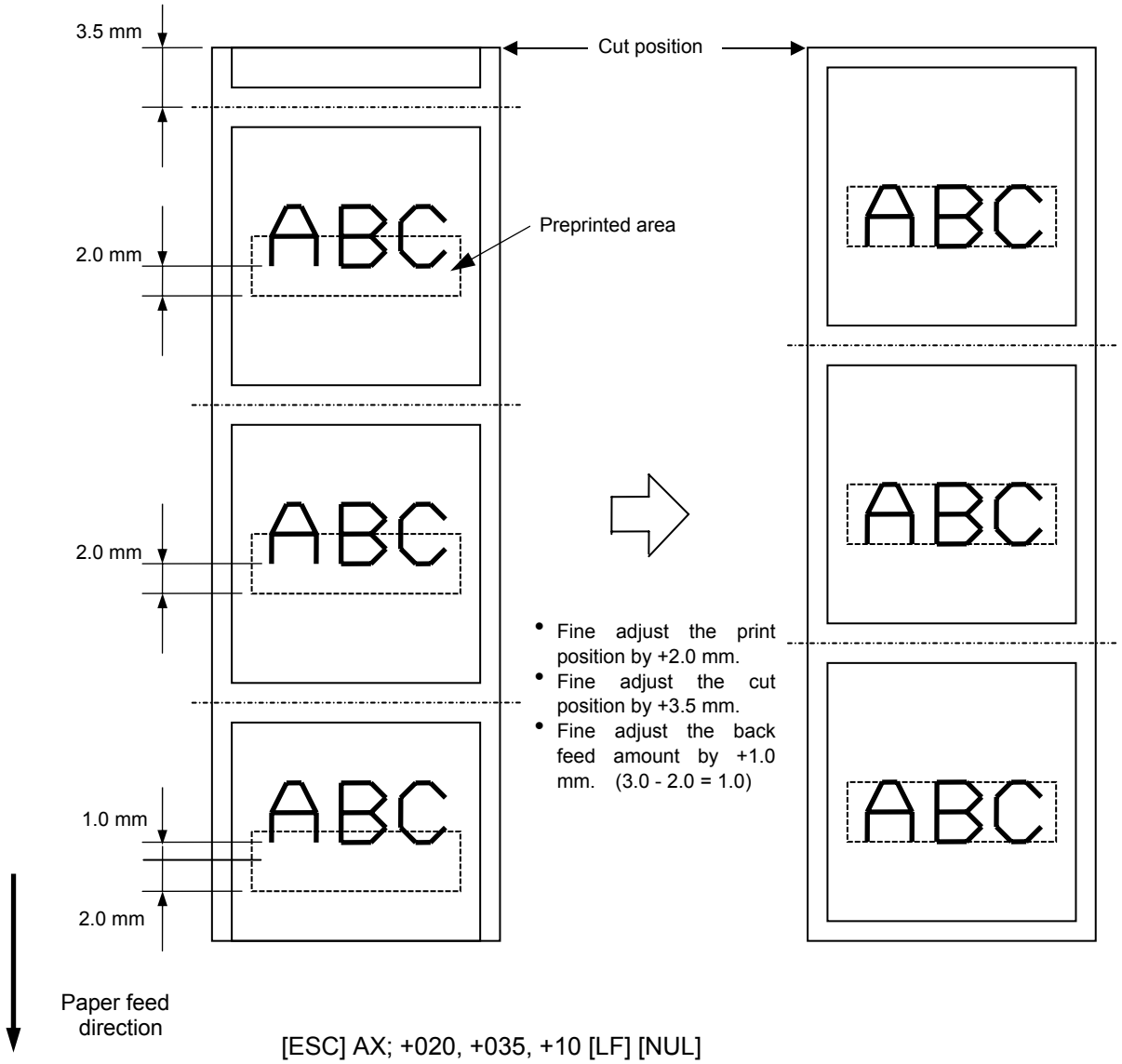
(3) While a cut issue is performed with the print head raised, raising the print head may become disabled due to temperature rise of the solenoid.

(8) Depending on the print conditions, there may be cases where a label is not returned to the former position even if it is fed backward for the same distance with the forward feed amount. In the case any media sensor is used and the media pitch is almost the same as the distance between the print head and the media sensors (75.5 mm), the media may not be returned to the former position by a back feed after a forward feed (for example, during cut issues, strip issues, automatic forward feed standby), which may result in an error. In such case, the error is avoidable by setting a back feed fine adjustment value in the positive (+) direction.

(9) The feed amount shall be less than the media pitch. (Feed amount < media pitch)
If the feed amount is larger than the media pitch, which causes the printer to feed the media backward from the print stop position to the next print start position, the printer operation is not guaranteed.

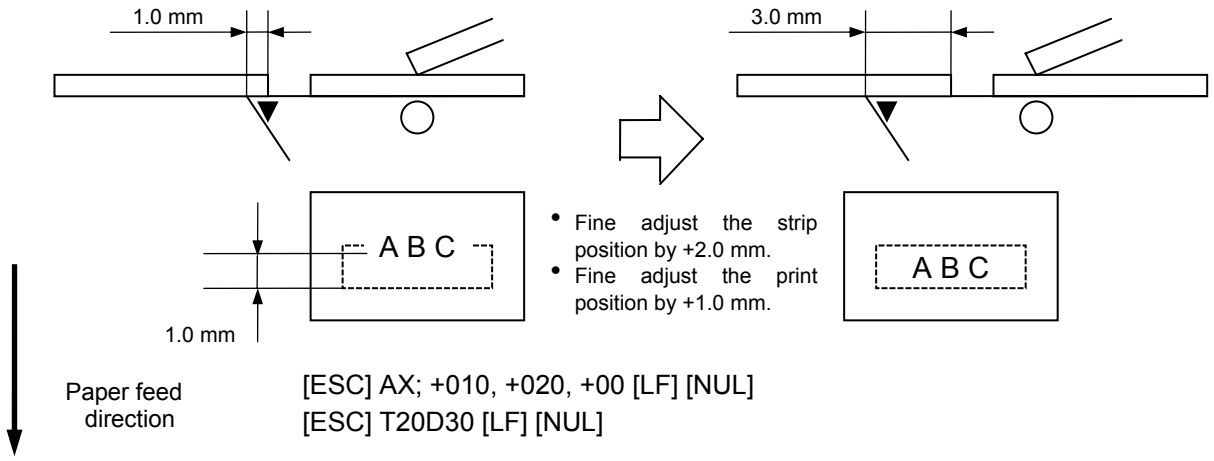
Examples

(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]

5.3.2 PRINT DENSITY FINE ADJUST COMMAND [ESC] AY

Function Fine adjusts the automatically set print density.

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

Term

a: Whether to increase or decrease the print density
+: Increase (darker)
–: Decrease (lighter)

bb: Print density fine adjustment value
When parameter a is set to "+": 00 to 10 (in units of 1 step)
(For the B-EX6T1/T3, 00 to 20)
When parameter a is set to "–": 00 to 20 (in units of 1 step)

c: Print method
0: Thermal transfer
1: Direct thermal

Explanation

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

(2) The fine adjustment value will be the sum of the values set by this command and in the system mode (key operation). The maximum fine adjustment values for each of the thermal transfer and direct thermal print modes are as follows:

	Thermal transfer		Direct thermal	
	Minimum	Maximum	Minimum	Maximum
Models other than B-EX6T1/T3	-20	+10	-20	+10
B-EX6T1/T3	-20	+20	-20	+20

(3) The fine adjustment values can be separately set for the thermal transfer print method and direct thermal print method.

(4) The Print Density Fine Adjust Command is backed up in the memory (retained even after the power is turned off).

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

(6) The maximum value for each print speed is as follows. When the value exceeds the rating of the print head, it is automatically corrected.

[Both Direct thermal and thermal transfer]

Print speed	B-EX4T1		B-EX4T2			B-EX4D2		B-EX6T1/T3	
	203 dpi	305 dpi	203 dpi	300 dpi	600 dpi	203 dpi	300 dpi	203 dpi	305 dpi
2 ips					+10				
3 ips	+10	+10	+10	+10	+10	+10	+10	+20	+20
4 ips					+10				
5 ips		+10		+10	+10		+10	+20	+20
6 ips	+10		+10		+10	+10			
8 ips		+10		+10			+10	+20	+20
10 ips	+10	+10	+10	+10		+10	+10	+20	+20
12 ips	+10	+10	+10	+10		+10	+10	+20	+20
14 ips	+10	+10							

Print speed	B-EX4T3
	600 dpi
2 ips	+10
3 ips	+10
4 ips	+10
5 ips	+10
6 ips	+10
8 ips	
10 ips	
12 ips	
14 ips	

Examples

To set the print density in thermal transfer print mode to -2.

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

To set the print density in direct thermal print mode to +3.

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

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

Function Fine adjusts the drive voltage of the ribbon motor.

Format [ESC]RM;abbcdd(,Re)[LF][NUL]

Term

a: Whether the ribbon take-up motor voltage is increased or decreased
+: Increased
–: Decreased

bb: Fine adjustment value for the ribbon take-up motor
When parameter a is set to "+": 00 to 10 (in units of 1 step)
When parameter a is set to "–": 00 to 15 (in units of 1 step)

c: Whether the ribbon feed motor voltage is increased or decreased
+: Increased
–: Decreased

dd: Fine adjustment value for the ribbon feed motor
When parameter c is set to "+": 00 to 10 (in units of 1 step)
When parameter c is set to "–": 00 to 15 (in units of 1 step)

Re: Ribbon width type (Omissible. When omitted, the ribbon width type set in the system mode will take effect.)
e: Ribbon width type
0: TYPE1
1: TYPE2
Applicable models: B-EX4T1-G/T-QM/CN with firmware version C1.2 or later
B-EX4T2-G/T-QM/CN with firmware version C1.2 or later
B-EX4T2-H-QM/CN with firmware version C1.1A or later
B-EX4D2-G/T-QM/CN with firmware version D1.1 or later
B-EX6T1/T3

Explanation

(1) If the ribbon wrinkles, adjusting the ribbon motor drive voltage with this command enables preventing the wrinkles.

(2) The ribbon motor drive voltage fine adjustment value is backed up in the memory (retained even after the power is turned off).

(3) The fine adjustment value is invalid for the reverse feed.

(4) Since he B-EX4D2 is a direct thermal printer, the values set by this command are not used for actual printing.

(5) Effective fine adjustment values for the take-up motor differ depending on the print speed, as shown in the table below.

Print speed	2 to 6 ips	8 ips	10 to 14 ips
Value	-15 to +10	-15 to +5	-15 to 0

(6) The fine adjustment value is the sum of the values for each of the ribbon take-up motor voltage and the ribbon feed motor voltage set by the command and in system mode (key operation). The maximum fine adjustment values are as shown below.

Take-up motor		Feed motor	
Min.	Max.	Min.	Max.
-15	+10	-15	+10

(7) After a RAM clear is performed, the fine adjustment value for the take-up motor voltage becomes “00” and that for the feed motor voltage becomes “+05”. (Both the command and the system mode)

(8) The factory default values are “00” for the take-up motor, and “+05” for the feed motor. (Both the command 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]

5.4 COMMANDS RELATED TO CLEAR

5.4.1 IMAGE BUFFER CLEAR COMMAND [ESC] C

Function Clears the image buffer where characters, lines, bar codes, and graphics are drawn.

Format [ESC]C[LF][NUL]

Explanation

(1) The image buffer must be cleared after the label size is changed.

(2) Increment/decrement designation (described later) will be valid until the Image Buffer Clear Command is sent.

(3) The link field designation (described later) will be valid until the Image Buffer Clear Command is sent.

(4) The RFID format and data are cleared with this command.

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

Examples

[ESC]D0508,0760,0468[LF][NUL]
[ESC]T20C51[LF][NUL]
[ESC]C[LF][NUL]
[ESC]RC000;ABC[LF][NUL]
[ESC]RC001;DEF[LF][NUL]
[ESC]XS;I,0001,0002C3000[LF][NUL]

5.4.2 CLEAR AREA COMMAND [ESC] XR

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

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

Term

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

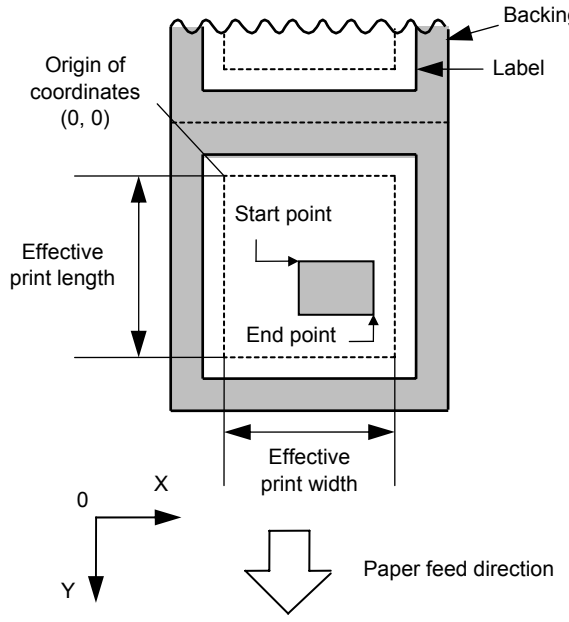
bbbb: Y-coordinate for the designated field start point
4 or 5 digits (in 0.1 mm units)

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

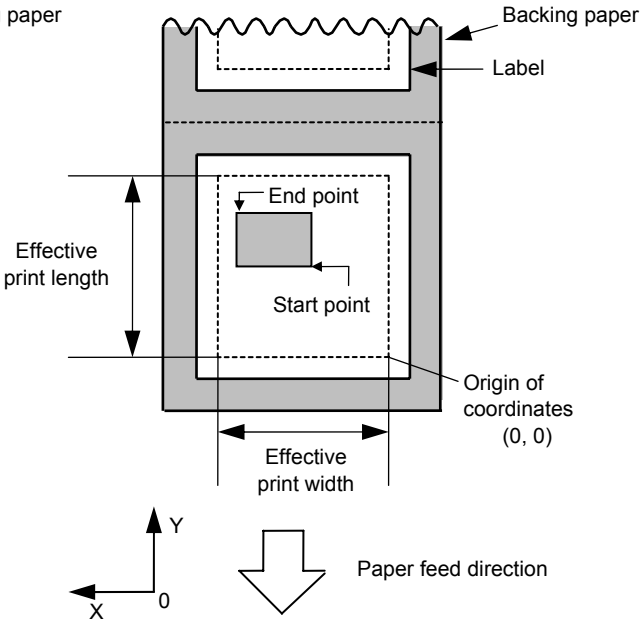
dddd: Y-coordinate for the designated field end point
4 or 5 digits (in 0.1 mm units)

e: Type of clear
A: Clears the data in the designated field to zeros.
B: Reverses the white/black dot pattern in the designated field.

Explanation



[Print direction: Bottom first]



[Print direction: Top first]

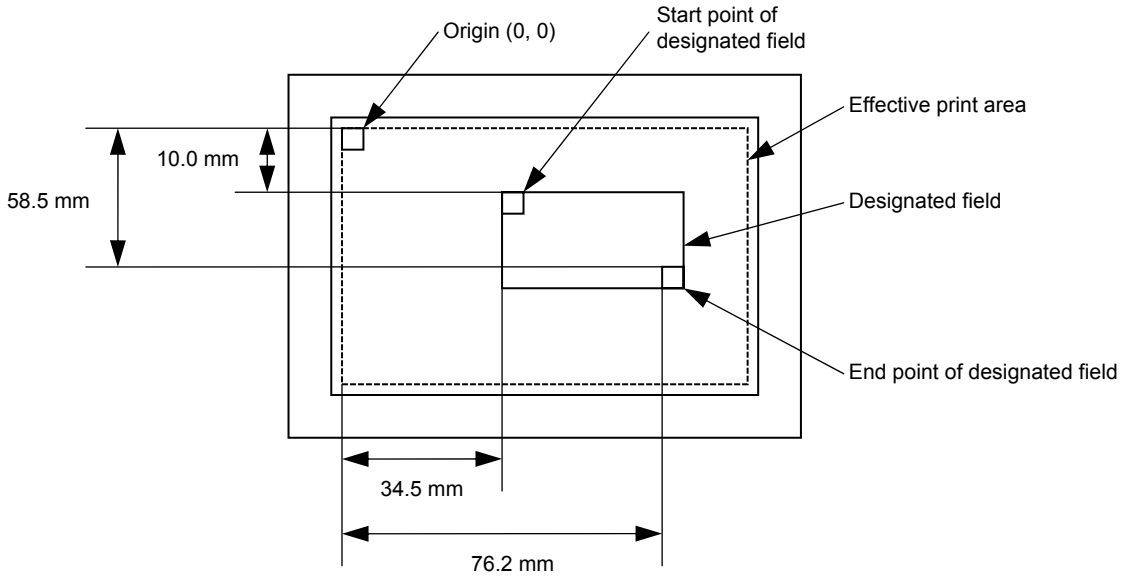
Notes

(1) The print result is the same even if the start and end point coordinates are reversed.

(2) The print result is the same even if the start and end point coordinates are set to an upper right and a lower left points, respectively.

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

Examples



[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]

5.5 COMMANDS RELATED TO DRAWING FORMAT SETTING

5.5.1 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 for the start point
Fixed to 4 digits (in 0.1 mm units)

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

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

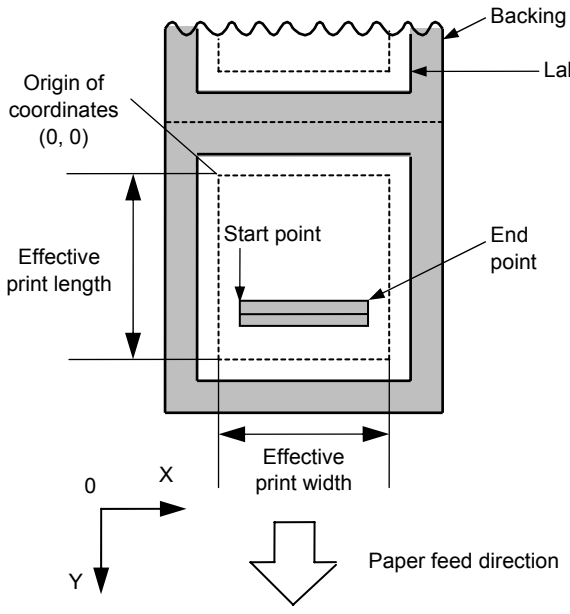
dddd: Y-coordinate for the end point
4 or 5 digits (in 0.1 mm units)

e: Type of line
0: Line (horizontal, vertical, slant)
1: Rectangle

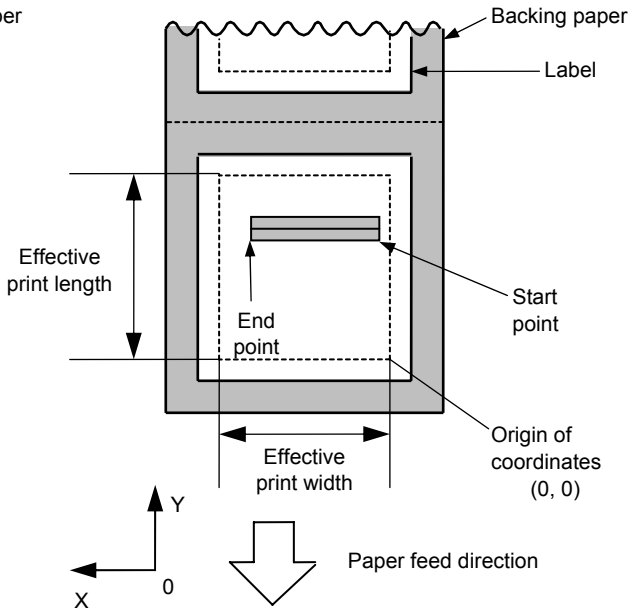
f: Number of line width dots
1 to 9 (in 0.1 mm units)

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

Explanation



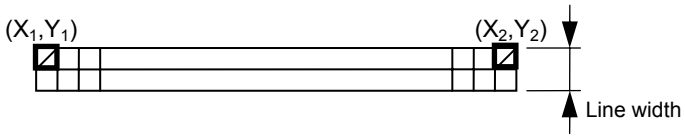
[Print direction: Bottom first]



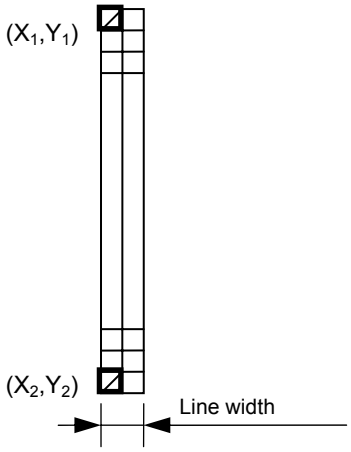
[Print direction: Top first]

[Line]

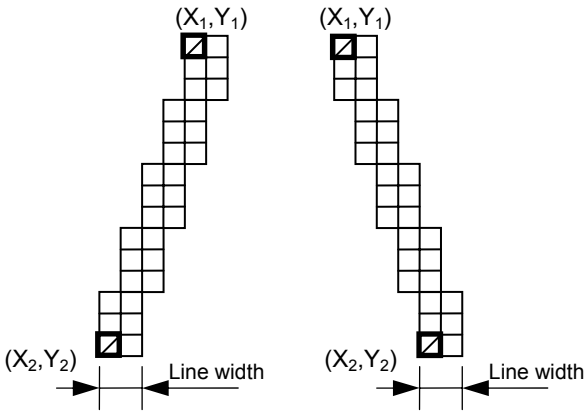
(1) Horizontal line (In the case of $|Y_2 - Y_1| = 0$)



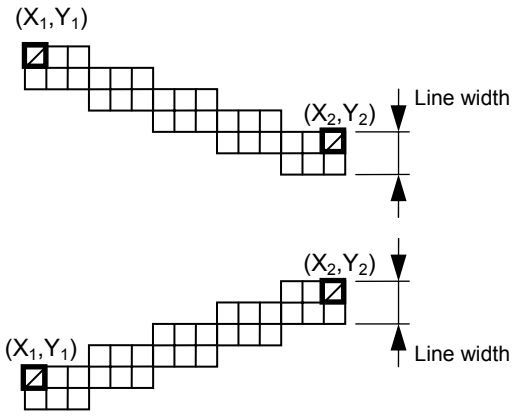
(2) Vertical line (In the case of $|X_2 - X_1| = 0$)



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

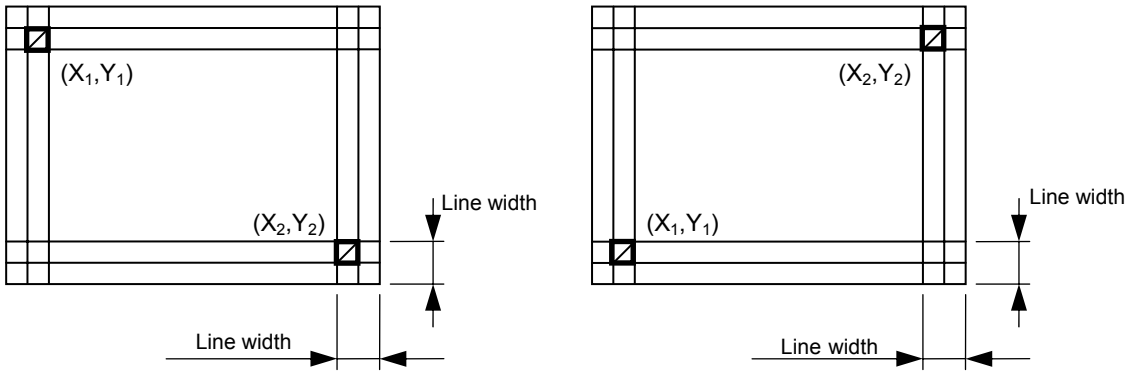


(4) Slant line B ($|X_2 - X_1| > |Y_2 - Y_1|$)

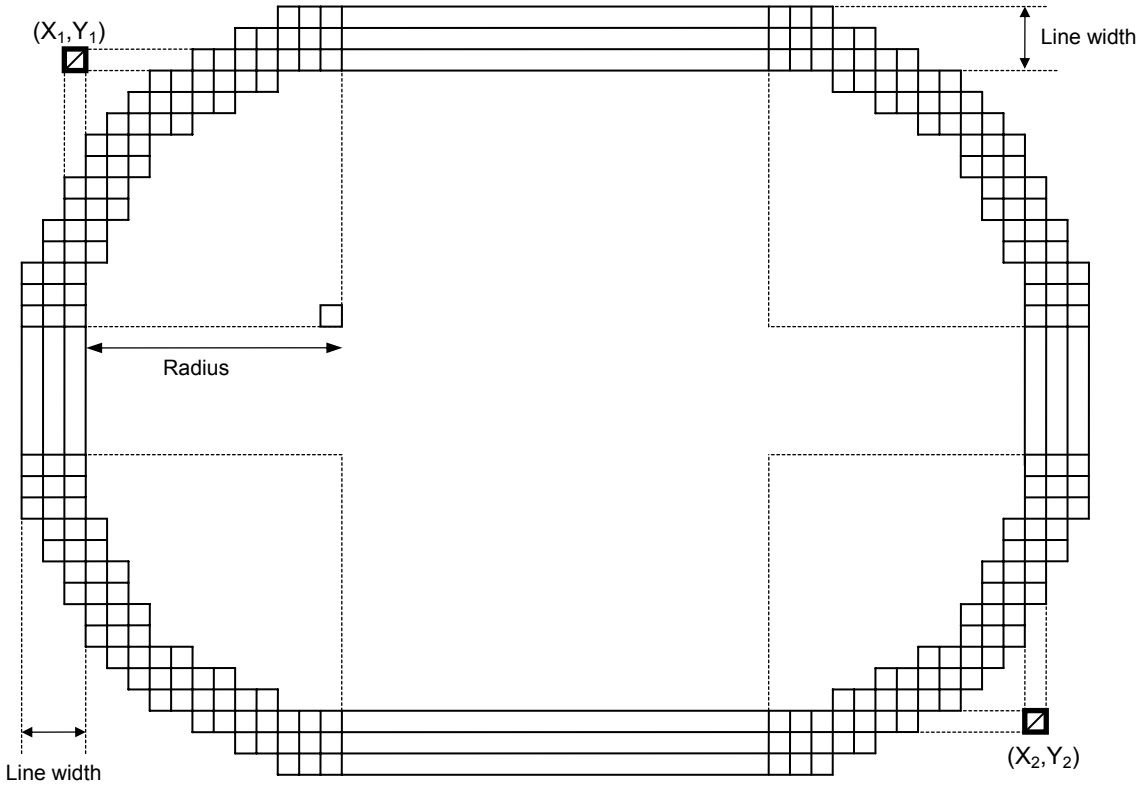


[Rectangle]

(1) Radius of rounded corners = 000 or parameter 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) The print result is 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 line is drawn within the effective print area set by the Label Size Set Command ([ESC] D).

(4) Programming 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 rectangle is printed.

(5) In the following case, a circle is drawn:

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

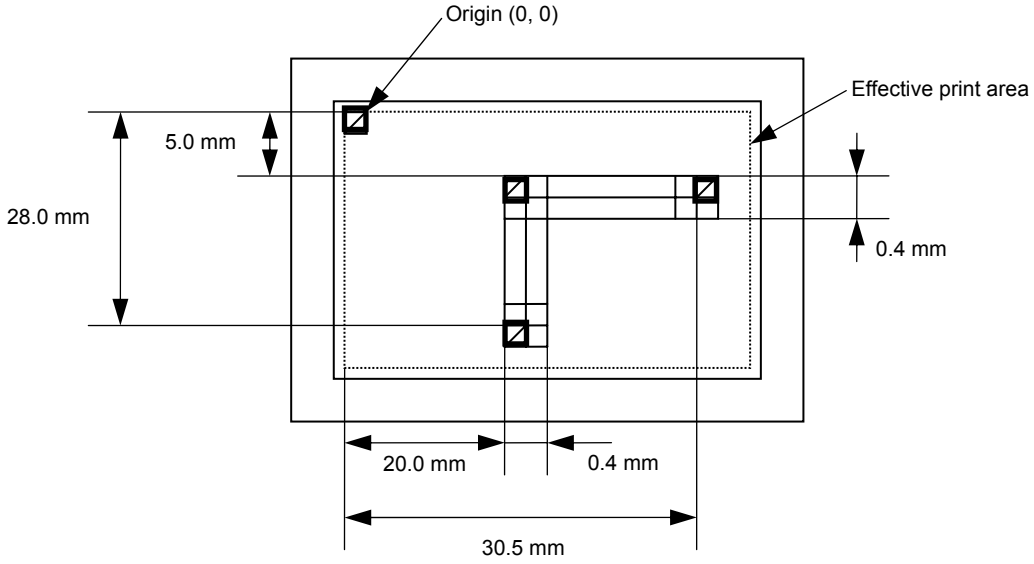
(6) When the reference coordinate is designated in units of 0.1 mm, actual lines may be drawn within ±1-dot allowance since a difference in the dot density is corrected.

[Line width and corresponding number of print dots]

Line width	203 dpi	300 dpi	305 dpi	600 dpi
1	1 dot	1 dot	1 dot	2 dots
2	2 dots	2 dots	2 dots	5 dots
3	2 dots	4 dots	4 dots	7 dots
4	3 dots	5 dots	5 dots	10 dots
5	4 dots	6 dots	6 dots	12 dots
6	5 dots	7 dots	7 dots	14 dots
7	6 dots	8 dots	8 dots	17 dots
8	6 dots	9 dots	10 dots	19 dots
9	7 dots	11 dots	11 dots	22 dots

Note: Even when the line width differs, the number of print dots will be the same.

Examples



[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]

5.5.2 BITMAP FONT FORMAT COMMAND [ESC] PC

Function Sets a format to specify where and how to print a bitmap font 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 digits, 00 to 99, also acceptable)

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

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

d: Character horizontal magnification
1 to 9 (magnification in integral numbers)

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

d d
- Magnification in 0.5 units: 0 or 5 (5 to 9 for 0.5x to 0.9x)
- Magnification in integral numbers: 0 to 9

e: Character vertical magnification
1 to 9 (magnification in integral numbers)

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

e e
- Magnification in 0.5 units: 0 or 5 (5 to 9 for 0.5x to 0.9x)
- Magnification in integral numbers: 0 to 9

ff: Type of font

			203 dpi	305 dpi
A:	Times Roman	(Medium)	12 point	8 point
B:	Times Roman	(Medium)	15 point	10 point
C:	Times Roman	(Bold)	15 point	10 point
D:	Times Roman	(Bold)	18 point	12 point
E:	Times Roman	(Bold)	21 point	14 point
F:	Times Roman	(Italic)	18 point	12 point
G:	Helvetica	(Medium)	9 point	6 point
H:	Helvetica	(Medium)	15 point	10 point
I:	Helvetica	(Medium)	18 point	12 point
J:	Helvetica	(Bold)	18 point	12 point
K:	Helvetica	(Bold)	21 point	14 point
L:	Helvetica	(Italic)	18 point	12 point
M:	Presentation	(Bold)	27 point	18 point
N:	Letter Gothic	(Medium)	14.3 point	9.5 point
O:	Prestige Elite	(Medium)	10.5 point	7 point

P:	Prestige Elite	(Bold)	15 point	10 point
Q:	Courier	(Medium)	15 point	10 point
R:	Courier	(Bold)	18 point	12 point
S:	OCR-A		12 point	12 point
T:	OCR-B		12 point	12 point

U(a): Kanji (16 x 16 dots) (Square Gothic) or Writable character 41 (16 x 16 dots): CN
Writable character 41 (16 x 16 dots): QM/QQ

V(a): Kanji (24 x 24 dots) (Square Gothic) or Writable character 42 (24 x 24 dots): CN
Writable character 42 (24 x 24 dots): QM/QQ

W(a): Kanji (32 x 32 dots) (Square Gothic) or Writable character 43 (32 x 32 dots): CN
Writable character 43 (32 x 32 dots): QM/QQ

X(a): Kanji (48 x 48 dots) (Square Gothic) or Writable character 44 (48 x 48 dots): CN
Writable character 44 (48 x 48 dots): QM/QQ

a: (Reserved)
b: (Reserved)
c: (Reserved)
d: (Reserved)
e: (Reserved)
f: (Reserved)
g: (Reserved)
h: (Reserved)
i: (Reserved)
j: (Reserved)
k: (Reserved)
l: (Reserved)
m: (Reserved)
n: (Reserved)
o: (Reserved)
p: (Reserved)
q: Gothic725 Black
r: Chinese (24 x 24 dots) or writable character 42 (24 x 24 dots): CN

Note: The specification of Kanji and Chinese characters for the B-EX4T3-HS12-QM-R is same as that of the B-EX4T3-HS12-CN-R model.

01 (a): External character 1 (1×1 dot to 720×720 dots)
to
40 (a): External character 40 (1×1 dot to 720×720 dots)
51 (a): 2-byte code set external character 1 (1×1 dot to 720×720 dots)
to
55 (a): 2-byte code set external 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: External memory
(When optional RTC + USB host interface board are installed.)
2: Reserved.

* 2-byte code external characters 52 to 55 are available only when the external memory is selected for the drive.
* When Drive is set to 2 (Reserved), the external memory is automatically selected. (To maintain the compatibility with B-SX)

* The following fonts are proportional fonts.
A, B, C, D, E, F, G, H, I, J, K, L, q

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

g: Whether to increase or decrease the character-to-character space.
+: Increase
-: Decrease

hh: No. of space dots between characters
00 to 99 (in 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 types A to r only

j: Character attribution

B: Black character

W (aabb): Reverse character

aa: No. of dots from the character string field to the end of the black background in the horizontal direction
01 to 99 (in units of dots)

bb: No. of dots from the character string field to the end of the black background in the vertical direction
01 to 99 (in units of dots)

F (aabb): Boxed character

aa: No. of dots from the character string field to the box in the horizontal direction
01 to 99 (in units of dots)

bb: No. of dots from the character string field to the box in the vertical direction
01 to 99 (in units of dots)

C (aa): Strike-through

aa: No. of dots from the character string field to the end of the strike-through
01 to 99 (in units of dots)

* Parameters in parentheses are omissible.
(When omitted, a value obtained by multiplying the horizontal or vertical character magnifications, whichever is larger by 6 dots will be specified.)

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

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

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

Mm: Type of check digit to be attached
(Omissible. When omitted, the check digit is not drawn.)
m: Type of check digit
0: Modulus 10 (Data and check digit are drawn.)
1: Modulus 43 (Data and check digit are drawn.)
2: DBP Modulus 10 (Only check digit is drawn.)

nooooooooooo: Increment and decrement
(Omissible. When omitted, incrementing/decrementing is not performed.)
n: Whether to increment or decrement.
+: Increment
- : Decrement

ooooooooooo: Skip value
0000000000 to 9999999999

Zpp: Zero suppression
(Omissible. When omitted, the zero suppression is not performed.)
pp: No. of digits to be zero-suppressed
00 to 20

Pq: Alignment (Omissible. When omitted, the alignment is set to left.)
q: Character position alignment
1: Left
2: Center
3: Right
4aaaa: Justification
aaaa: Character string field in X direction
B-EX4: 0050 to 1040 (in 0.1 mm units)
B-EX6: 0050 to 1600 (in 0.1 mm units)

5aaaabbbcc: Automatic line feed
aaaa: Character string field in X direction
B-EX4: 0050 to 1040 (in 0.1 mm units)
B-EX6: 0050 to 1600 (in 0.1 mm units)

* The value to be specified shall be less than the label width as the effective print width is not checked in this processing.

bbb: Line feed pitch
010 to 500 (in 0.1 mm units)

cc: Number of lines
01 to 99

6aaaabbb: Alignment of multiple lines: Left
aaaa: Character string field in X direction (Unused)
B-EX4: 0050 to 1040 (in 0.1 mm units)
B-EX6: 0050 to 1600 (in 0.1 mm units)

bbb: Line feed pitch
010 to 500 (in 0.1 mm units)

7aaaabbb: Alignment of multiple lines: Center
aaaa: Character string field in X direction (Unused)
B-EX4: 0050 to 1040 (in 0.1 mm units)
B-EX6: 0050 to 1600 (in 0.1 mm units)

bbb: Line feed pitch

010 to 500 (in 0.1 mm units)

8aaaabbb: Alignment of multiple lines: Right

aaaa: Character string field in X direction (Unused)
B-EX4: 0050 to 1040 (in 0.1 mm units)
B-EX6: 0050 to 1600 (in 0.1 mm units)

bbb: Line feed pitch
010 to 500 (in 0.1 mm units)

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

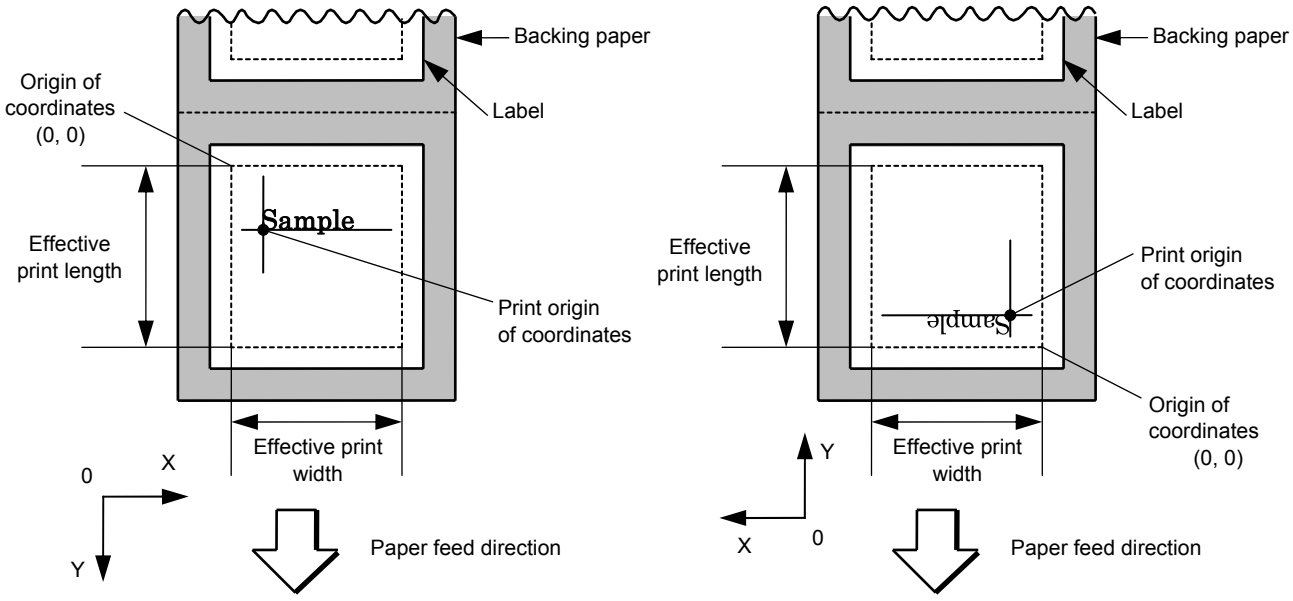
ss_1, ss_2, ss_3, ------, ss_{20}: Link field No. (Omissible)
01 to 99 (1 to 99 can also be used.)
Up to 20 fields can be designated using commas.

Explanation

(1) Character string number

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

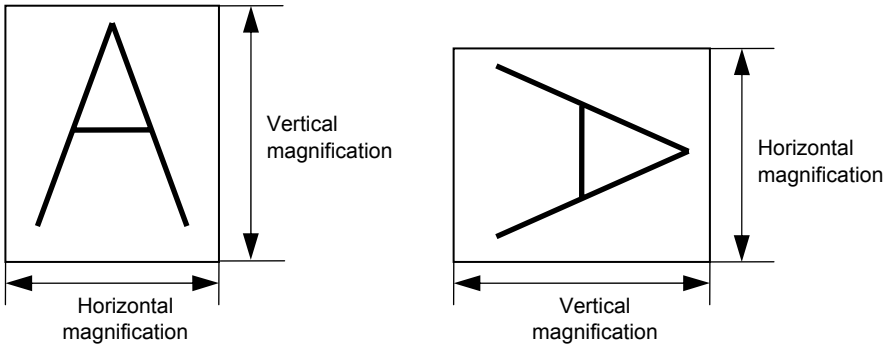
(2) Print origin of coordinates



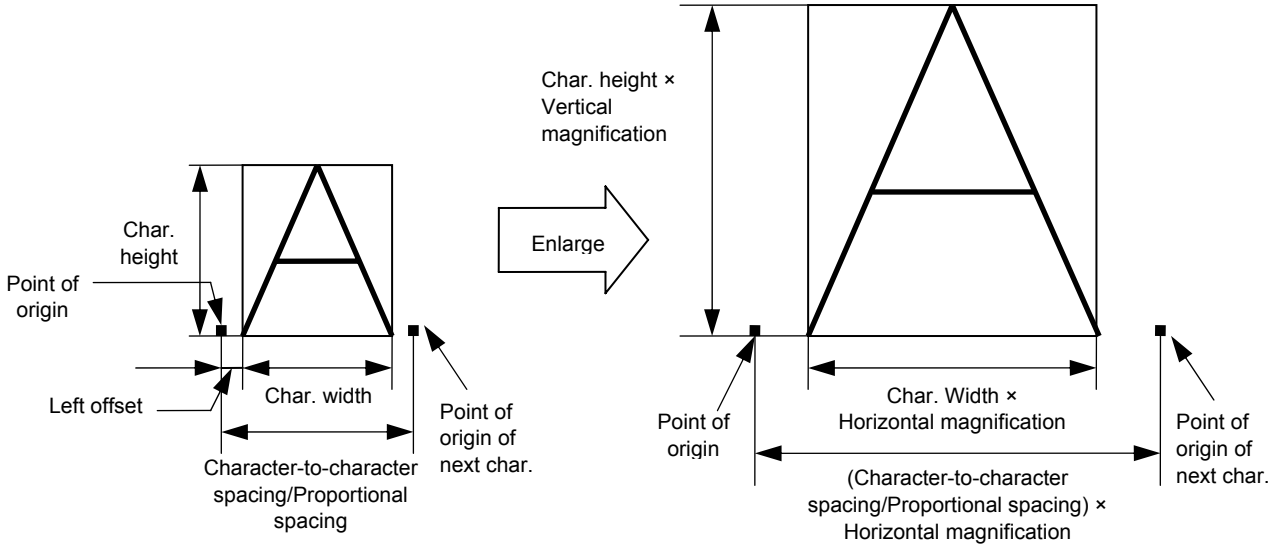
[Print direction: Bottom first] [Print direction: Top first]

The print origin of coordinates must be set so that the character is printed within the effective print area set with the Label Size Set Command ([ESC] D).

(3) Horizontal magnification and vertical magnification



[Relationship between drawing coordinates and magnification]



(4) Type of font

A: Times Roman : !"#$%&'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMabcdefghijklmÅîØÆåìÆ

B: Times Roman : **!"#$%&'()*+,-./0123456789:;<=>?@ABCDEFGabcdefgÅîØÆåìÆ**

C: Times Roman : **!"#$%&'()*+,-./0123456789:;<=>?@ABCDEFGabcdefgÅîØÆåìÆ**

D: Times Roman : **!"#$%&'()*+,-./0123456789:;<=>?@ABCDEFGabcdefgÅîØÆåìÆ**

E: Times Roman : **!"#$%&'()*+,-./0123456789@ABCDEFGabcdefgÅîØÆåìÆ**

F: Times Roman : *!"#$%&'()*+,-./0123456789@ABCDEFGabcdefgÅîØÆåìÆ*

G: Helvetica : !"#$%&'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVabcdefghijklmnopqrstuvwÅîØÆåìÆ

H: Helvetica : !"#$%&'()*+,-./0123456789:;<=>?@ABCDEFGHabcdefghÅîØÆåìÆ

I: Helvetica : !"#$%&'()*+,-./0123456789@ABCDEFGabcdefÅîØÆåìÆ

J: Helvetica : **!"#$%&'()*+,-./0123456789@ABCDEFGabcdeÅîØÆåìÆ**

K: Helvetica : **!"#$%&0123456789@ABCDEFabcdefÅîØÆåìÆ**

L: Helvetica : *!"#$%&'()*+,-./0123456789@ABCDEFGHabcdeÅîØÆåìÆ*

M: Presentation : **!"#$%&0123456789@ABCDEFABCDE**

N: Letter Gothic : !"#$%&'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNOPabcdefghijklmnopÅîØÆåìÆ

O: Prestige Elite : !"#$%&'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNOPabcdefghijklmnopÅîØÆåìÆ

P: Prestige Elite : **!"#$%&'()*+,-./0123456789:;<=>?@ABCDEFabcdefÅîØÆåìÆ**

Q: Courier : !"#$%&'()*+,-./0123456789:;<=>?@ABCDEFabcdefÅîØÆåìÆ

R: Courier : **!"#$%&'()*+,-./0123456789@ABCDEabcdeÅîØÆåìÆ**

S: OCR-A : !"#$%&'()*+,-./0123456789:;<=>?@ABCDEabcdef

T: OCR-B : !"#$%&'()*+,-./0123456789:;<=>?@ABCDEabcdef

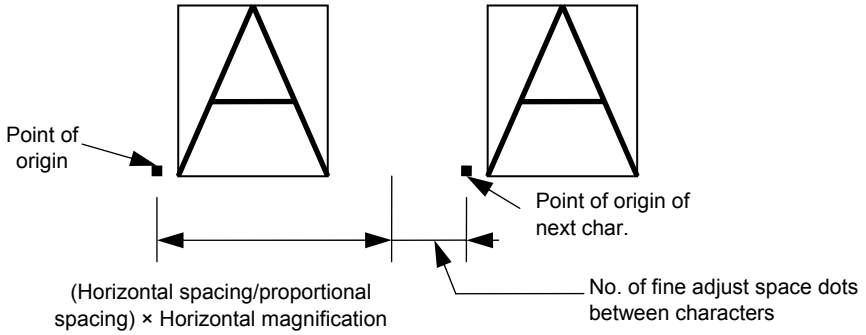
q: Gothic725 Black : **!"#$%&'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZabcdefghijklmnopqrstuvwxyzÇüéâäàåçêëèïîìÄÅÉæÆôöòûùÿÖÜ¢£Ø×ƒáíóúñÑªº¿®¬½**

r: Chinese (24×24 dots) 123ABCabcㄐㄑㄒㄓㄔㄕㄖㄗㄘㄙㄚㄛㄜㄝㄞㄟ啊阿埃挨哎唉哀皑癌蔼矮艾碍爱隘亍丌兀丐廿卅丕亘丞鬲孬噩丨禺丿邸郃郏郅

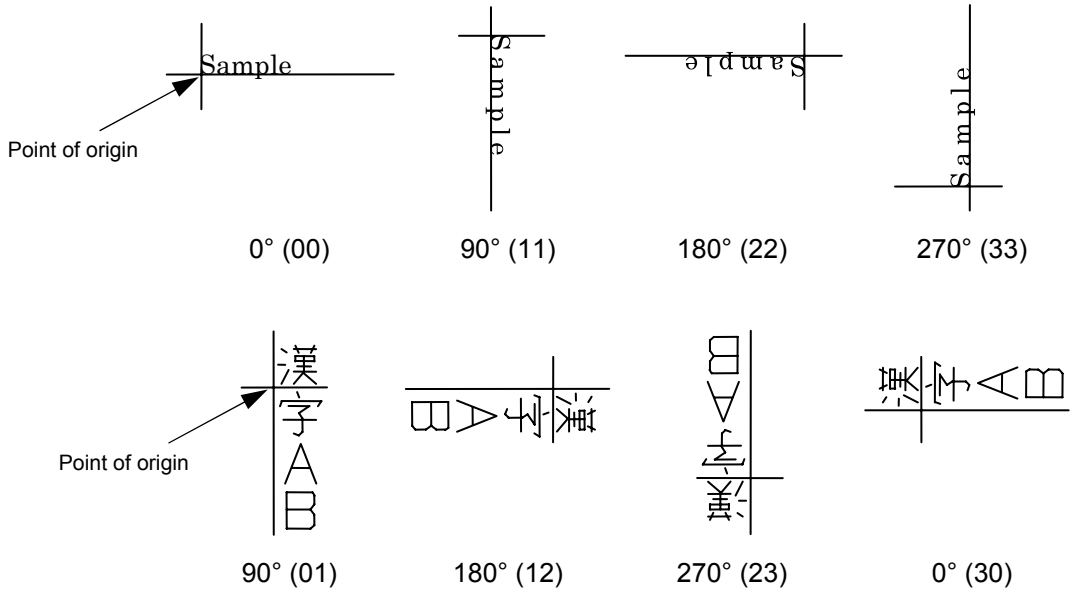
* To print font "r", Chinese character generator is required.

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

When no character-to-character space is specified or the number of space dots between characters is set to 0, characters are drawn according to the character-to-ccharacter space/proportional spacing determined for each character. When the character-to-character space is specified, drawing will take place according to the sum of the character-to-character space/proportional spacing determined for each character and the specified value.



(6) Rotational angles of a character and character string



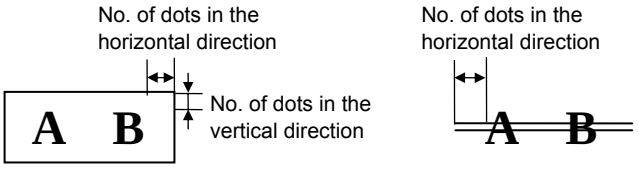
"01", "12", "23", and "30" are available only when the font types are A to r.

Specifying any font other than above results in an error.

(7) Selection of character attribution

Black characters

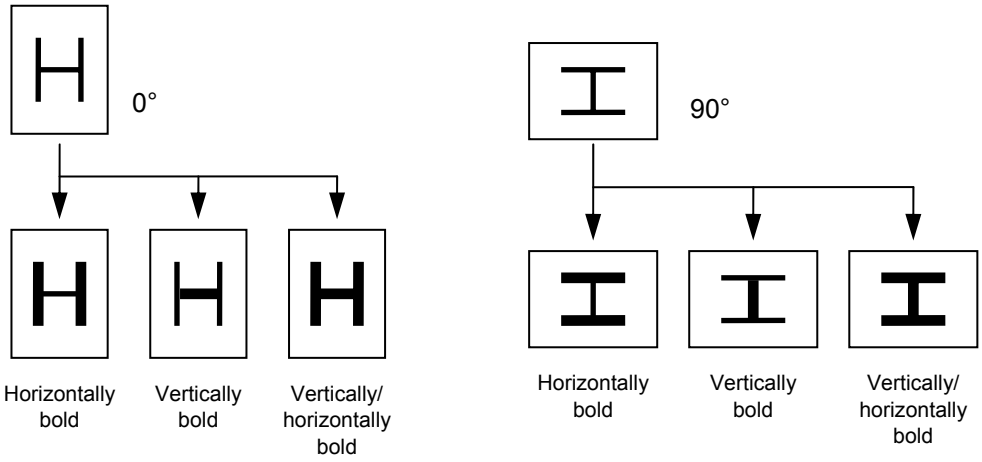
Reverse characters



Boxed characters

Strike-through

(8) Bold character



(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 when the data is drawn. When modulus 10 is designated and the data includes any data other than numerals, the data string will not be drawn. When modulus 43 is designated and the data includes any character other than CODE39, the drawing is not performed.

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.

When the font type is “r”, the check digit cannot be added. (If “r” is designated, the printer will behave as if this parameter setting is omitted.)

When the font type is any from 51 to 55, the check digit cannot be added. (If any option from 51 to 55 is designated, the printer operation is not guaranteed.)

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

(10) Increment/decrement

Printing is performed while the data is incremented or decremented every time a label is issued. Where the data string exceeds the maximum number of digits (40), such data string will not be drawn. When the font type is r, incrementing/decrementing cannot be designated. (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

● Increment/decrement for letters and numerals

Up to 40 digits (including letters, numerals, and symbols) of data can be incremented/decremented. Only numerals are selected and calculated for incrementing/decrementing, and are returned to the previous position to draw the data.

Example of increment/decrement calculation

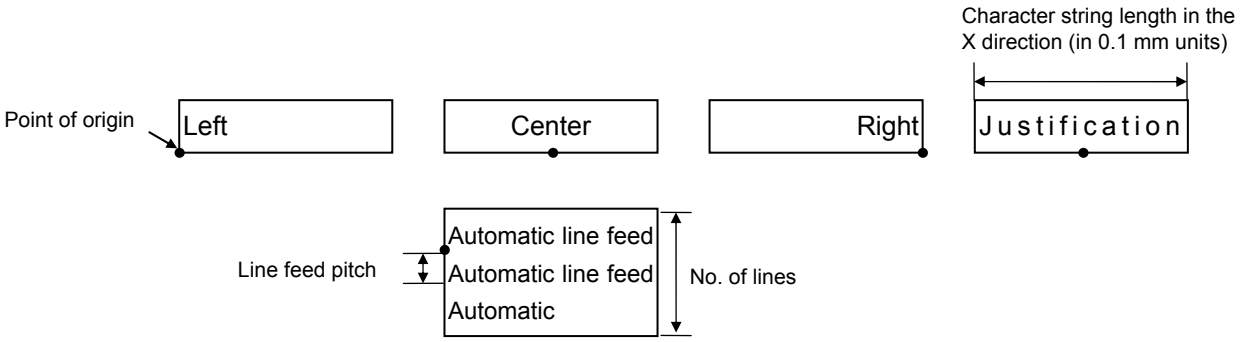
Initial value	00000	A0A0A	7A8/9	A2A0A
INC/DEC	+1	+1	+3	-3
1st label	00000	A0A0A	7A8/9	A2A0A
2nd label	00001	A0A1A	7A9/2	A1A7A
3rd label	00002	A0A2A	7A9/5	A1A4A
4th label	00003	A0A3A	7A9/8	A1A1A
5th label	00004	A0A4A	8A0/1	A0A8A

(11) Zero suppression

No. of digits to be zero-suppressed	0	1	2	2	3	4	5
Data	0000	0000	0000	0A12	0123	0123	0123
Print	0000	␣␣␣0	␣␣00	␣A12	␣123	0123	0123

The leading zero(s) in a data string is replaced by a space(s) according to the designated number of digits. However, if the number of digits to be suppressed is greater than that of the data string, the data string will be drawn without zero suppression. When the data string exceeds the maximum number of digits (40), the data string will not be drawn. When the font type is r, zero suppression cannot be designated. If it is designated, it is ignored and the printer operates as if there was no designation.

(12) Alignment



If all data characters do not fit in a specified field* when justification and automatic line feed are designated, the following steps are performed.

* In the case of the justification, the character string field specified by the character string field in X direction parameter. In the case of the automatic line feed, the specified number of lines

First, decrease the character-to-character space. If characters do not fit in one line even when the space is reduced to 0, restore the character-to-character space to its default. Then reduce the horizontal character magnification by 0.5.

If characters still do not fit in a line, repeatedly decrease the character-to-character space, then reduce the horizontal magnification. When characters do not fit in a line even if the character magnification is set to 0.5 and the character-to-character space is set to 0, the field is not drawn. (The previous data for the same field is not drawn, also.)

When “01”, “12”, “23”, or “30” is specified for the rotational angles of a character and character string, the alignment setting (center, right, justification, automatic line feed or alignment of multiple lines) 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 can be printed. However, when the font type is “r”, the maximum number of digits is 127. If the number of digits exceeds the maximum value, the overflowing data will be discarded.
For the character code table, refer to “CHARACTER CODE TABLE”.

(14) Link field No.

The link field No. can be set by designating it after a semicolon “;”. After the link field No. is designated in the Format Command, a data string is linked with the field No. by the Link Field Data Command to draw the data in this field.
Up to 20 fields can be linked.

The following shows an example data fields and data strings are linked and printed on a two-column label.

[Format Command]

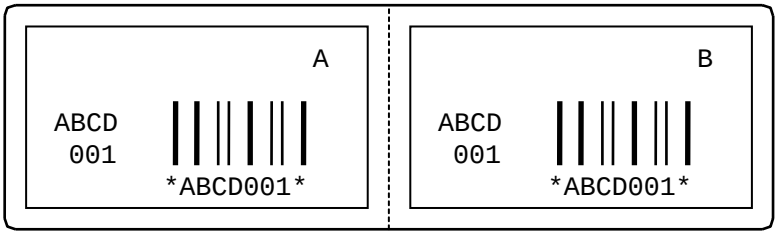
[ESC] PC01;	; 01 [LF] [NUL] :	Link field No. 1 is designated.
[ESC] PC02;	; 03 [LF] [NUL] :	Link field No. 3 is designated.
[ESC] PC03;	; 04 [LF] [NUL] :	Link field No. 4 is designated.
[ESC] XB01;	; 03, 04 [LF] [NUL] :	Link fields No. 3 and No. 4 are designated.
[ESC] PC04;	; 02 [LF] [NUL] :	Link field 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] RC; A [LF] B [LF] ABCD [LF] 001 [LF] [NUL]

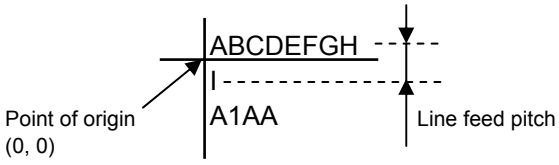
Data for link field No. 4
Data for link field No. 3
Data for link field No. 2
Data for link field No. 1



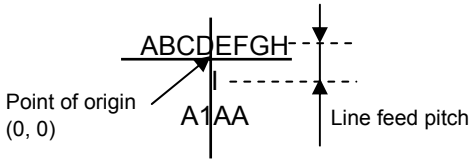
(15) Multiple lines alignment

The multiple lines alignment is different from the usual alignment in the point of origin. That is, the point of origin varies depending on the character string length in X direction (in units of 0.1 mm). Line feed of data is enabled by inserting a line feed character "¥n" (0x5c, 0x6e) in the print data.

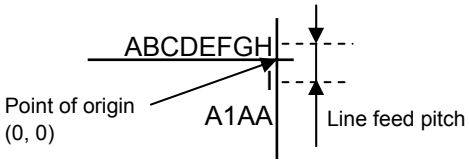
Left:



Center:



Right:



Notes

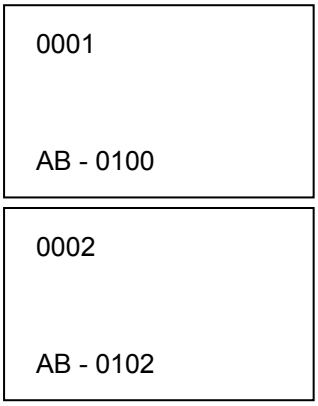
(1) The check digit attachment, increment/decrement, and zero suppression are performed according to the following priority. If any of the conditions are improper, no drawing will take place. (For example, the zero(s) is replaced by a space(s) as a result of zero suppression but the modulus 10 cannot be calculated though the attachment of modulus 10 is specified.)

Increment/decrement > zero suppression > attachment of check digit

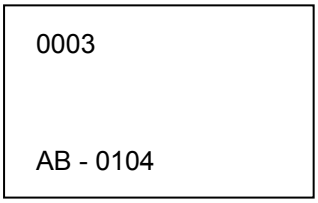
(2) Up to 32 fields to which increment/decrement is to be applied can be drawn. If the total number of increment/decrement fields including bitmap font, outline font and bar code exceeds 32, drawing will take place without incrementing/decrementing any excess field. The increment/decrement in the field will be continued until the Image Buffer Clear Command ([ESC] C) is sent.

[Example]

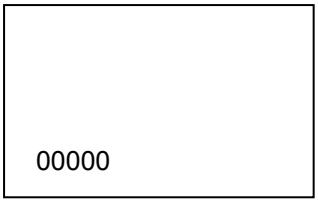
1) Format Command (Character string No. 001 is incremented (+1))
2) Format Command (No increment is specified for character string No. 002)
3) Format Command (Character string No. 003 is incremented (+2))
4) Image Buffer Clear Command
5) Data Command (Character string No. 001 “0001”)
6) Data Command (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 can be connected to the Outline 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) When the print data is variable for each label, the print data for the previous label is automatically cleared by specifying a different character string number to print next data. Therefore, a different character string number shall be linked with each drawing field. Since the automatic field clear is not performed between the Clear Command ([ESC] C) and Issue Command ([ESC] XS), the fixed data can be drawn using the same character string number. In this case, the Format Command and Data Command shall be sent alternately. (After the Issue Command is sent, the fields linked with the same character string number are automatically cleared until the Clear Command is sent.)

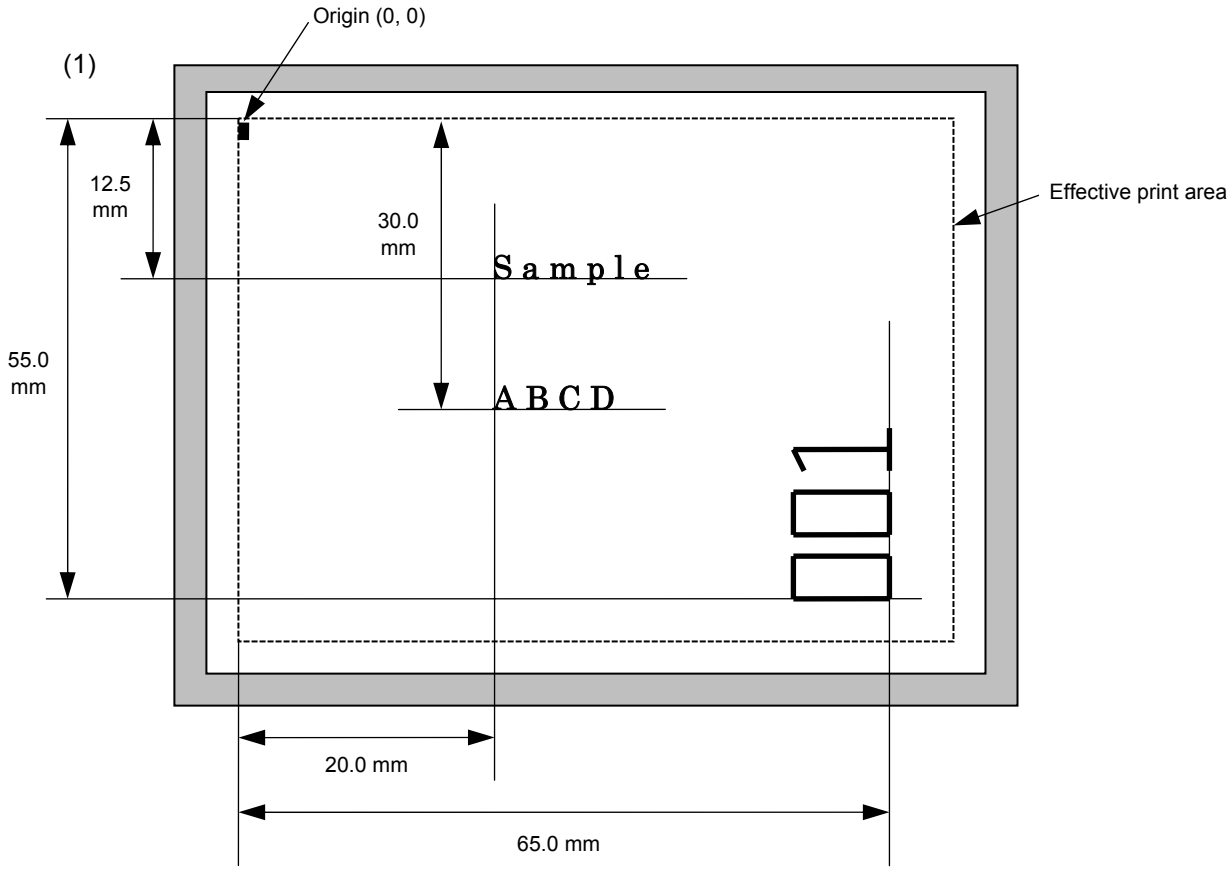
(5) The link field designation can be released by formatting a label format again without specifying the link field for the same character string No.
The link field designation can also be released by the Image Buffer Clear Command.

(6) Print data strings and link field Nos. cannot be programmed at the same time.

(7) When the reference coordinate is designated in units of 0.1 mm, actual print data may be drawn within ±1-dot allowance since a difference in the dot density is corrected.

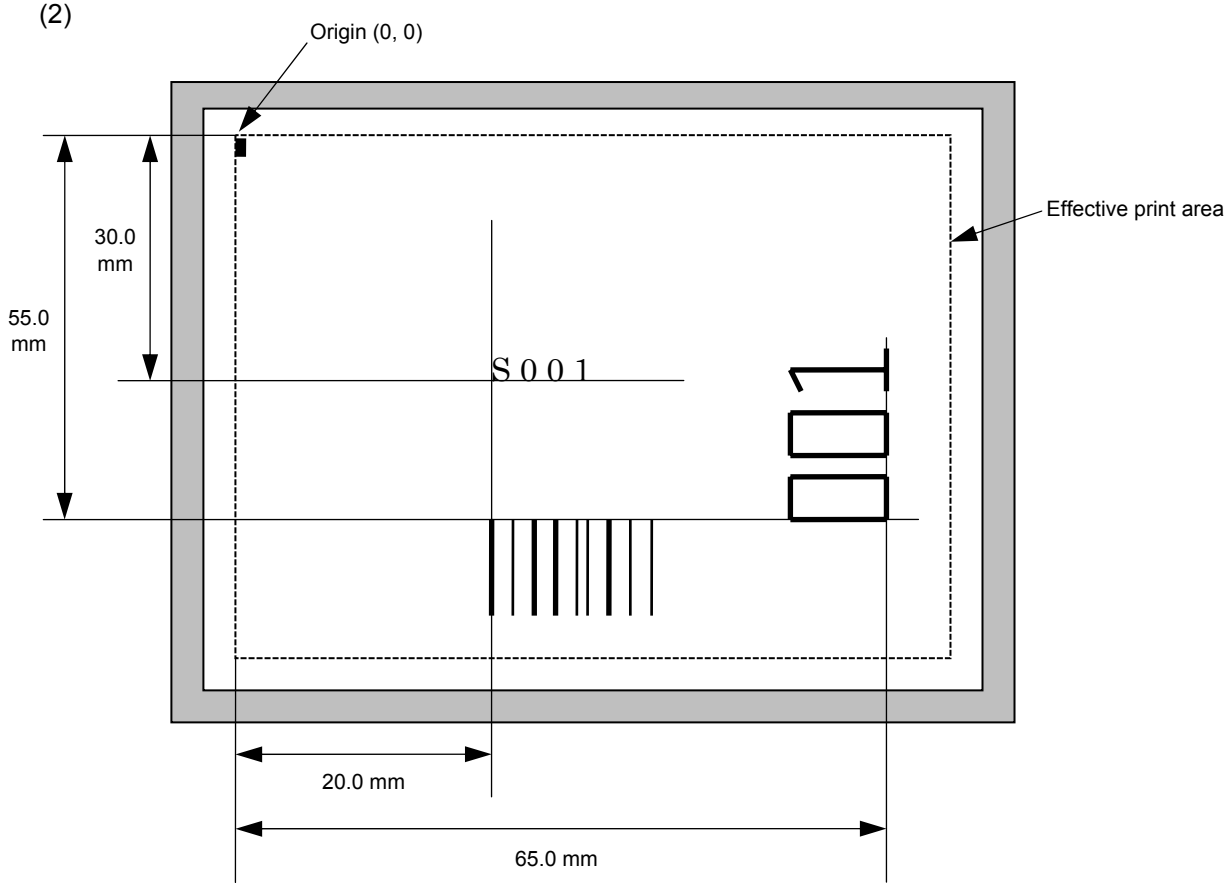
Refer to Bit Map Font Data Command ([ESC] RC)
Outline Font Format Command ([ESC] PV)
Bar Code Format Command ([ESC] XB)

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]

5.5.3 Outline Font Format Command [ESC] PV

Function — Sets a format to specify where and how to print an outline font on a label.

⊙ Outline font

Format

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

② [ESC]PVaa;bbbb,cccc,dddd(D),eeee(D),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 for the print origin of character string
Fixed to 4 digits (in 0.1 mm units)

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

dddd(D): Character width
0020 to 1500 (in 0.1 mm units)

eeee(D): Height of the character
0020 to 1500 (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: DUTCH801 Bold (Times Roman Proportional)
I: BRUSH738 Regular (Pop Proportional)
J: GOTHIC725 Black (Proportional)

ghhh: Fine adjustment of character-to-character space
(Omissible. When omitted, space is adjusted according to the designated font.)
g: Whether to increase or decrease the character-to-character space.
+: Increase
-: Decrease
hhh: No. of space dots between characters
000 to 512 (in 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 field to the end of the black background in the horizontal direction
01 to 99 (in units of dots)

bb: No. of dots from the character string field to the end of the black background in the vertical direction
01 to 99 (in units of dots)

F(aabb): Boxed character

aa: No. of dots from the character string field to the box in the horizontal direction
01 to 99 (in units of dots)

bb: No. of dots from the character string field to the box in the vertical direction
01 to 99 (in units of dots)

C(aa): Strike-through

aa: No. of dots from the character string field to the end of the strike-through
01 to 99 (in units of dots)

* Parameters in parentheses are omissible.
(When omitted, a value obtained by multiplying the horizontal or vertical character magnifications, whichever is larger by 8 dots will be specified.)

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 (Data and check digit are drawn.)
1: Modulus 43 (Data and check digit are drawn.)
2: DBP Modulus 10 (Only check digit is drawn.)

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

l: Whether to increment or decrement

+: Increment
-: Decrement

mmmmmmmmmm: Skip value
0000000000 to 9999999999

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

nn: No. of digits to be zero-suppressed
00 to 20

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

o: Character position alignment

1: Left

2: Center

3: Right

4aaaa: Justification

aaaa: X direction for the character string field

B-EX4: 0050 to 1040 (in 0.1 mm units)

B-EX6: 0050 to 1600 (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 accepted.)

Up to 20 fields can be designated using commas.

⊙ TrueType font

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

Term

aa: Character string number
00 to 99

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

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

dddd: Character width
0020 to 1500 (in 0.1 mm units)

eeee: Height of the character
0020 to 1500 (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 (File name: addttf01.ttf)
22: add_on TrueTypeFont 2 (File name: addttf02.ttf)
23: add_on TrueTypeFont 3 (File name: addttf03.ttf)
24: add_on TrueTypeFont 4 (File name: addttf04.ttf)
25: add_on TrueTypeFont 5 (File name: addttf05.ttf)

(*1) The font types 21 to 25 are to be added by a user. To use these fonts, they need to be stored in the external memory under the name “addttf01.ttf” to “addttf05.ttf”.

(*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

Location where the TrueType font files are stored

0: Flash ROM on the CPU board

1: External memory (When optional RTC + USB host interface are installed.)

2: Reserved.

* “0” cannot be specified for the font types from 21 to 25.

hiii: Fine adjustment of character-to-character space

(Omissible. When omitted, space is adjusted according to the designated font.)

h: Whether to increase or decrease the character-to-character space.

+: Increase

-: Decrease

iii: No. of space dots between characters

000 to 512 (in 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

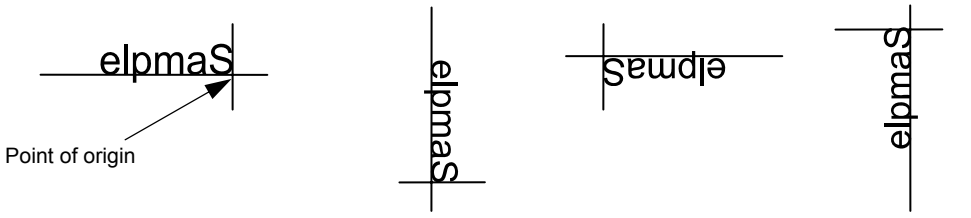
B: Black character

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 flash ROM on the CPU board or external memory.
For installation of TrueType font and other details, refer to the TrueType Font Specification.

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



0° (00) 90° (11) 180° (22) 270° (33)

⊙ OpenType font (Supported only by the B-EX6T)

Format

[ESC]PVaa;bbbb,cccc,dddd(D),eeee(D),o,fff------fff,g(,hiii),jj,l(,m)(=ppp------ppp)[LF][NUL]

Term

aa: Character string number
00 to 99

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

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

dddd: Character width
0020 to 1500 (in 0.1 mm units)

eeee: Height of the character
0020 to 1500 (in 0.1 mm units)

o: File Extension
0: file extension is .TTF
1: file extension is .OTF

fff------fff: Font File Name

Maximum length is 32 characters. Minimum Length is 1 character.

g: Drive
Location where the TrueType font files are stored
0: Flash ROM on the CPU board
1: Reserved.
2: Reserved.

hiii: Fine adjustment of character-to-character space
(Omissible. When omitted, space is adjusted according to the designated font.)
h: Whether to increase or decrease the character-to-character space.
+: Increase
-: Decrease
iii: No. of space dots between characters
000 to 512 (in 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)

l: Character attribution
B: Black character

m: Text direction

(Omissible. When omitted, default is LTR.)

0: Left To Right (LTR)
1: Right To Left (RTL)
2: Top To Bottom (TTB)
3: Bottom To Top (BTT)

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

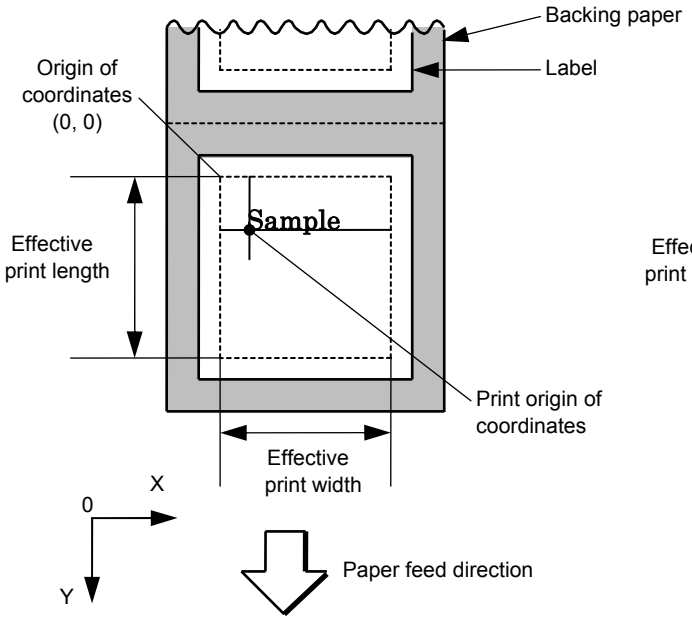
* Noto Sans CJK has been installed as standard. (File name: CJK.TTF) When other OTFs and TTFs are used, they need to be downloaded to the printer. For details of downloading procedure, please refer to the OTF Specification.
* Use of TTB/BTT is recommended for CJK (Chinese, Japanese and Korean) scripts like Hiragana, Katakana, etc.
* Use of RTL is recommended for scripts like Arabic, Hebrew, etc.
* When using Text direction settings (LTR, RTL, TTB, BTT) shaping must be enabled. For details on shaping, refer to [ESC] PS. If shaping is disabled, the coordinates of print images may differ from the expected output.
* If Input Data is non-Latin characters, set character code as UTF-8.

Explanation

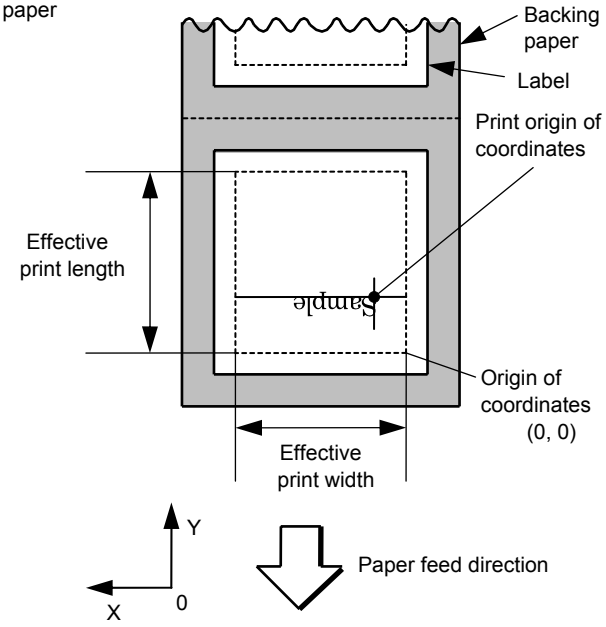
(1) Character string number

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

(2) Print origin of coordinates



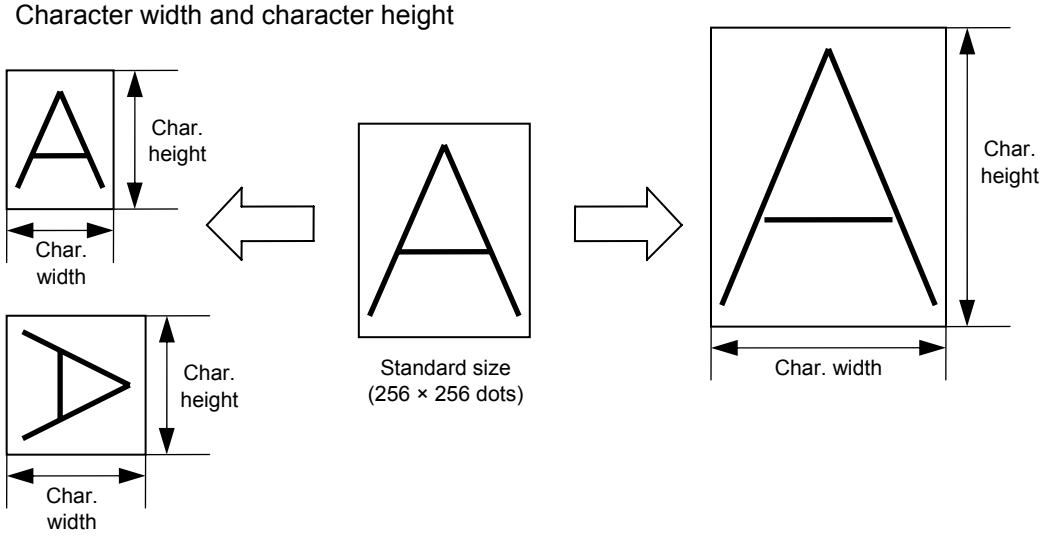
[Print direction: Bottom first]



[Print direction: Top first]

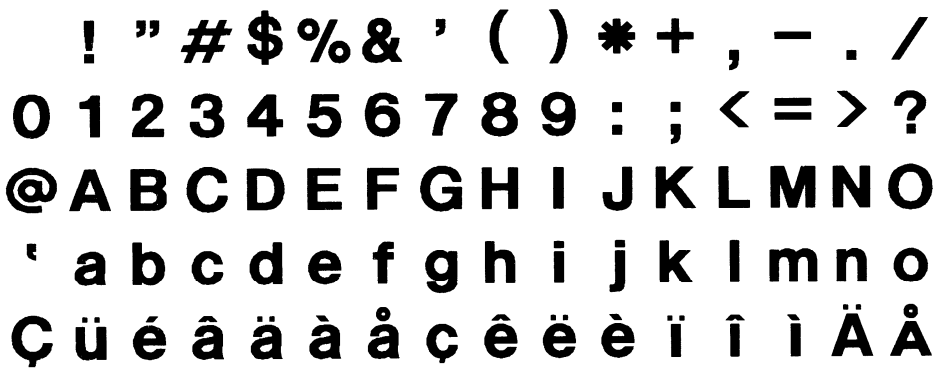
• The print origin of coordinates must be set so that the character is printed within the effective print area set by the Label Size Set Command ([ESC] D).

(3) Character width and character height

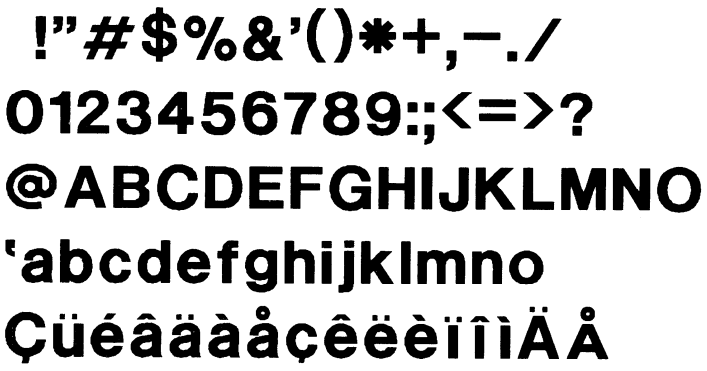


(4) Type of font

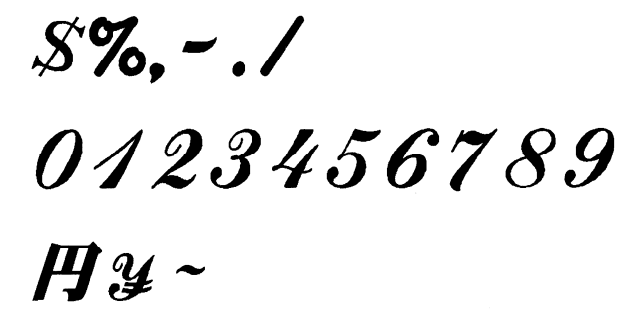
A: TEC FONT1 (Helvetica [bold])



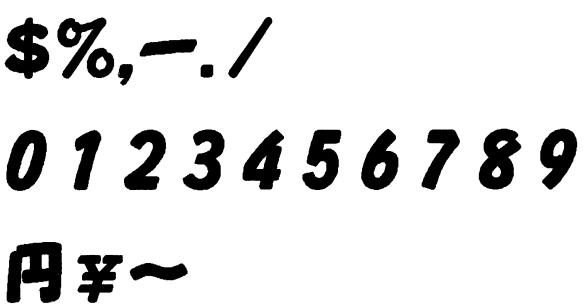
B: TEC FONT1 (Helvetica [bold] proportional)



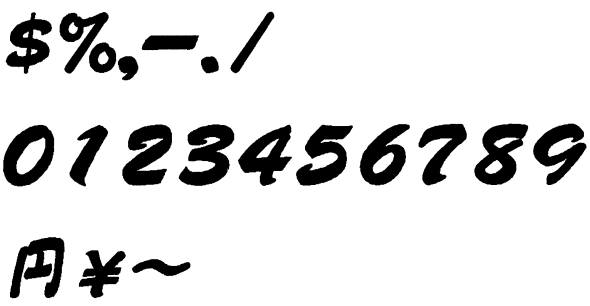
E: Price font 1 (POP font)



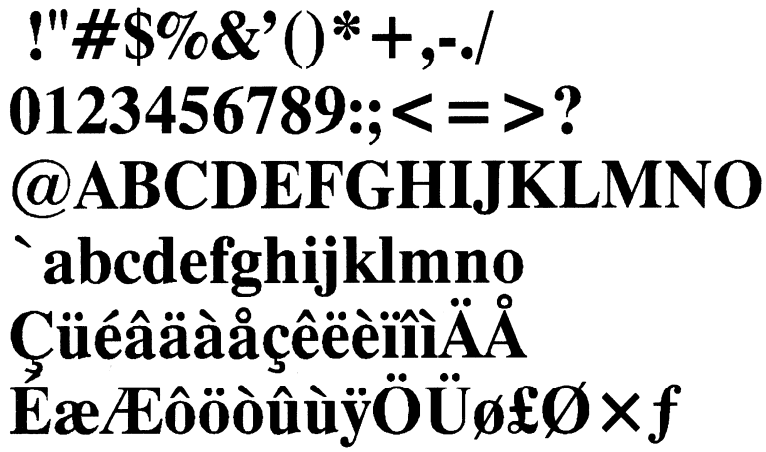
F: Price font 2 (POP font)



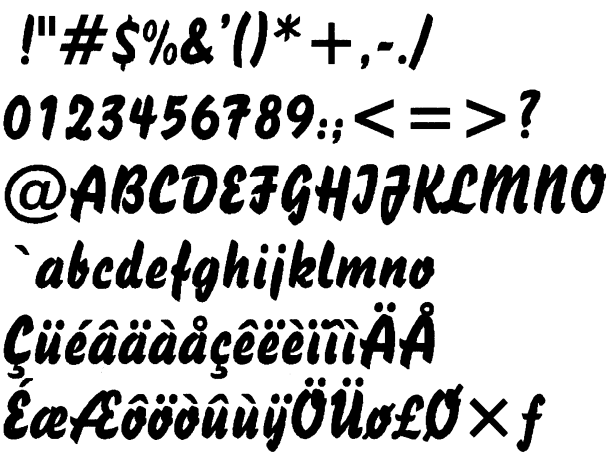
G: Price font 3 (POP font)



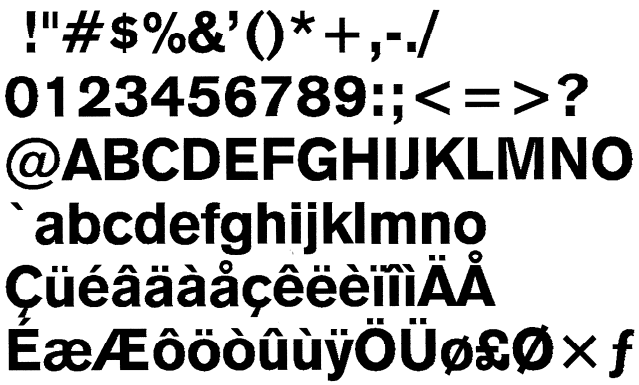
H: DUTCH801 Bold (Times Roman Proportional)



I: BRUSH 738 Regular (Pop Proportional)



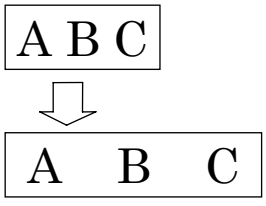
J: GOTHIC725 Black



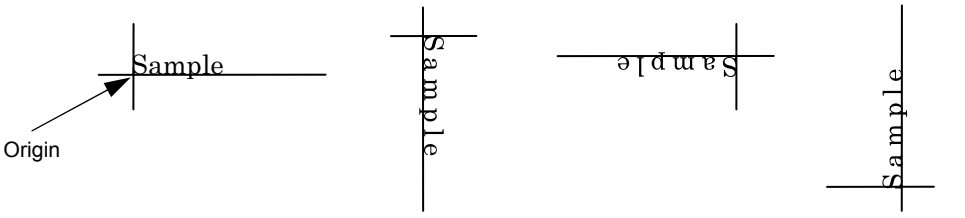
(5) Fine adjustment of character-to-character space

When no character-to-character space is specified or the number of space dots between characters is set to 0, characters are drawn according to the character-to-character space/proportional spacing determined for each character. When the character-to-character space is specified, drawing will take place according to the sum of the character-to-character space/proportional spacing determined for each character and the specified value.

When justification is selected for alignment, the character-to-character space setting is invalid. (The character-to-character space/proportional spacing is automatically increased or decreased depending on the character size.)



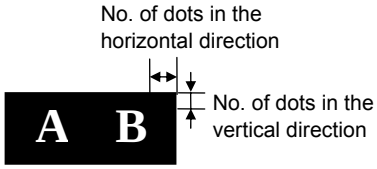
(6) Rotational angles of a character and character string



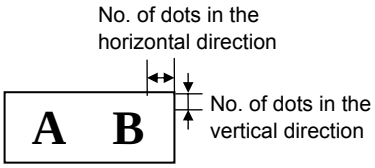
0° (00) 90° (11) 180° (22) 270° (33)

(7) Selection of character attribution

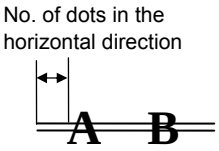
Black characters



Reverse characters



Boxed characters



Stroke-through

(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. When modulus 10 is designated and the data includes any data other than numerals, the data string will not be drawn. When modulus 43 is designated and the data includes any character other than CODE39, the drawing is not performed.

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 designed only for Deutsche Bundespost Postdienst.

(9) 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), such 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

● Increment/decrement for letters and numerals

Up to 40 digits (including letters, numerals, and symbols) of data can be incremented/decremented. Only numerals are selected and calculated for incrementing/decrementing, and are returned to the previous position to draw the data.

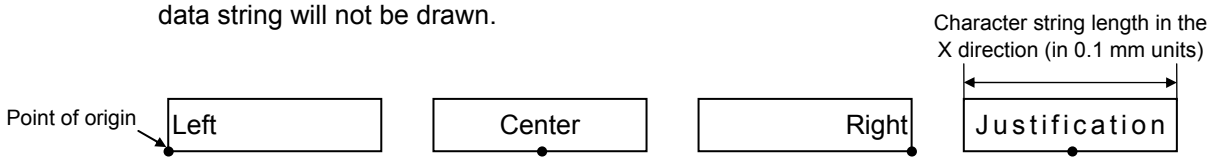
Example of increment/decrement calculation

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 to be suppressed	0	1	2	2	3	4	5
Data	0000	0000	0000	0A12	0123	0123	0123
Print	0000	␣␣␣0	␣␣00	␣A12	␣123	0123	0123

The leading zero(s) in a data string is replaced by a space(s) according to the designated number of digits. However, if the number of digits to be suppressed is greater than that of the data string, the data string will be drawn without zero suppression. When the data string exceeds the maximum number of digits (40), the data string will not be drawn.



(11) Alignment

If characters do not fit in a line when default justification is designated, the character width is automatically calculated. When the character width becomes narrower than the lower limit of outline font (2 mm), the field is not drawn. (The previous data for the same field is not drawn, also.)

(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. However, when the font type is any of "26" to "30", the maximum number of digits is 127. If the number of digits exceeds the maximum value, the overflowing data will be discarded.

For the character code table, refer to "CHARACTER CODE TABLE".

(13) Link field No.

The link field No. can be set by designating it after a semicolon ";". After the link field No. is designated in the Format Command, a data string is linked with the field No. by the Link Field Data Command to draw the data in this field.

Up to 20 fields can be linked.

The following shows an example data fields and data strings are linked and printed on a two-column label.

[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]

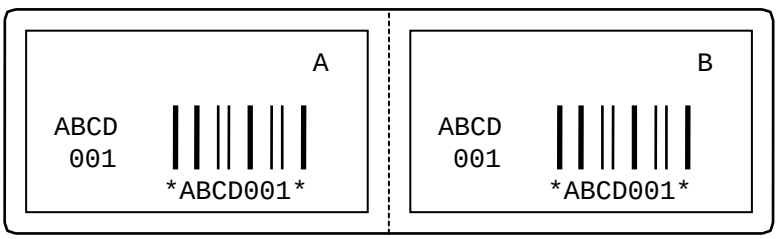
[ESC] RV; A [LF] B [LF] ABCD [LF] 001 [LF] [NUL]

Data for link field No. 4

Data for link field No. 3

Data for link field No. 2

Data for link field No. 1



Notes

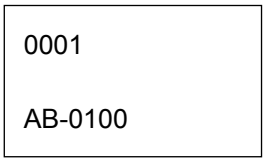
(1) The check digit attachment, increment/decrement, and zero suppression are performed according to the following priority. If any of the conditions are improper, no drawing will take place. (For example, the zero(s) is replaced by a space(s) as a result of zero suppression but the modulus 10 cannot be calculated though the attachment of modulus 10 is specified.)

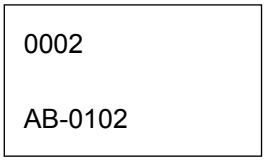
Increment/decrement > zero suppression > attachment of check digit

(2) Up to 32 fields to which increment/decrement is to be applied can be drawn. If the total number of increment/decrement fields including bitmap font, outline font and bar code exceeds 32, drawing will take place without incrementing/decrementing any excess field. The increment/decrement in the field will be continued until the Image Buffer Clear Command ([ESC] C) is sent.

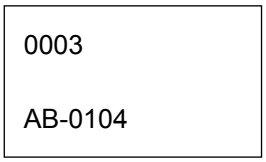
[Example]

1) Format Command (Character string No. 001 is incremented (+1))
2) Format Command (No increment is specified for character string No. 002)
3) Format Command (Character string No. 003 is incremented (+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)

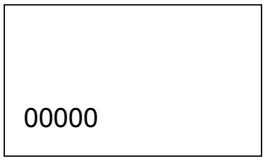




9) Issue Command (1 label)



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



(3) The Bit Map Font Format Command can be connected to the Outline 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) When the print data is variable for each label, the print data for the previous label is automatically cleared by specifying a different character string number to print next data. Therefore, a different character string number shall be linked with each drawing field. Since the automatic field clear is not performed between the Clear Command ([ESC] C) and Issue Command ([ESC] XS), the fixed data can be drawn using the same character string number. In this case, the Format Command and Data Command shall be sent alternately. (After the Issue Command is sent, the fields linked with the same character string number are automatically cleared until the Clear Command is sent.)

(5) When adjacent characters overlap each other due to a character-to-character space fine adjustment, the outline font is not filled properly. Program the fine adjustment value so that characters will not overlap. Also, when an outline font is printed over other drawing data, such as lines or characters, the outline font is not filled properly. For font types A and B, the fine adjustment value shall be set so that other drawings do not overlap the field where the outline font is to be drawn. For font types C, E, F and G, the fine adjustment value shall be set so that other drawings do not overlap the field of the designated character width and height.

(6) The link field designation can be released by formatting a label format again without specifying the link field for the same character string

The link field designation can also be released by the Image Buffer Clear Command.

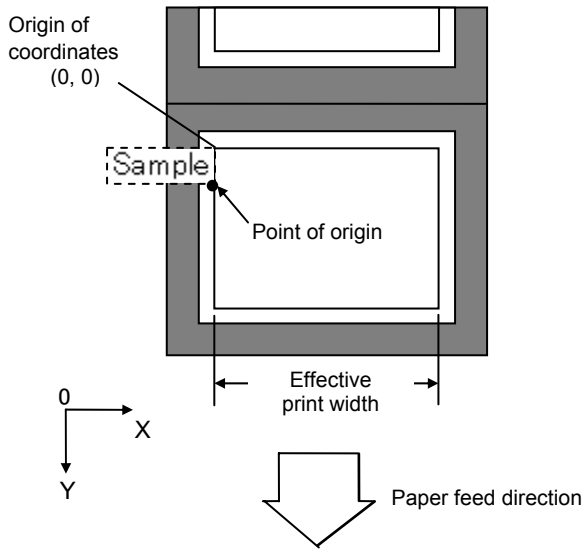
(7) Print data strings and link field Nos. cannot be programmed at the same time.

(8) When the reference coordinate is designated in units of 0.1 mm, actual print data may be drawn within ±1-dot allowance since a difference in the dot density is corrected.

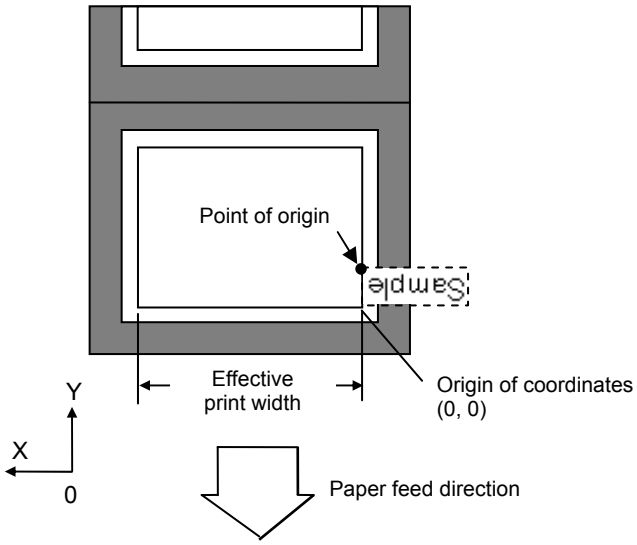
(9) When the outline fonts except TrueType fonts are designated, and if a part of a character string field is positioned outside the effective print range, printing is not guaranteed. Character string fields must be placed within the effective print range.

<Examples where a part of text field is positioned outside the effective print range>

Example 1: Character string rotation=0°, X-coordinate for the print origin=0mm, Alignment=Right

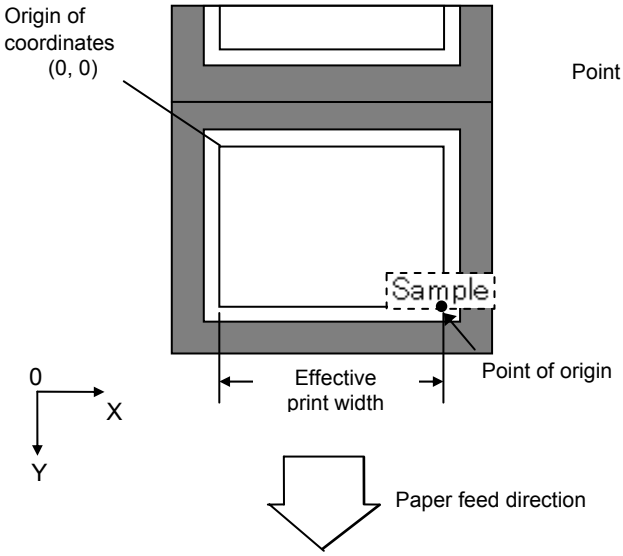


[Print direction: Bottom first]

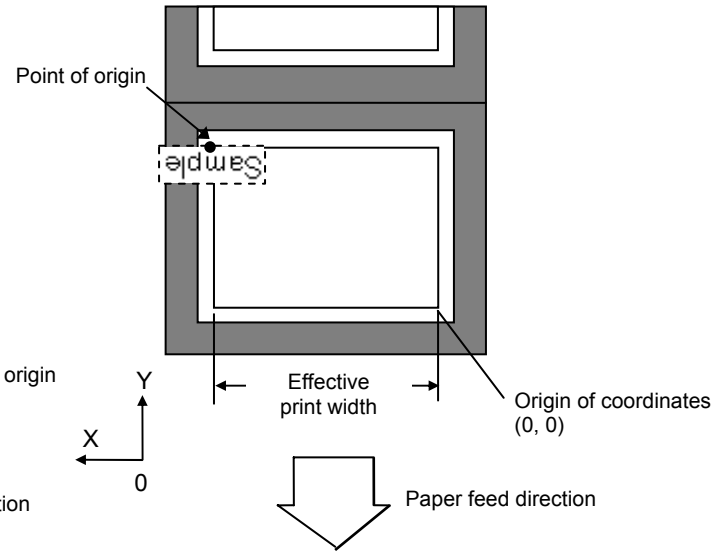


[Print direction: Top first]

Example 2: Character string rotation=0°, X-coordinate for the print origin=0mm, Alignment=Center



[Print direction: Bottom first]

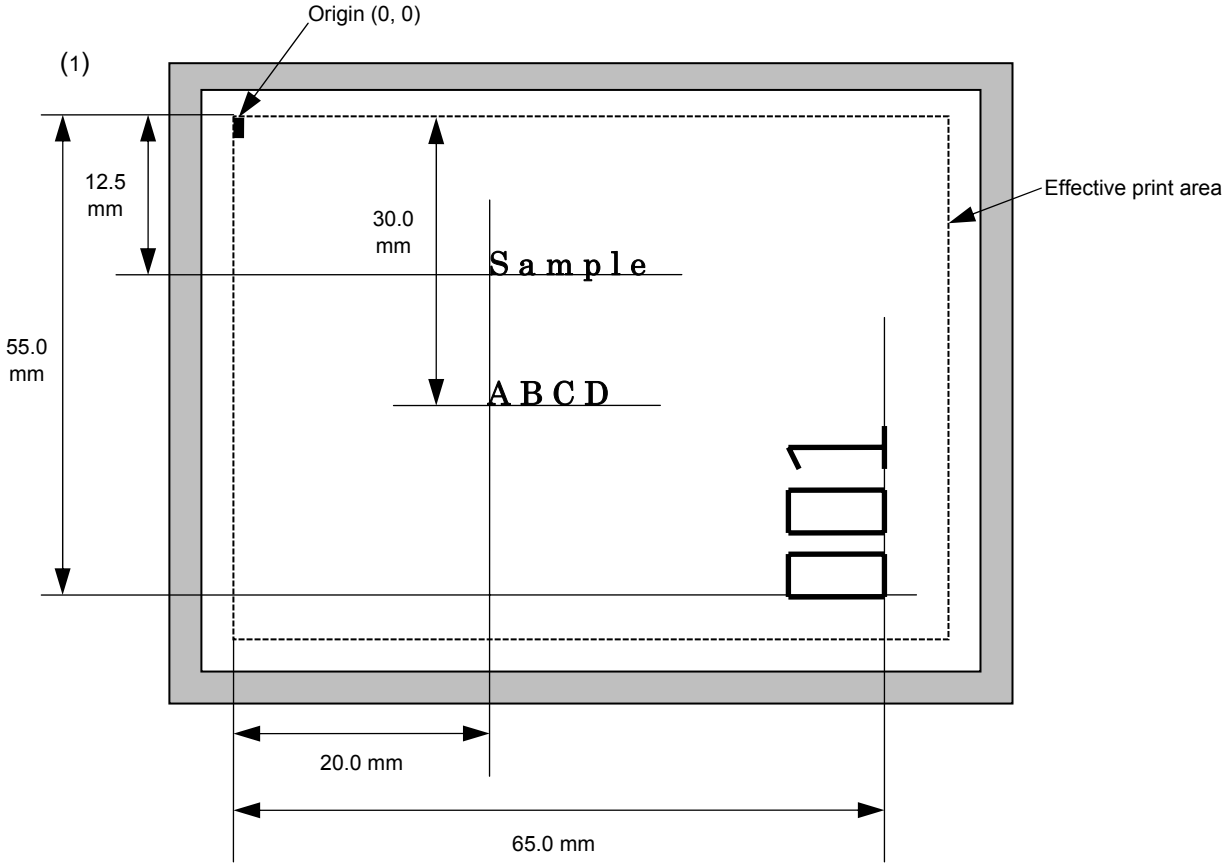


[Print direction: Top first]

Refer to

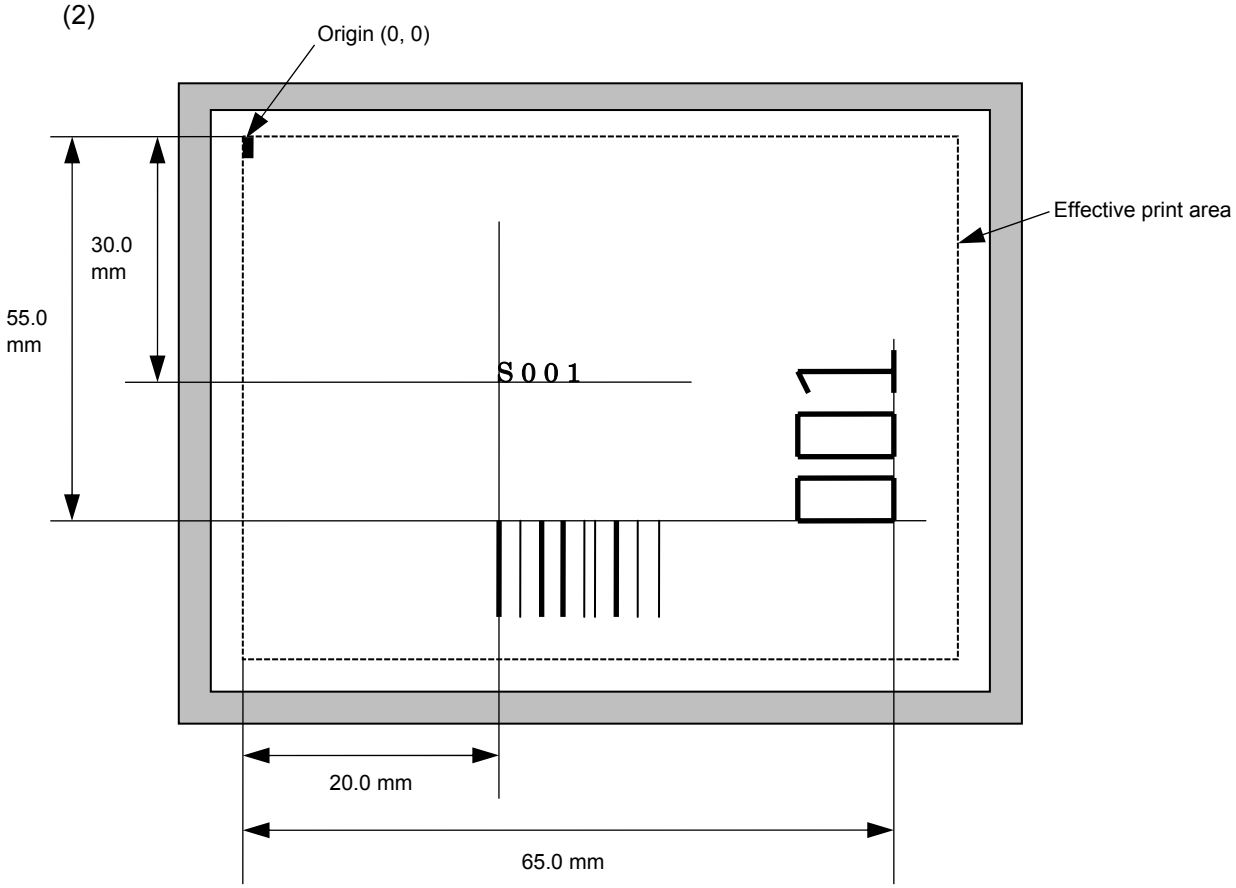
Outline Font Data Command ([ESC] RV)
Bit Map Font Format Command ([ESC] PC)
Bar Code Format Command ([ESC] XB)

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]

5.5.4 OpenType Font Setting Command [ESC] PS

Function Makes settings related to OpenType support. (Supported only by the B-EX6T1/T3.)

Format [ESC]PS;a,b,c(,d)[LF][NUL]

Term

a: Enable/Disable Bidirectional Algorithm
0: Disable Bidirectional Algorithm (Default)
1: Enable Bidirectional Algorithm

b: Unknown glyph character
0: A hollow box character (Default)
1: Space

c: Enable/Disable Character Shaping
0: Disable Character Shaping
1: Enable Character Shaping (Default)

Explanation

(1) The Bidirectional Algorithm is an implementation of the Unicode Bidirectional Algorithm. It is used for formatting texts containing LTR and RTL characters. If no RTL characters are being printed, then disabling this option is recommended.

(2) Character Shaping is required for Middle Eastern, Indic and several South-East Asian scripts like Thai. If not printing such scripts, it is recommended to disable this option. However, when using Text direction settings (LTR, RTL, TTB, BTT) in [ESC] PV shaping should be enabled. If shaping is disabled then the co-ordinates for print image may differ from the expected output.

Notes

(1) Setting will remain until printer is turned off.

5.5.5 BAR CODE FORMAT COMMAND [ESC] XB

Function: Sets a format to specify where and how to print a bar code on a label.

⊙ 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 for the print origin of the bar code
Fixed to 4 digits (in 0.1 mm units)

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

d: Type of bar code
- 0: JAN8, EAN8
- 5: JAN13, EAN130j
- 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: Attaching no check digit

2: Check digit check

WPC	Modulus 10
CODE93	Modulus 47
CODE128	PSEUDO 103

3: Check digit auto 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 auto attachment (2)

WPC	Modulus 10 + Price C/D 4 digits

5: Check digit auto 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 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, KIX CODE, the height of the long bar is specified.

mnnnnnnnnnn: Increment/decrement

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

m: 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 prolonged.)

000 to 100 (in 0.1 mm units)

p: Whether or not to print numerals under bars

(Omissible. When omitted, the numerals under the bars are not printed.)

0: Not printed
1: Printed

qq: No. of digits to be zero-suppressed
(Omissible. When omitted, the 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 accepted.)
Up to 20 fields can be designated using commas.

* Omissible parameters shown in parentheses (such as “Increment/decrement”, “Whether or not to print numerals under bars” and “No. of digits to be zero-suppressed”) cannot be set for the postal codes (Customer bar code, POSTNET, RM4SCC, and 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 for the print origin of the bar code
Fixed to 4 digits (in 0.1 mm units)

cccc: Y-coordinate for the print origin of the bar code
4 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 auto 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 auto attachment (2)

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

5: Check digit auto attachment (3)

MSI	IBM modulus 11 + IBM modulus 10

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

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

* In the case of industrial 2 of 5, an element-to-element space width is specified.

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

ii: Wide space width
01 to 99 (in 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 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 the bar code
0000 to 1000 (in 0.1 mm units)

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

m: Whether to increment or decrement
+: Increment
-: Decrement

nnnnnnnnnn: Skip value
0000000000 to 9999999999

p: Whether or not to print numerals under bars
(Omissible. When omitted, the numerals under the bars are not printed.)
0: Not printed
1: Printed

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

r: 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 accepted.)
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(,ijjjjjjjjjj,kk)(,Sll)(=sss------sss)[LF][NUL]

[ESC]XBaa;bbbb,cccc,d,e,ff,g,hhhh(,Muuu------uuu,vwww------www)(,Sll)(=sss------sss)[LF][NUL]

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

[ESC]XBaa;bbbb,cccc,d,e,ff,g,hhhh(,Muuu------uuu,vwww------www)(,Sll)(;tt_1,tt_2,tt_3,------,tt_{20})[LF][NUL]

Term

aa: Bar code number
00 to 31

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

cccc: Y-coordinate for the print origin of the bar code
4 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 (Truncated)
2: GS1 DataBar Stacked
3: GS1 DataBar Stacked Omnidirectional
4: GS1 DataBar Limited
5: GS1 DataBar Expanded
6: GS1 DataBar Expanded Stacked
7: UPC-A
8: UPC-E
9: EAN-13
A: EAN-8
B: UCC/EAN-128 with CC-A or CC-B
C: UCC/EAN-128 with CC-C

* When a composite component is printed, the linear bar code data is separated from the 2D code data with "|" (7CH).
Data = Linear bar code data | 2D code data

ff: 1-module width
01 to 15 (in dots)
* This data is also used for the height of a row of 2D codes.
Height of a row = (1-module width x 2) dots

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

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

When "0000" is set for the bar code height, no bar code (including guard bar) and numerals under bar are printed. A bar code printed on the previous label is cleared. Although the bar code height can be set as you like, it is preferable to set the recommended height for each bar code.

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

i: Whether to increment or decrement
+: Increment
-: Decrement

jjjjjjjjj: Skip value
0000000000 to 9999999999

* Increment/decrement cannot be specified when the mask pattern increment/decrement parameter is specified. When this parameter is set, the mask pattern increment/decrement will be ignored.

* Depending on the bar code type, data that cannot be printed may be generated. In that case, the mask pattern increment/decrement shall be used.

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

Muuuuu ------ uuuuu: Mask pattern increment/decrement
(Omissible. When omitted, mask pattern incrementing/decrementing is not performed.)

O or o:	Octal number
D or d:	Decimal number
H:	Hexadecimal number (Capital alphabet letters)
h:	Hexadecimal number (Small alphabet letters)
A:	Alphabet (Capital alphabet letters)
a:	Alphabet (Small alphabet letters)
N:	Alphanumerals (Capital alphabet letters)
n:	Alphanumerals (Small alphabet letters)
%:	Skip character

* Mask pattern increment/decrement cannot be specified when the increment/decrement parameter is specified. When the increment/decrement parameter is set, the mask pattern increment/decrement will be ignored.
* Up to 40 digits can be specified.
* Up to 32 fields can be specified per label.

vwww ------ www: Mask pattern increment/decrement skip value (Omissible)

* Enabled only when the mask pattern increment/decrement parameter is set.

v: Whether to increment or decrement
+: Increment
-: Decrement

www ------ www: Skip value (It depends on the mask pattern character to be separate incremented/decremented.)

O or o:	0 to 7
D or d:	0 to 9
H:	0 to 9, A to F
h:	0 to 9, a to f
A:	A to Z
a:	a to z
N:	0 to 9, A to Z
n:	0 to 9, a to z
%:	0

* Up to 40 digits can be specified.
* When the number of digits of the mask pattern and that of the skip value do not match, the processing is performed from the right-most digit.
* When omitted, the lowest digit will be incremented by 1.

SII: Segment width (Omissible. When omitted, “04” is specified.)
02 to 22 (Even number only. Specifying an odd number causes a command error.)
This parameter is effective only when the version (type of GS1 DataBar) is set to “6: GS1 DataBar Expanded Stacked.”
Setting this parameter to ”22” makes the symbol look similar to the GS1 DataBar Expanded.

sss ------ sss: Data string to be printed (Omissible)
Max. 200 digits However, it varies depending on the type of bar code.
(Refer to the max. number of characters per bar code.)
The printer receives data up to the command terminator ([LF][NUL]), but may not print bar codes depending on the version because the number of effective characters and effective character code are different.

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

Explanation

Mask pattern increment/decrement

Example) Only the lowest 3 digits out of 10-digit data are to be incremented:
Mask pattern = M%%%%%%%DDD,+0000000001
ABC0000**123** → ABC0000**124** → … → ABC0000**998** → ABC0000**999** → ABC0000**001**
…

Mask pattern = M%%%%%%%DDN,+0000000001
ABC0000**12A** → ABC0000**12B** → … → ABC0000**99Y** → ABC0000**99Z** → ABC0000**000**

Example) Only the 4 digits in the middle of 10-digit data are to be incremented:
Mask pattern = M%%%hhhh%%%,+0000001000
000**1119**000 → 000**111a**000 → … → 000**ffffe**000 → 000**fffff**000 → 000**00000**000

Mask pattern = M%%%AAAA%%%,+0000001000
000**AAAA**000 → 000**AAAB**000→ … → 000**ZZZY**000 → 000**ZZZZ**000 → 000**AAAA**000

Example) Only the highest 3 digits out of 10-digit data are to be decremented:
Mask pattern = MAAA%%%%%%%,-0010000000
AAA0000123 → **ZZZ**0000123 → **ZZY**0000123 → … → **AAB**0000123 → **AAA**0000123

Mask pattern = Mooo%%%%%%%,-0010000000
000000012A → **777**000012A → **776**000012A → … → **001**000012A → **000**000012A

⊙ 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 for the print origin of the bar code
Fixed to 4 digits (in 0.1 mm units)

cccc: Y-coordinate for the print origin of the bar code
4 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 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 selected for the ECC type, the format ID designation is ignored. When any of the format IDs from 11 through 16 is designated, ECC200 is automatically selected for the ECC type (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, no connection is executed.)

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 accepted.)
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,i,jjjj(=lll------lll)[LF][NUL]

② [ESC]XBaa;bbbb,cccc,d,ee,ff,gg,i,jjjj(;mm_1,mm_2,mm_3,------,mm_{20})[LF][NUL]

Term

aa: Bar code number
00 to 31

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

cccc: Y-coordinate for the print origin of the bar code
4 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 dots)

gg: No. of columns
01 to 30

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

jjjj: Bar height per row
0000 to 0100 (in 0.1 mm units)

lll-----lll: Data string to be printed (Omissible)
Max. 2,000 digits

mm_1, mm_2, mm_3, ------, mm_{20}: Link field No. (Omissible)
01 to 99 (1 to 99 can also be accepted.)
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 for the print origin of the bar code
Fixed to 4 digits (in 0.1 mm units)

cccc: Y-coordinate for the print origin of the bar code
4 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 accepted.)
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 smaller number of code words is automatically selected. When the numbers of code words is equal, the smaller number of columns is 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 for the print origin of the bar code
Fixed to 4 digits (in 0.1 mm units)

cccc: Y-coordinate for the print origin of the bar code
4 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 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
3:: MicroQR code (Selectable only when the High density level is set for the error correction level.)

Kj: Mask number
(Omissible. When omitted, the number is automatically set.)
● QR code:
j = 0 to 7: Mask number 0 to 7
8: No mask
● MicroQR code:
j = 0 to 3: Mask number 0 to 3
4 to 7: Automatically set
8: No mask

Jkkllmm: Connection setting (Omissible. When omitted, no connection is executed.)
kk = 01 to 16: Number indicating the connection order
ll = 01 to 16: Number of divided codes
mm = 00 to FF: A value for all data (before divided) to be printed, to which XOR is applied in units of bytes

* This parameter will be ignored when MicroQR code is selected.

nnn --- nnn: Data string to be printed (Omissible)
Model 1 or 2: Max. 2000 digits
MicroQR code: Max. 35-digit number, Max. 21-digit alphabet, Max. 15-byte binary data, or 9-character Kanji (2 byte character)

oo_1 --- oo_{20}: Link field No. (Omissible)
01 to 99 (1 to 99 can also be accepted.)
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 for the print origin of the bar code
Fixed to 4 digits (in 0.1 mm units)

cccc: Y-coordinate for the print origin of the bar code
4 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 setting is set to “TYPE1: Compatible with the current version” in the system mode:
  Default: 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 setting is set to “TYPE2: Special specification” in the system mode:
  Default: 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 shall be determined depending on the country code of the data command. When the country code is 840, select Mode 2. For other codes than 840, select Mode 3.

Jffgg: Connection setting (Omissible. When omitted, no connection is executed.)
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 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 for the print origin of the bar code
Fixed to 4 digits (in 0.1 mm units)

cccc: Y-coordinate for the print origin dinate of the bar code
4 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%

"0" (No designation) is selectable only when the number of code characters is specified. If "0 (No designation)" is selected without specifying the number of code characters, the CP code will not be printed. After the characters are encoded in accordance with the number of code characters specified, the remaining code areas are filled with ECC characters.

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

g: No. of character bits
0: Set automatically
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 of code for encoding the CP code.

1 character occupies a 3×3 square block.
When a value for "jj" larger than "ii" is set, 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 accepted.)
Up to 20 digits can be designated using commas.

⊙ In the case of RFID (Data write)

Function

Writes 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)(,Mg)(,Ph)(,Fi)(,Tff)(,Djj)(,Gk)(,Cl)(,Smmmm)(,Ennnn)(,Roooooooo)(,Kpppppppp)(,Lqq or ,Labcde)(,Jrrrrrrrr)(,Vs)(,Btt)(,uvvvvvvvvvv)(,Hxyyyyyyyy· · ·) (,Qzabcdef· · ·)(,Xghhhhhhhh· · ·)(,Uc)(=www------www)[LF][NUL]

② [ESC]XBaa;bbbb,cccc,d(,Aeee)(,Mg)(,Ph)(,Fi)(,Tff)(,Djj)(,Gk)(,Cl)(,Smmmm)(,Ennnn)(,Roooooooo)(,Kpppppppp)(,Lqq or ,Labcde)(,Jrrrrrrrr)(,Vs)(,Btt)(,uvvvvvvvvvv)(,Hxyyyyyyyy· · ·)(,Qzabcdef· · ·)(,Xghhhhhhhh· · ·)(,Uc)(;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 (data write)

Aeee: Address where the data is written (Omissible. When omitted, 0 is set.)
000 to 999
* Designates the address where data starts to be written.
* This parameter is ignored when the tag type is Gen2 tag and the parameter Btt (area where the data is written) is set to 01 (Bank1) or omitted.

Mg: Format of U-Code V1.19 (Omissible)
0: SGTIN 96 format
1: SSCC96 format
2: (Reserved)
* When the format of U-Code V1.19 is designated, the specified address, where the data is written, will become invalid.
* When this parameter is omitted, the U-Code V1.19 format is not used.
* Printer operation is not guaranteed when 2 (Reserved) is selected.

Ph: Partition number (Omissible)
0 to 6
This parameter is effective only when U-Code V1.19 or EPC format is designated. When omitted, 5 will be set.

Fi: Filter number (Omissible)
0 to 7
This parameter is effective only when U-Code V1.19 or EPC format is designated. When omitted, 0 will be set.

Tff: Tag type (Omissible)

00: None
11: I-Code
12: Tag-it
13: C220
14: ISO15693
15: C210
16: C240
17: C320
21: (Reserved)
22: (Reserved)
23: (Reserved)
24: EPC Class 1 Generation 2

Designates a type of RFID tag onto which data is written.
When omitted, the tag type set in the system mode will be designated.
The tag type specified with this command will be reflected in the system mode setting. However, when “00: NONE” is designated, the backed up tag type will be selected and the system mode setting will not be changed.

Djj: EPC format (Omissible)

00: No format (Default)
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: Data is set in ASCII and encoded in hexadecimal (Default)
1: Data is set in binary and encoded in hexadecimal
2: Data is set and encoded in hexadecimal
3: Data is set in ASCII and encoded in hexadecimal (with separator)
4: Data is set in binary and encoded in hexadecimal (with separator)
5: Data is set and encoded in hexadecimal (with separator)

To use a separator, a colon “:” (3AH) shall be inserted 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. (Default))

1: Enabled. (On-the-fly issue is performed.)

When “1: Enabled” is designated, writing data onto an RFID tag and printing on the surface of label are performed at the same time.
It is possible to program the positions where RFID data write is started and ended during printing using the following parameters. (For details, refer to [Explanation] (21) Explanation for RFID, ④ On-the-fly issue in Section 5.5.4 Bar Code Format Command.)

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 equal 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 for tags.
This parameter is effective only for EPC Class 1 Generation 2 tag type.

Kpppppppp: Kill password setting (Omissible)
Fixed to 8-digit hexadecimal number
00000000 to FFFFFFFF

Sets a kill password for tags.
This parameter is effective only for EPC Class 1 Generation 2 tag type.

<In the case of Lqq (2 digits)>

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

	Kill password	Access password	EPC code	TID	User data
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
64	(Reserved)				

Designates the areas to be locked. When omitted, no areas are locked.
This parameter is effective only for EPC Class 1 Generation 2 tag type.
Permanent lock: Areas are permanently non-writable.
Permanent unlock: Areas are permanently non-lockable.

<In the case of Labcde (5 digits)> (Supported by U2 module's firmware version #00T or later and the U4 module)

Labcde: Lock/unlock setting (Omissible)

a: Kill password
0: None
1: Unlock
2: Permanent unlock
3: Lock
4: Permanent lock

b: Access password
0: None
1: Unlock
2: Permanent unlock
3: Lock
4: Permanent lock

c: EPC bank
0: None
1: Unlock
2: Permanent unlock
3: Lock
4: Permanent lock

d: TID bank
0: None
1: Unlock
2: Permanent unlock
3: Lock
4: Permanent lock

e: User data
0: None
1: Unlock
2: Permanent unlock
3: Lock
4: Permanent lock

When parameters “a” to “e” are all set to 0, nothing is performed.
Example) To set the EPC bank to “Lock” and the user data to “Permanent lock”:
,L00304

Designates the areas to be locked. When omitted, no areas are locked.
This parameter is effective only for EPC Class 1 Generation 2 tag type.
Permanent lock: Areas are permanently non-writable.
Permanent unlock: Areas are permanently non-lockable.

Jrrrrrrrr: Access password entry (Omissible)
Fixed to 8-digit hexadecimal number
00000000 to FFFFFFFF
Enables accesses to the password-protected tags.
This parameter is effective only for EPC Class1 Generation 2 tag type.

Vs: Reserved.

Btt: Reserved.

uvvvvvvvvvv: Whether to increment or decrement (Omissible. When omitted, incrementing/decrementing is not performed.)

u: Whether to increment or decrement
+: Increment
-: Decrement

vvvvvvvvvv: Skip value (10 digits)
0000000000 to 9999999999

Hxyyyyyyyy: Reserved.

Qzabcdef: Reserved.

Xghhhhhhhh: Reserved.

Uc: EPC data write

0: Only EPC data is written. (Default)

1: PC + EPC are written.

The EPC data size shown in the PC must be the same as the actual EPC data size. (Proper data write is not guaranteed when they are different.)

Example:

{XB01;0000,0000,r,T24,G2,B01,U1=3000112233445566778899 00AABB|}

{XB01;0000,0000,r,T24,G2,B01,U1=480011223344556677889900AABBCCDDEEFF1122|}

NOTE: When only EPC is specified with this parameter set to 1, NULL will be written in the excess part.

Example:

When PC+EPC data is 3000112233445566778899 00AABBCCDDEEFF1122…: Sending the command {XB01;0000,0000,r,T24,G2,B01,U1=4800|} results in the writing PC+EPC data of 480011223344556677889900AABB000000000000…

2: PC + EPC are written

Data is written even if EPC data size shown in the PC differs from the actual EPC.

Example:

{XB01;0000,0000,r,T24,G2,B01,U2=3000112233445566778899 00AABBCCDDEEFF1122|}

{XB01;0000,0000,r,T24,G2,B01,U2=480011223344556677889900AABB|}

It is possible to write PC only.

Example:

{XB01;0000,0000,r,T24,G2,B01,U2=3000|}

{XB01;0000,0000,r,T24,G2,B01,U2=4800|}

NOTE: This parameter is effective in the following cases:

- EPC Class1 Generation 2 tag type
- 01 (EPC area) is selected for parameter B (area where the data is written).

When this parameter is set, parameters M and D become invalid.

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 accepted.)

Up to 20 fields can be designated using commas.

Explanation

(1) When the CALIB. MODE of the UHF setting is enabled in the printer system mode, the printer will automatically feed RFID media forward/backward for the distance specified by CALIB. POSITION parameter of the UHF setting, before writing/ reading RFID tag.

* This function is supported by the B-EX4T1-G/T-QM/CN C1.4 or later.
* For details of CALIB. MODE and CALIB. POSITION parameters, refer to the Key Operation Specification.

⊙ 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(,Neeee)(,Afff)(,Tgg)(,Ih)(,Jiiiiiii)(,Xjkkkkkkkk · · ·)(,Ui)[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.
When parameter Ih (RFID read mode) is set to 2 or 4 with Gen2 tag specified, this parameter will be ignored.

Afff: Address where the data is read (Omissible. When omitted, 0 is set.)
000 to 999
Designates the address where data starts to be read.
When parameter Ih (RFID read mode) is set to 2 or 4 with Gen2 tag specified, this parameter will be ignored.

Tgg: Tag type (Omissible)
00: None
11: I-Code
12: Tag-it
13: C220
14: ISO15693
15: C210
16: C240
17: C320
21: (Reserved)
22: (Reserved)
23: (Reserved)
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.
The tag type specified by this command will be reflected in the system mode setting. However, 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.
4: All data in the TID bank area of EPC C1 Gen2 tag is read. (Only when the U2/U4 module is used.)
5: User bank area of EPC C1 Gen2 tag is read in accordance with parameters N and A. (Only when the U2/U4 module is used.)

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.
Specifying 4 or 5 when using the H1 or H2 module causes a tag read to fail.

Jiiiiiiii: Access password entry (Omissible)

Fixed to 8-digit hexadecimal number
00000000 to FFFFFFFF
Enables accesses to the password-protected tags.
This parameter is effective only for EPC Class 1 Generation 2 tag type.

Xjkkkkkkkk: Reserved.

Ui:EPC data read

0: Only EPC data is read. (Default)
1: PC + EPC are read.
EPC data equivalent to the data size specified in the PC is read.
Example:
When PC+EPC data is 3000112233445566778899 00AABBCCDDEEFF1122…
Sending the command {XB01;0000,0000,f,I2,U1|} results in reading the data of 3000112233445566778899 00AABB.
2: PC + EPC are read.
PC + all EPC data is read.
Example:
When PC+EPC data is 3000112233445566778899 00AABBCCDDEEFF1122…
Sending the command {XB01;0000,0000,f,I2,U2|} results in reading the data of 3000112233445566778899 00AABBCCDDEEFF1122

NOTE: This parameter is effective in the following cases:
- EPC Class1 Generation 2 tag type
- 2 (Tag ID only) or 3 (Both tag ID and user data) is selected for parameter I.

Explanation

(1) The parameter, “Number of bytes to be read”, is effective only when RFID read mode is set to 1, 3, or 5 as this parameter is intended for reading user data. When reading tag ID, 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 an RFID data read failed with RFID (data read) being specified by this command, the printer will retry to read data after sending a void pattern printing end status (36H 30H) or result in an error and stop after sending an RFID write error status (36H 31H).

SOH	01H	Indicates the header of the status block
STX	02H	
Status	34H	Printer status
	32H	
Status type	34H	Indicates the end of an RFID read and issue.
Remaining count	3XH	Remaining number of labels to be printed
	3XH	
	3XH	
	3XH	
Tag type	XXH	30H30H: RFID read failed. 31H31H: I-Code 31H32H: Tag-it 31H33H: C220 31H34H: ISO15693 31H35H: C210 31H36H: C240 31H37H: C320 32H34H: EPC Class 1 Generation 2
	XXH	
Length	XXH	RFID data length
	XXH	
RFID data	XXH	Tag ID + User data * Data to be read is different depending on the RFID read mode setting.
	XXH	
	⋮	
	XXH	
	XXH	
ETX	03H	Indicates the terminator of the status block.
EOT	04H	
CR	0DH	
LF	0AH	

(4) When an access password designated with this command and the one actually set for the tag do not match, data write to a tag is disabled. However, a data read can be performed.
(In the case of read-locked Hibiki tags, a data read is also disabled.)

(5) When the CALIB. MODE of the UHF setting is enabled in the printer system mode, the printer will automatically feed RFID media forward/backward for the distance specified by CALIB. POSITION parameter of the UHF setting, before writing/reading RFID tag.

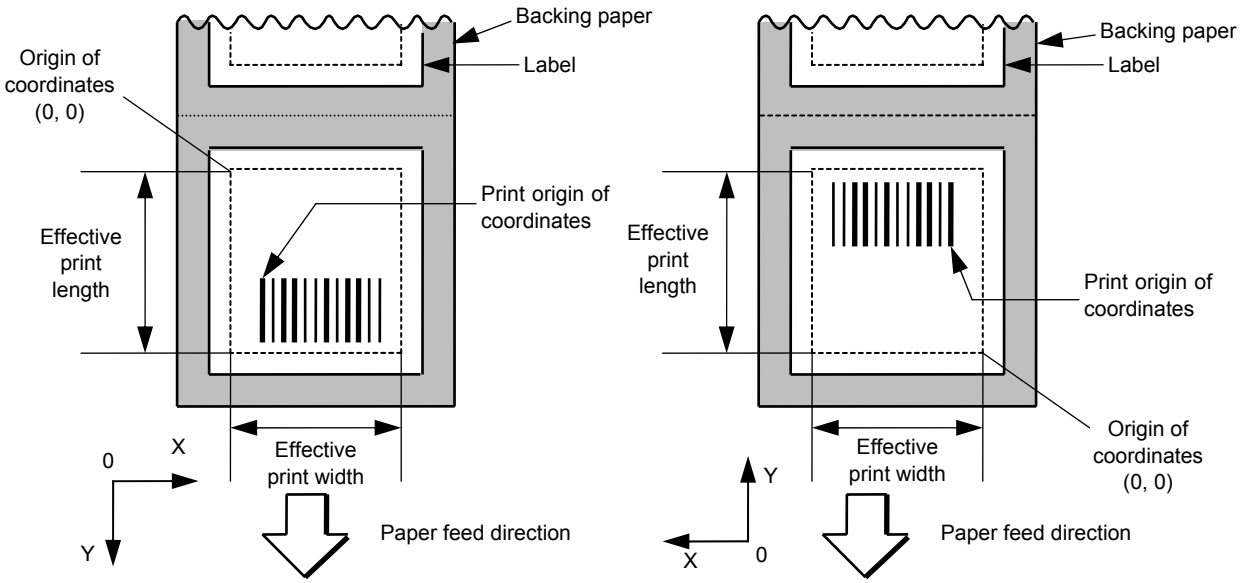
* This function is supported by the B-EX4T1-G/T-QM/CN C1.4 or later.
* For details of CALIB. MODE and CALIB. POSITION parameters, refer to the Key Operation Specification.

⊙ Comprehensive explanation of bar code format command

(1) Bar code number

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

(2) Print origin of coordinates



[Print direction: Bottom first] [Print direction: Top first]

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

(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

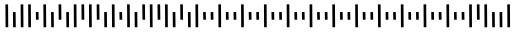
P: PDF417

Q: Data Matrix

R: Customer bar code

S: Highest priority customer bar code

T: QR code



U: POSTNET

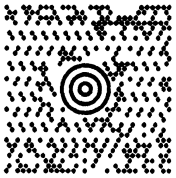
V: RM4SCC

W: KIX code

X: MicroPDF417

Y: CP Code

Z: MaxiCode



b: GS1 DataBar family

<When no compound composite is printed>

GS1 DataBar (Truncated)

GS1 DataBar Stacked

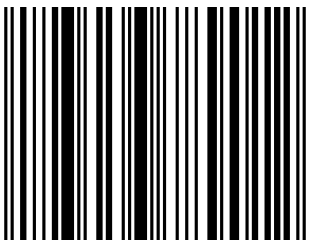
GS1 DataBar Stacked Omnidirectional

GS1 DataBar Limited

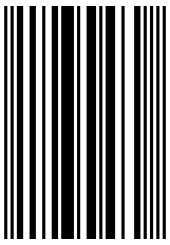
GS1 DataBar Expanded Stacked

GS1 DataBar Expanded

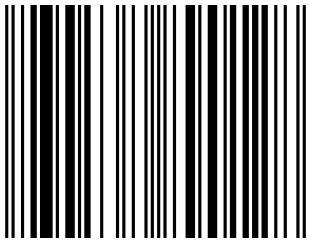
UPC-A



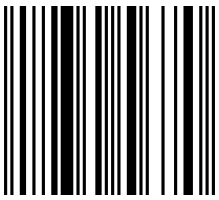
UPC-E



EAN-13



EAN-8



UCC/EAN-128 with CC-A or CC-B or CC-C

<When a compound composite is printed>

GS1 DataBar (Truncated)

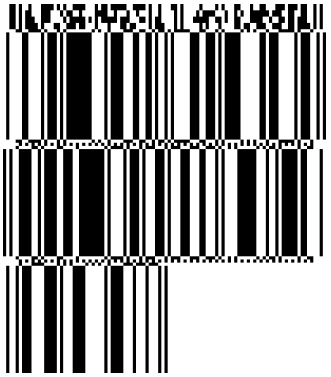
GS1 DataBar Stacked

GS1 DataBar Stacked Omnidirectional

GS1 DataBar Limited

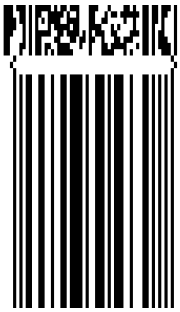
GS1 DataBar Expanded

GS1 DataBar Expanded Stacked

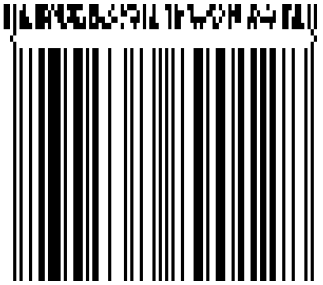


UPC-A

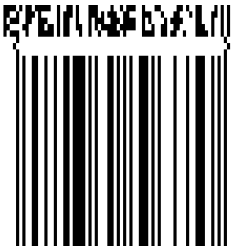
UPC-E



EAN-13



EAN-8



UCC/EAN-128 with CC-A or CC-B

UCC/EAN-128 with CC-C

Applicable composite components to each bar code version

Bar code version (Detailed type)	Composite component version		
	CC-A MicroPDF417 variant	CC-B MicroPDF417	CC-C PDF417
GS1 DataBar	✓	✓	-
GS1 DataBar Truncated	✓	✓	-
GS1 DataBar Stacked	✓	✓	-
GS1 DataBar Stacked Omnidirectional	✓	✓	-
GS1 DataBar Limited	✓	✓	-
GS1 DataBar Expanded	✓	✓	-
UPC-A	✓	✓	-
UPC-E	✓	✓	-
EAN-13	✓	✓	-
EAN-8	✓	✓	-
UCC/EAN-128 with CC-A or CC-B	✓	✓	-
UCC/EAN-128 with CC-C	-	-	✓

Selection between CC-A (MicroPDF417 variant) and CC-B (MicroPDF417) is automatically performed
Refer to “Max. number of data digits” in Chapter 11 (14) GS1 DataBar Expanded/GS1 DataBar Expanded Stacked.

(4) Type of check digit

① When “Attaching no check digit” is selected, the bar code will be drawn for the data string.

② When “Check digit check” is selected, the check digit is checked according to the type of bar code. A bar code is drawn when the check result is acceptable, and a bar code is not drawn. If the check digit is not proper.

③ When “Check digit auto attachment” is selected, a bar code is drawn with the check digit attached according to the type of bar code.

④ When 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 When the type of bar code is JAN, EAN, or UPC, the designation of “Attaching no check digit” is automatically changed to the “Check digit check.”

⑥ DBP Modulus 10 is Modulus 10 designed only for Deutsche Bundespost Postdienst.

⑦ When the type of bar code is MSI and.Check digit auto attachment (3): IBM Modulus 11 + IBM Mldulus 10 is designated, the calculation of IBM Modulus 10 may result in 10. In this case, no bar code symbol will be drawn for such data.

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

The bar, space, and character-to-character space widths shall be specified according to the type of bar code. Note that the proper value differs depending on the rotational angle of bar code, type, number of digits, print speed, paper used, etc.

Setting examples are shown below.
In the case of JAN, EAN, UPC, CODE93, CODE128, UCC/EAN128, PDF417, or MicroPDF417, a 2 to 6-module width is automatically calculated when a 1-module width is designated.

[Example of setting]

203 dpi (1 dot=1/8 mm):

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	3		6		9		12		-		-	
CODE93	2		4		6		8		-		-	
CODE128, EAN128	2		4		6		8		-		-	
PDF417	2		4		6		8		10		12	
MicroPDF417	2		4		6		8		10		12	

Type of bar code	Narrow		Wide		Character-to-character space
	Bar	Space	Bar	Space	
MSI	2	2	6	6	0
ITF	2	2	6	6	0
CODE39	2	2	6	6	2
NW7	2	2	6	6	2
Industrial 2 of 5	2	2	6	0	2
MATRIX 2 of 5	2	2	6	6	2

300 dpi (1 dot=1/11.8 mm)/305 dpi (1 dot=1/12 mm):

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

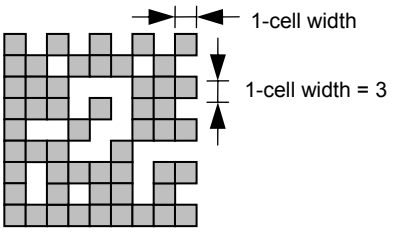
When the space character for NW7 is sent, its width will be equivalent to (narrow space ×12) dots. In this case, the max. space width is 255 dots.

600 dpi (1 dot=1/23.6 mm)

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	8		16		24		32		--		--	
CODE93	6		12		18		24		---		---	
CODE128, EAN128	6		12		18		24		---		---	
PDF417	6		12		18		24		30		36	
MicroPDF417	4		8		12		16		20		24	

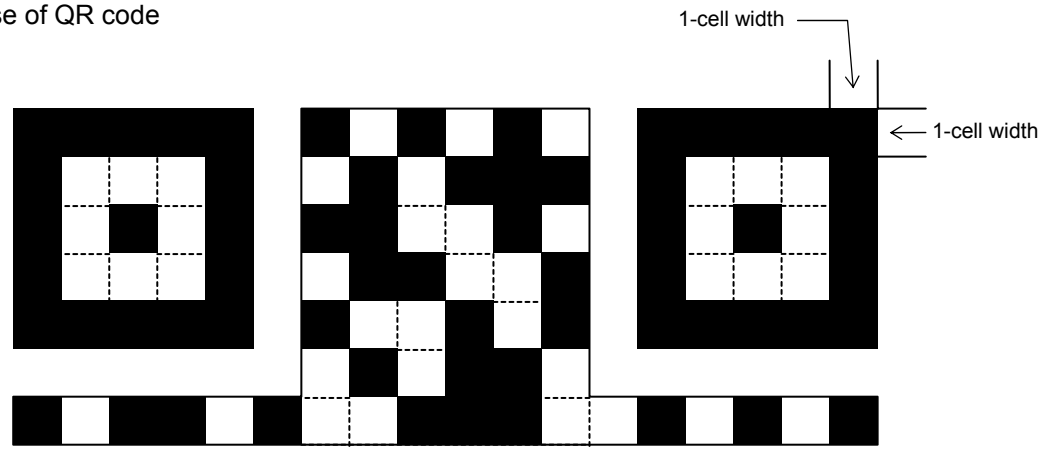
Type of bar code	Narrow		Wide		Character-to-character space
	Bar	Space	Bar	Space	
MSI	6	6	16	16	0
ITF	6	6	16	16	0
CODE39	6	6	16	16	6
NW7	6	6	16	16	6
Industrial 2 of 5	6	6	16	0	6
MATRIX 2 of 5	6	6	16	16	6

In the case of Data Matrix or CP code



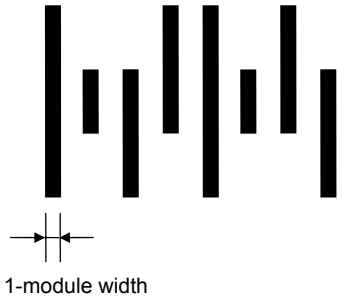
When 1-cell width is set to “00” for the Data Matrix or CP code, a two-dimensional code is not drawn. However, the two-dimensional code for the previous label is cleared.

In the case of QR code

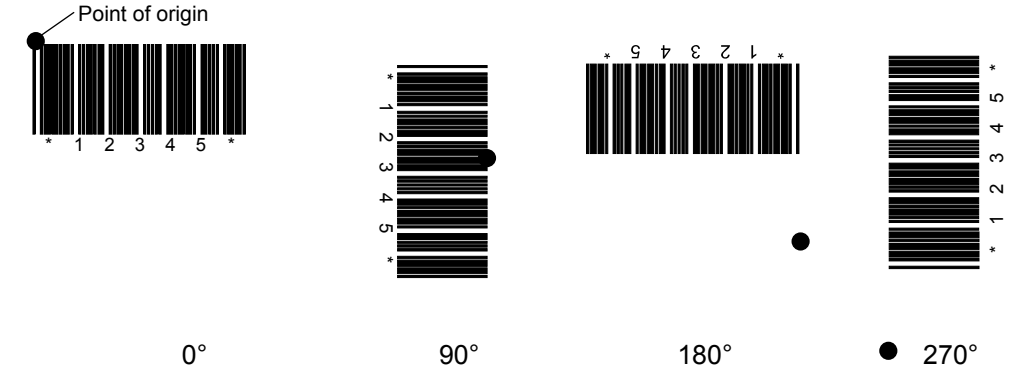


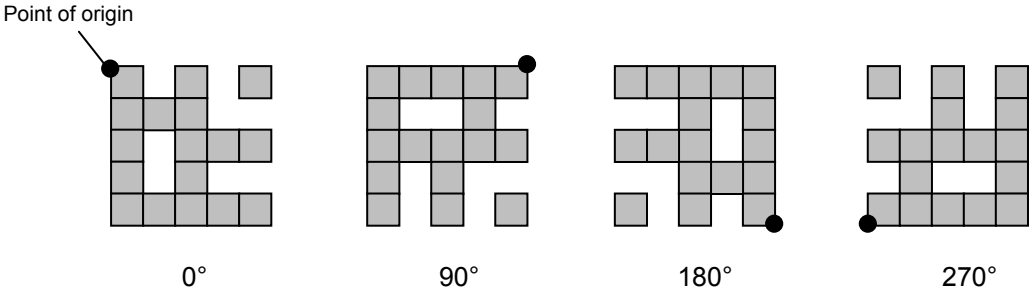
When the 1-cell width is set to “0”, a two-dimensional code is not drawn. However, the bar code for the previous label is cleared.

In the case of a postal code

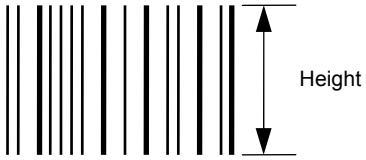


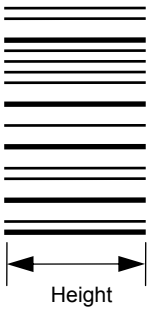
(6) Rotational angle of bar code





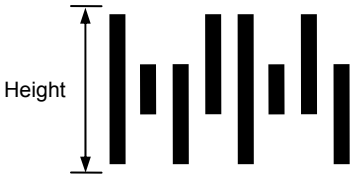
(7) Bar code height





[PDF417, MicroPDF417]

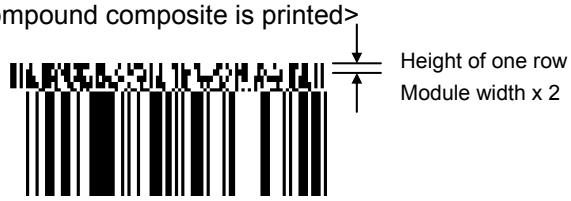
[Postal code]



[GS1 DataBar]

<When no compound composite is printed>

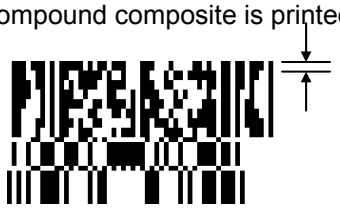
<When a compound composite is printed>



[GS1 DataBar Stacked]

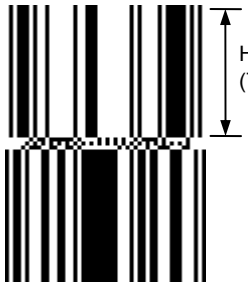
<When no compound composite is printed>

<When a compound composite is printed>

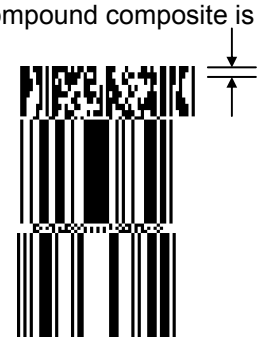


[GS1 DataBar Stacked Omnidirectional]

<When no compound composite is printed>



<When a compound composite is printed>



[GS1 DataBar Limited]

<When no compound composite is printed>

<When a compound composite is printed>

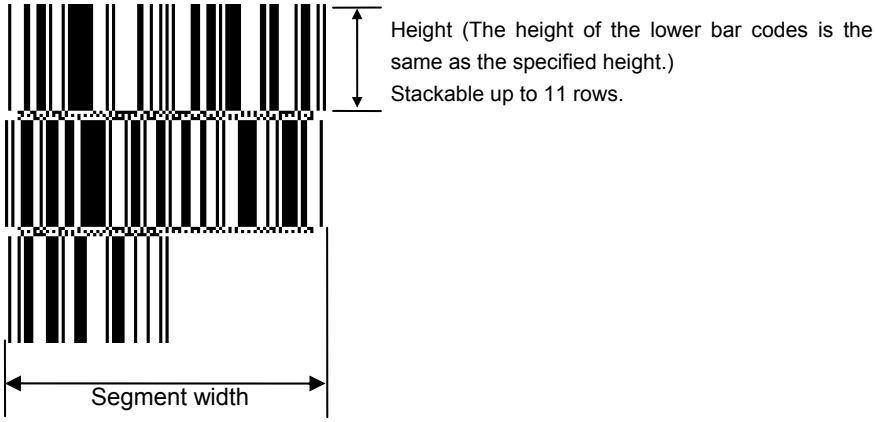
[GS1 DataBar Expanded]

<When no compound composite is printed>

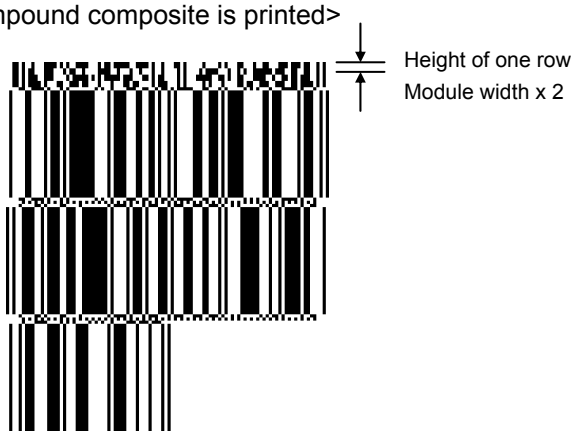
<When a compound composite is printed>

[GS1 DataBar Expanded Stacked]

<When no compound composite is printed>

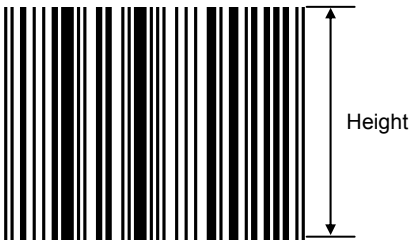


<When a compound composite is printed>

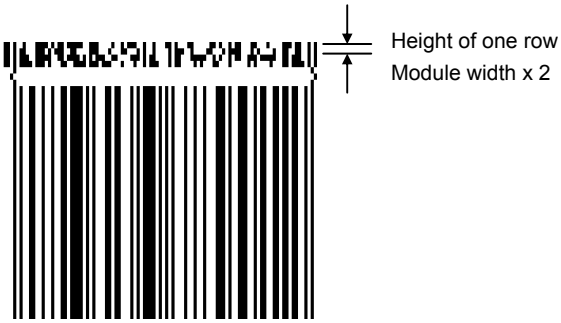


[UPC-A]

<When no compound composite is printed>

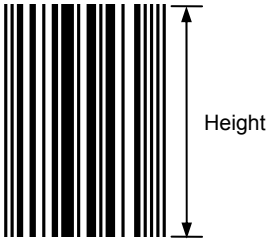


<When a compound composite is printed>

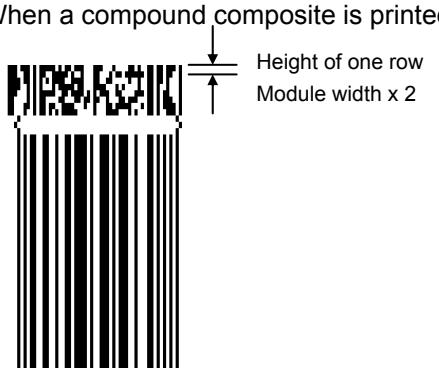


[UPC-E]

<When no compound composite is printed>

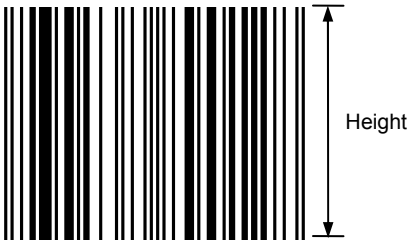


<When a compound composite is printed>



[EAN-13]

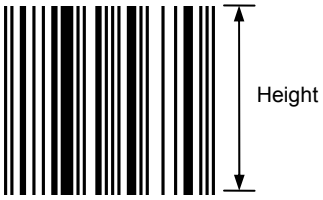
<When no compound composite is printed>



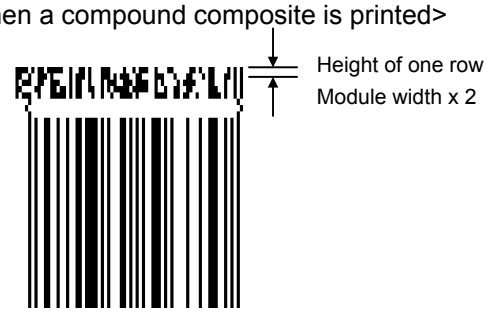
<When a compound composite is printed>

[EAN-8]

<When no compound composite is printed>



<When a compound composite is printed>



[UCC/EAN-128 with CC-A, CC-B, or CC-C]

<When no compound composite is printed>

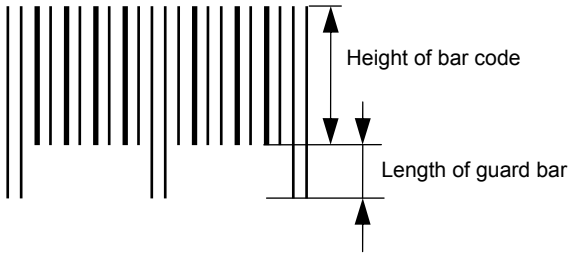
<When a compound composite is printed: UCC/EAN-128 with CC-A or CC-B>

<When a compound composite is printed>

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

This parameter is valid only when the type of bar code is WPC. It is ignored in all other cases.



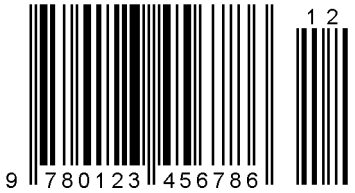
(9) Numerals under bars

Numerals are/are not provided under bars depending on the parameter specifying whether or not to print numerals under bars. The data of numerals under bars to be printed varies according to the type of bar code. The character set for numerals under bars is OCR-B. Such numerals are enlarged or reduced only in the horizontal direction according to the width of the bar code. The vertical scale factor is fixed to one magnification.

[Drawing positions of numerals under bars]

① JAN and EAN

(Example) EAN13 + 2 digits



(Example) EAN8

② UPC

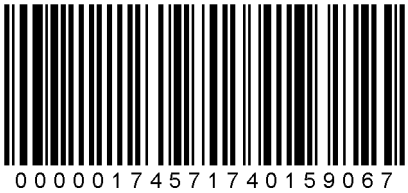
(Example) UPC-A + 2 digits

(Example) UPC-E

③ 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 or NW7.
- When this parameter is designated, whether or not the stop code and the start code are attached to the print data to be sent is not checked.
- When the parameter is omitted for CODE39 or NW7, start and stop codes will be attached. The code to be added is "*" in the case of CODE39, and "a" in the case of NW7.
- For details, refer to "AUTOMATIC ADDITION OF START/STOP CODES".

(11) 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), such data string will not be drawn.

When CODE128 (without auto code selection) is used, the start codes (code A, code B, and code C) are regarded as 2-digit values each.

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

● Increment/decrement for letters and numerals

For CODE39 (standard), CODE39 (full ASCII), NW-7, CODE93, CODE128, increment/decrement is performed even when a data string other than numerals is included in the data. 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) of data can be incremented/ decremented. Only numerals are selected and calculated for incrementing/decrementing, and 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. When the data string to be calculated is a numeral and the next (upper) digit is “>”, which means the data is a special code (shown with underline below). The next digit is calculated without incrementing/decrementing these two digits.

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 to be suppressed							
Data	0000	0000	0000	0A12	0123	0123	0123
Print	0000	␣␣␣	␣␣ 0	␣ A12	␣ 123	0123	0123

The leading zero(s) in a data string is replaced by a space(s) according to the designated number of digits. However, if the number of digits to be suppressed is greater than that of the data string, the data string will be drawn without zero suppression. When the data string exceeds the maximum number of digits (40), the data string will not be drawn.

When the print data including start and stop codes are sent, the start and stop codes are also counted in the number of digits. When the bar code type is JAN, EAN, UPC, UPC/EAN128, MSI, Interleaved 2 of 5 (ITF), Industrial 2 of 5, MATRIX 2 of 5 for NEC, or GS1 DataBar (GS1 DataBar Expanded and GS1 DataBar Expanded Stacked are excluded), the data will be drawn without 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 details about the codes, refer to "BAR CODE TABLE".

(14) Link field No.

The link field No. can be set by designating it after a semicolon ";". After the link field No. is designated in the Format Command, a data string is linked with the field No. by the Link Field Data Command to draw the data in this field. Up to 20 fields can be linked.
The following shows an example data fields and data strings are linked and printed on a two-column label.

[Format Command]

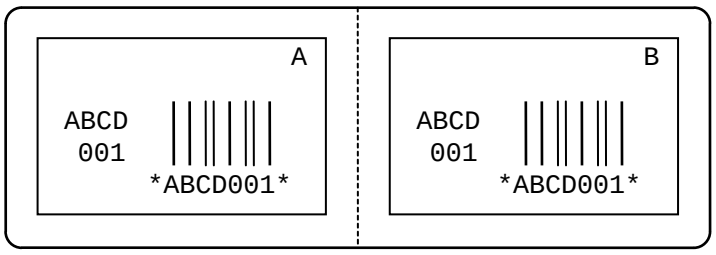
[ESC] PC01;	; 01 [LF] [NUL]	:	Link field No. 1 is designated.
[ESC] PC02;	; 03 [LF] [NUL]	:	Link field No. 3 is designated.
[ESC] PC03;	; 04 [LF] [NUL]	:	Link field No. 4 is designated.
[ESC] XB01;	; 03, 04 [LF] [NUL]	:	Link fields No. 3 and No. 4 are designated.
[ESC] PC04;	; 02 [LF] [NUL]	:	Link field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

Data for link field No. 4
Data for link field No. 3
Data for link field No. 2
Data for link field No. 1



(15) Explanation for Data Matrix

① ECC type

Data Matrix has a function to correct a code reading error and restore the erroneous data to normal data with the error correction code (ECC). Since there are several ECCs, it is required to choose an ECC suitable for the 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 alphanumerals, symbols and Kanji. Since data compression rate varies according to 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	Alphanumerals, symbols	0 to 9 A to Z space . , - /
4	Alphanumerals	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 or format ID.
Since each Kanji character uses 2 bytes, the maximum number of digits for Kanji 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 next page.

④ Connection setting

If data cannot be expressed with only a two-dimensional code, it is possible to divide the code into more than one two-dimensional code. In such case, a division number, such as 1/3, 2/3, and 3/3, is inserted into each two-dimensional code. If more than two-dimensional code for different data is printed on one label, setting the ID number enables the divided codes to connect to each other properly. For example, when there are two different data to be encoded into two codes 1/2 and 2/2, respectively, and printed on the same label, combination of two-dimensional codes is confusable. However, addition of the ID number helps avoid this problem.

Cell size and the effective data capacity

Symbol size		ECC000			ECC050			ECC080			ECC100			ECC140		
Row	Col	Numeric capacity	Alphanumeral capacity	8-bit byte capacity	Numeric capacity	Alphanumeral capacity	8-bit byte capacity	Numeric capacity	Alphanumeral capacity	8-bit byte capacity	Numeric capacity	Alphanumeral capacity	8-bit byte capacity	Numeric capacity	Alphanumeral 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	Alphanumeral 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	Alphanumeral 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 has a function to correct a code reading error and restore the erroneous data to normal data with the error correction code word. Since there are several security levels, it is required to choose a suitable one for the usage.

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

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

The number of rows is variable in the PDF417. The row length (No. of data columns) is also variable. Therefore, a symbol can be created in a form that can be easily printed, by changing the proportion of the height and width.

The number of columns varies in a range from 1 to 30.

If the number of columns is too small in spite of large data amount or high security level, drawing may not be performed. This is because reducing the number of columns causes the number of rows to exceed 90. (The number of rows for PDF417 shall be within a range from 3 to 90.)

For the MicroPDF417, not only the number of columns, but also the number of rows can be specified. For the setting method, refer to the table provided on the previous page. Note that the max. number of digits for the set parameter (gg) varies depending on the character type. If the data exceeds the max. number of digits set for the parameter (gg), a symbol is not printed. The number of columns varies in a range from 1 to 4.

The max. number of rows, which is 44, depends on the number of columns.

(17) Explanation for QR code

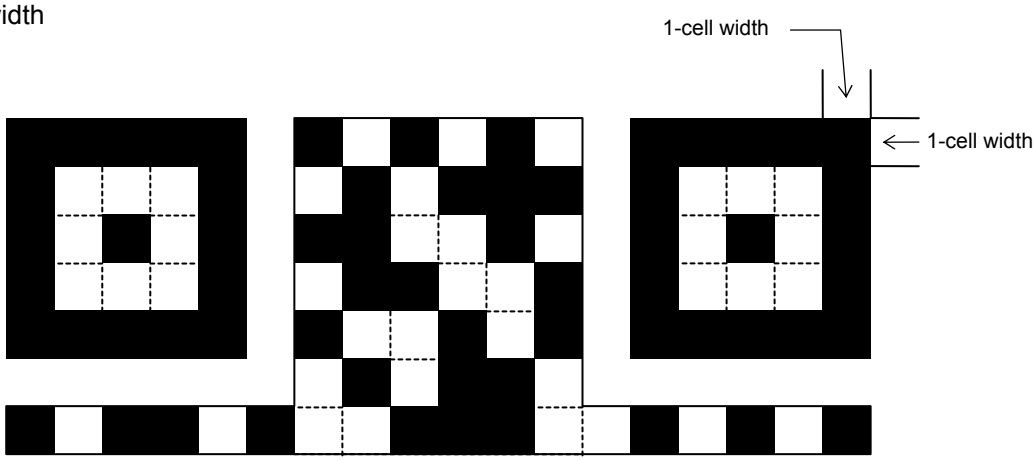
① Error correction level

The QR code has a function to detect and correct an error. If one of the data characters is damaged, the information can be restored when this code is read.

Since there are four error correction levels, it is required to choose suitable one for the usage. The general correction ability is as follows.

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

② 1-cell width



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

③ Selection of mode

QR code accepts all codes including alphanumerals, symbols and Kanji. Either 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 contain a large amount of data.

MicroQR code: Compact version of QR code

Data capacity per a max. size symbol is:

- Number: 35 digits
- Alphanumerals: 21 digits
- Binary data (8 bit): 15 bytes
- Kanji: 8 characters

⑤ Mask number

To ensure reading a QR code, it is preferable that white and black modules are arranged in this symbol in a balanced manner. This 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 for QR code or MicroQR code ranges from 0 to 7 or 0 to 3, respectively. The pattern is determined by placing the masking pattern for each 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

QR code can be divided into more than one symbol. This allows fitting entire code even in a narrow space. The code can be divided into up to 16. 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	Division No. 3	Parity data: 85	Data “0123”
Code No. 2	Division No. 3	Parity data: 85	Data “4567”
Code No. 3	Division No. 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

* Connection setting is ignored in the case of MicroQR code.

(18) Explanation for MaxiCode

① Connection setting

MaxiCode can be divided into up to 8 symbols.

(19) Explanation for CP code

① ECC (Error Correction Code) level

The CP code has a function to correct a code reading error and restore normal data with an error correcting code word. Since there are several error correction levels, it is required to choose suitable one for the usage.

The higher the percentage of the error correction code becomes, the higher the error correcting ability becomes.

When the number of code characters is specified by a user, all remaining areas are used for correcting errors. Therefore, “0” (No designation) can be selected as the ECC level.

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

② The number of bits per character

Data is compressed by using the 8-bit compression method. Selecting “0” also causes the data to 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 CP code, a 3×3 cell is considered as one block, and these blocks make up a CP code.
The number of characters in both X and Y directions can be set by a user.
When “0” is specified, the printer automatically sets the smallest code size in which the data set by the user can be contained.
The rectangular code is acceptable. In this case, the value in the Y direction shall be smaller than that in the X direction.
The number of cells per code is as follows.

(No. of code characters) × 3 + 2

(20) Explanation for GS1 DataBar

① When the command control code is manually set to “|” (0x7c) or a printable data code, printing of a GS1 DataBar is not guaranteed.

② When the increment/decrement is specified for the composite component, the data for both the linear bar code and the 2D code is incremented/decremented together across the “|” (0x7c).

Example) Increment

12345|ABC997 → 12345|ABC998 → 12345|ABC999 → 12346|ABC000 → 12346|ABC001

Example) Decrement

12345|ABC002 → 12345|ABC001 → 12345|ABC000 → 12344|ABC999 → 12344|ABC998

③ To disable incrementing/decrementing the data across the linear bar code and the 2D code, the mask pattern increment/decrement shall be used.

Example) Only the lowest 3 digits out of 10-digit data are to be incremented:
Mask pattern = M%%%%%%%DDD,+0000000001
12345|ABC997 → 12345|ABC998 → 12345|ABC999 → 12345|ABC000
→ 12345|ABC001……

Mask pattern = M%%%%%%%DDN,+0000000001
12345|ABC99X → 12345|ABC99Y → 12345|ABC99Z → 12345|ABC000
→ 12345|ABC001……

Example) Only the lowest 3 digits out of 10-digit data are to be decremented:
Mask pattern = M%%%%%%%DDD,+0000000001
12345|ABC002 → 12345|ABC001 → 12345|ABC000 → 12345|ABC999
→ 12345|ABC998……

Mask pattern = M%%%%%%%DDN,+0000000001
12345|ABC002 → 12345|ABC001 → 12345|ABC000 → 12345|ABC99Z

→ 12345|ABC99Y……

④ The max. bar code width is 542 modules of GS1 DataBar Expanded.

- When 1 module width is set to 1 dot: (25.4 mm/203 dpi) x 542 ≈ 67.8 mm
- When 1 module width is set to 2 dots, the bar code width will be 135.6 mm. In this case, a bar code does not fit into 4-inch print head width when it is printed at 0° or 180° rotation.

⑤ The max. bar code height is 373 modules of GS1 DataBar Expanded Stacked (11 rows) + 89 modules of the composite component (44 rows x 2 modules and 1-module separator)

- When 1 module width is set to 1 dot: (25.4 mm/203 dpi) x (373+88+1) ≈ 57.8 mm
- When 1 module width is set to 2 dots, the bar code height will be 115.6 mm. In this case, a bar code does not fit into 4-inch print head width when it is printed at 90° or 270° rotation.

(21) Explanation for RFID

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 or 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 or 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 BAR CODE TABLE.

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 no ribbon saving module is installed in the printer, the RFID tag paper may be jammed at the print head during a reverse feed. Even if the printer is provided with 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 tends to be 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 needs to feed the paper backward if a data write failed. 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 U-Code V1.19 and EPC format

When U-Code V1.19 or 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 U-Code V1.19 and EPC format are designated and both designations are incorrect, U-Code V1.19 takes precedence over the EPC format.
When U-Code V1.19 or EPC format is designated and the number of input digits of print data string is different from the size of the data to be formatted for the designated format, only the input data of designated size is formatted.
When the data string designated by the format is unsupported data, 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 is effective only for the EPC Class 1 Generation 2 tag type and is ignored for other tag types. This setting may not be effective for some of the EPC Class 1 Generation 2 tags.

⑧ Lock/unlock setting

This setting is effective only for the EPC Class 1 Generation 2 tag type and is ignored for other tag types. This setting may not be effective for some of the EPC Class 1 Generation 2 tags.

⑨ Access password entry

When the access password is entered to write data on an RFID, the printer prints the void pattern if the entered password and the access password for the RFID tag do not match. Note that data can be written on a password-protected tags even when an entry of the access password is omitted. However, an access password setting is disabled.
This setting is effective only for the EPC Class 1 Generation 2 tag type and is ignored for other tag types. This setting may not be effective for some of the EPC Class 1 Generation 2 tags.

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, the zero(s) is replaced by a space(s) as a result of zero suppression but the modulus 10 cannot be calculated though the attachment of modulus 10 is specified.)
Increment/decrement > zero suppression > attachment of check digit

(2) Up to 32 fields to which increment/decrement is to be applied can be drawn. If the total number of increment/decrement fields including bitmap font, outline font and bar code exceeds 32, drawing will take place without incrementing/decrementing any excess field. The increment/decrement in the field will be continued until the Image Buffer Clear Command ([ESC] C) is sent.

[Example]

① Format Command (Bar code No. 01 is incremented. (+1))
② Format Command (Bar code No. 02 is incremented. (+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 print data is variable for each label, the print data for the previous label is automatically cleared by specifying a different bar code number to print the next data. Therefore, a different bar code number shall be linked with each drawing field. Since the automatic field clear is not performed between the Clear Command ([ESC] C) and Issue Command ([ESC] XS), the fixed data can be drawn using the same bar code number. In this case, the Format Command and Data Command shall be sent alternately. (After the Issue Command is sent, the fields linked with the same bar code number are automatically cleared until the Clear Command is sent.)

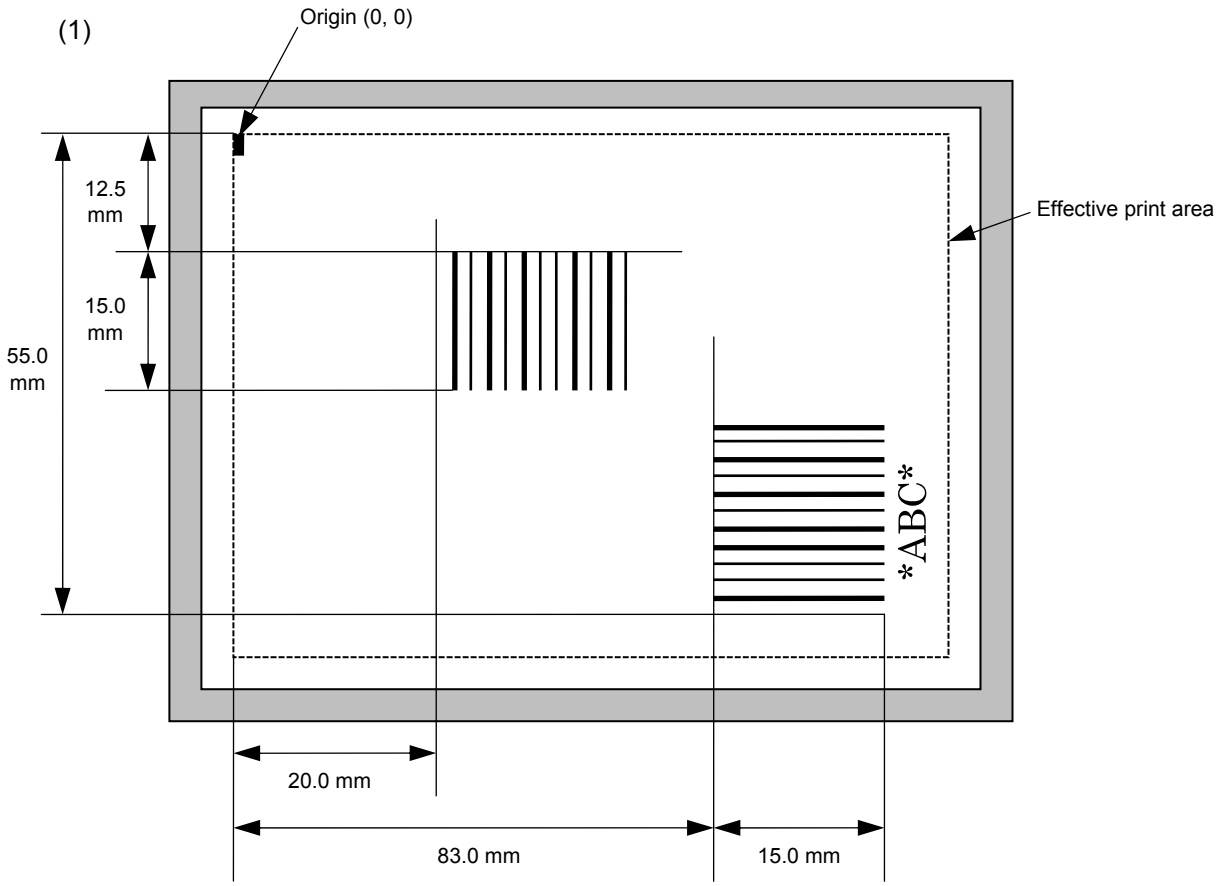
(5) The link field designation can be cleared by formatting a label format again without specifying the link field for the same bar code No.
The link field designation can also be cleared by the Image Buffer Clear Command.

(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)

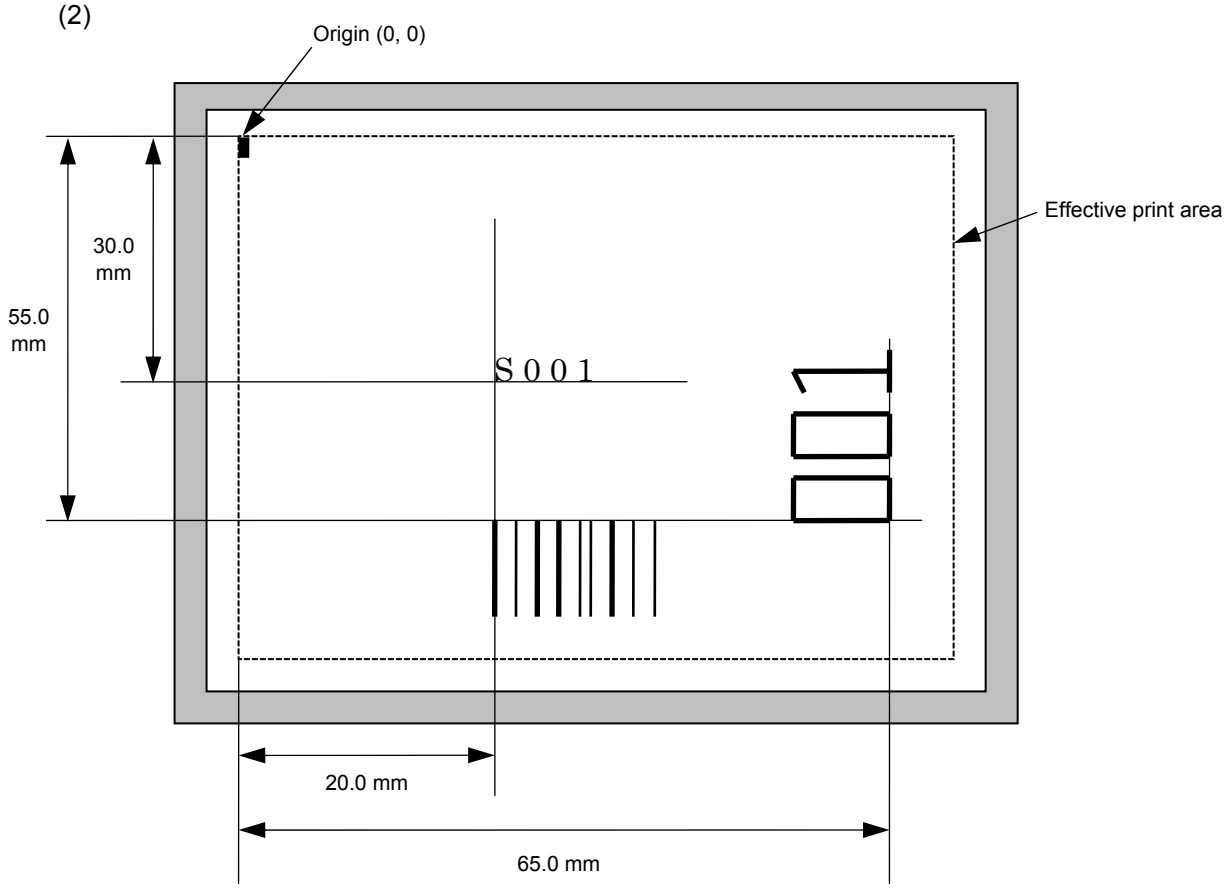
Examples

(1)



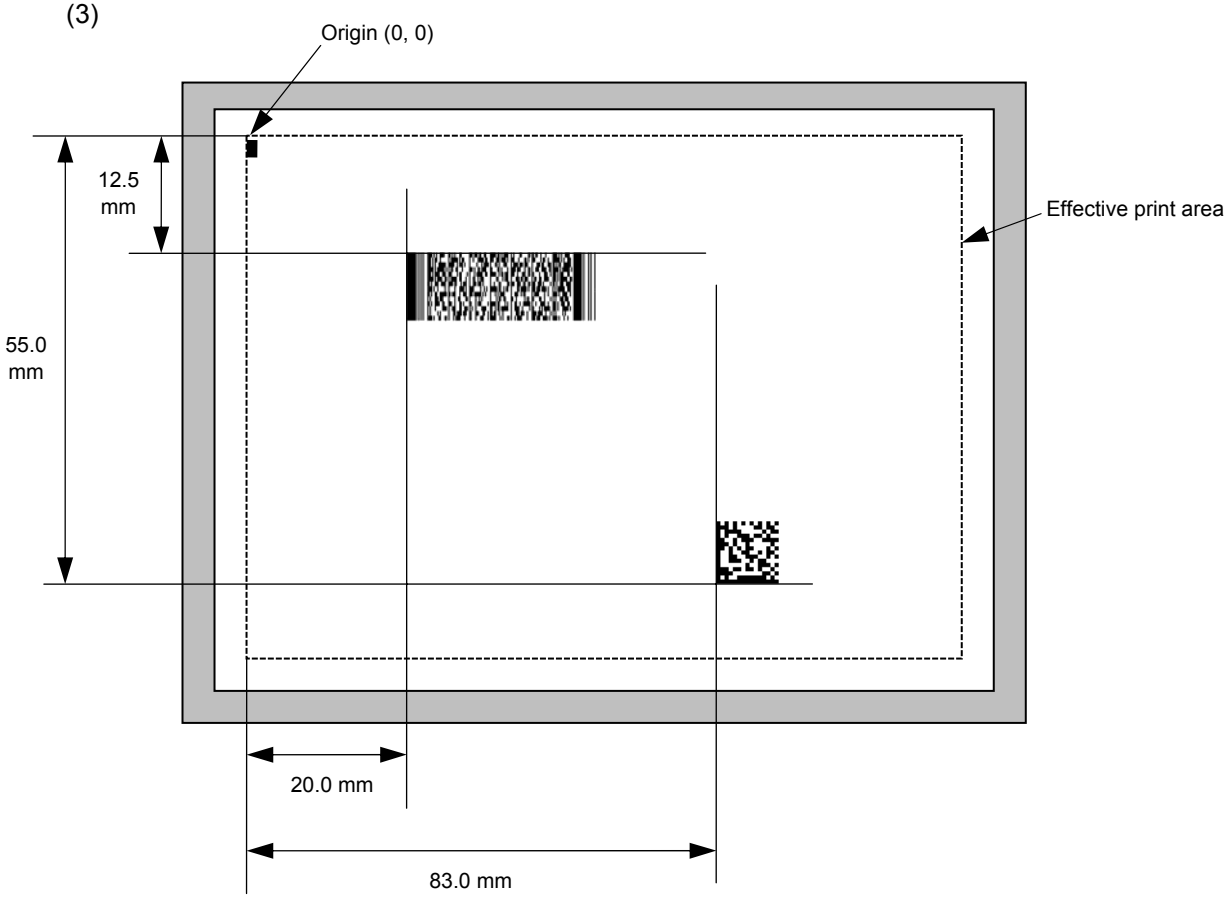
[ESC] C [LF] [NUL]
[ESC] XB01; 0200, 0125, 3, 1, 03, 03, 08, 08, 03, 0, 0150=12345 [LF] [NUL]
[ESC] XB02; 0830, 0550, 3, 1, 02, 04, 07, 08, 04, 3, 0150, +0000000000, 1, 00, N [LF] [NUL]
[ESC] RB02; *ABC* [LF] [NUL]
[ESC] XS; I, 0002, 0002C3000 [LF] [NUL]

(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]

5.6 COMMANDS RELATED TO PRINT DATA

5.6.1 BITMAP FONT DATA COMMAND [ESC] RC

Function Provides data for the bitmap font string.

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 099 (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 r, 51, 52, 53, 54, or 55.)
Any overflowing data will be discarded.
For the character codes, refer to “CHARACTER CODE TABLE”.
When unregistered writable character is called, the data will be replaced with spaces.

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

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

to

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

Note: If the Bit Map Font Data Command is sent without entering any data string for the specified number (e.g. [ESC]RC00;[LF][NUL]), the data string of the same character string number (No. 00 in the case of the above example) printed on the previous label is deleted.

Explanation (1) Link field data string

- After the link field No. is designated with the Format Command, the Link Field Data Command links data string with the designated field to print.
- Up to 255 digits of data strings can be linked. However, when the font type is r, 51, 52, 53, 54, or 55, only up to 127 digits can be linked.
  When the number of digits exceeds the maximum value, excess data will be discarded.
- Up to 99 data strings can be linked.
- The command length ([ESC] to [NUL]) of the Link Field Data Command is up to 2048 bytes.
- When the data string is omitted in the Link Field Data Command, the following processing is performed:
  ① No processing will be performed for the field to which no print data is linked 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 for Chinese character

- When the font type is r, Chinese character is selected. GB18030 can be printed.

(3) Chinese character code selection

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

① GB18030 (Chinese characters)

⊙ 20h to A0h: One-byte character Other codes: GB18030

A: Chinese character [中国]

[D6h] [D0h]	[B9h] [FAh]
中	国

B: Chinese character + One-byte character [中 ABC国 abc]

[D6h] [D0h]	[41h]	[42h]	[43h]	[B9h] [FAh]	[61h]	[62h]	[63h]
中	A	B	C	国	a	b	c

C: One-byte character [123ABC]

[31h]	[32h]	[33h]	[41h]	[42h]	[43h]
1	2	3	A	B	C

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

- The character code is specified in the manner described below.

① GB18030 (Chinese characters)

⊙ 20h to A0h: One-byte character Other codes: GB18030

A: Kanji [中国] + Writable character

[D6h] [D0h]	[B9h] [FAh]	[FAh] [A1h]
中	国	Writable character

B: Chinese character + One-byte character [中 ABC 国abc] + Writable character

[D6h] [D0h]	[41h]	[42h]	[43h]	[B9h] [FAh]	[61h]	[62h]	[63h]
中	A	B	C	国	a	b	c

[FAh] [A1h]
Writable character

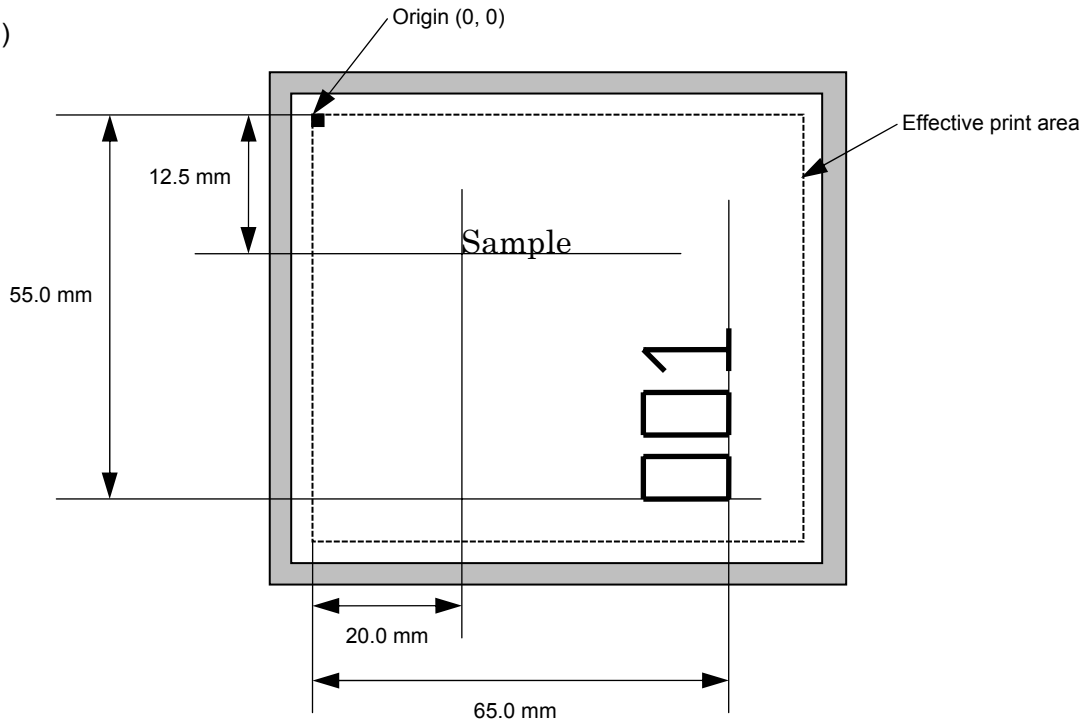
C: One-byte character [123ABC] + Writable character

[31h]	[32h]	[33h]	[41h]	[42h]	[43h]	[FAh] [A1h]
1	2	3	A	B	C	Writable character

Refer to Bitmap Font Format Command ([ESC] PC)

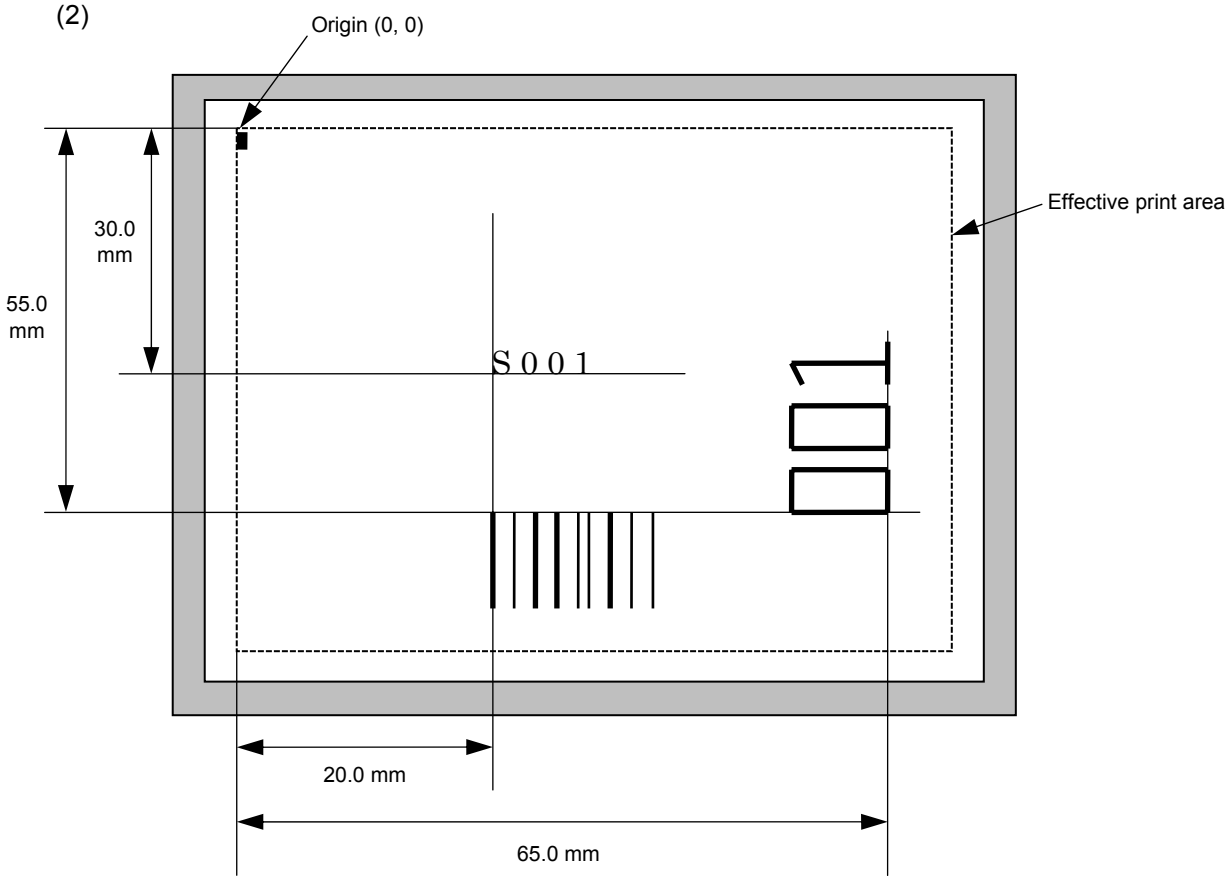
Examples

(1)



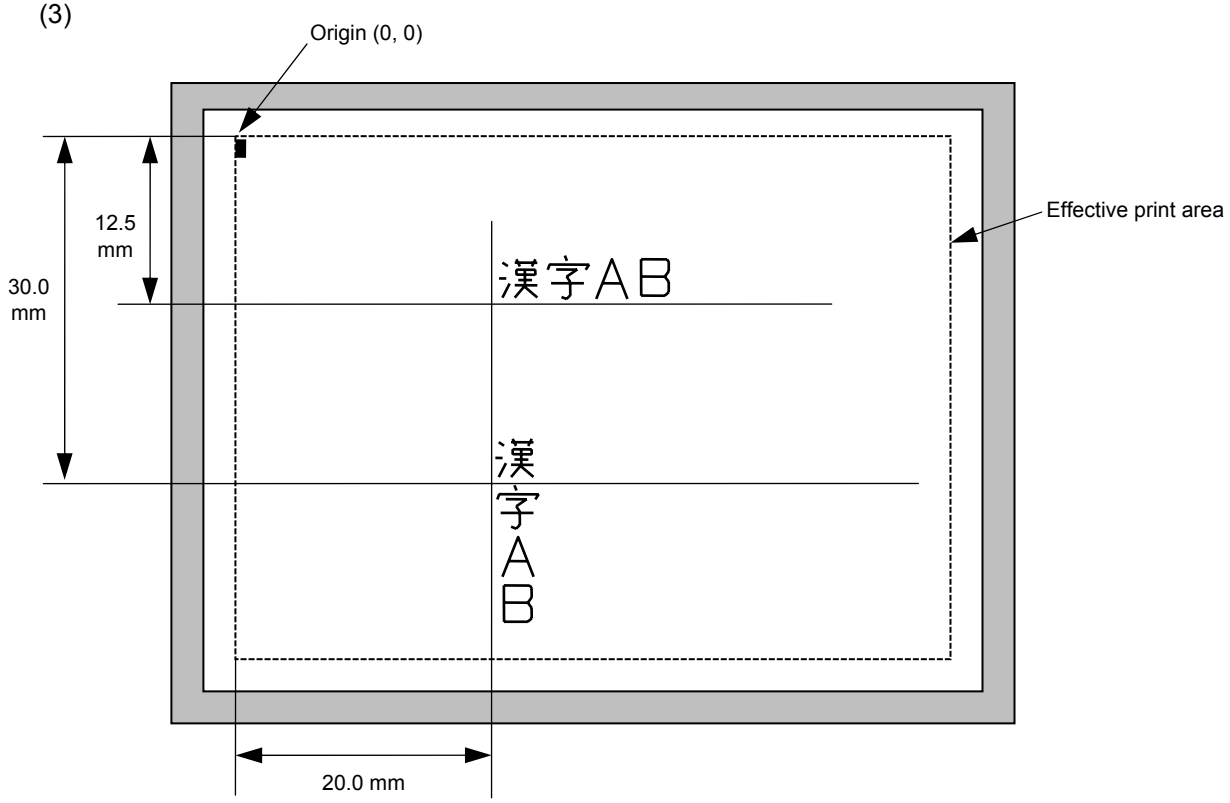
[ESC] C [LF] [NUL]
[ESC] PC001; 0200, 0125, 1, 1, C, 00, B [LF] [NUL]
[ESC] PC002; 0650, 0550, 2, 2, G, 33, B, +0000000001 [LF] [NUL]
[ESC] RC001; Sample [LF] [NUL]
[ESC] RC002; 001 [LF] [NUL]
[ESC] XS; I, 0002, 0002C3000 [LF] [NUL]

(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]

(3)



[ESC] C [LF] [NUL]
[ESC] PC000; 0200, 0125, 1, 1, X, 00, B [LF] [NUL]
[ESC] PC001; 0200, 0300, 1, 1, X, 01, B [LF] [NUL]
[ESC] RC000; 漢字　AB [LF] [NUL]
[ESC] RC001; 漢字　AB [LF] [NUL]
[ESC] XS; I, 0002, 0002C3000 [LF] [NUL]

5.6.2 OUTLINE FONT DATA COMMAND [ESC] RV

Function Provides data for the outline font or OpenType font string.

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 overflowing data will be discarded.
For the character codes, refer to “CHARACTER CODE TABLE”.

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

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

to

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

Note: If the Outline Font Data Command is sent without entering any data string for the specified number (e.g. [ESC]RV00;[LF][NUL]), the data string of the same character string number (No. 00 in the case of the above example) printed on the previous label is deleted.

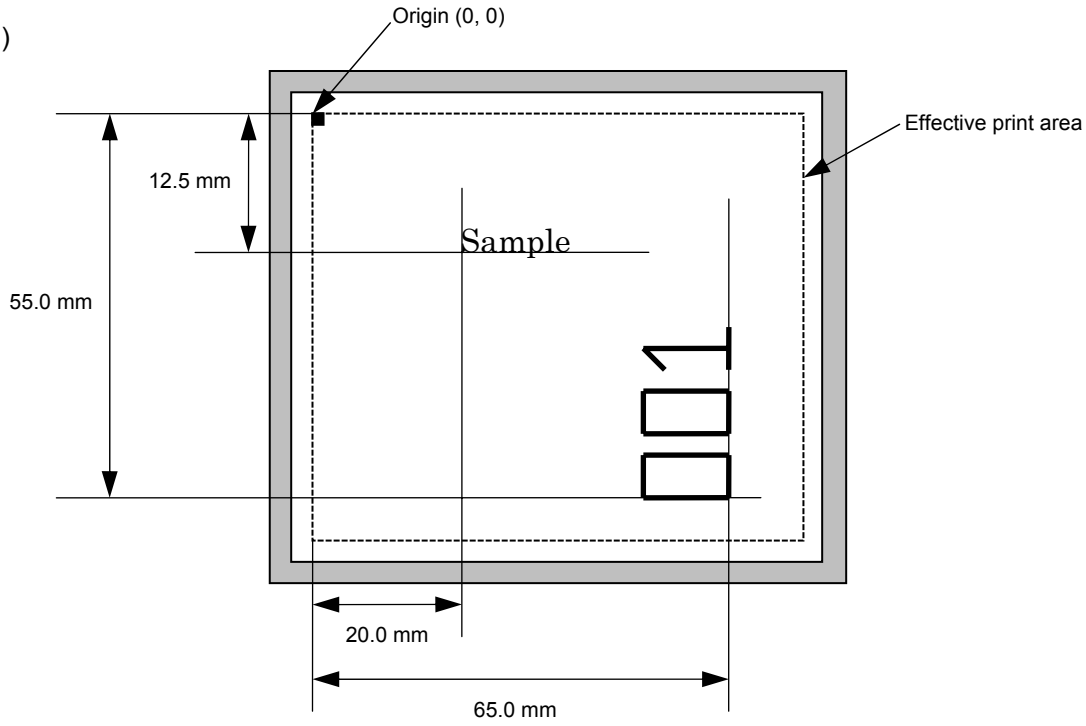
Explanation (1) Link field data string

- After the link field No. is designated in the Format Command, the Link Field Data Command links data string with the designated field to print.
- 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.
- The command length ([ESC] to [NUL]) of the Link Field Data Command is up to 2048 bytes.
- When the data string is omitted in the Link Field Data Command, the following processing is performed:
  - ① No processing 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)

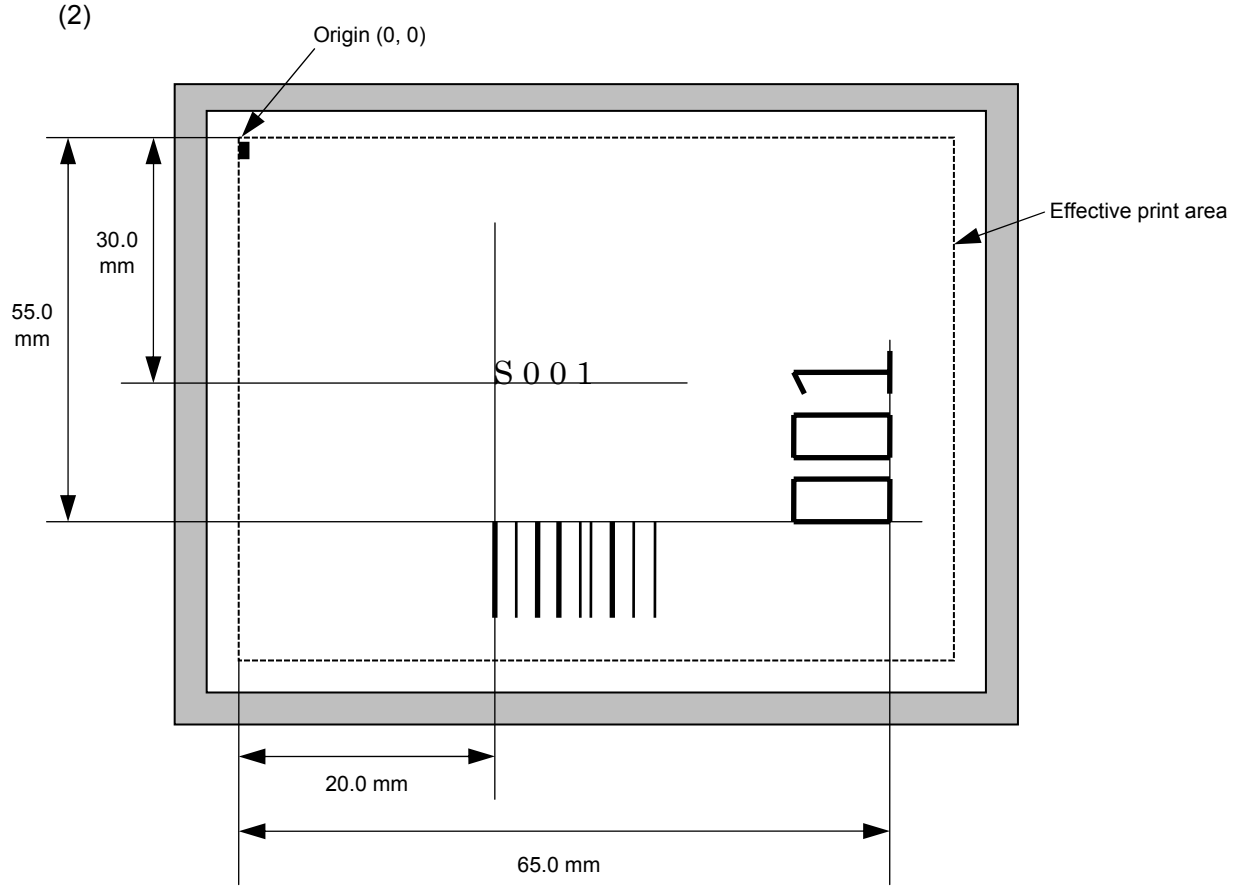
Examples

(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]

5.6.3 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]

② Link Field Data Command (specifying the number of data digits)
{RB; ^<eeee^<fff---fff|ggg---ggg|^=hhhh^=iii---iii| ------|^<yyyy^<xxx---xxx|}

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 for link field No. 1

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

to

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

^<eeee^<: The minimum number of data digits for link field No. 1

fff---fff|ggg---ggg: Data string for link field No. 1
The separator, which follows the first minimum data length specified by parameter eeee, is searched in the data string for link field No. 1.

^=hhhh^=: The number of data digits for link field No. 2

iii---iii: Data string for link field No. 2
Whether the code, coming right after the first minimum data length specified by parameter hhhh, is a separator or not is checked in the data string for link field No. 2.

to

^<yyyy^<: The minimum number of data digits for link field No. 99

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

NOTES:
- The command length ([ESC] to [NUL]) of the Bar Code Data Command is up to 2048 bytes. ([EXC], [LF] and [NUL] are included, but designation of the minimum number of data digits (^<eeee^<, ^=hhhh^=) are excluded.)
- Up to 2000 digits of data strings per link field can be specified. The number of digits differs according to the bar code type.
- The Data Command for the MaxiCode is described later.

Explanation

(1) Data check

When the data string contains data which does not meet the type of bar code, the 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.
When a data type different from the one designated by the format ID is contained in the data string for Data Matrix, the symbol is not drawn.
When the Bar Code Data Command is sent without entering any data string for the specified number (e.g. [ESC]RB00;[LF][NUL]), the data string of the same character string number (No. 00 in the case of the above example) printed on the previous label is deleted.

In the case of the bar code type of which data length is specified (e.g. Binary mode of QR code), the previously drawn bar code cannot be deleted just by setting the data length to zero. To delete the previous bar code, be sure to send the command without entering any data string.

(2) Number of data digits for link field

When the command control code is set to "{ | }", both the separator for GS1 DataBar with composite component and the link field separator use the same code "|" (0x7c). To properly print bar code data for GS1 DataBar including "|" (0x7c), the minimum number of data digits and the number of data digits are specified.

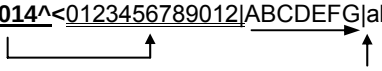
- The minimum number of data digits
  Data received before the first separator "|" (0x7c) or [LF] which comes after the first minimum data length specified by parameter ^<eeee^< is considered as the data for one link field. (Any separators included in the first minimum data digits specified by parameter ^<eeee^< are not processed as the separator.)

- The number of data digits
  When the data which comes immediately after the minimum data length specified by parameter ^=hhhh^= is a separator "|" (0x7c) or [LF], the received data is considered as the data for one link field. Otherwise, a command error results. (Any separators included in the first minimum data digits specified by parameter ^=hhhh^= are not processed as the separator.)

- Supplement
  Link field can be specified only when the bar code type is set to b: GS1 DataBar family (with compound composite). Data link to a field is not guaranteed when the number of data digits is specified on the other conditions.

  When the control code has been manually set (in the printer system mode), it must be different from "^", "<" or "=" used for specifying the number of data digits for link field. In the case the same code is used as the control code, such code will be considered as the control code. In this case, print data is not guaranteed.

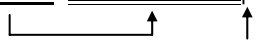
Example 1) {RB;**^<0014^<**0123456789012|ABCDEFG|abcdefghij|123123123|}



The first 14-byte data is unconditionally read, and the data before the next "|" (0x7c) is considered as the data for one link field.

Data string for link field No. 1: 0123456789012|ABCDEFG
Data string for link field No. 2: abcdefghij
Data string for link field No. 3: 123123123

Example 2) {RB;**^<0013^<**0123456789012|ABCDEFG|abcdefghij|123123123|}

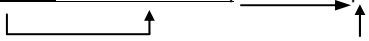


The first 13-byte data is unconditionally read, and the data before the next “|” (0x7c) is considered as the data for one link field.

Data string for link field No. 1: 0123456789012
Data string for link field No. 2: ABCDEFG
Data string for link field No. 3: abcdefghij
Data string for link field No. 4: 123123123

NOTE: Though data of Example 2 is the same as that of Example 1, the data is separated differently when the minimum number of data digits differs.

Example 3) {RB;123123123|**^<0014^<**0123456789012|ABCDEFG|abcdefghij|}

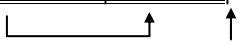


The first 14-byte data is unconditionally read, and the data before the next “|” (0x7c) or [LF] is considered as the data for one link field.

Data string for link field No. 1: 123123123
Data string for link field No. 2: 0123456789012|ABCDEFG
Data string for link field No. 3: abcdefghij

- ^<eeee^< specifies the minimum number of data digits only when it comes right after the first separator “|” or [LF] in a command . In other cases, it will be processed as normal print data.
- “eeee” is fixed to 4 digits. (0001 to 2000)
  Setting a value outside this range results in a command error.
- A value for “eeee” shall be entered between “^<” and “^<”.
- A value entered for “eeee” shall not exceed the number of data digits to the lin k field terminator. Otherwise, print data is not guaranteed.
- When a value does not meet the format of ^<eeee^<, it will be processed as normal print data.
- When a wrong value is entered for the minimum number of data digits or the data strings are entered in the wrong order, the data may not be printed.

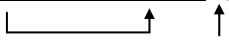
Example 4) {RB;**^=0021^=**0123456789012|ABCDEFG|abcdefghij|123123123|}



The first 21-byte data is unconditionally read, and the next character is checked. When it is “|” (0x7c) or [LF], the read data is considered as the data for one link field.

Data string for link field No. 1: 0123456789012|ABCDEFG
Data string for link field No. 2: abcdefghij
Data string for link field No. 3: 123123123

Example 5) {RB;**^=0020^=**0123456789012|ABCDEFG|abcdefghij|123123123|}



The first 20-byte data is unconditionally read, and the next character is checked. When it is not "|" (0x7c) or [LF], a command error occurs.

NOTE: Though data of Example 5 is the same as that of Example 4, a command error results when the minimum number of data digits differs.

- ^<hhhh^= specifies the minimum number of data digits only when it comes right after the semi-colon ";" or the first separator "|" or [LF] in a command . In other cases, it will be processed as normal print data.
- "hhhh" is fixed to 4 digits. (0001 to 2000)
  Setting a value outside this range results in a command error.
- A value for "hhhh" shall be entered between "^=" and "^=".
- A value entered for "hhhh" shall not exceed the number of data digits to the link field terminator. Otherwise, print data is not guaranteed.
- When a value does not meet the format of ^=hhhh^=, it will be processed as normal print data.
- When a wrong value is entered for the minimum number of data digits or the data strings are entered in the wrong order, the data may not be printed causing a command error.

(3) 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 does not correspond to 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 3 and mode 4 or 6, the maximum number of digits is 84 and 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 is a half of the values described below since a Kanji character occupies 2 bytes.

Max 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

	Numeral	Alphanumeral	8 bit
ECC200	2000	2000	1556

The maximum writable data volume on the RFID is 512 bytes. However, the actually 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		Numeral capacity	Alphanumeral capacity	8-bit byte capacity	Numeral capacity	Alphanumeral capacity	8-bit byte capacity	Numeral capacity	Alphanumeral capacity	8-bit byte capacity	Numeral capacity	Alphanumeral capacity	8-bit byte capacity	Numeral capacity	Alphanumeral 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		Numeral capacity	Alphanumeral 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		Numeral capacity	Alphanumeral 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 specified, 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 according to modes is as follows.

When letters and numbers are mixed in data in EXC mode, for example, the maximum values become smaller than the values shown below, since the internal mode selection code is used.

The maximum value becomes further smaller since the error correction code words below are use to correct a reading error by designating the security level.

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.
So, 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

(4) 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 ①-(a), 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 Among ①-(a), if the data begins with an odd number of digits:

(a) The (CODE A) or (CODE B) character is inserted just before the last numeric data. When (FNC1) is found in the number and it breaks a pair of digits in the number, the (CODE A) or (CODE B) character is inserted before the numeric data right before the (FNC1). Selection of (CODE A) or (CODE B) conforms to ①-b) and (c).

③ If four or more digits of numeric data continues in (CODE A) or (CODE B).

(a) When the numeric data is an even number of digits, the (CODE C) character is inserted just before the first numeric data.

(b) When the numeric data is an odd number of digits, the (CODE C) character is inserted immediately after the first numeric data.

④ If a control character appears in (CODE B):

(a) When a small letter appears before the next control character or four or more consecutive digits in the subsequent data, the (SHIFT) character is inserted before the first control character.

(b) When not so, the (CODE B) character is inserted just before the first control character.

⑤ If a small letter appears in (CODE A):

(a) When a control character appears before the next small letter or four or more consecutive digits in the subsequent data, the (SHIFT) character is inserted before the first small letter.

(b) When not so, the (CODE B) character is inserted just before the first small letter.

⑥ If any data other than the numerals appears in (CODE C):

(a) The (CODE A) or (CODE B) character is inserted just before the data other than the numerals. Selection of (CODE A) or (CODE B) conforms to ①-(b) and (c).

(5) 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).

(6) Kanji code selection

- In the case of Data Matrix, PDF417, and QR code, Kanji codes can be printed. Shift JIS, JIS hexadecimal, JIS 8 codes can be mixed.

(7) Link field data string

- After the link field No. is designated in the Format Command, the Link Field Data Command links data string with the designated field to print.
- Up to 2000 digits of data strings of Data Matrix and PDF417 can be linked. For other bar codes, up to 126 digits can be linked. (The value varies according to the type of bar code.)
  When the number of digits exceeds the maximum value, the overflowing data will be discarded.
- Up to 99 data strings can be linked.
- The command length ([ESC] to [NUL]) of the Link Field Data Command is up to 2048 bytes.
- When the data string is omitted in the Link Field Data Command, the following processing is performed:
  ① No processing 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.)

(8) When manual mode is selected for a QR code in the Format Command

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 accepts all codes including alphanumerals, 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	Number	0 to 9
A	Alphanumerals, symbols	A to Z 0 to 9 space $ % * + - . / :
B	Binary (8-bit)	00H to FFH
K	Kanji	Shift JIS, JIS hexadecimal

When mixed mode is selected, up to 200 modes can be selected in a QR code.

(9) When the automatic mode is selected in the Format Command for a QR code:

Data to be printed

(10) 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)

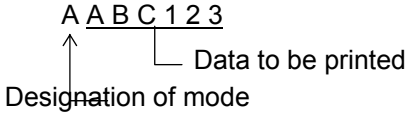
(11) Transfer code for QR code

	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								

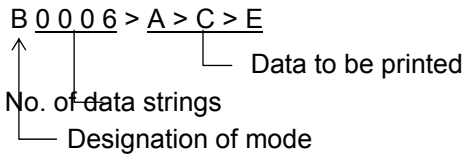
* The shaded parts are Japanese.
They are omitted here.

(12) Examples of data designation

① Alphanumeric mode: ABC123

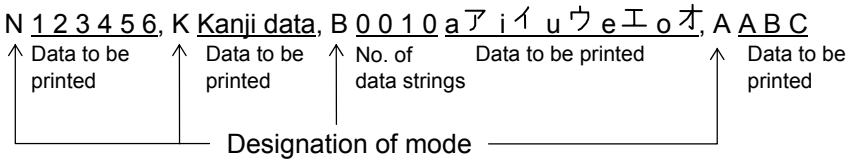


② Binary mode: 01H, 03H, 05H



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

(13) MaxiCode data

For mode 2 or 3:
[ESC] RBaa; bbbbbbbbbcccdddeeeee --- eeeee [LF] [NUL]

For mode 4 or 6:
[ESC] RBaa; fffffffffggggg --- ggggg [LF] [NUL]

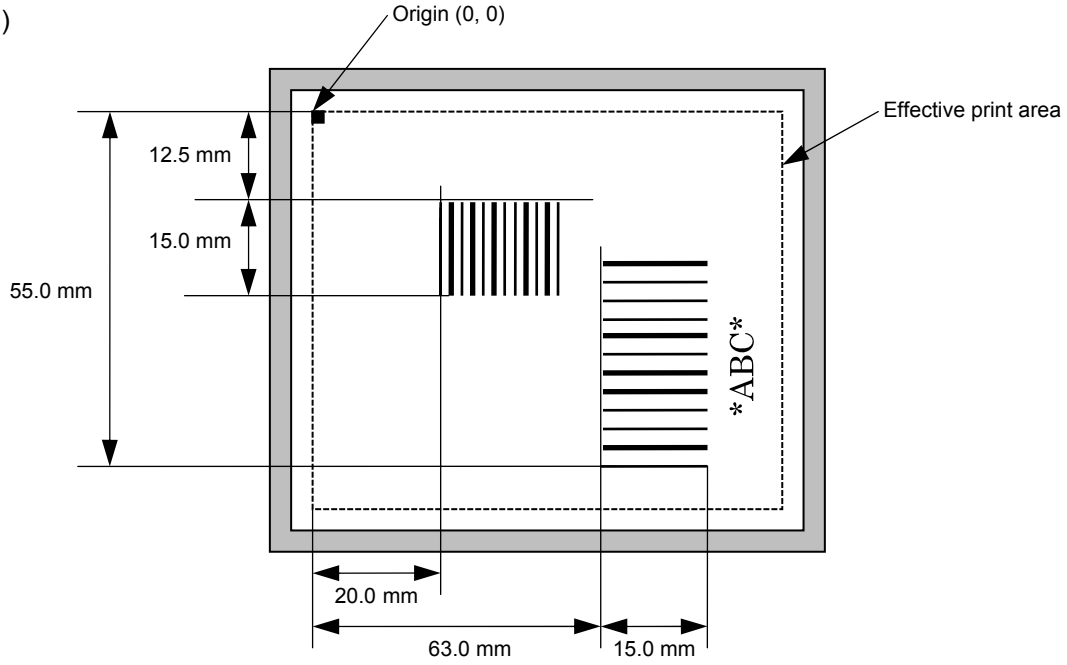
①	bbbbbbbbb:	Postal code	Fixed to 9 digits
•	Mode 2:		
	b1b2b3b4b5:	Zip code	Fixed to 5 digits (Number)
	b6b7b8b9:	Zip code extension	Fixed to 4 digits (Number)
•	Mode 3:		
	b1b2b3b4b5b6:	Zip code	Fixed to 6 digits (Character "A" of code set)
	b7b8b9:	Vacant	Fixed to 3 digits (20H)
②	ccc:	Class of service	Fixed to 3 digits (Number)
③	ddd:	Country code	Fixed to 3 digits (Number)
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 number 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. *If the message data is less than 84 digits when mode 2 or 3 is selected, the printer adds a CR (000000) at the end of the data, and the remaining digits will be padded with FSs (011100). When message data exceeding 84 digits is received, the excess data will be discarded before drawing a MaxiCode.*
3. *If the message data is less than 93 digits (9 digits + 84 digits) when mode 4 or 6 is selected, the printer adds a CR (000000) at the end of the data, and the remaining digits will be padded with FSs (011100). When message data exceeding 93 digits is received, the excess data will be discarded before drawing a MaxiCode.*
4. *Mode 6 shall not be used for usual operation since it is used for scanner programming.*
5. *When "TYPE2: Special specification" has been set for MaxiCode specification setting in the system mode, the country code must be 840 for Mode 2. Otherwise, a MaxiCode will not be printed.*
6. *When "TYPE2: Special specification" has been set for MaxiCode specification setting in the system mode, the country code must be other than 840 for Mode 3. Otherwise, a MaxiCode will not be printed.*

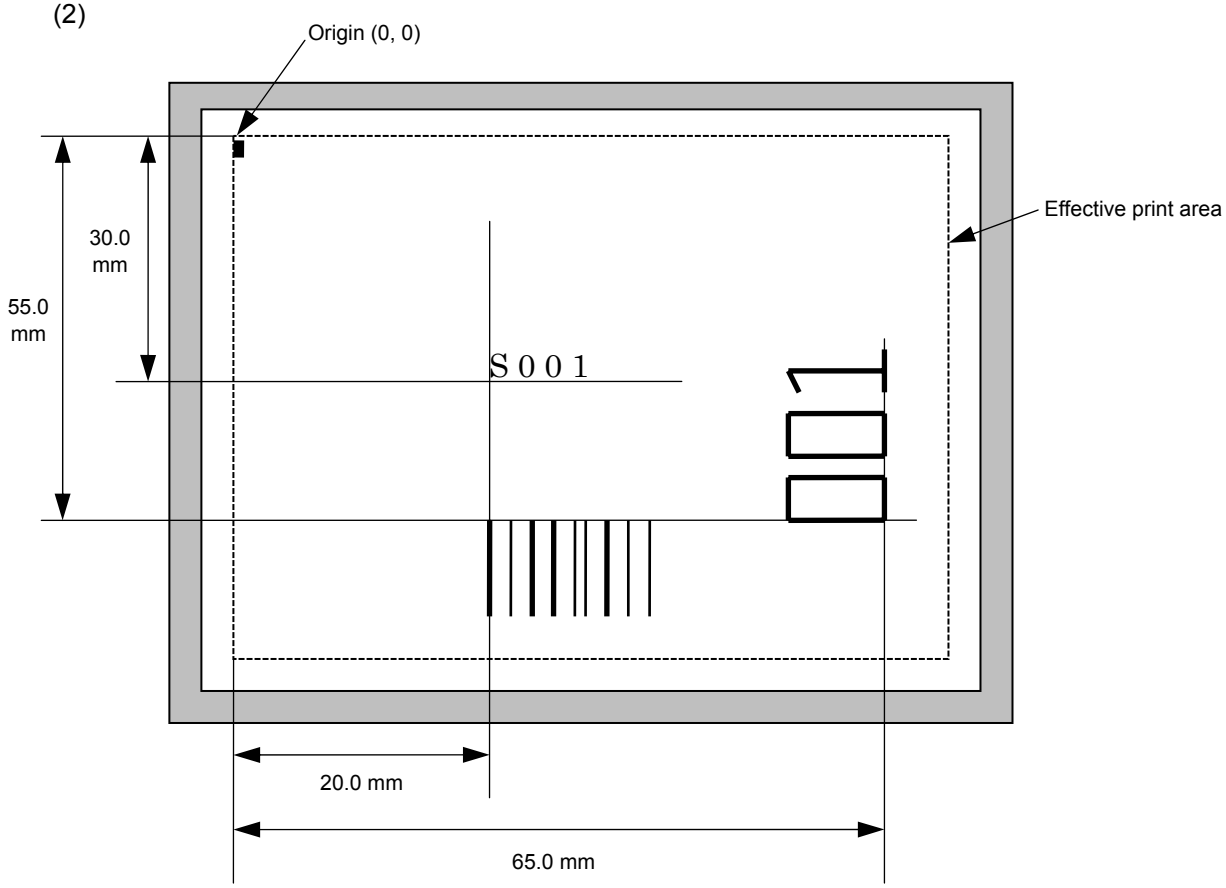
Examples

(1)



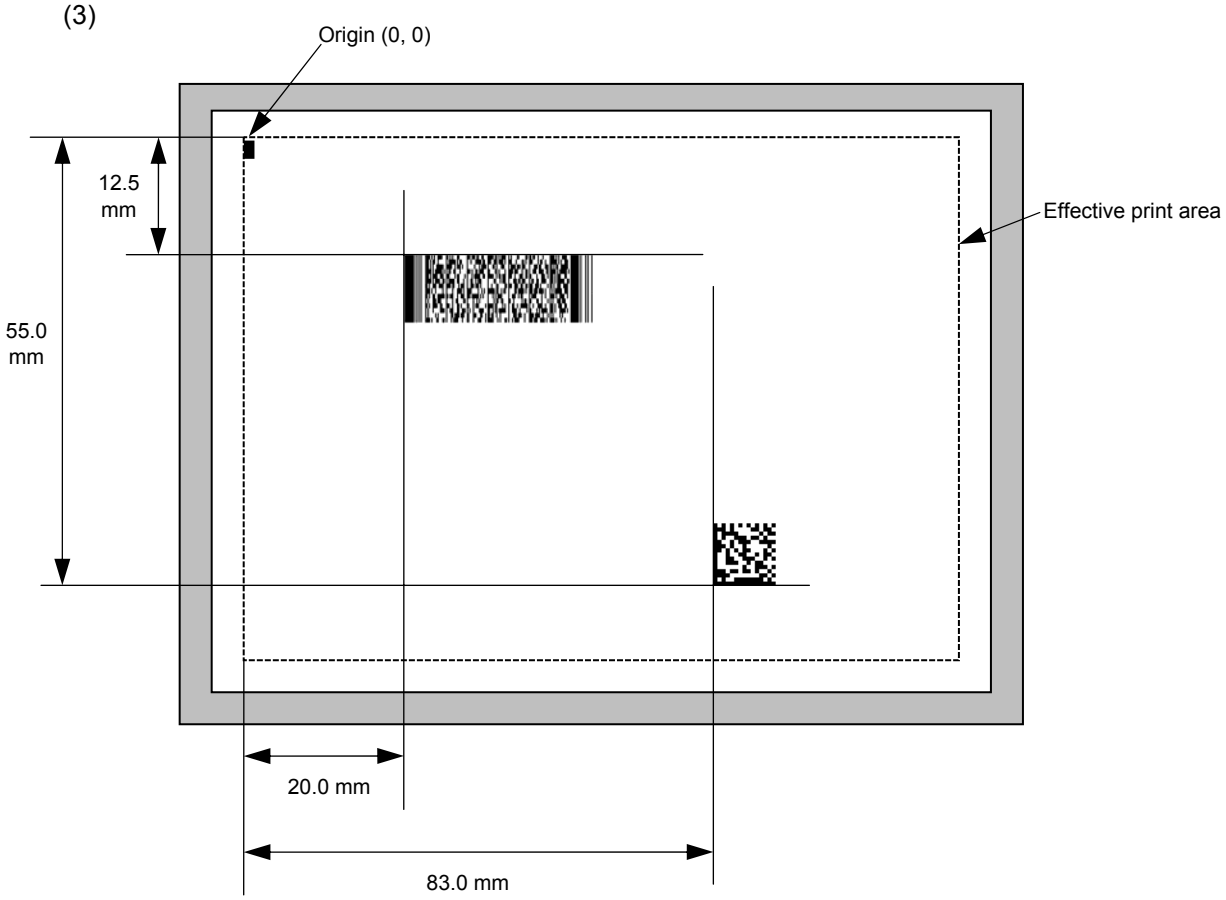
[ESC] C [LF] [NUL]
[ESC] XB01; 0200, 0125, 3, 1, 02, 02, 06, 06, 02, 0, 0150 [LF] [NUL]
[ESC] XB02; 0830, 0550, 3, 1, 02, 04, 07, 08, 04, 3, 0150, +0000000000, 1, 00, N [LF] [NUL]
[ESC] RB01; 12345 [LF] [NUL]
[ESC] RB02; *ABC* [LF] [NUL]
[ESC] XS; I, 0002, 0002C3000 [LF] [NUL]

(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]

5.7 COMMANDS RELATED TO ISSUE AND FEED

5.7.1 ISSUE COMMAND [ESC] XS

Function Issues labels according to the print conditions programmed.

Format [ESC]XS;I,aaaa,bbbcdefgh(,Skk)(,TI)[LF][NUL]

Term

aaaa: Number of labels to be issued
0001 to 9999

bbb: Cut interval Designates the number of labels to be printed before cut.
000 to 100 (no cut when 000)

c: Type of sensor
0: No sensor
1: Reflective sensor
2: Transmissive sensor (when using normal labels)
3: Transmissive sensor (when using preprinted labels)
4: Reflective sensor (when using a manual threshold value)

d: Issue mode
C: Batch mode
D: Strip mode (with back feed and the strip sensor enabled.)
E: Strip mode (with back feed enabled, the strip sensor ignored, the applicator supported)

e: Issue speed

B-EX4T1

<203 dpi>	<305 dpi>
3: 3 ips	3: 3 ips
6: 6 ips	5: 5 ips
A: 10 ipw	8: 8 ips
C: 12 ips	A: 10 ips
E: 14 ips	C: 12 ips
	E: 14 ips

B-EX4T2

<203 dpi>	<300 dpi>	<600 dpi>
3: 3 ips	3: 3 ips	2: 2 ips
6: 6 ips	5: 5 ips	3: 3 ips
A: 10 ips	8: 8 ips	4: 4 ips
C: 12 ips	A: 10 ips	5: 5 ips
	C: 12 ips	6: 6 ips

B-EX4D2

<203 dpi>	<300 dpi>
3: 3 ips	3: 3 ips
6: 6 ips	5: 5 ips
A: 10 ips	8: 8 ips
C: 12 ips	A: 10 ips
	C: 12 ips

B-EX6T1/T3

<203 dpi>	<305 dpi>
3: 3 ips	3: 3 ips
5: 5 ips	5: 5 ips
8: 8 ipw	8: 8 ips
A: 10 ips	A: 10 ips
C: 12 ips	C: 12 ips

B-EX4T3
<600 dpi>
2: 2 ips
3: 3 ips
4: 4 ips
5: 5 ips
6: 6 ips

f: Whether to use ribbon
0: Without ribbon
1: With ribbon (ribbon saving function enabled)
2: With ribbon (ribbon saving function disabled)
3: Without ribbon (head up function enabled)

Note: Since the head-up mechanism is not provided to the B-EX4T2, B-EX4T3-HS and B-EX6T3, the parameter setting will be automatically corrected:
1 → 2
3 → 0
Since the B-EX4D2 is a direct thermal printer and has no head-up mechanism, the parameter settings 1 to 3 will be automatically corrected to 0.

g: Printing direction
0: Printing bottom first
1: Printing top first
2: Bottom first mirror printing
3: Top first mirror printing

h: Status response
0: No status response is sent.
1: Status response is sent.

Skk: Type of supply (Omissible. When omitted, it follows the setup information.)
Options are different depending on the setting for parameter f (whether to use ribbon.)
When parameter f is set to “0” or”3” (without ribbon):
00: Standard (Standard)
(Factory default and initial value after RAM clear)
01: Reserve 1 (Reserve1)
02: Reserve 2 (Reserve2)
03: Reserve 3 (Reserve3)
04: Reserve 4 (Reserve4)
05: Reserve 5 (Reserve5)
06: Reserve 6 (Reserve6)
07: Reserve 7 (Reserve7)
08: Reserve 8 (Reserve8)
09: Reserve 9 (Reserve9)

When parameter f is set to “1” or”2” (with ribbon):

<B-EX4T1-G/T-QM/CN> (C1.4 or before)

00: Semi-resin 1 (Semi-resin 1)
(Factory default and initial value after RAM clear)
01: Semi-resin 2 (Semi-resin 2)
02: Resin 1 (Resin 1)
03: Resin 2 (Resin 2)
04: Resin 3 (Resin 3) (See Note)
05: Reserve 1 (Reserve1)
06: Reserve 2 (Reserve2)
07: Reserve 3 (Reserve3)
08: Reserve 4 (Reserve4)
09: Reserve 5 (Reserve5)

Note: “Resin 3” is non-usable for the B-EX4T1-T-QM/CN model.

<B-EX4T1-G/T-QM/CN> (C1.5 or later)

00: Semi-resin 1 (Semi-resin 1) (See Note 1.)
01: Semi-resin 2 (Semi-resin 2)
02: Resin 1 (Resin 1)
03: Resin 2 (Resin 2)
04: Resin 3 (Resin 3) (See Note 2.)
05: SX compatible (SX compatible) (See Note 3.)
06: Reserve 2 (Reserve2)
07: Reserve 3 (Reserve3)
08: Reserve 4 (Reserve4)
09: Reserve 5 (Reserve5)

Note 1: Factory default and initial value after RAM clear for other than CN

Note 2: “Resin 3” is non-usable for the B-EX4T1-T-QM/CN model.

Note 3: “SX compatible” is a setting for securing the print quality equivalent to that of the B-SX, but it is not supported by the print speed of 10 ips or faster. If 10 ips or faster print speed is specified, the printer operation is not guaranteed. This is a factory default for CN model and initial value after RAM clear (CN).
For details, refer to the Supply Specification for the B-EX4T1 series.

<B-EX4T2-G/T> (Firmware C1.0C or before)

00: Wax1 (Wax1)
(Factory default and initial value after RAM clear)
01: Wax 2 (Wax2)
02: Semi resin 1 (Semi resin 1)
03: Semi resin 2 (Semi resin 2)
04: Resin 1 (Resin 1)
05: Reserve 1 (Reserve1)
06: Reserve 2 (Reserve2)
07: Reserve 3 (Reserve3)
08: Reserve 4 (Reserve4)
09: Reserve 5 (Reserve5)

<B-EX4T2-G/T> (Firmware C1.0D)

00: Wax1 (Wax1)
(Factory default and initial value after RAM clear)
01: Wax 2 (Wax2)
02: Semi resin 1 (Semi resin 1)
03: Semi resin 2 (Semi resin 2)
04: Resin 1 (Resin 1)

05: Wax 3 (Wax3)
06: Semi resin 3 (Semi resin 3)
07: Reserve 1 (Reserve1)
08: Reserve 2 (Reserve2)
09: Reserve 3 (Reserve3)

<B-EX4T2-G/T> (Firmware C1.0E to C1.2)
<B-EX4D2-G/T> (Note)
00: Wax1 (Wax1)
(Factory default and initial value after RAM clear)
01: Wax 2 (Wax2)
02: Semi resin 1 (Semi resin 1)
03: Semi resin 2 (Semi resin 2)
04: Resin 1 (Resin 1)
05: Wax 3 (Wax3)
06: Semi resin 3 (Semi resin 3)
07: Resin 2 (Resin 2)
08: Reserve 1 (Reserve1)
09: Reserve 2 (Reserve2)
Note: Since the B-EX4D2 is a direct thermal printer, the above values are not used for actual printing.

<B-EX4T2-G/T> (Firmware C1.3 or later)
00: Wax1 (Wax1) (See Note 1.)
01: Wax 2 (Wax2)
02: Semi resin 1 (Semi resin 1)
03: Semi resin 2 (Semi resin 2)
04: Resin 1 (Resin 1)
05: Wax 3 (Wax3)
06: Semi resin 3 (Semi resin 3)
07: Resin 2 (Resin 2)
08: Multiple type (Multiple type) (See Note 2.)
09: Reserve1 (Reserve1)
Note 1: Factory default and initial value after RAM clear for other than CN
Note 2: Factory default for CN model and initial value after RAM clear (CN).

<B-EX4T2-H> (Firmware C1.0F or before)
00: Resin 1 (Resin 1)
(Factory default and initial value after RAM clear)
01: Resin 2 (Resin 2)
02: Reserve 1 (Reserve1)
03: Reserve 2 (Reserve2)
04: Reserve 3 (Reserve3)
05: Reserve 4 (Reserve4)
06: Reserve 5 (Reserve5)
07: Reserve 6 (Reserve6)
08: Reserve 7 (Reserve7)
09: Reserve 8 (Reserve8)

<B-EX4T2-H> (Firmware C1.1A or later)
00: Resin 1 (Resin 1)
(Factory default and initial value after RAM clear)
01: Resin 2 (Resin 2)
02: Resin 3 (Resin 3)
03: Reserve 1 (Reserve1)

04: Reserve 2 (Reserve2)
05: Reserve 3 (Reserve3)
06: Reserve 4 (Reserve4)
07: Reserve 5 (Reserve5)
08: Reserve 6 (Reserve6)
09: Reserve 7 (Reserve7)

<B-EX6T1/T3-G/T>
00: Generic (General-purpose)
(Factory default and initial value after RAM clear)
01: Reserve 1 (Reserve1)
02: Reserve 2 (Reserve2)
03: Reserve 3 (Reserve3)
04: Reserve 4 (Reserve4)
05: Reserve 5 (Reserve5)
06: Reserve 6 (Reserve6)
07: Reserve 7 (Reserve7)
08: Reserve 8 (Reserve8)
09: Reserve 9 (Reserve9)

<B-EX4T3-H>
00: Resin 1 (Resin 1)
(Factory default and initial value after RAM clear)
01: Resin 2 (Resin 2)
02: Resin 3 (Resin 3)
03: Reserve 1 (Reserve1)
04: Reserve 2 (Reserve2)
05: Reserve 3 (Reserve3)
06: Reserve 4 (Reserve4)
07: Reserve 5 (Reserve5)
08: Reserve 6 (Reserve6)
09: Reserve 7 (Reserve7)

TI: Selection of threshold setting (B-EX4T3-H only)

Note: Omissible. When omitted, a value set by the parameter setting becomes effective. Options are different depending on the value set for parameter c (Type of sensor) of this command.)

When 0 to 2 or 5 is set for parameter c:
Invalid

When 3 is set for parameter c: Transmissive sensor (when using preprinted labels)
1: Manual threshold value for transmissive sensor (Default)
2: Manual threshold value 2 for transmissive sensor
3: Manual threshold value 3 for transmissive sensor
4: Manual threshold value 4 for transmissive sensor
5: Manual threshold value 5 for transmissive sensor

When 4 is set for parameter c: Reflective sensor (when using a manual threshold value)
1: Manual threshold value for reflective sensor (Default)
2: Manual threshold value 2 for reflective sensor
3: Manual threshold value 3 for reflective sensor
4: Manual threshold value 4 for reflective sensor
5: Manual threshold value 5 for reflective sensor

Explanation

(1) Number of labels to be issued

① When increment/decrement is not specified, the same drawing data will be printed on the specified number of labels.

② When increment/decrement is specified, the specified number of labels will be issued while incrementing/decrementing the data in the designated drawing field 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 “C”. When an error occurs during a cut issue, the printer restarts printing from the label where the error occurred after cutting and ejecting the printed labels.

When the auto forward wait function has been enabled in the printer system mode, if no subsequent command is sent from the PC for 1 second after issuing the last label, the printer automatically performs a forward feed.

When the printer receives an Issue Command during the automatic forward feed standby, it feeds the label back to the home position and starts printing.

The automatic forward feed is not performed after the printer executes any command sent after an Issue Command. To finish issuing, no command shall be sent after an Issue Command.

When the printer power is turned off and on or the printer is reset in the pause state prior to an automatic forward feed, a forward feed by depression of the [FEED] key is disabled. Therefore, the printer shall not be turned off then on, or shall not be reset in a pause state before the automatic forward feed is performed.

When the FEED] key on the printer is pressed to feed the label while the printer is in the state after a forward feed standby, the printer feeds and cuts one label, performs an automatic forward feed, 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.

Head-up function (Except for the B-EX4T2, B-EX4D2, B-EX4T3-HS and B-EX6T3)

When the cut interval is effective and whether to use ribbon is set to “1: With ribbon (ribbon saving function enabled)” or “3: Without ribbon (head-up function enabled)”, the head-up is performed in the following way:

<In the case of the disc cutter>
The print head is not raised while the printed media is fed to the cut position, and it is raised during the reverse feed after cut.

<In the case of rotary cutter>
When the media pitch is the minimum size (Label: 38.0 mm, Tag: 30.0 mm) or greater, the print head is raised during both the media feed to the cut position and the reverse feed after cut.

(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 reflective sensor automatically detects black marks provided on the back side of the tag paper for fine adjusting the paper position one by one.

③ Transmissive sensor (when using normal labels):

Printing takes place according to the parameter designated by the Label Size Set Command. However, the transmissive sensor automatically detects label-to-label gaps for fine adjusting the paper position one by one.

④ Transmissive sensor (when using preprinted labels):

Printing takes place according to the parameter designated by the Label Size Set Command. However, the transmissive sensor automatically detects label-to-label gaps for fine adjusting paper position one by one, according to the threshold value set by the threshold setting operation (key operation).

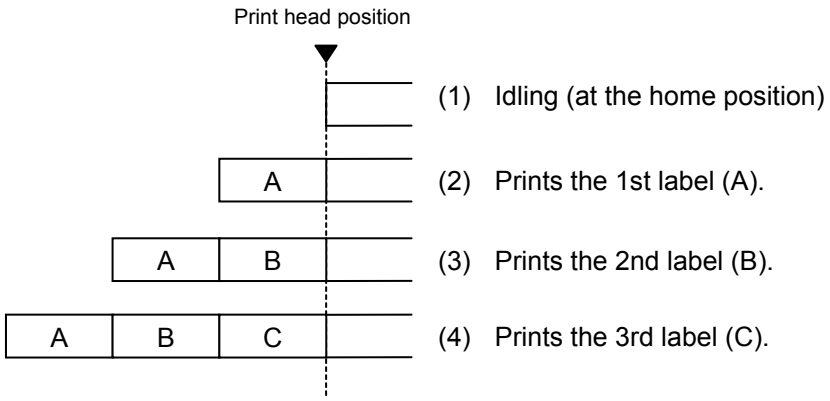
⑤ Reflective sensor (when using a manual threshold value)

Printing takes place according to the parameters designated by the Label Size Set Command. However, the reflective sensor automatically detects black marks on the back of the tag paper for fine adjusting the paper position one by one, according to the threshold value set by the threshold setting operation (key operation).

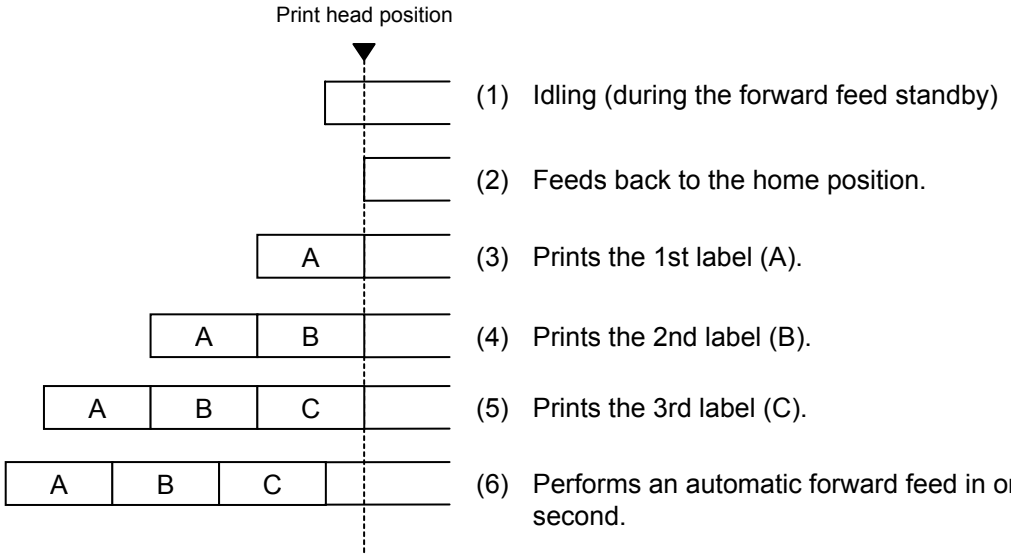
NOTES:
- A suitable sensor type for the media to be used shall be selected. Improper selection may cause stop position misalignment or feed jam error.
  Bad example)
  Sensor type: Transmissive sensor
  Media: Tag paper with black marks
  In this case, the reflective sensor must be selected.
- To detect holes in tag paper, the Transmissive sensor shall be selected. (During the sensor adjustment, the sensor level at the holes shall be registered.)
- If a paper jam error occurs during printing with no sensor specified, the printer does not stop media feed until it feeds the media for the specified label pitch length. Care must be taken the media may be drawn into the rollers inside the printer.

(4) Issue mode

[C: Batch mode]
Cut interval: 0
Issue count: 3
Automatic forward feed standby: OFF (set in the system mode)



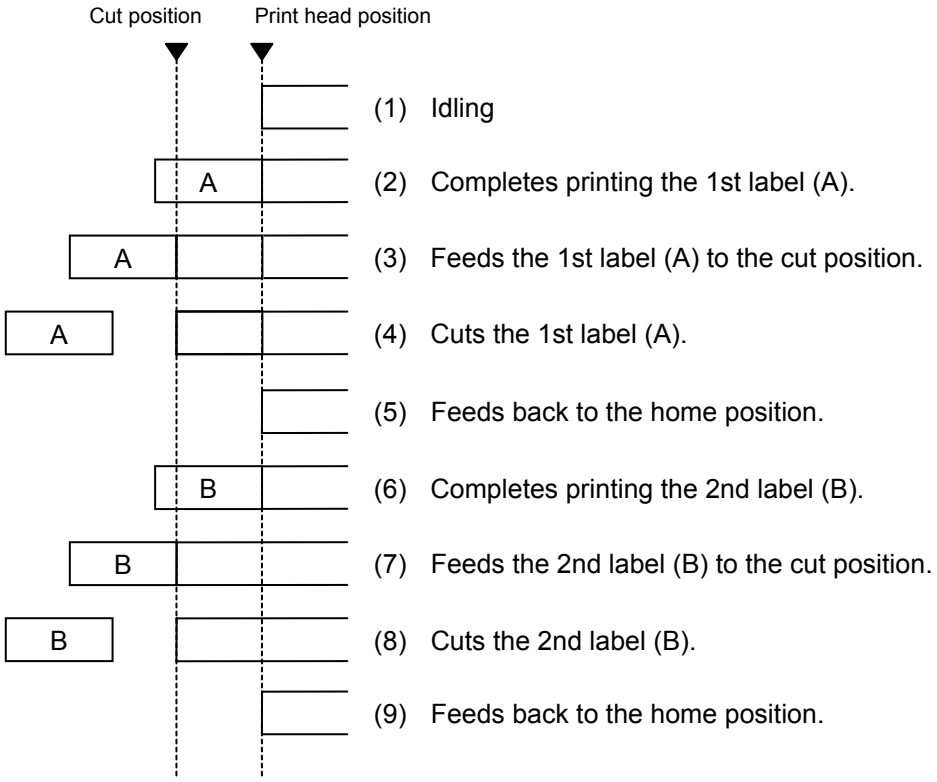
[C: Batch mode]
Cut interval: 0
Issue count: 3
Automatic forward feed standby: ON (set in the system mode)



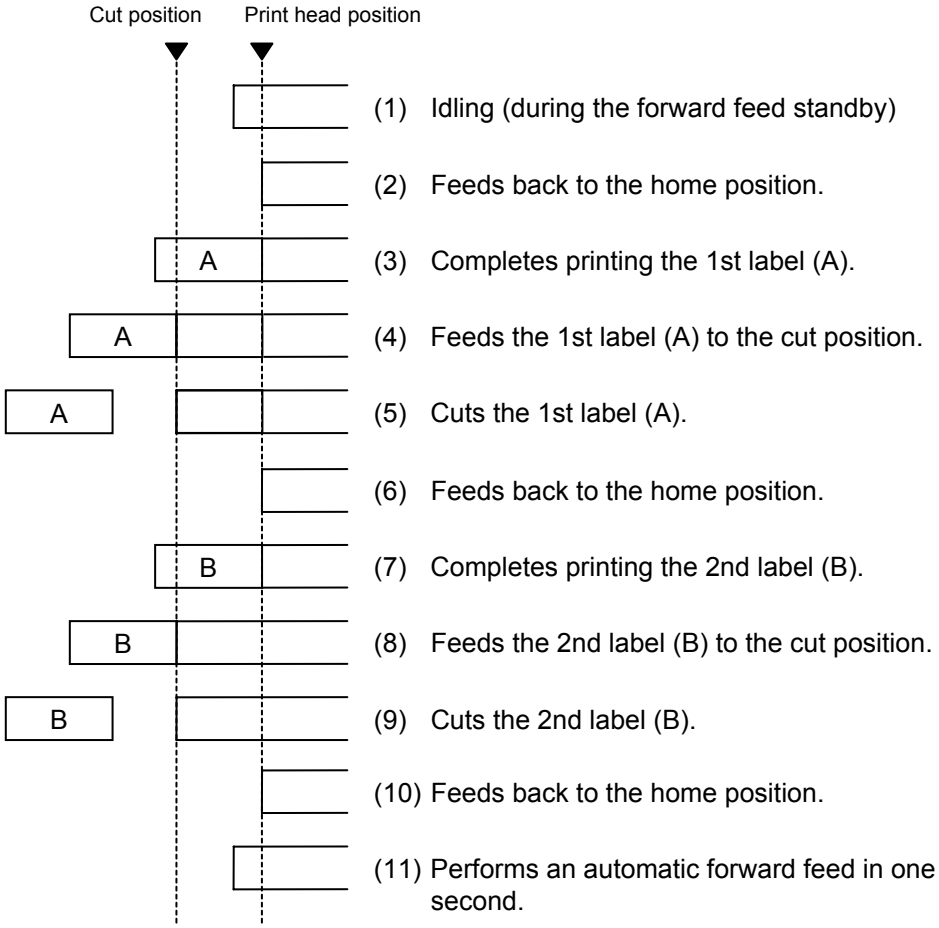
NOTES:

1. If the pitch of the media used for the previous issue was less than 20mm, the forward wait will not be activated regardless of the parameter setting.
   <Supplement> In the case labels with the different pitch (less than 20mm and 20mm or longer) are alternately placed in one label roll, the forward wait is not activated for the labels with the pitch of less than 20mm. Therefore it stays at the print stop position without being fed backward. Before the next label with the pitch of 20mm or larger is printed, however, it is automatically fed backward along with the previously printed label. This may cause the print data to be printed on the previous label.
2. The media will stay at the forwarded position even if the power is turned off/on, the printer is reset, or the print head is opened/closed.

[C: Batch mode]
Cut interval: 1
Issue count: 2
Automatic forward feed standby: OFF (set in the system mode)
Cutter: Disc cutter



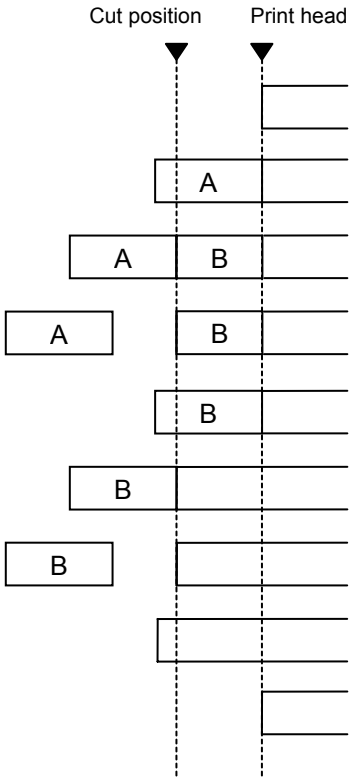
[C: Batch mode]
Cut interval: 1
Issue count: 2
Automatic forward feed standby: ON (set in the system mode)
Cutter: Disc cutter



NOTES:

1. If the pitch of the media used for the previous issue was less than 20mm, the forward wait will not be activated regardless of the parameter setting.
   <Supplement> In the case labels with the different pitch (less than 20mm and 20mm or longer) are alternately placed in one label roll, the forward wait is not activated for the labels with the pitch of less than 20mm. Therefore it stays at the print stop position without being fed backward. Before the next label with the pitch of 20mm or larger is printed, however, it is automatically fed backward along with the previously printed label. This may cause the print data to be printed on the previous label.
2. The media will stay at the forwarded position even if the power is turned off/on, the printer is reset, or the print head is opened/closed.

[C: Batch mode]
Cut interval: 1
Issue count: 2
Automatic forward feed standby: OFF (set in the system mode)
Cutter: Rotary cutter



(1) Idling (at the home position)

(2) Completes printing the 1st label (A).

(3) Starts printing the 2nd label (B).

(4) The 1st label (A) reaches the cut position and is cut.

(5) Completes printing the 2nd label (B).

(6) Feeds the 2nd label (B) to the cut position.

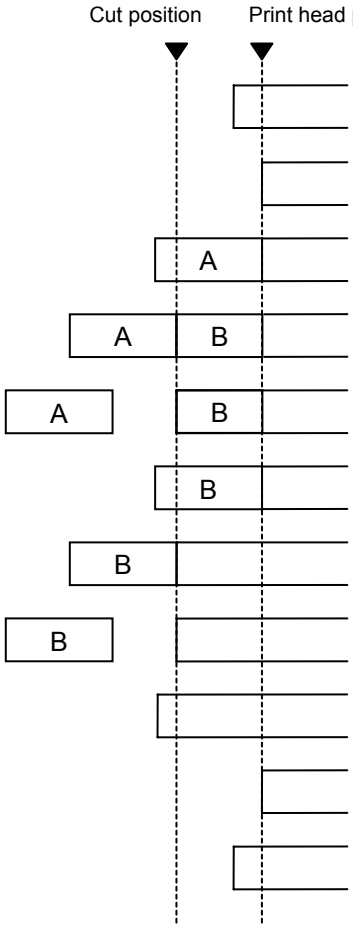
(7) The 2nd label (B) reaches the cut position and is cut.

(8) Since non-stop cutting is performed, paper is fed and stopped past the cut position.

(9) Feeds back to the home position.

* When the 2nd label (B) has been normally cut, the printer returns a status.

[C: Batch mode]
Cut interval: 1
Issue count: 2
Automatic forward feed standby: ON (set in the system mode)
Cutter: Rotary cutter

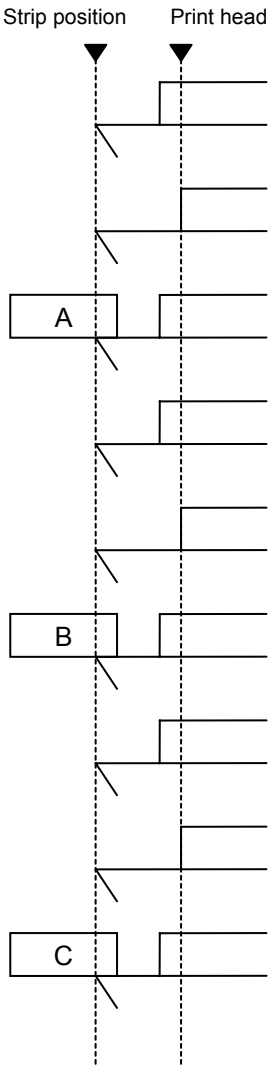


(1) Idling (during the forward feed standby)
(2) Feeds back to the home position.
(3) Completes printing the 1st label (A).
(4) Starts printing the 2nd label (B).
(5) The 1st label (A) reaches the cut position and is cut.
(6) Completes printing the 2nd label (B).
(7) Feeds the 2nd label (B) to the cut position.
(8) The 2nd label (B) reaches the cut position and is cut.
(9) Since non-stop cutting is performed, paper is fed and stopped past the cut position.
(10) Feeds back to the home position.
(11) Performs an automatic forward feed in one second.

NOTES:

1. If the pitch of the media used for the previous issue was less than 20mm, the forward wait will not be activated regardless of the parameter setting.
   <Supplement> In the case labels with the different pitch (less than 20mm and 20mm or longer) are alternately placed in one label roll, the forward wait is not activated for the labels with the pitch of less than 20mm. Therefore it stays at the print stop position without being fed backward. Before the next label with the pitch of 20mm or larger is printed, however, it is automatically fed backward along with the previously printed label. This may cause the print data to be printed on the previous label.
2. The media will stay at the forwarded position even if the power is turned off/on, the printer is reset, or the print head is opened/closed.

[D: Strip mode]
Issue count: 3



(1) Idling

(2) Feeds back to the home position.

(3) Completes printing the 1st label (A).

(4) Remove the 1st label (A).

(5) Feeds back to the home position.

(6) Completes printing the 2nd label (B).

(7) Remove the 2nd label (B).

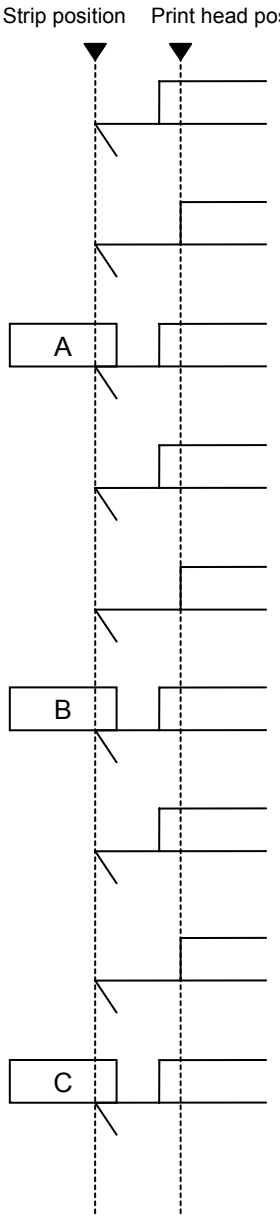
(8) Feeds back to the home position.

(9) Completes printing the 3rd label (C)

* The next label is not printed until the printed label is removed.

* When label (C) is the last label in the print job, the printer does not feed the next label back to the home position even after label (C) is removed. The next label stays at the current position. It will be fed back to the home position when the next print job is started.

[E: Strip mode]
Issue count: 3
Optional expansion I/O board: Installed
(The printer ignores the strip sensor, and issues labels while checking the pause signal generated from the expansion I/O.)



(1) Idling
The PAUSE signal generated from the expansion I/O is turned ON.

(2) The PAUSE signal generated from the expansion I/O is turned OFF.
Feeds back to the home position.

(3) Completes printing the 1st label (A).
The PAUSE signal generated from the expansion I/O is turned ON.

(4) Remove the 1st label (A).
The PAUSE signal generated from the expansion I/O is turned OFF.

(5) Feeds back to the home position.

(6) Completes printing the 2nd label (B).
The PAUSE signal generated from the expansion I/O is turned ON.

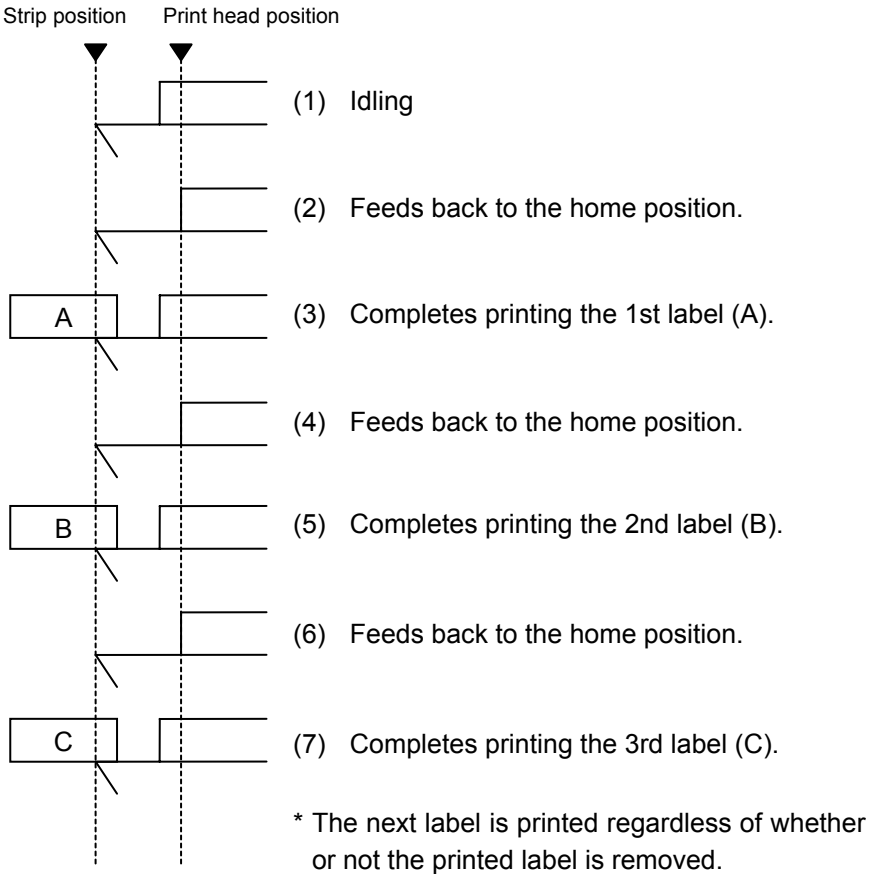
(7) Remove the 2nd label (B).
The PAUSE signal generated from the expansion I/O is turned OFF.

(8) Feeds back to the home position.

(9) Completes printing the 3rd label (C).
The PAUSE signal generated from the expansion I/O is turned ON.

* When the PAUSE signal generated from the expansion I/O is on, a label is not printed.

[E: Strip mode]
Issue count: 3
Optional expansion I/O board: Not installed
(The printer issues labels while ignoring the strip sensor.)



*1 Issue mode E is different from issue mode D in the way the subsequent labels are issued. In issue mode E, labels are issued regardless of whether or not the printed label is removed.

*2 The peripheral device such as an applicator shall control the PAUSE signal generated from the expansion I/O.

*3 When the issue count is set to 2 or more on the condition the expansion I/O has been installed, the printer issues the specified number of labels while the PAUSE signal generated from the expansion I/O is off.

*4 When the issue count is set to 2 or more on the condition the expansion I/O has not been installed, the printer issues the specified number of labels.

*5 Pause interval setting is effective even when the expansion I/O has been installed. The printer pauses at the specified pause interval (This is not a pause caused by the PAUSE signal.) When a peripheral device such as an applicator, it is recommended to set “000” for the pause interval.

(5) Issue speed

- Printing takes place at the designated speed.
  However, the back feed in cut mode and strip mode is performed at the specified speed (2 ips or 3 ips) set in the system mode.
- The rotary cutter does not support the print speed of 10 ips or faster. When the rotary cutter has been installed, the print speed is automatically corrected to 6 ips (203 dpi) or 8 ips (300/305 dpi), respectively, even if the print speed is set to 10 ips or faster (regardless of whether or not the cut issue is specified.)
- When the print speed is set to 10 ips or faster in strip issue mode, pre-peel-off function is automatically performed. However, the print speed is corrected depending on the following conditions:
  (1) When the expansion I/O mode is set to TYPE1 (Standard), the print speed is adjusted to 10 ips for 203 dpi or 8 ips for 305 dpi, respectively.
  (2) When the expansion I/O mode is set to TYPE2 (Inline specification), the specified print speed is effective.
  (3) In the case of the print speed less than 10 ips, the pre-peel-off function is performed only when it is enabled in the system mode.
- The forward feed speed for the pre-peel-off is fixed to 3 ips. The reverse feed speed depends on the back feed speed setting in the system mode (2 ips or 3 ips).
- The available issue speed varies according to types and sizes of the supply. For details, refer to the Supply Specification.

<table>
<tr><td>Model</td><td colspan="4">B-EX4T1</td><td colspan="3">B-EX4T2</td><td colspan="2">B-EX4D2</td><td colspan="2">B-EX6T1/T3</td><td>B-EX4T3</td></tr>
<tr><td>Resolution</td><td colspan="2">203 dpi</td><td colspan="2">305 dpi</td><td>203 dpi</td><td>300 dpi</td><td>600 dpi</td><td>203 dpi</td><td>300 dpi</td><td>203 dpi</td><td>305 dpi</td><td>600 dpi</td></tr>
<tr><td>Rotary cutter / Parameter</td><td>Not fitted</td><td>Fitted</td><td>Not fitted</td><td>Fitted</td><td>Not fitted</td><td>Not fitted</td><td>Not fitted</td><td>Not fitted</td><td>Not fitted</td><td>Not fitted</td><td>Not fitted</td><td>Not fitted</td></tr>
<tr><td>1</td><td rowspan="3">3 ips</td><td rowspan="3">3 ips</td><td rowspan="3">3 ips</td><td rowspan="3">3 ips</td><td rowspan="3">3 ips</td><td rowspan="3">3 ips</td><td>2 ips</td><td rowspan="3">3 ips</td><td rowspan="3">3 ips</td><td rowspan="3">3 ips</td><td rowspan="3">3 ips</td><td>2 ips</td></tr>
<tr><td>2</td><td rowspan="2">3 ips</td><td rowspan="2">3 ips</td></tr>
<tr><td>3</td></tr>
<tr><td>4</td><td>4 ips</td><td>4 ips</td></tr>
<tr><td>5</td><td rowspan="3">6 ips</td><td rowspan="8">6 ips</td><td rowspan="3">5 ips</td><td rowspan="3">5 ips</td><td rowspan="3">6 ips</td><td rowspan="3">5 ips</td><td>5 ips</td><td rowspan="3">6 ips</td><td rowspan="3">5 ips</td><td rowspan="3">5 ips</td><td rowspan="3">5 ips</td><td>5 ips</td></tr>
<tr><td>6</td><td rowspan="7">6 ips</td></tr>
<tr><td>7</td></tr>
<tr><td>8</td><td rowspan="3">10 ips</td><td>8 ips</td><td rowspan="7">8 ips</td><td rowspan="3">10 ips</td><td>8 ips</td><td rowspan="3">10 ips</td><td>8 ips</td><td>8 ips</td><td>8 ips</td></tr>
<tr><td>9</td><td>10 ips</td><td>10 ips</td><td>10 ips</td><td>10 ips</td><td>10 ips</td><td>10 ips</td></tr>
<tr><td>A</td></tr>
<tr><td>B</td><td rowspan="2">12 ips</td><td rowspan="2">12 ips</td><td rowspan="3">12 ips</td><td rowspan="3">12 ips</td><td rowspan="3">12 ips</td><td rowspan="3">12 ips</td><td rowspan="3">12 ips</td><td rowspan="3">12 ips</td><td rowspan="3">12 ips</td></tr>
<tr><td>C</td></tr>
<tr><td>D</td><td rowspan="2">14 ips</td><td rowspan="2">14 ips</td></tr>
<tr><td>E</td></tr>
</table>

(6) Whether to use ribbon

① Without ribbon: Direct thermal paper is used.

② With ribbon: Thermal transfer ribbon is used.

Note: Since the B-EX4D2 is a direct thermal printer, it behaves in the same way as “without ribbon”.

③ Ribbon saving function enabled:

- When a non-print area (see the table below) is detected, ribbon saving is performed automatically. (For the non-print area at the start of printing, a gap + non-print area shall be required.)
- The minimum print area (in the feed direction) while the ribbon saving is performed is 8 mm. If the print area is less than 8 mm, it is automatically regarded as 8-mm print area.

- The ribbon saving can be performed up to 4 fields per label (Max: 4 printing fields + 4 ribbon saving fields).
- When this parameter of the Issue Command is set to “Ribbon saving function disabled”, or the ribbon saving function parameter in the system mode is disabled, no ribbon saving will take place.
- When the issue mode parameter of the Issue Command is set to D (strip) or E (strip), the ribbon saving function will be disabled regardless of the ribbon saving function parameter setting.
- Since the head-up mechanism is not provided to the B-EX4T2, B-EX4T3-HS and B-EX6T3, the ribbon saving function is not performed.
- Since the B-EX4D2 is a direct thermal printer and has no head-up mechanism, it behaves in the same way as “without ribbon”.

NOTES: *1. To use the ribbon saving function, it is necessary to set the parameter depending on the head lever position. This selection is performed by the parameter settings in the system mode.*
Head lever position is “TAG”: Select “TAG” for RBN SAVE parameter.
Head lever position is “LABEL”: Select “LABEL” for RBN SAVE parameter.
Incorrect selection may disable the proper ribbon saving function.

2. Without the ribbon saving module, when the parameter of the Issue Command is set to “Ribbon saving function enabled”, or the ribbon saving module is set to available in the system mode, the ribbon will be loosened during printing.

④ Without ribbon (head up function enabled): Direct thermal paper is used. When the following non-print area is detected, the print head is raised in the same way with the ribbon save function.

[Non-print area required for ribbon saving or head up]

Non-print area / Print speed	B-EX4T1 (Tag/Label)		B-EX4T1 (Tag2/Label2)	
	203 dpi	305 dpi	203 dpi	305 dpi
3 ips	20 mm or more		20 mm or more	
5 ips	---	20 mm or more	---	20 mm or more
6 ips	20 mm or more	---	20 mm or more	---
8 ips	---	25 mm or more	---	35 mm or more
10 ips	35 mm or more		65 mm or more	
12 ips	60 mm or more		85 mm or more	
14 ips	75 mm or more		105 mm or more	

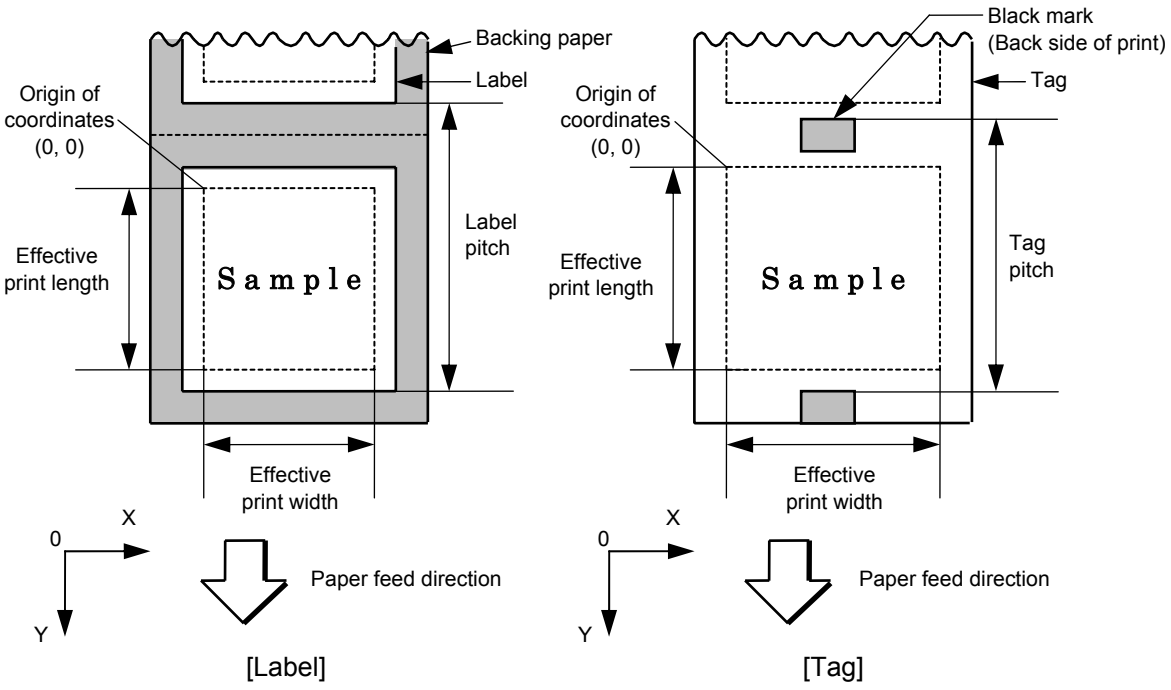
Non-print area / Print speed	B-EX6T1 (Tag/Label)	
	203 dpi	305 dpi
3 ips	20 mm or more	
5 ips	20 mm or more	
8 ips	25 mm or more	
10 ips	35 mm or more	
12 ips	60 mm or more	

- Since the head-up mechanism is not provided to the B-EX4T2, B-EX4D2, B-EX4T3-HS and B-EX6T3, the ribbon saving function is not performed.

(7) Printing direction

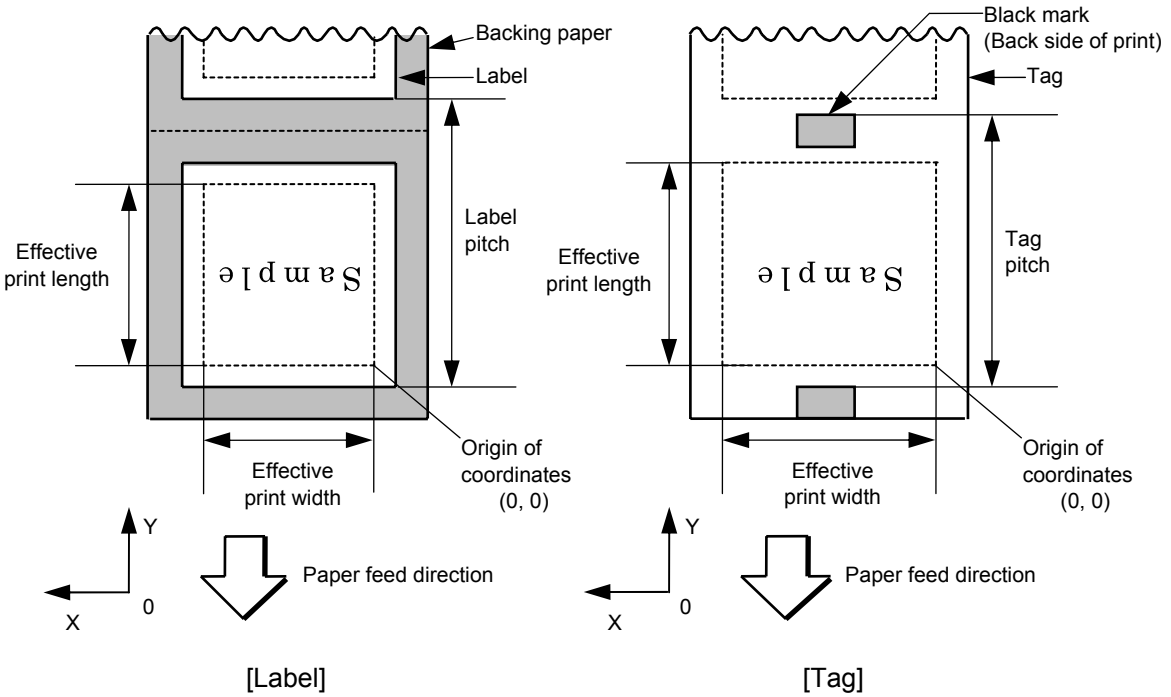
The origin of coordinates and the orientation of print image vary according to the printing direction parameter setting.

① Printing bottom first



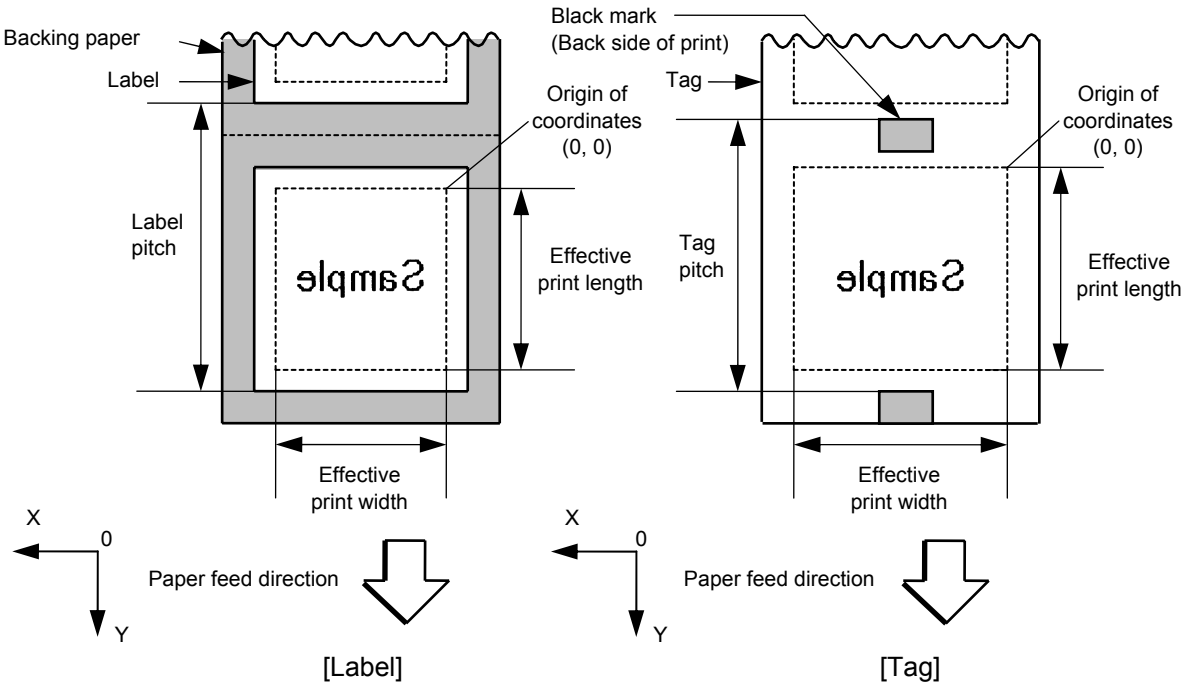
[Label] [Tag]

② Printing top first

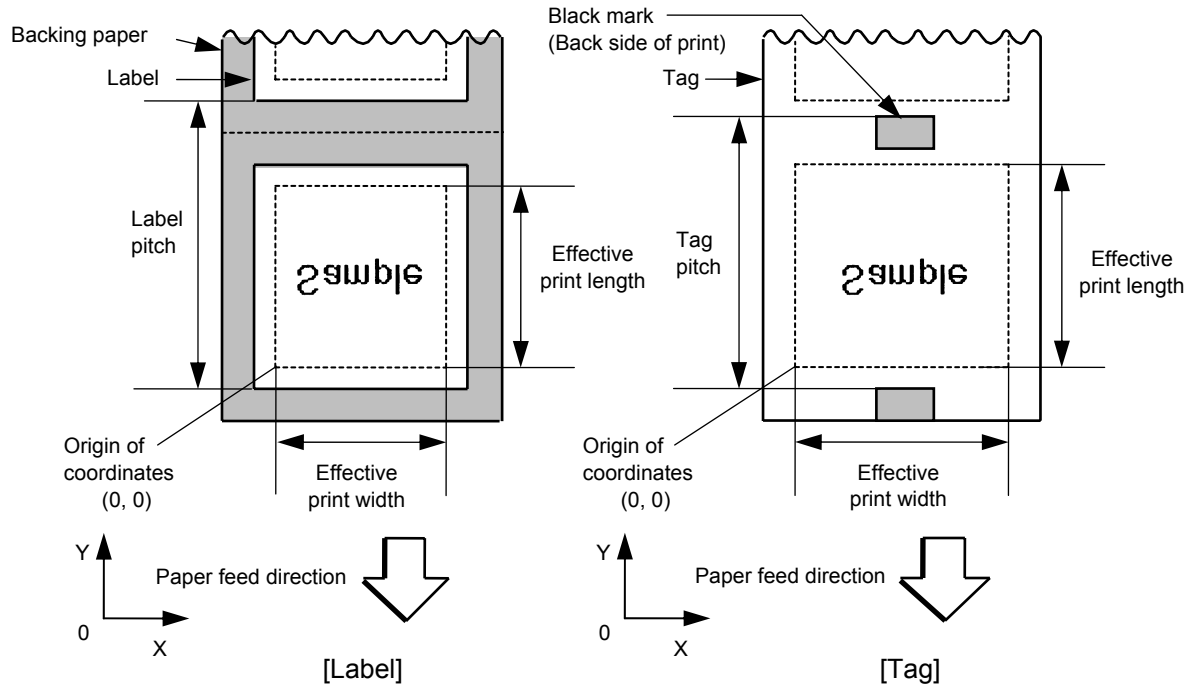


[Label] [Tag]

③ Bottom first mirror printing



④ Top first mirror printing



(8) Status response

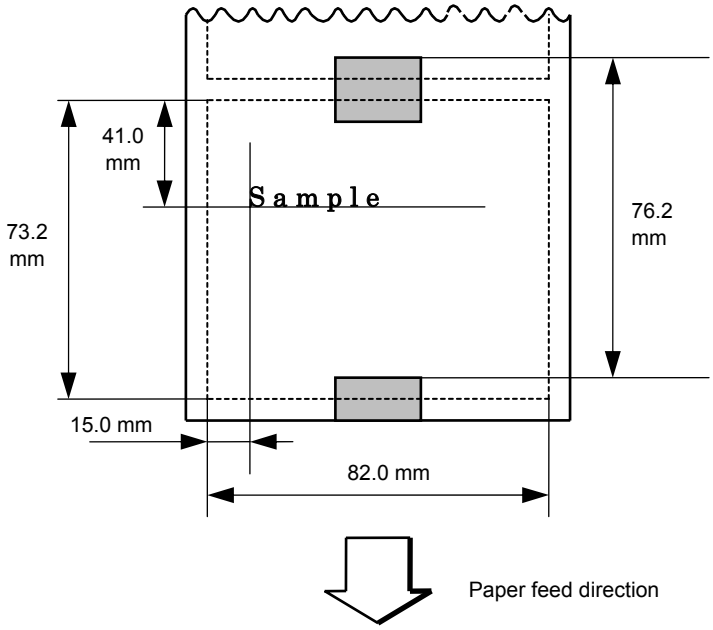
When “Status response is sent” has been selected for the status response parameter, the printer returns a status at the end of printing or occurrence of an error.
In the batch mode or the cut mode, a print end status is sent after the specified number of labels have been printed.
In the strip mode, a print end status is sent each time a label is printed.

* The value for the status response parameter must not be changed during printing. Doing so may disable proper status response processing.

(9) Type of supply

This parameter is intended for performing printing appropriately for the supplies (media and ribbon) to be used. This is used to temporarily change the energy level applied to the print head that has been set by the ENERGY TYPE parameter in the system mode. If a different type of supply from this parameter setting is used, poor print may occur. Refer to the Supply Specification for the suitable setting.
This setting remains effective for printing initiated through the expansion I/O or the [RESTART] key, until a next issue command is sent.

Examples



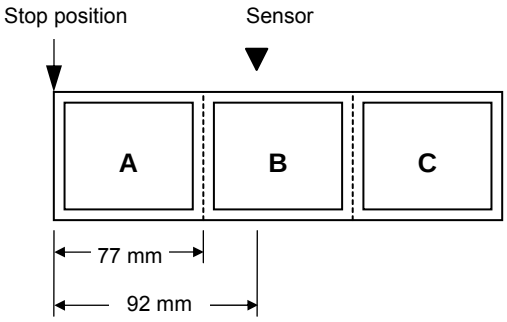
- Issue count: 4
- Cut interval: 1
- Paper: Tag paper (Reflective sensor used)
- Issue mode: Cut issue
- Issue speed: 8”/sec.
- Ribbon: With
- Status response: On

[ESC] D0762, 0820, 0732 [LF] [NUL]
[ESC] T11C30 [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, 0011C8201 [LF] [NUL]

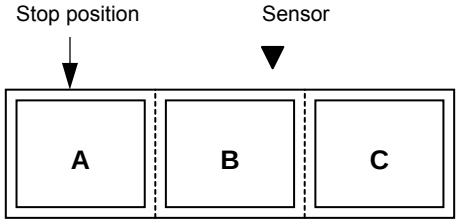
Notes

⊙ Explanation of processing to stop the label at the home position after a head-open state is detected:

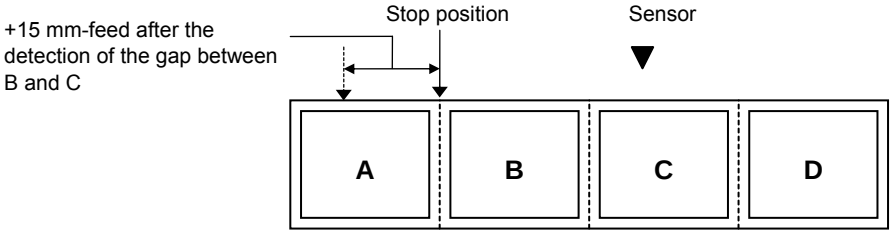
When a gap between labels (black mark) is found after the head open state is detected, the value is programmed again so that the label placed between the print head and the sensor stops at the home position.



- The paper is shifted from the above state.



- Stop position after feeding one label



* An error will result if this status meets feed jam conditions.

Paper feed direction

⊙ In the following cases, the printer issues media intermittently.

- When the ribbon is used and the print head temperature exceeds 65°C, 1.5-second interval is inserted between the specified number of labels.
- When no ribbon is used and the print head temperature exceeds 70°C, printing is stopped between the specified number of labels to cool down, and restarted after the temperature decreases to under 70°C.

When the above status occurs, the printer behavior becomes as follows:

- While the printer is stopped for cooling down, data transmission shall be enabled like in the online.
- When the printer receives a status request while cooling down, it returns 02H status if there is a next print job and 00H if there is not a next print job.
- While cooling down, the PAUSE key is usable and cancellation and restart of print job shall be enabled.
- If the print head is opened while cooling down, the printer is placed in the same state as the head up during idle. When printing is started, Head Open error occurs.
- While the printer is stopped for cooling down, the LED and LCD function in the same way as they are in printing if there is a next print job. If there is not a next print job, they depend on the current printer status.

5.7.2 FEED COMMAND [ESC] T

Function: Feeds media.

Format: [ESC]Tabcde(,TI)[LF][NUL]

Term:

a: Type of sensor
- 0: No sensor
- 1: Reflective sensor
- 2: Transmissive sensor (when using normal labels)
- 3: Transmissive sensor (when using preprinted labels)
- 4: Reflective sensor (when using a manual threshold value)

b: Cut operation
- 0: None
- 1: Cut

c: Feed mode
- C: Batch mode (Cut and feed when “1 (Cut)” is selected for parameter b.)
- D: Strip mode (with back feed)
- E: Strip mode (with back feed enabled, the strip sensor ignored, the applicator supported.)

d: Feed speed

B-EX4T1

<203 dpi>	<305 dpi>
3: 3 ips	3: 3 ips
6: 6 ips	5: 5 ips
A: 10 ips	8: 8 ips
C: 12 ips	A: 10 ips
E: 14 ips	C: 12 ips
	E: 14 ips

B-EX4T2

<203 dpi>	<300 dpi>	<600 dpi>
3: 3 ips	3: 3 ips	2: 2 ips
6: 6 ips	5: 5 ips	3: 3 ips
A: 10 ips	8: 8 ips	4: 4 ips
C: 12 ips	A: 10 ips	5: 5 ips
	C: 12 ips	6: 6 ips

B-EX4D2

<203 dpi>	<300 dpi>
3: 3 ips	3: 3 ips
6: 6 ips	5: 5 ips
A: 10 ips	8: 8 ips
C: 12 ips	A: 10 ips
	C: 12 ips

B-EX6T1/T3

<203 dpi>	<305 dpi>
3: 3 ips	3: 3 ips
5: 6 ips	5: 5 ips
8: 10 ips	8: 8 ips
A: 10 ips	A: 10 ips
C: 12 ips	C: 12 ips

B-EX4T3

<600 dpi>
2: 2 ips
3: 3 ips
4: 4 ips
5: 5 ips
6: 6 ips

e: Whether to use ribbon
0: Without ribbon
1: With ribbon (ribbon saving function enabled)
2: With ribbon (ribbon saving function disabled)
3: Without ribbon (Head-up function enabled)

Since the head-up function is not available to the B-EX4T2, B-EX4T3 and B-EX6T3, .the parameter setting will be automatically corrected:
1 → 2
3 → 0
Since the B-EX4D2 is a direct thermal printer and has no head-up mechanism, the parameter settings 1 to 3 will be automatically corrected to 0.

TI: Selection of threshold setting (B-EX4T3-H only)

Note: Omissible. When omitted, a value set by the parameter setting becomes effective. Options are different depending on the value set for parameter a (Type of sensor) of this command.)

When 0 to 2 or 5 is set for parameter a:
Invalid

When 3 is set for parameter a: Transmissive sensor (when using preprinted labels)
1: Manual threshold value for transmissive sensor (Default)
2: Manual threshold value 2 for transmissive sensor
3: Manual threshold value 3 for transmissive sensor
4: Manual threshold value 4 for transmissive sensor
5: Manual threshold value 5 for transmissive sensor

When 4 is set for parameter a: Reflective sensor (when using a manual threshold value)
1: Manual threshold value for reflective sensor (Default)
2: Manual threshold value 2 for reflective sensor
3: Manual threshold value 3 for reflective sensor
4: Manual threshold value 4 for reflective sensor
5: Manual threshold value 5 for reflective sensor

Explanation (1) Type of sensor

① No sensor:
A media feed takes place according to the parameter setting specified with the Label Size Set Command.

② Reflective sensor:
A media feed takes place according to the parameter setting specified with the Label Size Set Command. However, the reflective sensor automatically detects black marks provided on the back side of the tag paper for fine adjusting the stop position.

③ Transmissive sensor (when using normal labels):

A media feed takes place according to the parameter setting specified with the Label Size Set Command. However, the transmissive sensor automatically detects label-to-label gaps for fine adjusting the stop position.

④ Transmissive sensor (when using preprinted labels):

A media feed takes place according to the parameter setting specified with the Label Size Set Command. However, the transmissive sensor detects label-to-label gaps for fine adjusting the stop position, according to the threshold value set by the threshold setting operation (key operation).

⑤ Reflective sensor (when using a manual threshold value)

A media feed takes place according to the parameters setting specified with the Label Size Set Command. However, the reflective sensor detects black marks provided on the back of the tag paper for fine adjusting the paper position one by one, according to the threshold value set by the threshold setting operation (key operation).

NOTES:
- A suitable sensor type for the media to be used shall be selected. Improper selection may cause stop position misalignment or feed jam error.
  Bad example)
  Sensor type: Transmissive sensor
  Media: Tag paper with black marks
  In this case, the reflective sensor must be selected.
- To detect holes in tag paper, the Transmissive sensor shall be selected. (During the sensor adjustment, the sensor level at the holes shall be registered.)
- If a paper jam error occurs during printing with no sensor specified, the printer does not stop media feed until it feeds the media for the specified label pitch length. Care must be taken the media may be drawn into the rollers inside the printer.

(2) Cut operation

This option is valid only when the feed mote parameter is set to “C” (batch). (None is selected for the strip mode.)
When the automatic forward feed standby has been enabled in the system mode, the printer automatically performs an approximately 13.7-mm forward feed if no subsequent command is sent from the PC for 1 second after feeding the last label.

When the printer receives a Feed Command during the automatic forward feed standby, it feeds the label back to the original position first, then feeds the label forward.

* For precautions, refer to Issue Command.
Regarding use of the label having label pitch of 25.4 mm or less with the disc cutter, refer to the Position Fine Adjust Command.

Head-up function (Except for the B-EX4T2, B-EX4D2, B-EX4T3-HS and B-EX6T3)

When the cut operation is effective and whether to use ribbon is set to “1: With ribbon (ribbon saving function enabled)” or “3: Without ribbon (head-up function enabled)”, the head-up is performed in the following way:

<In the case of the disc cutter>
The print head is not raised while the printed media is fed to the cut position, and it is raised during the reverse feed after cut.

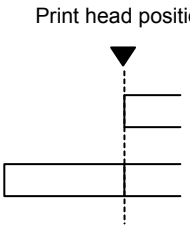
<In the case of rotary cutter>
When the media pitch is the minimum size (Label: 38.0 mm, Tag: 30.0 mm) or

greater, the print head is raised during both the media feed to the cut position and the reverse feed after cut.

(3) Feed mode

[C: Batch]

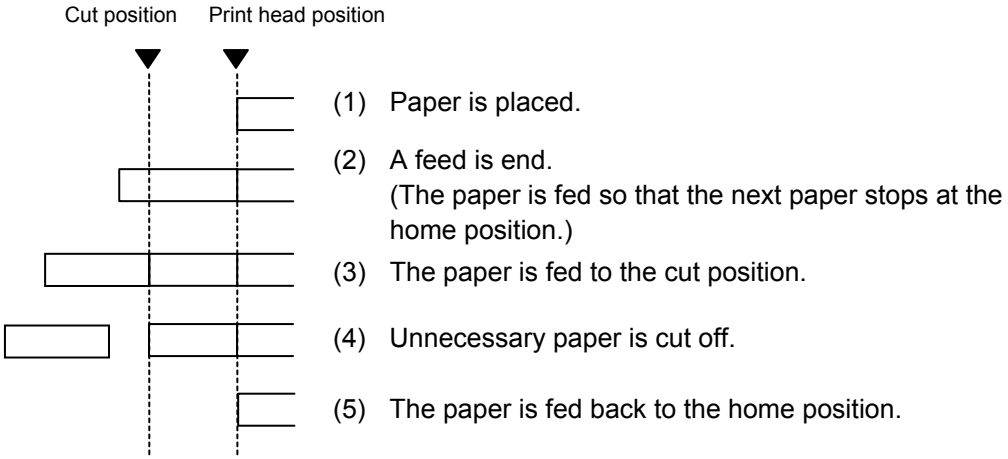
Cut operation: None



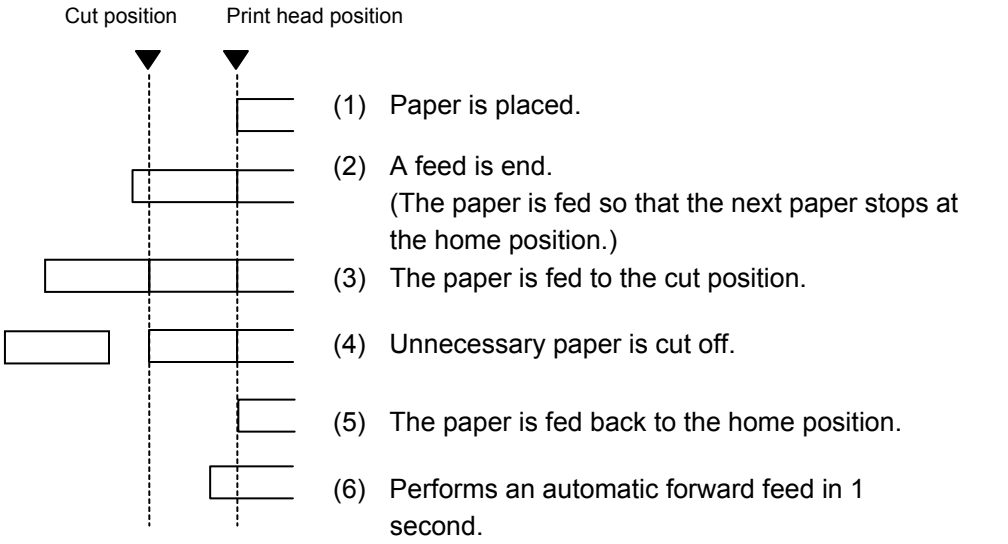
(1) Paper is placed.

(2) A feed is end.
(The paper is fed so that the next paper stops at the home position.)

[C: Batch]
Cut operation: Cut
Automatic forward feed standby: OFF (system mode setting)
Cutter: Disc cutter



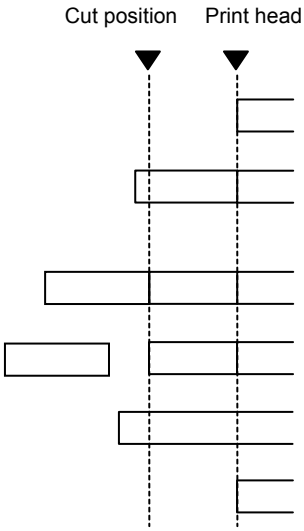
[C: Batch]
Cut operation: Cut
Automatic forward feed standby: ON (system mode setting)
Cutter: Disc cutter



NOTE:
If the pitch of the media used for the previous issue was less than 20mm, the forward wait will not be activated regardless of the parameter setting.

[C: Batch]

Cut operation: Cut
Automatic forward feed standby: OFF (system mode setting)
Cutter: Rotary cutter



(1) Paper is placed.

(2) A feed is end.
(The paper is fed so that the next paper stops at the home position.)

(3) The paper is fed to the cut position.

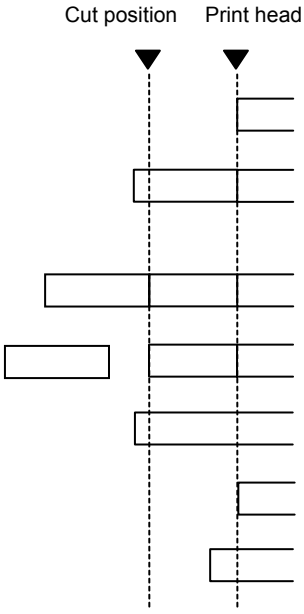
(4) Unnecessary paper is cut off.

(5) Since the rotary cutter performs non-stop cut, paper stops past the cut position.

(6) The paper is fed back to the home position.

[C: Batch]

Cut operation: Cut
Automatic forward feed standby: ON (system mode setting)
Cutter: Rotary cutter



(1) Paper is placed.

(2) A feed is end.
(The paper is fed so that the next paper stops at the home position.)

(3) The paper is fed to the cut position.

(4) Unnecessary paper is cut off.

(5) Since the rotary cutter performs non-stop cut, paper stops past the cut position.

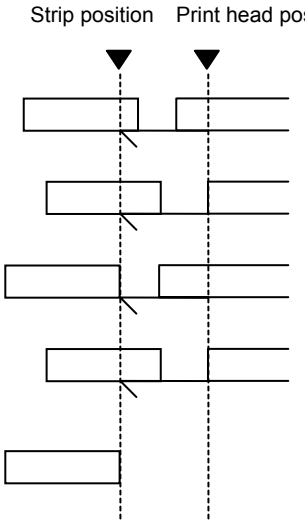
(6) The paper is fed back to the home position.

(7) Performs an automatic forward feed in 1 second.

NOTE:

If the pitch of the media used for the previous issue was less than 20mm, the forward wait will not be activated regardless of the parameter setting.

[D: Strip]



(1) Paper is placed.

(2) The 2nd label is fed back to the home position.

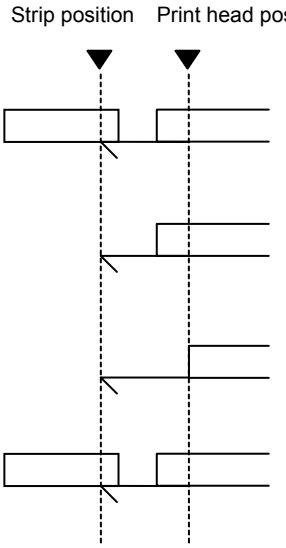
(3) A feed is started.

(4) A feed is end.
(The paper is fed so that the next paper stops at the home position.)

* Even if a label is not removed, a feed is performed.

[E: Strip]

Optional expansion I/O board: Installed
(The printer ignores the strip sensor, and issues labels while checking the pause signal generated from the expansion I/O.)



(1) Paper is placed.
The PAUSE signal generated from the expansion I/O is turned ON.

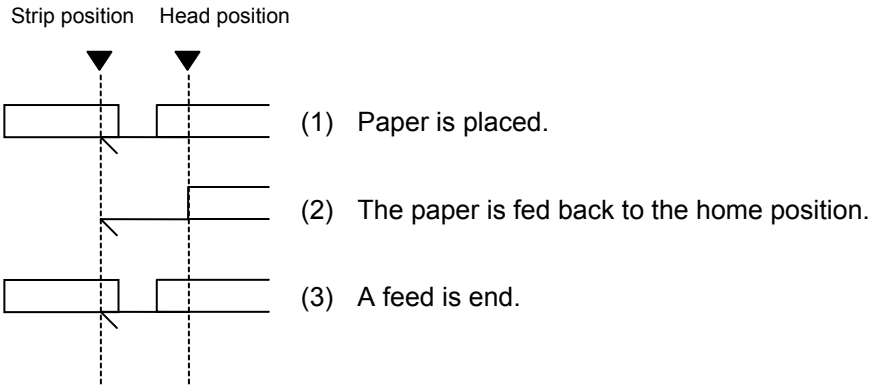
(2) The label is removed.
The PAUSE signal generated from the expansion I/O is turned OFF.

(3) The paper is fed back to the home position.

(4) A feed is end.
The PAUSE signal generated from the expansion I/O is turned ON.

[E: Strip]

Optional expansion I/O board: Not installed
(The printer feeds labels while ignoring the strip sensor.)



*1 Feed mode E is different from feed mode D in the way the subsequent labels are issued. In feed mode E, labels are issued regardless of whether or not the printed label is removed.

*2: The peripheral device such as an applicator shall control the PAUSE signal generated from the expansion I/O.

(4) Feed speed

- Media feed is performed at the specified speed.
  The back feed in cut mode or strip mode is performed at the specified back feed speed (2 ips or 3 ips) set in the system mode
- The rotary cutter does not support the print speed of 10 ips or faster. When the rotary cutter has been installed, the print speed is automatically corrected to 6 ips (203 dpi) or 8 ips (300/305 dpi), respectively, even if the print speed is set to 10 ips or faster (regardless of whether or not the cut issue is specified.)
- When the print speed is set to 10 ips or faster in strip issue mode, pre-peel-off function is automatically performed. However, the print speed is corrected depending on the following conditions:
  (1) When the expansion I/O mode is set to TYPE1 (Standard), the print speed is adjusted to 10 ips for 203 dpi or 8 ips for 305 dpi, respectively.
  (2) When the expansion I/O mode is set to TYPE2 (Inline specification), the specified print speed is effective.
  (3) In the case of the print speed less than 10 ips, the pre-peel-off function is performed only when it is enabled in the system mode.

- The forward feed speed for the pre-peel-off is fixed to 3 ips. The reverse feed speed depends on the back feed speed setting in the system mode (2 ips or 3 ips).
- The available issue speed varies according to types and sizes of the supply. For details, refer to the Supply Specification.

<table>
<tr><td>Model</td><td colspan="4">B-EX4T1</td><td colspan="3">B-EX4T2</td><td colspan="2">B-EX4D2</td><td colspan="2">B-EX6T1/T3</td><td>B-EX4T3</td></tr>
<tr><td>Resolution</td><td colspan="2">203 dpi</td><td colspan="2">305 dpi</td><td>203 dpi</td><td>300 dpi</td><td>600 dpi</td><td>203 dpi</td><td>300 dpi</td><td>203 dpi</td><td>305 dpi</td><td>600 dpi</td></tr>
<tr><td>Rotary cutter / Parameter</td><td>Not fitted</td><td>Fitted</td><td>Not fitted</td><td>Fitted</td><td>Not fitted</td><td>Not fitted</td><td>Not fitted</td><td>Not fitted</td><td>Not fitted</td><td>Not fitted</td><td>Not fitted</td><td>Not fitted</td></tr>
<tr><td>1</td><td rowspan="4">3 ips</td><td rowspan="4">3 ips</td><td rowspan="4">3 ips</td><td rowspan="4">3 ips</td><td rowspan="4">3 ips</td><td rowspan="4">3 ips</td><td>2 ips</td><td rowspan="4">3 ips</td><td rowspan="4">3 ips</td><td rowspan="4">3 ips</td><td rowspan="4">3 ips</td><td>2 ips</td></tr>
<tr><td>2</td><td rowspan="2">3 ips</td><td rowspan="3">3</td></tr>
<tr><td>3</td></tr>
<tr><td>4</td><td>4 ips</td><td>4</td></tr>
<tr><td>5</td><td rowspan="3">6 ips</td><td rowspan="8">6 ips</td><td rowspan="3">5 ips</td><td rowspan="3">5 ips</td><td rowspan="3">6 ips</td><td rowspan="3">5 ips</td><td>5 ips</td><td rowspan="3">6 ips</td><td rowspan="3">5 ips</td><td rowspan="3">5 ips</td><td rowspan="3">5 ips</td><td>5</td></tr>
<tr><td>6</td><td rowspan="7">6 ips</td><td rowspan="3">6</td></tr>
<tr><td>7</td></tr>
<tr><td>8</td><td rowspan="3">10 ips</td><td>8 ips</td><td rowspan="7">8 ips</td><td rowspan="3">10 ips</td><td>8 ips</td><td rowspan="3">10 ips</td><td>8 ips</td><td>8 ips</td><td>8 ips</td></tr>
<tr><td>9</td><td>10 ips</td><td rowspan="3">10 ips</td><td>10 ips</td><td>10 ips</td><td>10 ips</td><td>10 ips</td></tr>
<tr><td>A</td><td rowspan="5">6 ips</td></tr>
<tr><td>B</td><td rowspan="2">12 ips</td><td rowspan="2">12 ips</td><td rowspan="4">12 ips</td><td rowspan="4">12 ips</td><td rowspan="4">12 ips</td><td rowspan="4">12 ips</td><td rowspan="4">12 ips</td><td rowspan="4">12 ips</td><td rowspan="6">6 ips</td></tr>
<tr><td>C</td></tr>
<tr><td>D</td><td rowspan="2">14 ips</td><td rowspan="2">14 ips</td></tr>
<tr><td>E</td></tr>
</table>

(5) Whether to use ribbon

① Without ribbon: The ribbon motors are not driven during media feed.

② With ribbon: The ribbon motors are driven during media feed.

Note: Since the B-EX4D2 is a direct thermal printer, it behaves in the same way as “without ribbon”.

③ Ribbon saving function enabled:

- Ribbon saving is automatically performed when the ribbon saving function is enabled in the system mode.
- Ribbon saving is not performed when it is disabled in the system mode.
- In the case of the media pitch shown in the table below, no ribbon save is performed.
- When the issue mode parameter of the Issue Command is set to D (strip) or E (strip), the ribbon saving function will be disabled regardless of the ribbon saving function parameter setting.
- Since the head-up mechanism is not provided to the B-EX4T2, B-EX4T3-HS and B-EX6T3, the ribbon saving function is not performed.
- Since the B-EX4D2 is a direct thermal printer and has no head-up mechanism, it behaves in the same way as “without ribbon”.

④ Ribbon saving function disabled:

- Ribbon saving is not performed.
- In the case of the media pitch shown in the table below, no ribbon save is performed.

Non-print area / Print speed	B-EX4T1 (TAG, LABEL)		B-EX4T1 (TAG2, LABEL2)	
	203 dpi	305 dpi	203 dpi	305 dpi
3 ips	Less than 20 mm		Less than 20 mm	
5 ips	---	Less than 20 mm	---	Less than 20 mm
6 ips	Less than 20 mm	---	Less than 20 mm	---
8 ips	---	Less than 25 mm	---	Less than 35 mm
10 ips	Less than 35 mm		Less than 65 mm	
12 ips	Less than 60 mm		Less than 85 mm	
14 ips	Less than 75 mm		Less than 105 mm	

Non-print area / Print speed	B-EX6T1 (Tag/Label)	
	203 dpi	305 dpi
3 ips	Less than 20 mm	
5 ips	Less than 20 mm	
8 ips	Less than 25 mm	
10 ips	Less than 35 mm	
12 ips	Less than 60 mm	

- Since the head-up mechanism is not provided to the B-EX4T2, B-EX4D2, B-EX4T3-HS and B-EX6T3, the ribbon saving function is not performed.

Notes

(1) After changing the label size or type of sensor, fine adjusting the feed amount, cut position/strip position, or back feed amount, one label needs to be fed prior to printing to adjust the next label to the print start position.

(2) The parameters of the Feed Command are backed up in the memory (retained even after the power is turned off).

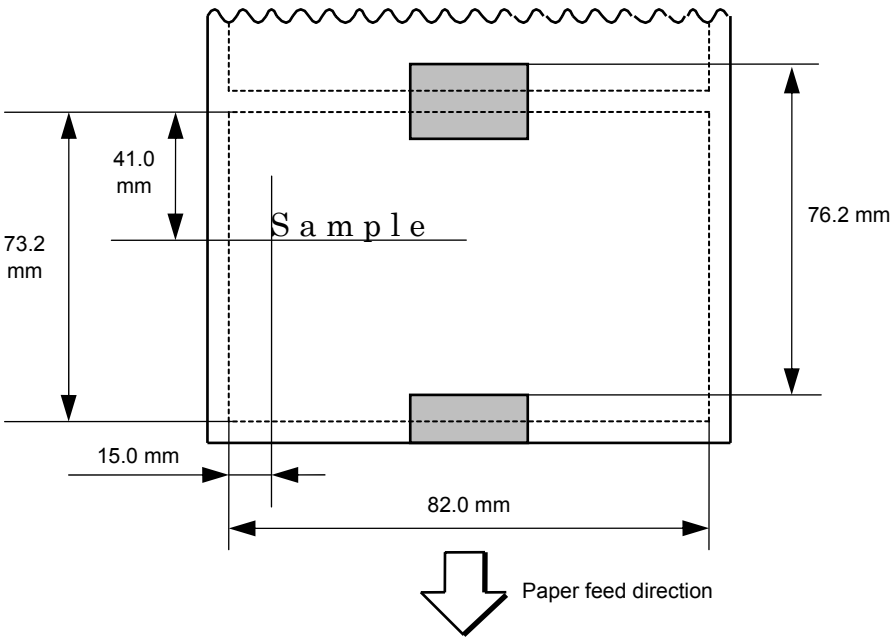
(3) When “Status response is sent” has been selected for the status response parameter in the Issue Command, the printer returns a status at the end of media feed or occurrence of an error.

(4) Regarding the processing for stop a label at the home position, refer to the Issue Command.

(5) If no subsequent command is sent from the PC for 1 second after the last media feed on the condition the automatic forward feed standby has been enabled in the system mode, the printer automatically performs a forward feed. When the printer receives a Feed Command during the automatic forward feed standby, it feeds the label back to the home position and starts feeding.

* For precautions, refer to the Issue Command.

Examples



[ESC] D0762, 0820, 0732 [LF] [NUL]
[ESC] AX; +010, +000, +10 [LF] [NUL]
[ESC] T11C30 [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]

5.7.3 EJECT COMMAND [ESC] IB

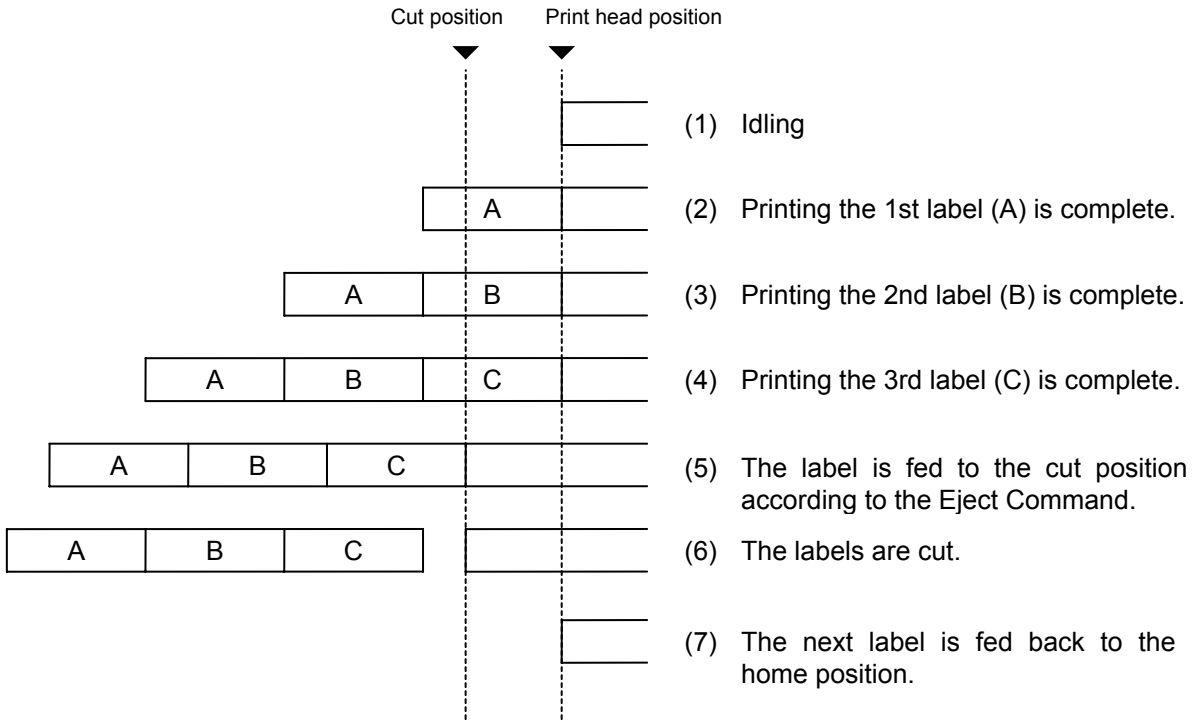
Function Ejects (or cuts) the label presently left between the print head and the cutter, and returns the next label to the original position.

Format [ESC]IB[LF][NUL]

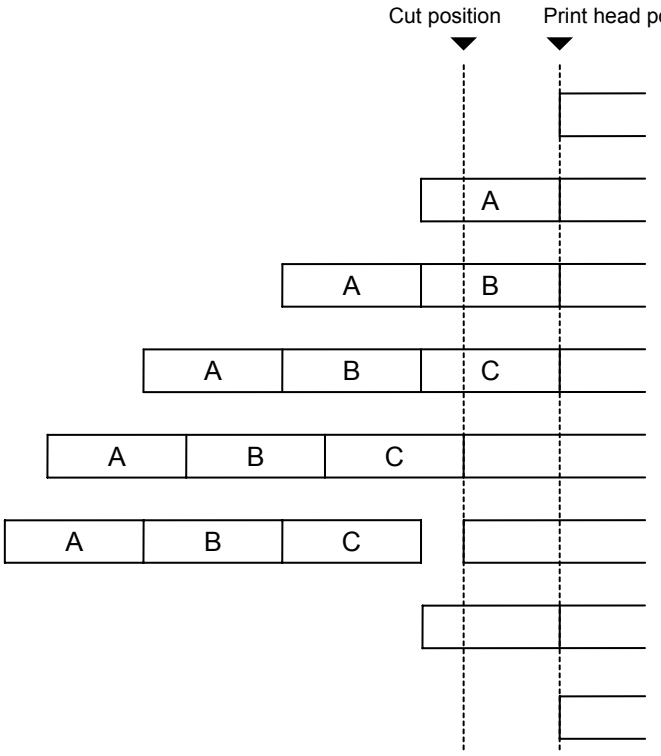
Notes If no subsequent command is sent from the PC within 1 second after the ejection of label when the automatic forward wait has been enabled in the system mode, the printer automatically performs a forward feed.
When the printer receives an Eject Command while it is in the automatic forward wait state, it feeds the label back to the home position and starts ejecting label.
However, if the pitch of the media used for the previous issue was less than 20mm, the forward wait will not be activated regardless of the parameter setting.

* For precautions, refer to the Issue Command.

Examples • When the disc cutter is used:



• When the rotary cutter is used:



(1) Idling

(2) Printing the 1st label (A) is complete.

(3) Printing the 1st label (B) is complete.

(4) Printing the 1st label (C) is complete.

(5) The label is fed to the cut position according to the Eject Command.

(6) The labels are cut.

(7) Since the rotary cutter performs non-stop cut, paper stops past the cut position.

(8) The next label is fed back to the home position.

[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]

5.7.4 FORWARD/REVERSE FEED COMMAND [ESC] U1, [ESC] U2

Function

After printing or feeding the paper, feeds the paper to the position at which a label can be cut manually.
When issuing the next label, feeds the paper back to the print start position.

Format

Forward Feed
[ESC]U1;aaaa(,b)[LF][NUL]

Reverse Feed
[ESC]U2;aaaa(,b)[LF][NUL]

Term

aaaa: Feed amount by which the paper is fed forward or backward.
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.
Note: Since the head-up mechanism is not provide to the B-EX4T2, B-EX4D2, B-EX4T3-HS and B-EX6T3, the parameter setting is automatically corrected to “0” if “1” is selected.

Notes

(1) When the Forward Feed Command has already been transmitted to the printer, pressing the [FEED] key causes one label to be fed before the specified length of forward feed is performed.

(2) The Forward/Reverse Feed Command is backed up in the memory (retained even after the power is turned off).

(3) The Forward/Reverse Feed Command is ignored when the following conditions are satisfied.

① When the strip module has been installed and the previous issue was executed by:
- Issue command with the issue mode set to D: Strip mode (with back feed and the strip sensor enabled)
- Feed command with the feed motor set to D: Strip mode (with back feed)

② Regardless of whether the strip module has been installed or not, when the previous issue was executed by:
- Issue command with the issue mode set to E: Strip mode (with back feed enabled, the strip sensor ignored, the applicator supported)
- Feed command with the feed motor set to E: Strip mode (with back feed enabled, the strip sensor ignored, the applicator supported)

③ When the cutter module has been installed and the previous issue was executed by:
- Issue command with the issue mode set to C: Batch mode and the cut interval set to 001 or more
- Eject command

④ When the auto forward wait parameter is set to ON in the printer system mode.

(4) As long as the ribbon saving function parameter is set to OFF in the printer system mode, a head up function is not performed even if the “Head up function is performed” is specified for parameter b of this command.

(5) The forward feed is performed at the speed specified with the Issue Command or Feed Command. The reverse feed is performed at 3 ips. This reverse feed speed can be changed from 3 ips to 2 ips in the system mode.

(6) There may be cases, where a specified length of a reverse feed is not performed, depending on the print conditions. In the case the media sensor is used and the label pitch is almost the same as the distance between the print head and the media sensor (75.5 mm), a label/tag may not be returned to the original position, even if the same value is specified for both a forward feed and a reverse feed, resulting in an error. To prevent this error from occurring, set the reverse feed amount to a value larger than the forward feed amount.

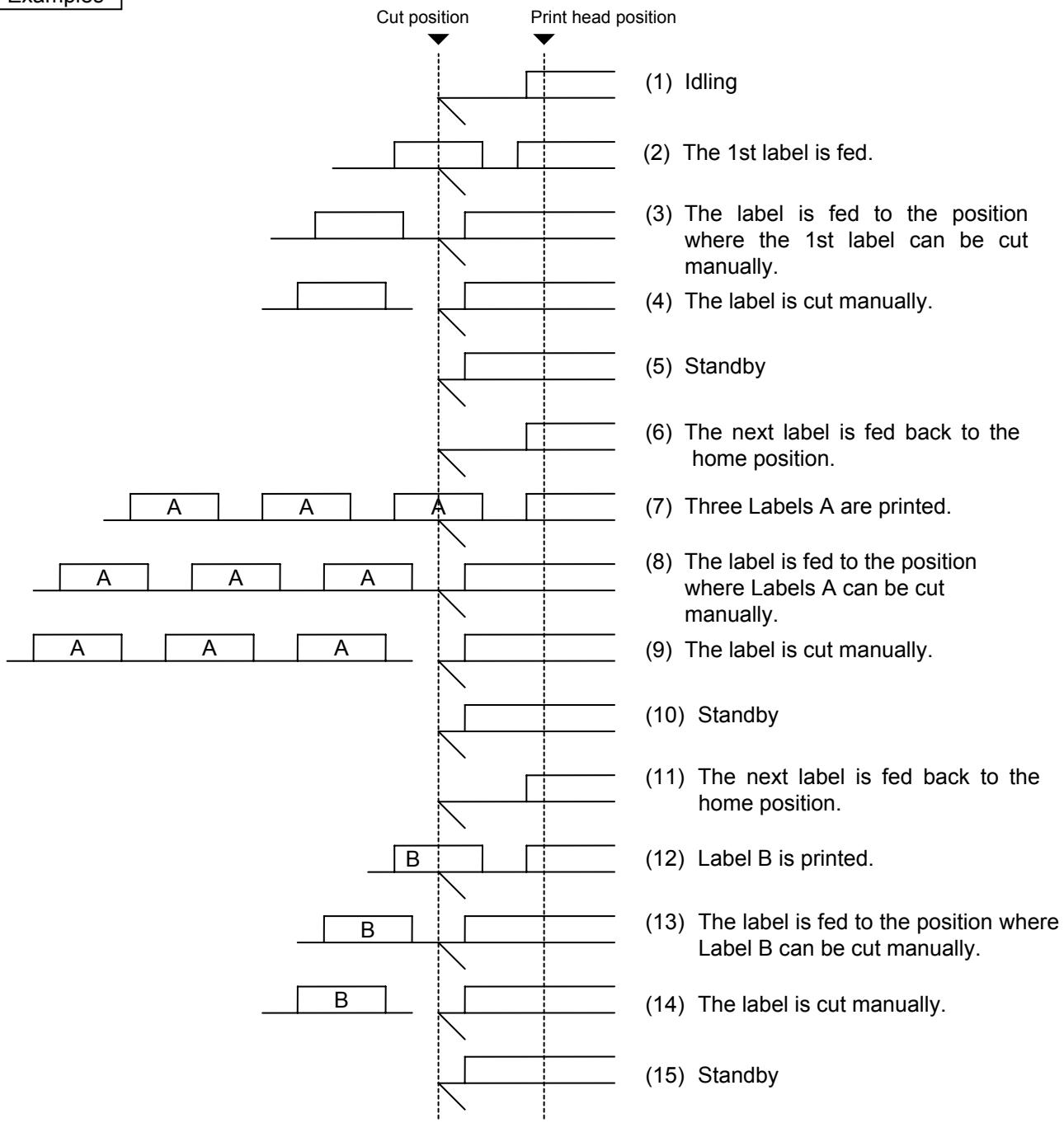
(7) Even if the “Head up function is performed” is specified for the Forward Feed Command, the print head is not raised in the case of the following combination of the feed speed and the feed amount.

Feed amount / Feed speed	B-EX4T1	
	203 dpi	305 dpi
3 ips	Less than 20 mm	
5 ips	---	Less than 20 mm
6 ips	Less than 20 mm	---
8 ips	---	Less than 25 mm
10 ips	Less than 35 mm	
12 ips	Less than 60 mm	
14 ips	Less than 75 mm	

Non-print area / Print speed	B-EX6T1	
	203 dpi	305 dpi
3 ips	Less than 20 mm	
5 ips	Less than 20 mm	
8 ips	Less than 25 mm	
10 ips	Less than 35 mm	
12 ips	Less than 60 mm	

(8) Even if the “Head up function is performed” is specified for the Reverse Feed Command, the print head is not raised when the feed amount is 20mm or less.

Examples



[ESC] T20C30 [LF] [NUL]
[ESC] U1; 0120 [LF] [NUL]
Cut manually.
[ESC] U2; 0120 [LF] [NUL]
[ESC] RC001; A [LF] [NUL]
[ESC] XS; I, 0003, 0002C3001 [LF] [NUL]
[ESC] U1; 0120 [LF] [NUL]
Cut manually.
[ESC] U2; 0120 [LF] [NUL]
[ESC] RC001; B [LF] [NUL]
[ESC] XS; I, 0001, 0002C3001 [LF] [NUL]
[ESC] U1; 0120 [LF] [NUL]

5.8 COMMANDS RELATED TO WRITABLE CHARACTERS

5.8.1 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 24 (0 KB to 3072 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 3072 KB.

(2) When “25” or more is set for the storage area for each area (except setting “AA” for the BASIC file storage area), a command error results.

(3) The storage areas are allocated in the following order of precedence
① Size of BASIC file storage area: 00 to 24
TrueType font > Bit map writable character > BASIC > PC command

② Size of BASIC file storage area: AA
BASIC > TrueType font > Bit map writable character > PC command

[When the size of BASIC file storage area is set in a range of “00” to “24”.]

(4) When this command is received, the entire area in flash ROM on the CPU board is cleared.

(5) Until this command is sent, the storage area in flash ROM on the CPU board cannot be used.

(6) The storage areas are allocated in the following order of precedence:
TrueType font > Bit map writable character > BASIC file
After these storage areas are allocated, the remaining area is used for storing the PC commands.

(7) 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 area to save PC commands.

(8) 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 a remaining area after the above-mentioned two areas are allocated, it is used for storing the BASIC file. There is no area to save PC commands.

(9) 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.

(10) When “24” (3072 KB) is specified for any of the TrueType font storage area, the bit map writable character storage area, and the BASIC file storage area, the entire storage area is occupied by that area. For example, if “24” is specified for the TrueType Font storage area, the entire storage area is used for storing TrueType Font. There is no area to save the bit map writable characters, the BASIC files, or the PC commands.

[When the size of BASIC file storage area is set to “AA”]

(11) When this command is received, only the BASIC file storage area is retained and the other areas in flash ROM on the CPU board are cleared.

(12) Until this command is 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 though the BASIC file storage area has not been allocated, the BASIC file storage area remains unallocated.

(13) 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 storing the PC commands.

(14) 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 obtained by subtracting the BASIC file storage area size from 3072 KB, the TrueType font storage area and the bit map writable character storage area are allocated as specified. In this case, however, there is no area to save PC commands.

(15) If the sum of TrueType font storage area and the bit map writable character storage area, specified by this command, exceeds the size obtained by subtracting the BASIC file storage area size from 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. There is no area to save PC commands.

(16) 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.

(17) When the size obtained by subtracting the BASIC file storage area size from 3072 KB 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 “22”, “23” or “24” for the size of the TrueType font storage area while the BASIC file storage area secures “2” (256KB), the entire storage area except the BASIC file storage area is allocated to the TrueType font storage area. There is no area to save the bit map writable character or the PC commands.

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 1280 KB and 384 KB, respectively.
(PC command save area: 3072 KB − 1280KB − 384 KB = 1408 KB)

[ESC] XF; 10, 03, 00 [LF] [NUL]

5.8.2 FLASH MEMORY FORMAT COMMAND [ESC] J1

Function

Formats (initializes) the external memory used for storage or flash ROM on the CPU board.

Format

[ESC]J1;a(,b)[LF][NUL]

Term

a: Formatting (initializing) range
- A: PC command save area + Writable character storage area in the flash ROM
- B: PC command save area in the flash ROM
- C: Writable character storage area in the flash ROM

b: Drive (Omissible. When omitted, flash ROM on the CPU board is selected.)
- 0: Flash ROM on the CPU board
- 1: External memory (When optional RTC and USB host interface board are installed)
- 2: Reserved

Explanation

(1) Up to 8-GB external memory can be formatted.

(2) It is possible to format (initialize) the PC command save area and the writable character storage area in the flash ROM on the CPU board separately or together.

(3) When the external memory is selected, the PC command save area and the writable character storage area are deleted separately or together. (This is not formatting.)

(4) Do not create files or folders arbitrarily in the folders storing the PC command save or writable character with a PC. These files or folders may not be able to be deleted, causing a format error. If there is any in the external memory, manually delete it.

(5) After the external memory is formatted, the remaining memory, the remaining memory is displayed on the LCD.

(6) When the label issue operation is performed after the Flash Memory Format Command is sent, the image buffer is automatically cleared.

(7) When storing of writable characters, logos, or PC interface commands is not continued, the printer automatically enters the online mode (label issue operation) in about 10 seconds. At this time, the image buffer is automatically cleared.

Note

Approximate time for formatting a USB memory (Reference)
1GB: About 11 seconds
2GB: About 23 seconds
4GB: About 50 seconds
8GB: About 99 seconds

Refer to

- Bit Map Writable Character Command ([ESC] XD)
- Save Start Command ([ESC] XO)
- Save Terminate Command ([ESC] XP)

Example

[ESC] J1; A, 1 [LF] [NUL]

5.8.3 EXTERNAL MEMORY FORMAT COMMAND [ESC] JA

Function Formats (initializes) the external memory used for storage.

Format [ESC]JA;a[LF][NUL]

Term a: Drive

1: External memory (When optional RTC and USB host interface board are installed)
2: Reserved

Explanation

(1) Up to 8-GB external memory can be formatted.

(2) When the label issue operation is performed after the External Memory Format Command is sent, the image buffer is automatically cleared.

(3) When storing of writable characters, logos, or PC interface commands is not continued, the printer automatically enters the online mode (label issue operation) in about 10 seconds. At this time, the image buffer is automatically cleared.

(4) Special care must be taken when executing this command because it will delete everything in the memory, including not only the PC command save area and writable character storage area, but also arbitrarily created files, Web printer setup files, and XML setup files.
The following functions become unusable after formatting the external memory since they use the setup files stored in the external memory.
- Web printer function (HTTP)
- Email function (POP3/SMTP)
- XML function (when using the external memory)

(5) Before the external memory is formatted, the Web printer function and XML function shall be set to OFF.

(6) The file system and the cluster size remain unchanged after a format. Supported formats are FAT12, FAT16 and FAT32.

Note Approximate time for formatting a USB memory (Reference)

1GB: About 7 seconds
2GB: About 12 seconds
8GB: About 27 seconds

Refer to
- Bitmap Writable Character Command ([ESC] XA)
- Save Start Command ([ESC] XV)
- Save Terminate Command ([ESC] XP)

Example [ESC] JA; 2 [LF] [NUL]

5.8.4 2-BYTE WRITABLE CHARACTER CODE RANGE COMMAND [ESC] XE

Function Sets the range when 2-byte writable character codes are stored in 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.)

Explanation

(1) The character code range for 2-byte character such as Kanji may be divided into two or more. It is possible to delete unnecessary control information area by designating the character code range, and to use the flash memory efficiently.

(2) The total number of characters for each range must not exceed 0x4000 (16384 characters).

(3) Up to 2700 character code ranges can be designated.

(4) A character code improper for the setting of this command cannot be stored.

(5) The first character code for each area to be set shall be sent in the ascending order. Each area must not overlap with others. If these 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]

5.8.5 BITMAP WRITABLE CHARACTER STORE COMMAND [ESC] XD

(For Flash Memory or External Memory)

Function Stores writable characters or logos in the flash ROM on the CPU board or external memory.

Format [ESC]XD;(Sj,)aa,b,ccc,ddd,eee,fff,ggg,h,iii------iii[LF][NUL]

Term

Sj: Drive where writable characters or logos are stored
(Omissible. When omitted, flash ROM on the CPU board is selected.)

j: Drive
- 0: Flash ROM on CPU board
- 1: External memory (When optional RTC and USB host interface board are installed)
- 2: Reserved

aa: Writable character type

• External memory

01 to 40
41 16 × 16 dots
42 24 × 24 dots
43 32 × 32 dots
44 48 × 48 dots

• Flash ROM on the CPU board

01 to 40
41 16 × 16 dots
42 24 × 24 dots
43 32 × 32 dots
44 48 × 48 dots
51 2-byte code character

b(b): Writable character code
20H to FFH (Set in hex. format)
40H to 7EH, 80H to FCH (When the writable character type is 41 to 44)
2020H to FFFFH (When the writable character type is 51.)

ccc: Left offset
000 to 719 (in dots)

ddd: Top offset
000 to 719 (in dots)

eee: Character width
001 to 720 (in dots)

fff: Character height
001 to 720 (in dots)

ggg: Character-to-character space/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, the left offset, top offset, character width, character height, and character-to-character space/proportional spacing are fixed to “000” regardless of the parameter settings.

5.8.6 BITMAP WRITABLE CHARACTER STORE COMMAND [ESC] XA

(For External Memory)

Function Stores writable characters or logos in the external memory.

Format [ESC]XA,j,aa,b(b),ccc(c),ddd(d),eee(e),fff(f),ggg(g),h,iii------iii[LF][NUL]

Term

j: Drive
- 1: External memory (When optional RTC and USB host interface board are installed)
- 2: Reserved

aa: Writable character type

01 to 40
41 16 × 16 dots
42 24 × 24 dots
43 32 × 32 dots
44 48 × 48 dots
51 to 55 (2-byte code character)

b(b): Writable character code

20H to FFH (Set in hex. format)
40H to 7EH, 80H to FCH (When the writable character type is 41 to 44)
2020H to FFFFH (When the writable character type is 51 to 55)

ccc(c): Left offset

B-EX4T1/4T2/4D2-G: 000 to 831 (in dots)
B-EX4T1-T: 000 to 1247 (in dots)
B-EX4T2-T: 000 to 1227 (in dots)
B-EX4T2/4D2-H: 000 to 2454 (in dots)
B-EX6T1/T3-G: 000 to 1279 (in dots)
B-EX6T1/T3-T: 000 to 1919 (in dots)
B-EX4T3-H: 000 to 2454 (in dots)

ddd(d): Top offset

000 to 5460 (in dots)

eee(e): Character width

B-EX4T1/4T2/4D2-G: 001 to 832 (in dots)
B-EX4T1-T: 001 to 1248 (in dots)
B-EX4T2-T: 001 to 1228 (in dots)
B-EX4T2/4D2-H: 001 to 2455 (in dots)
B-EX6T1/T3-G: 000 to 1280 (in dots)
B-EX6T1/T3-T: 000 to 1920 (in dots)
B-EX4T3-H: 000 to 2455 (in dots)

fff(f): Character height

001 to 5460 (in dots)

ggg(g): Character-to-character space/proportional spacing

B-EX4T1/4T2/4D2-G: 000 to 832 (in dots)
B-EX4T1-T: 000 to 1248 (in dots)
B-EX4T2/4D2-T: 000 to 1228 (in dots)
B-EX4T2-H: 000 to 2455 (in dots)
B-EX6T1/T3-G: 000 to 1280 (in dots)
B-EX6T1/T3-T: 000 to 1920 (in dots)

B-EX4T3-H: 000 to 2455 (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, the left offset, top offset, character width, character height, and character-to-character space/proportional spacing are fixed to “000” regardless of the parameter settings.

Explanation

(1) Type of writable character

Up to 49 types of writable character sets can be stored in the external memory. 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 sets 41 to 44, each writable character size is fixed.

(2) Character code

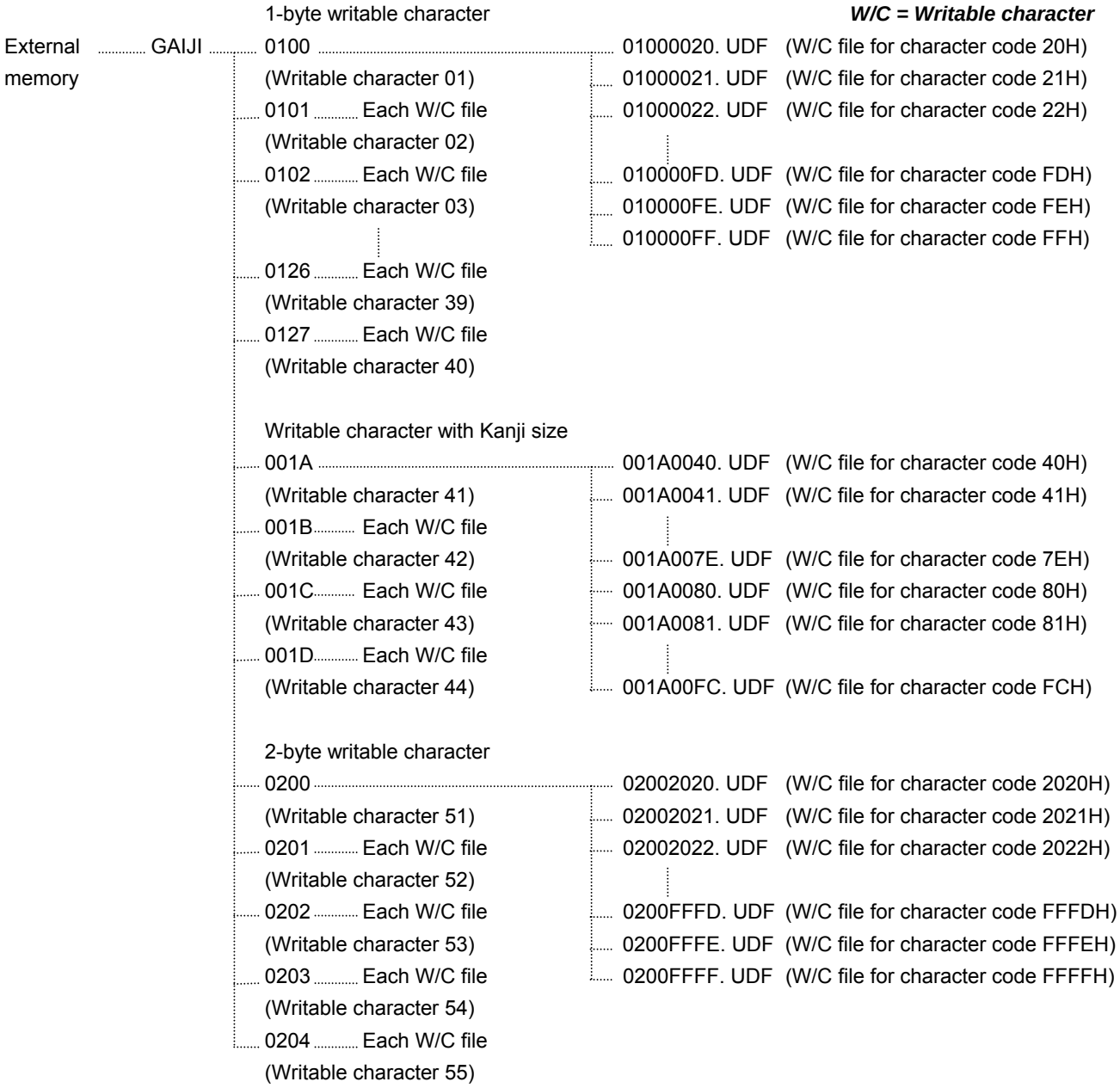
Up to 224 characters can be stored per character set. The maximum number of characters is 40 character sets × 224 characters = 8960 characters. It varies depending on the writable character size and the number of characters because of the limited memory capacity. For character sets 41 to 44, a character code consisting is stored in 1 byte. When the character code is called, F0H is added to the upper digit to make it 2 bytes. In this case, up to 188 characters can be stored per character set.

(3) Only the external memory with the capacity of up to 8GB can be used for storing writable characters.

(4) The configuration of the writable character file stored in the external memory is as follows.

1st byte	No. of dots for left offset
2nd byte	(from upper to lower)
3rd byte	No. of dots for top offset
4th byte	(from upper to lower)
5th byte	No. of dots for character height
6th byte	(from upper to lower)
7th byte	No. of dots for character width
8th byte	(from upper to lower)
9th byte	No. of dots for character-to-character spacing/proportional spacing
10th byte	(from upper to lower)
11th byte ⋮	Writable character data (Hex. data) (When it is stored in the nibble mode, data is 8 bits/byte.)

(5) When writable characters are stored in the external memory, the “GAIJI” directory is created and the directory for each writable character set is created under the “GAIJI” directory level as shown on the next page. A file is created for each writable character in the writable character set directory.



• How to name the a writable character set directory

Directory name for writable character 01 → "0100"
Directory name for writable character 02 → "0101"

Directory name for writable character 39 → "0126"
Directory name for writable character 40 → "0127"
Directory name for writable character 41 → "001A"

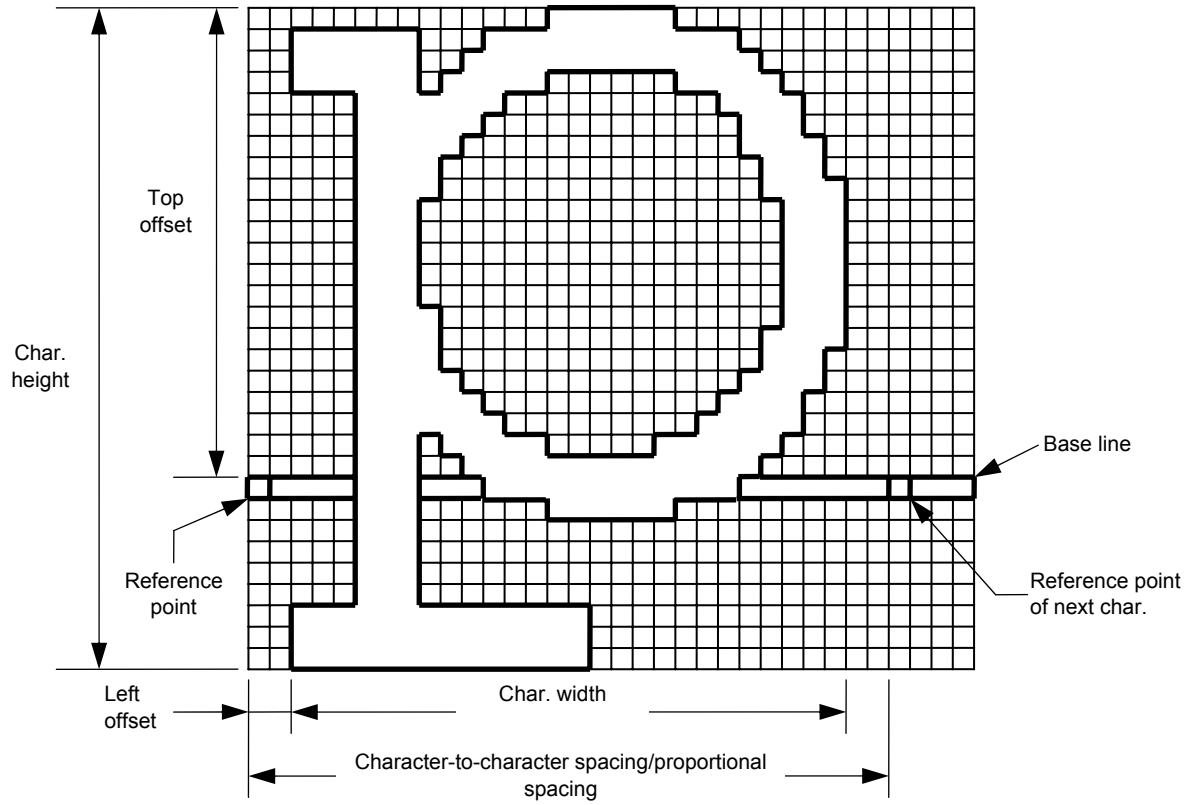
Directory name for writable character 44 → "001D"
Directory name for writable character 51 → "0200"

Directory name for writable character 55 → "0204"

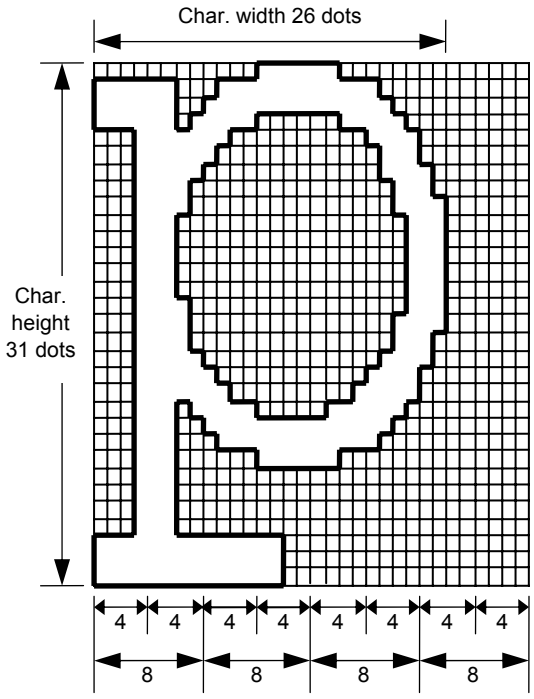
• How to name the file

0100 0022. UDF (Writable character 01: writable character file for character code 22H)
- UDF: Identifier indicating the writable character file
- 0022: Character code (2-byte code: Code 22H)
- 0100: Writable character set (Writable character 01: Same as the directory name)

(6) Each parameter



(7) Writable character set: 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 divided by four dots and sent in the above order (***1*** → ***248***). (Upper digit: "3")

(2) The data of writable characters to be stored ranges from 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 number of writable character data to be stored must be as follows:
The number of writable characters data 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]

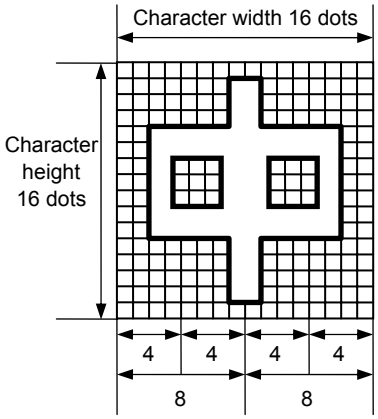
(1) The writable character data to be stored is divided by eight dots and sent in the above order (***1*** → ***124***).

(2) The data of writable characters to be stored ranges from 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 number of writable character data to be stored must be as follows:
The number of writable character data 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.

(8) Writable character set: 41 (16×16 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 divided by four dots and sent in the above order (***1*** → ***64***). (Upper digit: “3”)

(2) The data of writable characters to be stored ranges from 30H to 3FH.

(3) The writable character data to be stored must be 64 bytes.

[Hex. mode]

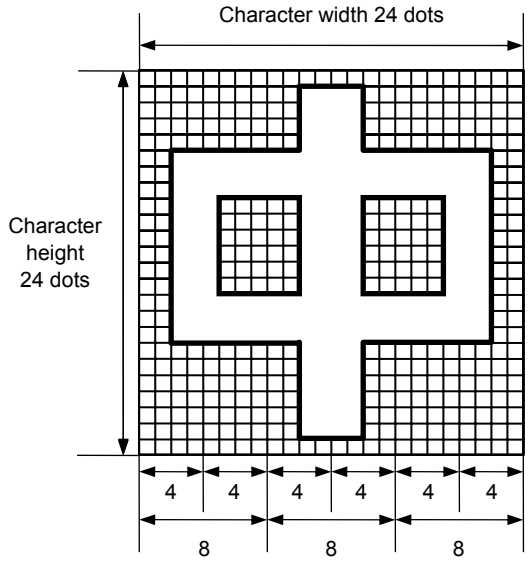
(1) The writable character data to be stored is divided by eight dots and sent in the above order (***1*** → ***32***).

(2) The data of writable characters to be stored ranges from 00H to FFH.

(3) The writable character data to be stored must be 32 bytes.

* When writable character 41 is designated, the width and height of the character are both 16 dots.

(9) Writable character set: 42 (24×24 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 divided by four dots and sent in the above order (***1*** → ***144***). (Upper digit: “3”)

(2) The data of writable characters to be stored ranges from 30H to 3FH.

(3) The writable character data to be stored must be 144 bytes.

[Hex. mode]

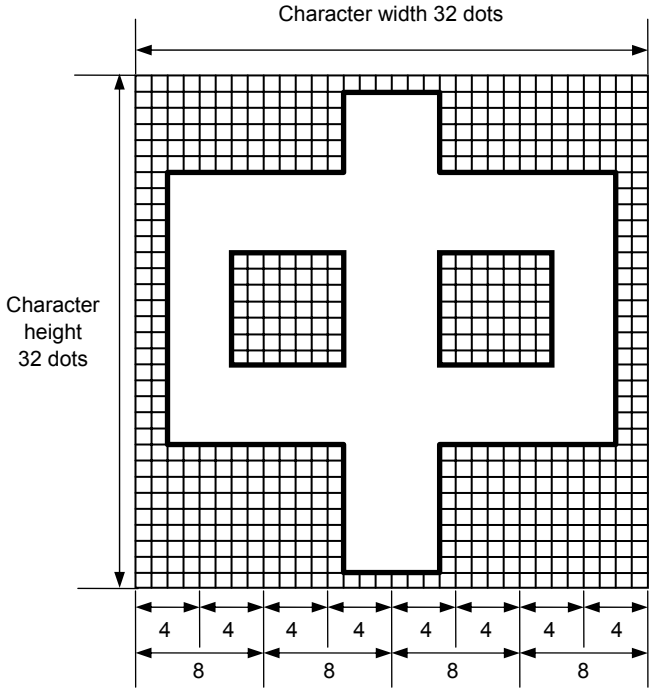
(1) The writable character data to be stored is divided by eight dots and sent in the above order (***1*** → ***72***).

(2) The data of writable characters to be stored ranges from 00H to FFH.

(3) The writable character data to be stored must be 72 bytes.

* When writable character 42 is designated, the width and height of the character are both 24 dots.

(10) Writable character set: 43 (32×32 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 divided by four dots and sent in the above order (***1*** → ***256***). (Upper digit: “3”)

(2) The data of writable characters to be stored ranges from 30H to 3FH.

(3) The writable character data to be stored must be 256 bytes.

[Hex. mode]

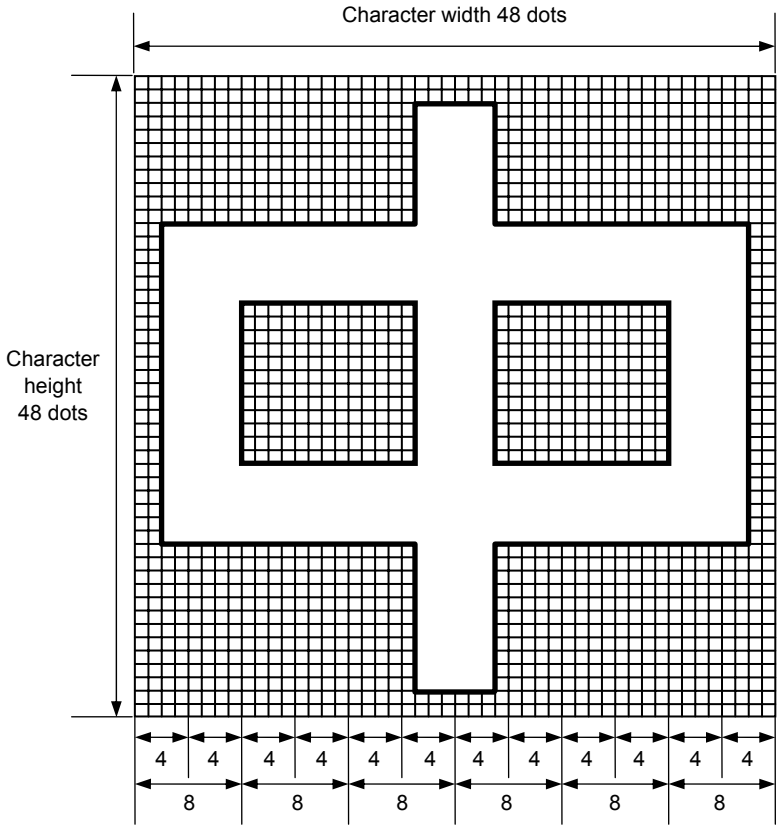
(1) The writable character data to be stored is divided by eight dots and sent in the above order (***1*** → ***128***).

(2) The data of writable characters to be stored ranges from 00H to FFH.

(3) The writable character data to be stored must be 128 bytes.

* When writable character 43 is designated, the width and height of the character are both 32 dots.

(11) Writable character set: 44 (48×48 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 divided by four dots and sent in the above order (***1*** → ***576***). (Upper digit: "3")

(2) The data of writable characters to be stored ranges from 30H to 3FH.

(3) The writable character data to be stored must be 576 bytes.

[Hex. mode]

(1) The writable character data to be stored is divided by eight dots and sent in the above order (***1*** → ***288***).

(2) The data of writable characters to be stored ranges from 00H to FFH.

(3) The writable character data to be stored must be 288 bytes.

* When writable character 44 is designated, the width and height of the character are both 48 dots.

Notes

(1) No matter what character set or character code is selected, no memory will be wasted.

(2) When a new writable character is stored, the Flash Memory Format Command ([ESC] J1) or the External Memory Format Command ([ESC] JA) must be transmitted.

(3) Character codes already stored can be stored again in the flash ROM on the CPU board by sending a Bitmap Writable Character Store Command ([ESC] XD). However, the memory will be consumed every time characters are stored. The memory can be efficiently used by sending the Flash Memory Format Command ([ESC] J1) before storing characters again.

(4) It is possible to change the character width and height for each character code of the same writable character set. In other words, character size can be changed for each character, which enables saving the memory.

(5) Proportional spacing and descending characters are enabled depending on the parameter settings for the character-to-character spacing/proportional spacing, left offset, and top offset.

(6) When top offset is set to 000, the reference coordinates for drawing are placed at the upper left because the base line is set at the topmost line. (Coordinate setting is facilitated for logos.)

(7) When the label issue operation is performed after the Bitmap Writable Character Store Command ([ESC]XD or [ESC]XA) is sent, the image buffer is automatically cleared.

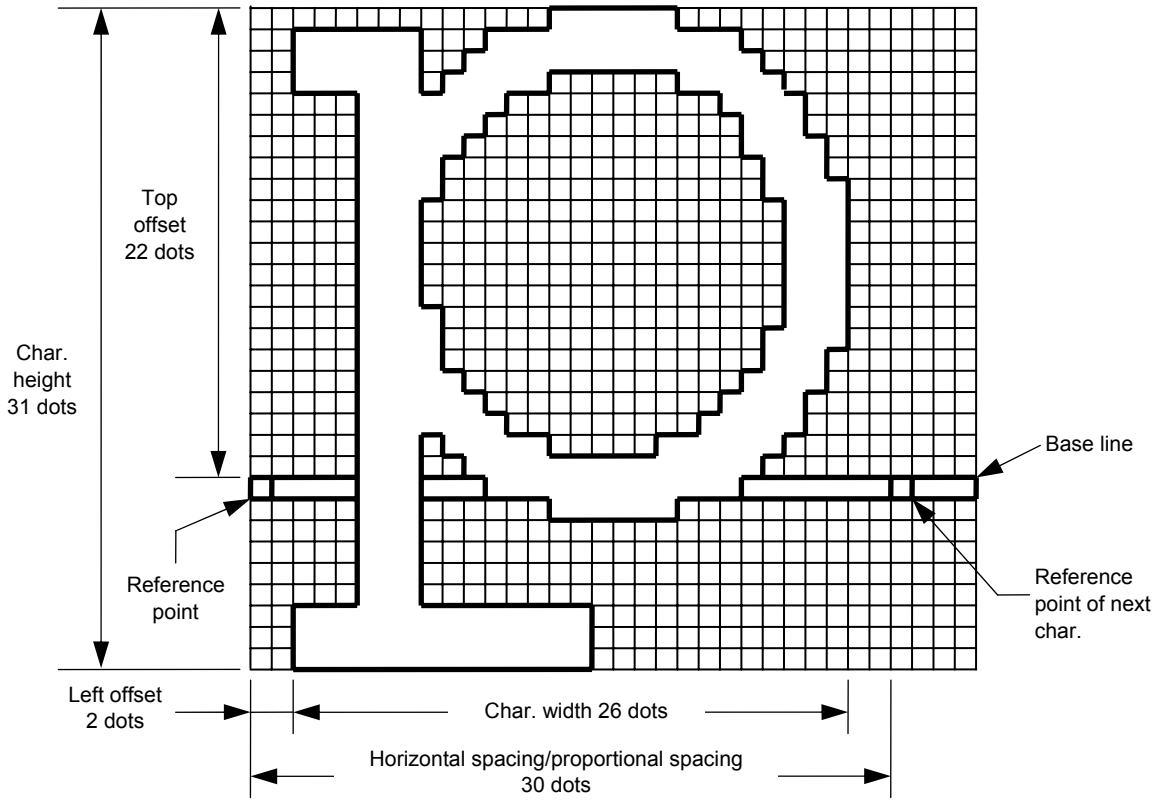
(8) When storing of writable characters or logos is not continued, the printer automatically enters the online mode (label issue operation) in about 10 seconds. At this time, the image buffer is automatically cleared.

Refer to

Flash Memory Format Command ([ESC] J1)
External Memory Format Command ([ESC] JA)

Examples

Writable character set: 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 = ”?”

5.9 COMMANDS RELATED TO GRAPHICS

5.9.1 GRAPHIC COMMAND [ESC] SG

Function Draws graphic data.

Format

[ESC]SG;aaaa(D),bbbb(D),cccc,dddd(,Mxxyy),e,ggg---ggg[LF][NUL]
or
[ESC]SG0;aaaa(D),bbbb(D),cccc,dddd,(,Mxxyy),e,ffff,ggg---ggg[LF][NUL]

Term

aaaa(D): X-coordinate for the print origin of drawing graphic data
Fixed to 4 digits (in 0.1 mm units)
* When “D” is attached after a 4-digit value, the coordinate is specified in dots.
0000D -

bbbb(D): Y-coordinate for the print origin of drawing graphic data
4 or 5 digits (in 0.1 mm units)
* When “D” is attached after a 4- or 5-digit value, the coordinate is specified in dots.
0000D -

cccc: No. of graphic width dots
Fixed to 4 digits (in dots)
When the type of graphic data is set to “2: BMP file” or “6: PCX file”, this setting value is ignored. (The graphic width information is contained in the graphic data.)

dddd: No. of graphic height dots
4 or 5 digits (in dots)
When the type of graphic data is set to “2: BMP file” or “6: PCX file”, this setting value is ignored. (The graphic width information is contained in the graphic data.)
When the type of graphic data is set to “3: TOPIX compression mode”, this parameter specifies the resolution of graphic data.
203 dpi/300 dpi/305 dpi
0150: 150 DPI (The data is drawn in doubled size.)
0300: 300 DPI (The data is drawn in the original size.)
600 dpi
0150: 150 DPI (The data is drawn in fourfold size.)
0300: 300 DPI (The data is drawn in doubled size.)
0600: 600 DPI (The data is drawn in the original size.)

e: Type of graphic data

[ESC] SG; -- command:

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
8:	BMP/PCX file mode	

[ESC] SG0; -- command:

A:	Printer driver compression mode	Overwrite drawing

ffff: Data count (Effective only for [ESC] SG0; -- command)

Fixed to 4 digits

Represents the total number of bytes for the compressed graphic data by 32 bits in Hex. format.

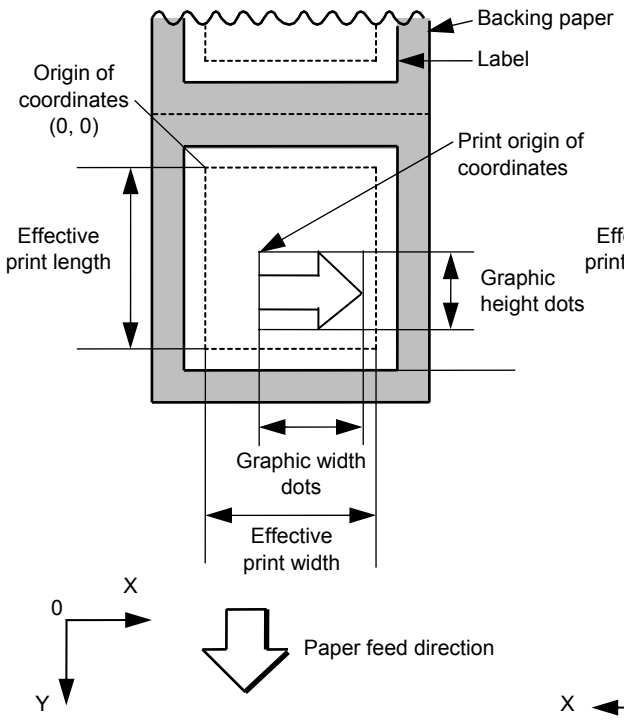
Range: 0 to 4,294,967,295 bytes
(00H, 00H, 00H, 00H to FFH, FFH, FFH, FFH)

ggg --- ggg: Graphic data

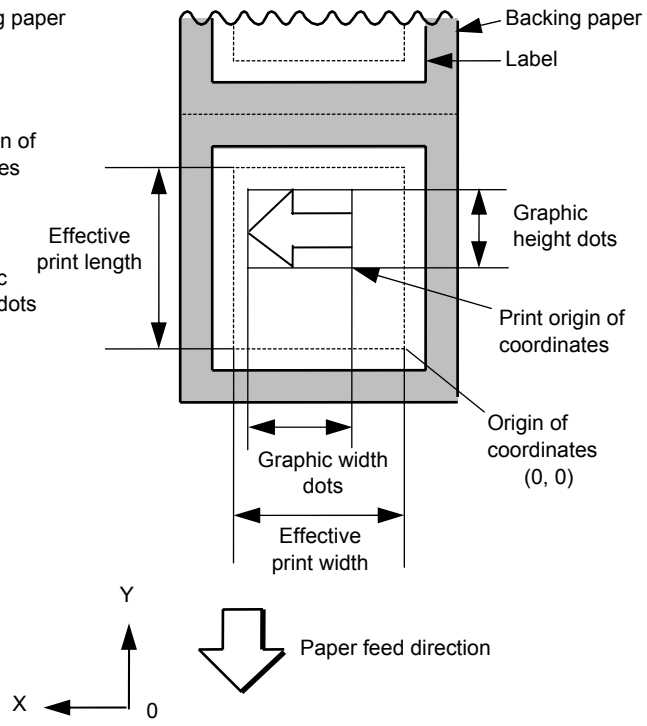
Explanation

(1) When the type of graphic data is set to “0”, “1”, “2”, “3”, “6”, or “A”, the graphic data is drawn by overwriting the image buffer.

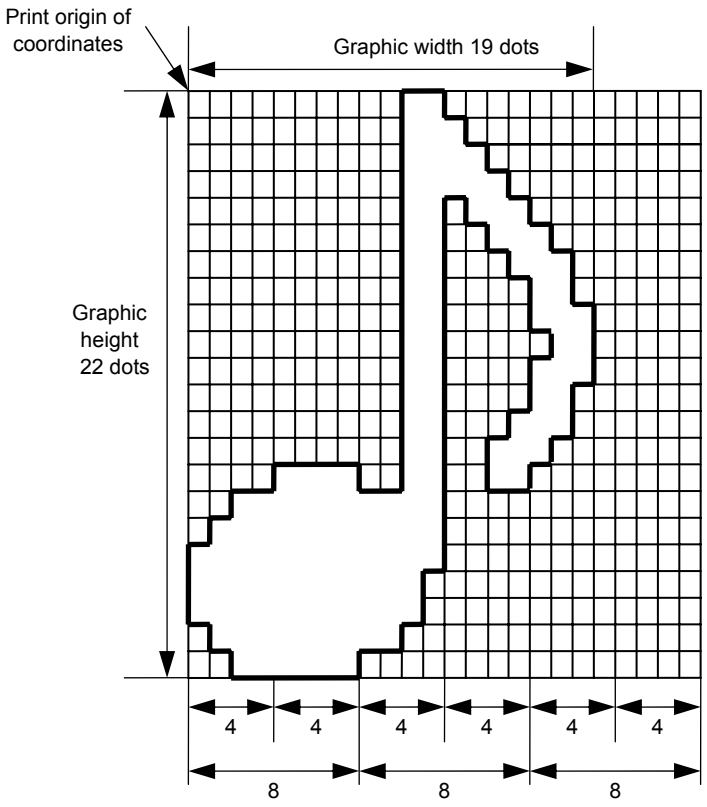
(2) When the type of graphic data is set to “4” or “5”, the graphic data is drawn by carrying out OR between the graphic data and the data in the image buffer.



[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 divided by four dots and sent in the above order (***1*** → ***132***). (Upper digit: "3")

(2) The graphic data ranges from 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 divided by eight dots and sent in the above order (***1*** → ***66***).

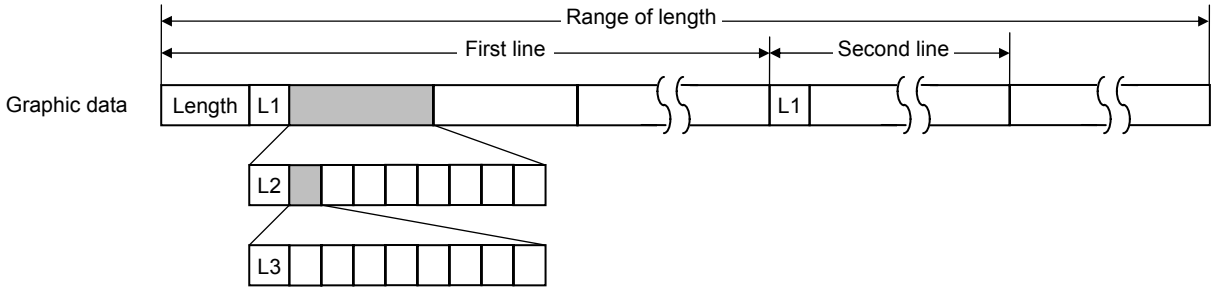
(2) The graphic data ranges from 00H to FFH.

(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.

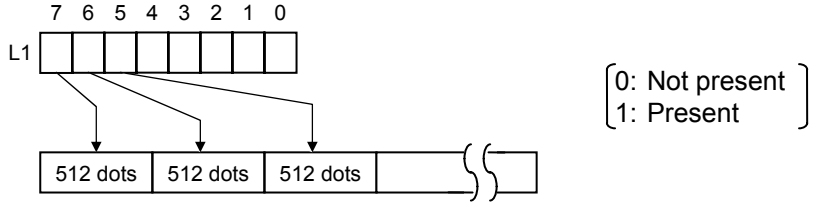
[When TOPIX compression mode is selected]



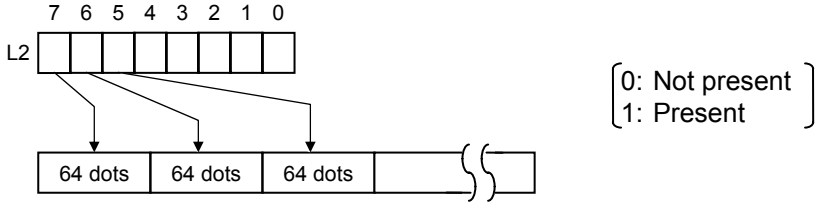
(1) Length: Total number of bytes of the graphic data (0001H to later)

Ex. Length = 20 bytes: 00 14

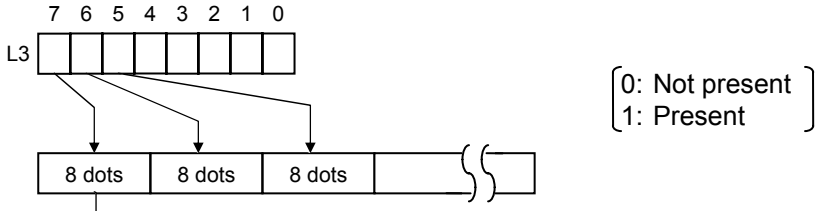
(2) L1 parameter: Shows in which large block (512 dots/block) the changed data is contained.



(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 on the previous line. Only the changed bit is set to ON (1). The alignment of dots is MSB (left dots) and LSB (right dots).

* For the graphic width per line, whichever is smaller, the designated value or the max. buffer size (512 KB), is drawn. The minimum unit of the drawing data is 8 dots (1 byte). Even if the graphic width is set to 3 dots, it will be corrected to 8 dots (1 byte).

[When the BMP/PCX file mode is selected]

(1) Graphic data file name shall be specified by the Graphic data parameter (ggg…ggg). The file name shall be comprised of up to 8 letters + 4-digit file extension (either of .BMP or .PCX.) When the number of letters exceeds this format, a command error occurs. If a file does not exist or the XML function is disabled, a command error results.

(2) Graphic data shall be stored in the following area in advance.
- When the external memory is specified in the XML settings
  (Standard/Oracle/SAP: External memory):
  /ATA0/GRP_DATA/XXXXXXXX.BMP (or .PCX)
- When the other memory is specified in the XML settings (Standard/Oracle/SAP):
  /ram0/GRP_DATA/XXXXXXXX.BMP (or .PCX)

  Note: When using RAM disk, graphic data is downloaded to the FROM with the tool.

  For details of the XML settings, refer to XML Specification.

[When the printer driver compression mode is selected]

(1) The parameter for the data count is attached after the parameter for the type of graphic data. When the total number of data cannot be found on the printer driver, “00H, 00H, 00H, 00H” are specified for the number of graphic data. However, in this case, the printer diver cannot perform printing through a serial interface (RS-232C).

(2) How to compress data

Compression is performed for data per line specified for the number of graphic width dots.
The data is made up in units of 8 dots. A repeatedly appearing value is encoded in 2 bytes. The first byte is (-n+1), which ranges from –127 to -1. The value “n” indicates the number of repetitions. The second byte is the repeated value.
When a value is not repeated, the first byte is the numeric value “m”. The length of the values is indicated by (m+1). The value “m” ranges from 0 and 126.
The values “n” and ”m” shall not exceed 127 and 126, respectively. If it exceeds the upper limit, it needs to be divided into plural blocks.
When the same data lines are repeated consecutively, the number of repeated lines is encoded in 2 bytes. The first byte is fixed to 127. The second byte “N” indicates the number of repetitions, which ranges from 1 to 255. The value “N” shall not exceed 255. If it exceeds the upper limit, one data line is newly compressed, then the remaining number of repetitions is 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 printed graphic data will be within the effective print area set by the Label Size Set Command ([ESC] D).

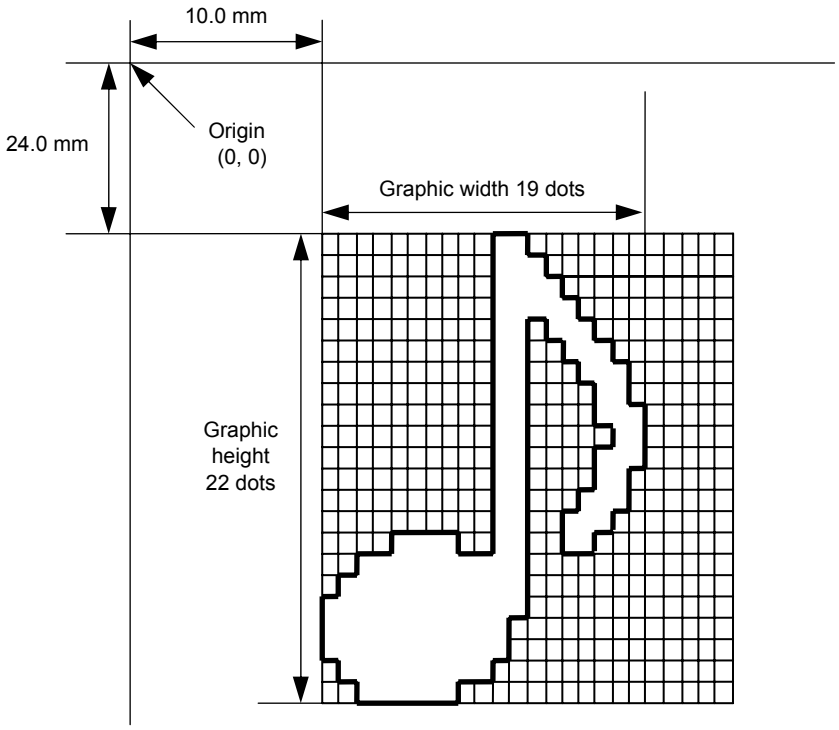
(2) The number of graphic width dots and the number of graphic height dots must also be set so that the printed graphic data will be within the effective print area set by the Label Size Set Command ([ESC] D) in the same manner as the above.

(3) The width and height are as follows.
203 dpi: 8 dots/mm
300 dpi: 11.8 dots/mm
305 dpi: 12 dots/mm
600 dpi: 23.6 dots/mm

(4) The print position in the X direction of the print result may vary from the designated print origin of the X-coordinate.
203 dpi: ±0.5 mm in X direction
300/305 dpi: ±0.33 mm in X direction
600 dpi: ±0.17 mm in X direction

(The data is directly developed in the image buffer without applying bit by bit correction with respect to the designated X-coordinate in order to draw the received graphic data at high speed. Consequently, an error of up to 4 bits occurs.)

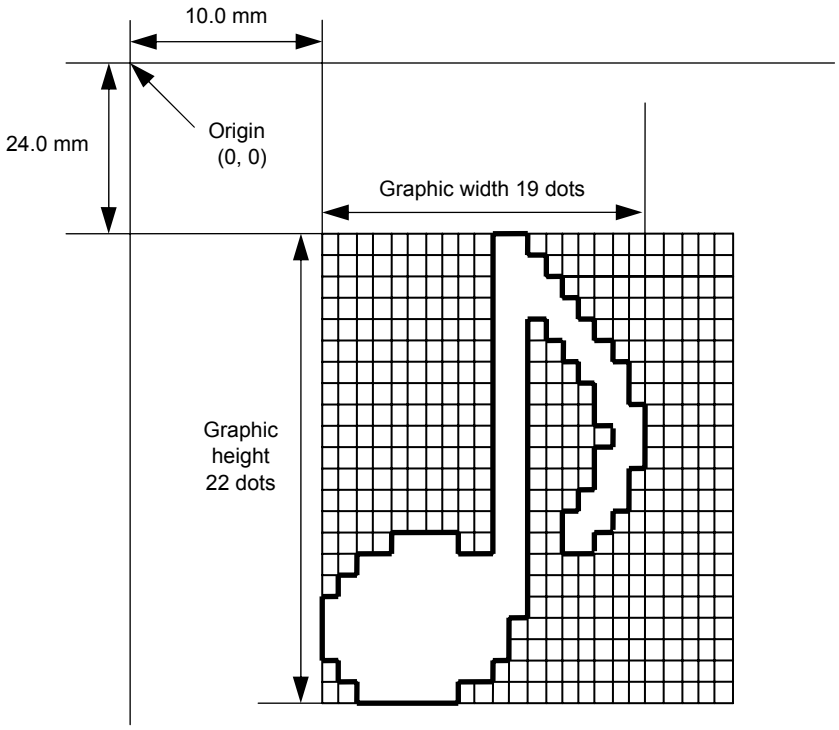
Examples



[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)

5.10 COMMANDS RELATED TO PC COMMAND SAVE

5.10.1 SAVE START COMMAND [ESC] XO

(For Flash ROM on the CPU Board or External Memory)

Function Declares the start of saving PC interface commands.
(Places the printer in the mode where PC interface commands are written in flash memory.)

Format [ESC]XO;aa,(Sb,)c[LF][NUL]

Term

aa: Identification number to be used for saving or calling
01 to 99

Sb: Drive in which the PC interface command is stored
(Omissible. When omitted, flash ROM on the CPU board is selected.)

b: Drive

0: Flash ROM on the CPU board
1: External memory (When optional RTC and USB host interface board are installed)
2: Reserved

c: Status response while storing the PC commands

0: No status response is sent.
1: Status response is sent.

Explanation

(1) Up to 131065 bytes can be saved per a save.

(2) When the PC interface command is stored in the external memory, the “PCSAVE” directory is created. Command files are named according to the format, “PCSAVE ID number.PCS” and saved under this directory.

Notes

(1) After sending the Save Start Command ([ESC] XO), any command other than the following will be saved in the flash memory without being analyzed.

- Save Start Command ([ESC] XO, [ESC] XV)
- Save Terminate Command ([ESC] XP)
- Saved Data Call Command ([ESC] XQ, [ESC] XT)
- Bitmap Writable Character Save Command ([ESC] XD, [ESC] XA)
- Reset Command ([ESC] WR)
- Status Request Command ([ESC] WS)
- Flash Memory Format Command ([ESC] J1)
- External Memory Format Command ([ESC] JA)

(2) No error check is performed for the commands when saved.

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]

5.10.2 SAVE START COMMAND [ESC] XV

(For External Memory)

Function Declares the start of saving PC interface commands.
(Places the printer in the mode where PC interface commands are written in the external memory.)

Format [ESC]XV;dddddddd,b,c[LF][NUL]

Term dddddddd: Identifier to be used for saving or calling
Up to 8-letter file name

Available characters:
A to Z: A to Z (in both capital and lower cases)
0 to 9: Numbers from 0 to 9
Symbols: !, #, $, %, &, ',), (, -, ^, _, {, }, ~

b: Drive
1: External memory (When optional RTC and USB host interface board are installed)
2: Reserved

c: Status response while storing the PC commands
0: No status response is sent.
1: Status response is sent

Explanation (1) When the PC interface command is stored in the external memory, the "PCSAVE" directory is created. Command files are named according to the format, "Specified file name.PCS" and saved under this directory.

(2) Up to about 1 MB can be saved per a save.

Notes (1) After sending the Save Start Command ([ESC] XV), any command other than the following will be saved into the ATA card without being analyzed.

- Save Start Command ([ESC] XO)
- Save Terminate Command ([ESC] XP)
- Saved Data Call Command ([ESC] XQ, [ESC] XT)
- Bitmap Writable Character Save Command ([ESC] XD, [ESC] XA)
- Reset Command ([ESC] WR)
- Status Request Command ([ESC] WS)
- Flash Memory Format Command ([ESC] J1)
- External Memory Format Command ([ESC] JA)

(2) No error check is performed for the commands when saved.

(3) If "PCSAVE##" (## represents a number ranging from 00 to 99) is set for the identifier, the file name can possibly be identical to the one created in the external memory by a Save Start Command [ESC]XO. In such case, the file created by the Save Start Command [ESC]XO will be overwritten
On the contrary, the file created by the Save Start Command [ESC]XV will be overwritten if a file with the same name is created in the external memory by the Save Start Command [ESC]XO.
Accordingly, care must be taken when the identifier is set to "PCSAVE##" (## represents a number ranging from 00 to 99.)

Refer to

Save Terminate Command ([ESC] XP)
External Memory Format Command ([ESC] JA)

Examples

[ESC] JA; B [LF] [NUL]
[ESC] XV; PC_SAVE, 1, 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

5.10.3 SAVE TERMINATE COMMAND [ESC] XP

Function	Declares the termination of saving PC interface commands.
Format	[ESC]XP[LF][NUL]
Note	When storing the PC interface commands is discontinued, the printer automatically enters the online mode (label issue operation) in about 10 seconds. At this time, the image buffer will be cleared automatically.
Refer to	Save Start Command ([ESC] XO, [ESC] XV)

5.10.4 SAVED DATA CALL COMMAND [ESC] XQ

(For Flash ROM on the CPU Board or External Memory)

Function Calls PC interface commands saved in flash memory or external memory.

Format [ESC]XQ;aa,(Sb,)c,d[LF][NUL]

Term

aa: Identification number of the file to be called from the flash memory or external memory
01 to 99

Sb: Drive from which the command is called
(Omissible. When omitted, flash ROM on the CPU board is selected.)

b: Drive
0: Flash ROM on the CPU board
1: External memory (when optional RTC and USB host interface board are installed)
2: Reserved

c: Status response while calling data
0: No status response is sent.
1: Status response is sent.

d: Automatic call at power on time
L: Automatic call
M: Not called.

Notes

(1) If the applicable save identification number is not found, a command error results.

(2) When the automatic call at power on time is enabled, absence of the applicable save identification number does not result in an error since the parameter setting is automatically changed to “Not called.”

(3) If a command error is found in the PC interface command called by a Saved Data Call Command or automatically called at power on time, a command error results. After an error has occurred, the printer power needs to be turned off. The automatic call will be disabled when the power is turned on again.

(4) The printer enters the online mode (label issue operation) when the Save Data Call Command is sent immediately after the Save Terminate Command.

(5) When the automatic call has been already enabled by XQ or XT command, the settings specified by this command is given priority.

(6) When the printer is reset in the user system mode, the automatic call for the PC commands stored in the on-board flash ROM is disabled.

(7) Performing a RAM clear after disabling the automatic call causes the automatic call feature applied only to the PC commands stored in the on-board flash ROM to recover.

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]

5.10.5 SAVED DATA CALL COMMAND [ESC] XT

(For External Memory)

Function Calls PC interface commands saved in the external memory.

Format [ESC]XT;dddddddd,b,c,d[LF][NUL]

Term dddddddd: Identifier for the file to be called from the external memory
Up to 8-letter file name

b: Drive
1: External memory (when optional RTC and USB host interface board are installed)
2: Reserved

c: Status response while calling data
0: No status response is sent.
1: Status response is sent.

d: Automatic call at power on time
L: Automatic call
M: Not called

Notes

(1) If the applicable identification number is not found, a command error results.

(2) When the automatic call at power on time is enabled, absence of the applicable save identification number does not result in an error since the parameter setting is automatically changed to “Not called.”

(3) If a command error is found in the PC interface command called by a Saved Data Call Command or automatically called at power on time, a command error results. After an error has occurred, the printer power needs to be turned off. The automatic call will be disabled when the power is turned on again.

(4) The printer enters the online mode (label issue operation) when the Save Data Call Command is sent immediately after the Save Terminate Command.

(5) When the automatic call has been already enabled by XQ or XT command, the settings specified by this command is given priority.

Refer to Save Start Command ([ESC] XV)
Save Terminate Command ([ESC] XP)

Examples

[ESC] XT; PC_SAVE, 1, 0, M [LF] [NUL]
[ESC] RC001; Sample [LF] [NUL]
[ESC] RC002; 100 [LF] [NUL]
[ESC] XS; I, 0002, 0002C3000 [LF] [NUL]

5.11 COMMANDS RELATED TO CHECK

5.11.1 HEAD BROKEN DOTS CHECK COMMAND [ESC] HD

Function Checks the thermal head for broken dots.

Format [ESC]HD001(,a)[LF][NUL].....All dots check

Term a: Check result transmission (Omissible)
A: Check result is sent.
(When omitted, the check result is not sent.)

Explanation

(1) The Head Broken Dots Check Command is processed in batch. In the case this command is sent after the Label Issue Command which instructs issuing 100 labels, the head broken dots check will be executed after 100 labels have been issued.

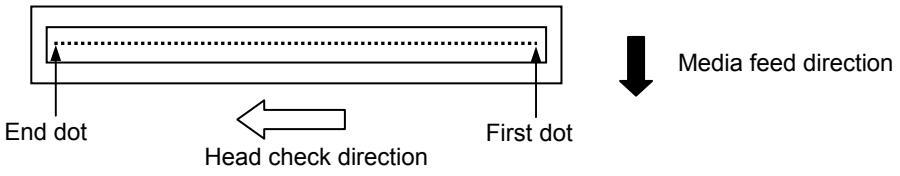
(2) In the case of all dots check, the all the heater elements of the thermal head are checked.

(3) When the check result transmission is not disabled, the next command is processed when the broken dots check normally terminated. If any abnormality is found, an error occurs. Whether or not to send the status at an occurrence of an error depends on the setting in the Issue Command.
When the check result transmission is enabled, a head check normal end status is sent and the next command is processed when the broken dots check normally terminated. If any abnormality is found, the printer sends a head check error status and stops.
▪ Head check normal end status
[SOH] [STX] “0020000” [EXT] [EOT] [CR] [LF]
▪ Head check error status
[SOH] [STX] “1720000” [EXT] [EOT] [CR] [LF]

(4) All dots check takes the following time.

B-EX4	203 dpi:	Max. 5 sec.
	300/305 dpi:	Max. 6 sec.
	600 dpi:	Max. 9 sec.
B-EX6	203 dpi:	Max. 6 sec.
	305 dpi:	Max. 7 sec.

(5) A head broken dot check is performed in the following direction.



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]

5.12 COMMANDS RELATED TO DISPLAY

5.12.1 MESSAGE DISPLAY COMMAND [ESC] XJ

Function Displays a message on the 3rd line of the LCD.

Format [ESC]XJ;aaa------aaa[LF][NUL]

Term aaa ------ aaa: Display data (21 digits)

Explanation When the printer receives the Message Display Command, it displays the message on the 3rd line of the LCD then enters a pause state after processing the already received data (i.e. after completing the label issue in the case the printer has received the Issue Command).
Pressing the [RESTART] key clears the pause state, then the LCD displays the online message. After the pause state is cleared, the printer resumes processing of the data received right after the Message Display Command.

Notes

(1) Up to 21 characters are displayed. When the display data is less than 21 characters, the blank digits are filled with spaces. When the display data exceeds 21 characters, the overflowing data is discarded.

(2) The printer does not process the Message Display Command received while the printer is in a pause, a halt due to an error, or a head open state. After the above state is cleared, the command is processed.

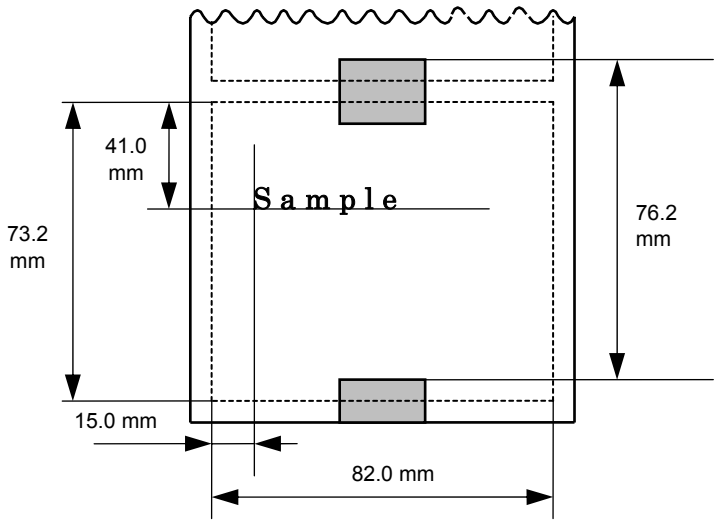
(3) The following characters can be displayed.
If a code other than the following is received, it will be replaced with "?" or a command error results.

	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	←				

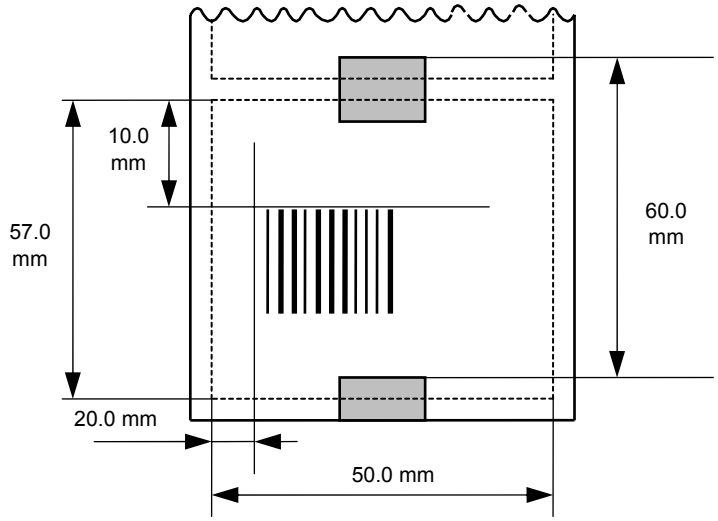
* The shaded parts are Japanese. They are omitted here.

Examples

① Paper is placed.
② One label is fed.
③ 4 labels are issued.



④ Message “Please set [Tag]” is displayed.
⑤ Paper is changed.
⑥ The [RESTART] key is pressed.
⑦ One label is fed.
⑧ 2 labels are issued.



[ESC] D0762, 0820, 0732 [LF] [NUL]
[ESC] T11C30 [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]
[ESC] XJ; Please set [Tag] [LF] [NUL]
[ESC] D0600, 0500, 0570 [LF] [NUL]
[ESC] T11C30 [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]

5.13 COMMANDS RELATED TO CONTROL

5.13.1 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 while printing, it returns to its initial state after completing the current printing operation. No command must be sent after this command while the printer is performing initialization processing.

Notes

(1) When the printer receives any commands in the system mode, they are not processed except the Reset Command.

(2) If a command error or communication error occurs when receiving the Reset Command, the error message is displayed in the online mode. However, it is not displayed in the system mode.

(3) After the command control code of the Bitmap Writable Character Save Command ([ESC]XD or [ESC]XA) or the Graphic Command ([ESC]SG) is received, the printer does not process the Reset Command until it receives the type of data.

Example [ESC] WR [LF] [NUL]

5.13.2 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) and the Fine Adjustment Value Set Command ([ESC Z2;2]), will take effect when the printer is initialized. Therefore, this command shall be sent after the Parameter Set Command ([ESC] Z2;1) or Fine Adjustment Value Set Command ([ESC] Z2;2) is sent.

5.14 COMMANDS RELATED TO STATUS

5.14.1 STATUS REQUEST COMMAND [ESC] WS

Function Sends a printer status to the host computer.

Format [ESC]WS[LF][NUL]

Explanation This command makes the printer send a status regardless of the status response parameter setting. The status to be returned is the current printer status, and only the latest status is indicated. The remaining number of labels to be printed is the number out of a batch currently being printed. The remaining number of labels in the print queue is not included.

Notes

(1) A status is returned to the all connected and enabled interfaces among the RS-232C, USB Function, LAN and WLAN (socket communication).

Note 1: When a WS command is sent via any interface other than USB and the USB I/F status parameter has been disabled in the system mode, a status will not be returned via USB.

Note 2: When a WS command is sent via Centronics, a status can be sent in the nibble mode.

(2) After the command control code of the Bitmap Writable Character Save Command ([ESC]XD or [ESC]XA) or the Graphic Command ([ESC]SG) is received, the printer does not process the Status Request Command until it receives the type of data.

(3) When the printer sends the status after receiving the Status Request Command, a max. of 20-msec. delay may occur.

(4) At least 20-msec interval shall be provided between the Status Request Command and the next Status Request Command. If the interval is less than 20 msec., the printer may fail to receive the Status Request Command.

Example [ESC] WS [LF] [NUL]

5.14.2 RECEIVE BUFFER FREE SPACE STATUS REQUEST COMMAND [ESC] WB

Function Sends a printer status along with the receive buffer free space size to the host.

Format [ESC]WB[LF][NUL]

Explanation

(1) This command makes the printer send a printer status and free space size of the receive buffer, regardless of the status response parameter setting. The status to be returned is the current printer status, and only the latest status is indicated. The remaining number of labels to be printed is the number out of a batch currently being printed. The remaining number of labels in the print queue is not included.
Regarding the receive buffer free space size, the printer sends the free space size of the receive buffer for the interface used for sending this command.

Notes

(1) A status is returned to the all connected and enabled interfaces among the RS-232C, USB Function, LAN and WLAN (socket communication).
Note 1: When a WB command is sent via any interface other than USB and the USB I/F status parameter has been disabled in the system mode, a status will not be returned via USB.
Note 2: When a WB command is sent via Centronics, a status can be sent in the nibble mode.

(2) After the command control code of the Bitmap Writable Character Save Command ([ESC]XD or [ESC]XA) or the Graphic Command ([ESC]SG) is received, the printer does not process the Receive Buffer Free Space Status Request Command until it receives the type of data.

(3) When the printer sends the status after receiving the Receive Buffer Free Space Status Request Command, a max. of 20-msec. delay may occur.

(4) At least 20-msec interval shall be provided between the Receive Buffer Free Space Status Request Command and the next one. If the interval is less than 20 msec, the printer may fail to receive the next Receive Buffer Free Space Status Request Command.

Example [ESC] WB [LF] [NUL]

5.14.3 VERSION INFORMATION ACQUIRE COMMAND [ESC] WV

Function Sends the program version information of the printer.

Format [ESC]WV[LF][NUL]

Explanation (1) The format of the program version data (total 27 bytes) to be sent to the host is as follows.

SOH		01H
STX		02H
Creation date	"0"	30H
	"1"	31H
	"A"	41H
	"P"	50H
	"R"	52H
	"2"	32H
	"0"	30H
	"1"	31H
	"1"	31H
Model	"B"	42H
	"-"	2DH
	"E"	45H
	"X"	58H
	"4"	34H
	"T"	54H
	"1"	31H
Version	"V"	56H
	"1"	31H
	"."	2EH
	"0"	30H
	"A"	41H
ETX		03H
EOT		04H
CR		0DH
LF		0AH

Creation date of program:
9 bytes of data indicated in order of Day-Month-Year

Model:
7 bytes of ASCII code indicating the model

Program version:
5 bytes of data: V x.x x
- Revision
- Version
- V: Japan model
  C/N/D: Global model

Note: For the B-EX4T3-HS-QM/CN-R, the version No. starts with "V".

(2) This command is one of the command types that are processed in the order of receipt. Processing does not take place until the command sent earlier than this command has been processed. Therefore, the program version data may not be returned immediately unless this command is sent while the printer is in the idle state.

Notes

A status is returned to the interface used for sending a WV command and RS-232C (if enabled) among the RS-232C, USB Function, LAN and WLAN (socket communication).
NOTES:

1. When a WV command is sent via RS-232C, a status is returned via RS-232C and LAN.
2. When a WV command is sent via USB and the USB I/F status parameter has been disabled in the system mode, a status will not be returned via USB.
3: When a WV command is sent via Centronics, a status will not be returned via RS-232C, USB Function, LAN and WLAN.

5.14.4 EXTERNAL MEMORY INFORMATION ACQUIRE COMMAND [ESC] WI

Function Sends information regarding the external memory.

Format [ESC]WI;a,b[LF][NUL]

Term

a: Drive
- 1: External memory (When optional RTC and USB host interface board are installed.)
- 2: Reserved

b: Information to be acquired
- A: Free space
- B: Writable character list
- C: Stored PC command file

Explanation (1)The format of information to be returned to the host is as follows:

A: Free space

SOH	STX	"A"	Drive	Free space (Kbyte)						ETX	EOT	CR	LF
01H	02H	41H	xxH	3xH	3xH	3xH	3xH	3xH	3xH	03H	04H	0DH	0AH

Free space (in units of Kbytes):
000000 (KB) to 999999 (KB)

Drive:
"1" (31H): External memory
"2" (32H): Reserved

When an external memory is not inserted, "00H, 00H, 00H, 00H, 00H, 00H" is returned as the free space. When the free space size exceeds the max. value of 999999 (K bytes), it will be automatically corrected to 999999 (K bytes).

B: Writable character list

SOH	STX	"B"	Drive	Writable character storage information (55 bytes)					ETX	EOT	CR	LF
01H	02H	42H	xxH	"0"/"1"	"0"/"1"	·····	"0"/"1"	"0"/"1"	03H	04H	0DH	0AH

Whether or not writable character No. 55 is stored

Whether or not writable character No. 54 is stored

Whether or not writable character No. 02 is stored

Whether or not writable character No. 01 is stored

Drive
"1" (31H): External memory
"2" (32H): Reserved

"0" (30H): Not stored
"1" (31H): Stored

Even if only one character has been stored, that writable character No. is set to "1" (Stored). Whether or not a specific character code is stored can be obtained by using the External Memory Writable Character Information Acquire Command ([ESC] WG).
The total size of the writable character storage information is 55 bytes, but the effective writable character Nos. are from 01 to 44, and from 51 to 55. Since Nos. 45 to 50 are vacant, "0" (30H) is always set. When an external memory is not inserted, the printer returns the writable character storage information with "00H" set to the all bytes.

C: Stored PC command file

SOH	STX	"C"	Drive	Stored PC command file name	ETX	EOT	CR	LF
01H	02H	43H	xxH	File name 1 00H File name 2 00H….File name n 00H	03H	04H	0DH	0AH

File name (including a file extension):
"00H" is inserted between file names.

Drive:
"1" (31H): External memory
"2" (32H): Reserved

In the following cases, 1 byte of "00H" is returned as the PC command file name.

① No file is found.
② The external memory has not been inserted.

(2) This command is one of the command types that are processed in the order of receipt. Processing does not take place until the command sent earlier than this command has been processed. Therefore, a status may not be returned immediately unless this command is sent while the printer is in the idle state.

Note

A status is returned to the interface used for sending a WI command and RS-232C (if enabled) among the RS-232C, USB Function, LAN and WLAN (socket communication).
NOTES:

1. When a WI command is sent via USB and the USB I/F status parameter has been disabled in the system mode, a status will not be returned via USB.
2: When a WI command is sent via Centronics, a status will not be returned via RS-232C, USB Function, LAN and WLAN.

5.14.5 EXTERNAL MEMORY WRITABLE CHARACTER INFORMATION ACQUIRE COMMAND [ESC] WG

Function Sends the information regarding the writable character stored in the external memory.

Format [ESC]WG;a,bb,cc[LF][NUL]

Term

a: Drive
- 1: External memory (When optional RTC and USB host interface board are installed.)
- 2: Reserved

bb: Writable character set
01 to 44, 51 to 55

cc: Writable character code
To 1-byte writable characters, “00H” shall be attached to the top of the data.

Explanation (1)The format of information to be returned to the host is as follows:

SOH	STX	“D”	Drive	Writable character set		Character code		Storage	ETX	EOT	CR	LF
01H	02H	44H	xxH	3xH	3xH	xxH	xxH	“0”/“1”	03H	04H	0DH	0AH

Whether or not a writable character is stored
“0”: Not stored
“1”: Stored

Character code (to be described in 2 bytes)
To 1-byte writable characters, “00H” is attached to the top of the data.

Writable character set
“01” (30H, 31H) to “44” (34H, 34H)
“51” (35H, 31H) to “55” (35H, 35H)

Drive
“1” (31H): External memory
“2” (32H): Reserved

When an external memory is not inserted, “00H, 00H, 00H, 00H, 00H, 00H” (5 bytes) is returned as the information from Writable character set to Storage.

Note A status is returned to the interface used for sending a WG command and RS-232C (if enabled) among the RS-232C, USB Function, LAN and WLAN (socket communication).
NOTES:
1. When a WG command is sent via USB and the USB I/F status parameter has been disabled in the system mode, a status will not be returned via USB.
2: When a WG command is sent via Centronics, a status will not be returned via RS-232C, USB Function, LAN and WLAN.

Example

When the following information is acquired from the external memory:

Writable character set 44, writable character code 41H

[ESC] WG; 1, 44, (0x00) (0x41) [LF] [NUL]

* (0x00) represents data of 00H.
* (0x41) represents data of 41H.

5.14.6 PRINTER OPTION STATUS ACQUIRE COMMAND [ESC] WN

Function Sends the information what optional devices are installed.

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 (9 bytes)									ETX	EOT	CR	LF
01H	02H	45H	30H	30H	30H	30H	30H	30H	30H	30H	30H	03H	04H	0DH	0AH

Wireless LAN board
30H: Not installed.
31H: Installed.

RS-232C interface board
30H: Not installed.
31H: Installed.

Centronics interface board
30H: Not installed.
31H: Installed.

Internal serial port
30H: Not installed.
31H: RFID module (H1)
32H: RFID module (Reserved)
33H: RFID module (H2)
34H: RFID module (U2, U4 or U4 module preinstall model)
35H: RFID module (Reserved)

Cutter
30H: Not installed.
31H: Disc cutter
32H: Rotary Cutter

Reserved (USB board compatible with the B-SX)
31H: Installed (Fixed)

Reserved (100Base LAN board compatible with the B-SX)
31H: Installed (Fixed)

RTC + USB host
30H: Not installed.
31H: RTC+USB host interface board (with USB memory)
32H: RTC+USB host interface board (No USB memory)

RTC + USB host
30H: Not installed.
31H: RTC+USB host interface board (with USB memory)
32H: RTC+USB host interface board (No USB memory)

Note

A status is returned to the all connected and enabled interfaces among the RS-232C, USB Function, LAN and WLAN (socket communication).
However, when a WB command is sent via any interface other than USB and the USB I/F status parameter has been disabled in the system mode, a status will not be returned via USB.

5.14.7 PRINTER INFORMATION GET COMMAND [ESC] IR

Function Obtains the printer information.

Note: The B-EX4T3-HS does not support this command.

Format [ESC]IR[LF][NUL]

Term Model name and serial number of the printer stored by the Printer Information Save Command ([ESC]IG) are retrieved.

[Size of the information]

Model name	Serial No.
20 bytes	11 bytes to 32 bytes

Examples When the following information has been stored:

Model name: B-EX4T1-TS12-QM

Serial No.: 2303A000001

Model name: [42H] [2DH] [45H] [58H] [34H] [54H] [2DH] [54H] [53H] [31H] [32H] [2DH] [51H] [4DH] [20H][20H] [20H] [20H] [20H] [20H]

Serial No. [32H] [33H] [30H] [33H] [41H] [30H] [30H] [30H] [30H] [30H] [31H]

5.15 COMMANDS RELATED TO TCP/IP SETTING

5.15.1 IP ADDRESS SET COMMAND [ESC] IP

Function Sets the IP address required for the network connection for the printer.

Format [ESC]IP;a,bbb,ccc,ddd,eee[LF][NUL]

Term

a: IP address to be set
- 2: Printer IP address (Default: 192.168.10.20)
- 3: Gateway IP address (Default: 0.0.0.0)
- 4: Subnet mask (Default: 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 can be also set 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]

5.15.2 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: Whether to enable or disable the socket communication
- 0: Socket communication is disabled.
- 1: Socket communication is enabled.

bbbbb: Port number (Fixed to 5 digits.)
00000 to 65535

Explanation The above can be set also 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]

5.15.3 DHCP FUNCTION SET COMMAND [ESC] IH

Function Enables or disables the DHCP function, and sets the DHCP client ID.

Format [ESC]IH;a(,bbb----bbb)[LF][NUL]

Term

a: Whether to enable or disable the DHCP function
- 0: DHCP function is disabled.
- 1: DHCP function is enabled.

bbb---bbb: DHCP client ID (Omissible. When omitted, FFH is set for all bytes.)
(1 to 64 byte data is described in 2 to 128 byte Hex. format.)

Explanation

- The above can be also set in the system mode. The setting which was last made takes effect.
- Since “FFH” is recognized as a terminator, “FFH” is not allowed to be used in data.
- If “FFH” is set as the first byte of the DHCP client ID, the printer assumes the DHCP client ID is not specified. In this case, the MAC address of the LAN board installed on the printer is used as the DHCP client ID, instead.
- DHCP client ID shall be even byte hex. format data. Otherwise, a command error occurs.
- When the DHCP client ID is less than 64 bytes, insufficient bytes are filled with FFH.

Example To enable the DHCP function and set the DHCP client ID to “12H56HCDH”.

[ESC] IH; 1, 1256CDFFFFFFFFFFFF … FFFFFFFFFFFFF [LF] [NUL]

5.16 COMMANDS RELATED TO INTERNAL SERIAL INTERFACE

5.16.1 PASS-THROUGH COMMAND [ESC] @002

Function Passes the serial interface data to the internal serial interface.

Format [ESC]@002;aaa,bbb---bbb[LF][NUL]

Term

aaa: Number of data bytes to be passed
001 to 999

bbb --- bbb: Binary data to be passed

Explanation This command is used for making a serial communication with the RFID module. The data, of which number of bytes is specified with this command, is output to the internal serial interface (CNJ1: RFID) without being processed. Data received from the internal serial interface (CNJ1: RFID) is output to the serial interface or LAN (Socket).

This command is enabled when the interface type is RS-232C or LAN (socket communications).

5.16.2 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: Baud rate
- 0: 2400 bps
- 1: 4800 bps
- 2: 9600 bps
- 3: 19200 bps
- 4: 38400 bps
- 5: 115200 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 configured by this command take effect immediately after this command is analyzed. (There is no need to turn off and on the printer.) This command is backed up in the memory and retained even after the power is turned off.

When a communication error occurs on the internal serial interface, the ON LINE LED goes off, the ERROR LED lights up, “INTERNAL COM ERR” is displayed on the LCD, then the printer stops due to an error.

Example To set the baud rate, 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]

5.17 COMMANDS RELATED TO PARAMETER SETTING

5.17.1 PARAMETER SET COMMAND [ESC] Z2; 1

Function Sets each parameter for the printer.

Format [ESC]Z2;1,abcdefghijkklmnooppqqrstuuvwxyzABCDEFGHIJ[LF][NUL]

Term

a: Character code
- 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”
- 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 transmission control

0: XON/XOFF protocol
(No XON output when the power is turned on, no XOFF output when the power is turned OFF)

1: READY/BUSY (DTR) protocol
(No XON output when the power is turned on, no XOFF output when the power is turned OFF)

2: XON/XOFF + READY/BUSY (DTR) protocol:
(XON output when the power is turned on, XOFF output when the power is turned OFF)

3: XON/XOFF protocol:
(XON output when the power is turned on, XOFF output when the power is turned OFF)

4: RTS protocol
(No XON output when the power is turned on, no XOFF output when the power is turned OFF)

h: Language for LCD messages

0: English
1: German
2: French
3: Dutch
4: Spanish
5: Japanese
6: Italian
7: Portuguese***
8: Chinese
9: Korean*
A: Turkish**
B: Polish**

* Korean is supported from the B-EX4T1-G/T-QM/CN C1.0I, B-EX4T2-G/T-QM/CN C1.0F, B-EX4T2-H-QM/CN C1.1A, B-EX4D2-G/T-QM/CN D1.1, and B-EX6T1/T3.

** Turkish and Polish are supported from the B-EX4T1-G/T-QM/CN C1.3, B-EX4T2-G/T-QM/CN C1.2A, B-EX4T2-H-QM/CN C1.1A, B-EX4D2-G/T-QM/CN D1.2, and B-EX6T1/T3.

*** The B-EX4T3-HS12-CN-R V1.1A does not support Portuguese. If Portuguese is selected, Chinese will be automatically set.

i: Automatic forward feed standby after an issue

0: OFF (Not performed)
1: ON (Performed)

j: Direction of the stop position fine adjustment for the forward feed standby

+: Increase the forward feed amount
-: Decrease the forward feed amount

kk: Stop position fine adjustment for the forward feed standby

00 to 50 (in units of 0.1 mm)

l: Head-up operation in the cut issue mode, or the use of the rewinder in the batch issue mode.

0: OFF (Head-up operation is not performed/the rewinder is not used.)
1: ON (Head-up operation is performed/the rewinder is used.)

Note: Since the head-up mechanism is not provided to the B-EX4T2, B-EX4D2, B-EX4T3-HS and B-EX6T3, this parameter is to choose whether to use the Rewinder or not. The head-up operation is fixed to “OFF”.

m: Ribbon saving function
- 0: OFF (Not used)
- 1: ON (Head lever position is “TAG”)
- 2: ON (Head lever position is “LABEL”)
- 3: ON (Head lever position is “LABEL2”) (Unused)
- 4: ON (Head lever position is “TAG2”) (Unused)

Note: The head-up mechanism is not provided to the B-EX4T2, B-EX4D2, B-EX4T3-HS and B-EX6T3. Therefore, even if “1” or “2” is selected, the setting will be automatically changed to ”0: OFF”.

When the ribbon saving function is used on the B-EX6T1, set “1”.

n: Type of command control code
- 0: Automatic selection
- 1: ESC, LF, NUL mode
- 2: {, |, } mode
- 3: Manual mode

oo: 1st byte code of the control code (*2)
“00” to “FF” (Specify a hex code in 2-byte ASCII code.) (*3)

pp: 2nd byte code of the control code (*2)
“00” to “FF” (Specify a hex code in 2-byte ASCII code.) (*3)

qq: 3rd byte code of the control code (*2)
“00” to “FF” (Specify a hex code in 2-byte ASCII code.) (*3)

r: Peel-off wait
- 0: OFF (does not wait for the printed label to be removed.)
- 1: ON (waits for the printed label to be removed.)

s: [FEED] key function
- 0: FEED: Feeds one label.
- 1: PRINT: Prints data of the image buffer on one label.

t: Kanji code
- 0: TYPE1
- 1: TYPE2

uu: Euro code
“20” to “FF” (Specify a hex code in 2-byte ASCII code) (*3)

v: Automatic head broken dots check
- 0: OFF (Broken dots check is not performed when the printer power is turned on.)
- 1: ON (Broken dots check is automatically performed when the printer power is turned on.)

w: Centronics ACK/BUSY timing
- 0: TYPE1
- 1: TYPE2

x: Web printer function
- 0: OFF (Web printer function is disabled.)
- 1: ON (Web printer function is enabled, using the internal memory.)
- 2: ON (Web printer function is enabled, using the external memory.)

y: Reset processing when the nInit signal is ON
0: OFF (Reset processing is not performed.)
1: ON (Reset processing is performed.)

z: Ribbon near end detection
0: Not detected.
1: Detected when the remaining ribbon length is 30 m.
2: Detected when the remaining ribbon length is 70 m.

A: Expansion I/O operation mode
0: Standard mode
1: In-line mode

B: Reserved
0: Fixed to 0.

C: Plug-and-play operation mode
0: OFF (Plug-and-play operation is disabled.)
1: ON (Plug-and-play operation is enabled.)

D: Label end/ribbon end processing
0: TYPE1 (When a label end state is detected, the printer immediately stops.)
1: TYPE2 (When a label end state is detected, the printer continues printing as much as possible before it stops.)

E: Pre-peel-off processing
0: OFF (The pre-peel-off is not performed.)
1: ON (The pre-peel-off is performed.)

F: Back feed speed
0: 3 ips
1: 2 ips

G: Reserved
0: Fixed to 0.

H: MaxiCode specification
0: TYPE1 (Compatible with the current version)
1: TYPE2 (Special specification)

I: Forward feed standby action
0: Mode 1
1: Mode 2

J: Reserved
0: Fixed to 0

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.

*2 This fine adjustment value is effective only when parameter “n” (Type of the command control code) is set to “3” (Manual mode). When this parameter is set to any value other than “3”, this fine adjustment value is discarded.

*3 A hex code shall be set in a 2-byte ASCII code.
Example 1: To set 36H: ”36” (33H, 36H)
Example 2: To set 42H: ”42” (34H, 32H)
Example 3: To set FFH: ”FF” (46H, 46H)

5.17.2 FINE ADJUSTMENT VALUE SET COMMAND [ESC] Z2; 2

Function Sets various fine adjustment values on the printer.

Format [ESC]Z2;2,abbbcdddeffghhhijjkllmnnoppqqrr[LF][NUL]

[ESC]Z2;2,abbbcdddeffghhhijjkllmnnoppqqrrs1s2t1t2u1u2v1v2[LF][NUL]
Note: Supported only by the B-EX4T3-H.

Term

a: Whether the print start position is shifted forward or backward
+: Forward
–: Backward

bbb: Feed amount fine adjustment value
000 to 500 (in units of 0.1 mm)

c: Whether the cut position/strip position is shifted forward or backward
+: Forward
–: Backward

ddd: Fine adjustment value for the cut position (or strip position)
000 to 500 (in units of 0.1 mm)

e: Whether to increase or decrease the back feed amount
+: Increase
–: Decrease

ff: Back feed amount fine adjustment value
00 to 95 (in units of 0.1 mm)

g: Direction, left or right, in which the X-coordinate fine adjustment is made.
+: Right
–: Left

hhh: X-coordinate fine adjustment value
000 to 995 (in units of 0.1 mm)

i: Whether to increase or decrease the density for the thermal transfer print mode
+: Increase (darker)
–: Decrease (lighter)

jj: Print density fine adjustment value (for the thermal transfer print mode)
When parameter i is set to +: 00 to 10 (in units of 1 step)
When parameter i is set to –: 00 to 20 (in units of 1 step)

k: Whether to increase or decrease the density for the direct thermal print mode
+: Increase (darker)
–: Decrease (lighter)

ll: Print density fine adjustment value (for the direct thermal print mode)
When parameter k is set to +: 00 to 10 (in units of 1 step)
When parameter k is set to –: 00 to 20 (in units of 1 step)

m: Fine adjustment direction for the ribbon take-up motor voltage
+: Increase
–: Decrease

nn: Fine adjustment value for the ribbon take-up motor voltage
When parameter m is set to +: 00 to 10 (in units of 1 step)
When parameter m is set to –: 00 to 15 (in units of 1 step)

o: Fine adjustment direction for the ribbon feed motor voltage
+: Increase
–: Decrease

pp: Fine adjustment value for the ribbon feed motor voltage
When parameter o is set to +: 00 to 10 (in units of 1 step)
When parameter o is set to –: 00 to 15 (in units of 1 step)

qq: Manual threshold fine adjustment value for the reflective sensor
00 to 40 (in units of 0.1 V)

rr: Manual threshold fine adjustment value for the transmissive sensor
00 to 40 (in units of 0.1 V)

The following parameters are supported only by the B-EX4T3-H.

s1: Manual threshold value 2 for reflective sensor
00 to 40 (in units of 0.1V)

s2: Manual threshold value 2 for transmissive sensor
00 to 40 (in units of 0.1V)

t1: Manual threshold value 3 for reflective sensor
00 to 40 (in units of 0.1V)

t2: Manual threshold value 3 for transmissive sensor
00 to 40 (in units of 0.1V)

u1: Manual threshold value 4 for reflective sensor
00 to 40 (in units of 0.1V)

u2: Manual threshold value 4 for transmissive sensor
00 to 40 (in units of 0.1V)

v1: Manual threshold value 5 for reflective sensor
00 to 40 (in units of 0.1V)

v2: Manual threshold value 5 for transmissive sensor
00 to 40 (in units of 0.1V)

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.

5.17.3 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
- 0: Not installed.
- 1: H1 (B-EX700-RFID-H1-QM-R)
- 2: Reserved
- 3: H2 (B-EX700-RFID-H2-R)
- 4: U2 (B-EX700-RFID-U2-EU/US-R)
  U4 (B-EX700-RFID-U4-R, B-EX700-RFID-U4-EU/US-R)
  U4 module preinstall model (B-EX4T1/EX4T2-GS18/TS18-CN-R)
- 5: Reserved

Note: When this parameter is set to 2 or 5, it is ignored and the current setting remains effective.

bb: Tag type
- 00: None
- 11: I-Code
- 12: Tag-it
- 13: C220
- 14: ISO15693
- 15: C210
- 16: C240
- 17: C320
- 21: Reserved
- 22: Reserved
- 23: Reserved
- 24: EPC Class 1 Generation 2

Note: When this parameter is set to 21, 22 or 23, it is ignored and the current setting remains effective.

c: RFID error tag detection
- 0: Reserved.
- 1: Reserved.

Note: When this parameter is set to 0 or 1, it is ignored and the current setting remains effective.

ddd: Max. number times RFID tag issue is retried
000 to 255

eee: Max. number times data read is retried
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 times data write is retried
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 tag position adjustment for retry
+: Backward
−: Forward

jj: Feed amount of tag position 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 power output level
000 to 255

ll: RFID AGC threshold setting
00 to 15

m: RFID channel setting
0: AUTO
1: 2CH
2: 3CH
3: 4CH
4: 5CH
5: 6CH
6: 7CH
7: 8CH

nn: Q value
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

Note: For the B-EX700-RFID-U4-R, B-EX700-RFID-U4-EU/US-R, and U4 module preinstall model, this parameter does not work.

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.

5.18 COMMANDS RELATED TO RFID

5.18.1 RFID TAG POSITION ADJUSTMENT COMMAND [ESC] @003

Function

Sets the feed amount to place the RFID tag at the data write position.
When the paper is at the print start position but the RFID tag is not positioned just above the RFID antenna, the printer automatically feeds the paper forward or backward by the specified amount in order to write data onto the RFID tag prior to printing.
Also, specifies the offset printing function for short-pitch labels, which enables writing data on the next tag while printing is performed on the previous label.

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 for the specified length. After the data write, the printer returns the paper to the print start position for printing.

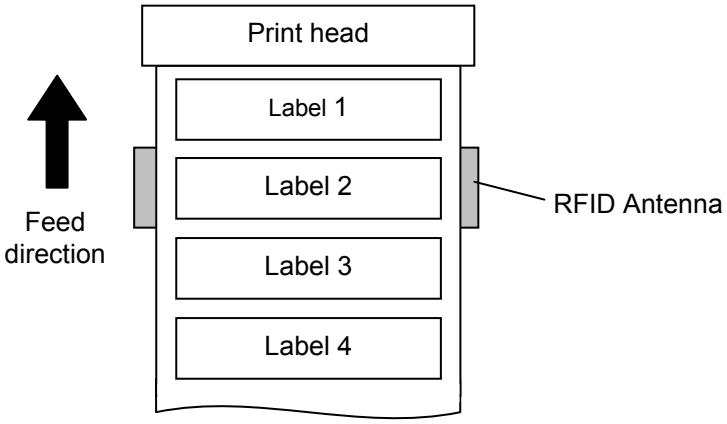
(2) Only the value of −30 or less, or +30 or more becomes effective.

(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 causes the settings of this command to be cleared.

(5) This command is ignored when the on-the-fly issue is performed.

(6) The offset printing is a function that the printer prints on a label while writing data onto the RFID tag of a next label. This is useful to continuously issue multiple RFID labels.
When using approx. 20-mm pitch labels, for example, a next label (Label 2) is supposed to be positioned just above the antenna when the previous label (Label 1) is at the print position. In this case, enabling the offset printing eliminates a need for a reverse feed to the tag write position, causing the total throughput to increase.



How the printer performs printing and data write when print data for several labels is transmitted to the printer 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 needs 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 intended for adjusting 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.

(7) When the CALIB. MODE parameter of the UHF setting is enabled in the printer system mode, this command's parameters "a" (Feed direction) and "bbbb" (Feed amount) become invalid, and only parameter "c" (Offset printing) becomes effective.

When parameter "c" is set to 1 or 2 with the CALIB. MODE enabled in the system mode, the printer will behave as if a value obtained by subtracting the label pitch from the value specified for the CALIB. POSITION parameter in the system mode is set for parameters "a" and "bbbb".

When parameter "c" is set to "0" or omitted with the CALIB. MODE enabled in the system mode, the printer will behave as if a value specified for the CALIB. POSITION parameter in the system mode is set for parameters "a" and "bbbb".

* This function is supported by the B-EX4T1-G/T-QM/CN C1.4 or later.

5.18.2 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…)(,Ui)[LF][NUL]

Term Naaaa: 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.
When parameter Id (RFID read mode) is set to 2 or 4 for Gen2 tags, this parameter will be ignored.

Abbb: Address of data to be read (Omissible. When omitted, 0 is set.)
000 to 999
The address where reading the RFID tag is started is specified.
When omitted, the value will be set to 18.
When parameter Id (RFID read mode) is set to 2 or 4 for Gen2 tags, this parameter will be ignored.

Tcc: Type of tag (Omissible)
00: None
11: I-Code
12: Tag-it
13: C220
14: ISO15693
15: C210
16: C240
17: C320
21: Reserved
22: Reserved
23: Reserved
24: EPC Class 1 Generation 2
Designates the type of RFID tag to be read.
When omitted, the tag type set in system mode will be designated.
The tag type specified by this command will be reflected in the system mode setting.
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: Only user data is read.
2: Only tag ID is read.
3: Both tag ID and user data are read.
4: All data in the TID bank area of EPC C1 Gen2 tag is read.
(Only when the U2/U4 module is used)
5: User bank area of EPC C1 Gen2 tag is read.
(Only when the U2/U4 module is used)
This is dependent on parameter N (the number of bytes to be read) and parameter A (address of data to be read.)

When omitted, only user data will be read.
When the tag type is Gen2, user data means TID bank + user bank, and tag ID means EPC bank.
When the H1 or H2 module is used, specifying 4 or 5 causes a tag read to fail.

Jeeeeeeee: Access password entry (Omissible)
Fixed to 8-digit hexadecimal number
00000000 to FFFFFFFF
Enables accesses to the password-protected tags.
This parameter is effective only for the EPC Class 1 Generation 2 tag type.

Xfggggggg: Reserved.

Ui:EPC data read
0: Only EPC data is read. (Default)
1: PC + EPC are read.
EPC data equivalent to the data size specified in the PC is read.
Example:
When PC+EPC data is 3000112233445566778899 00AABBCCDDEEFF1122…
Sending the command {WF;I2,U1|} results in reading the data of
3000112233445566778899 00AABB.
2: PC + EPC are read.
All PC + EPC data is read.
Example:
When PC+EPC data is 3000112233445566778899 00AABBCCDDEEFF1122…
Sending the command {WF;I2,U1|} results in reading the data of
3000112233445566778899 00AABBCCDDEEFF1122

NOTE: This parameter is effective in the following cases:
- EPC Class1 Generation 2 tag type
- 2 (EPC area) is selected for parameter I (RFID read mode).

Explanation

(1) The parameter, “Number of bytes to be read”, is effective only when RFID read mode is set to 1, 3, or 5 as this parameter is intended for reading user data. When reading tag ID, 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 user data and the ID bytes of the specified data bytes will be returned in accordance with the tag types, as shown in the table below.

Tag type	Number of user data bytes
Tag-it	32 bytes
I-Code	44 bytes
C220	9 bytes
C320	32 bytes
ISO15693	32 bytes
C210	0 bytes
C240	224 bytes
EPC Class 1 Generation 2	8 bytes

Tag type	Number of ID bytes
Tag-it	4 bytes
I-Code	8 bytes
C220	5 bytes
ISO15693	8 bytes
C210	8 bytes
C240	8 bytes
EPC Class 1 Generation 2	8 bytes or 12 bytes

Supplemental explanation of parameter “I”

When Gen2 tag is used, options for the parameter “I” are as follows:

I1: TID & User area data
I2: EPC data
I3: EPC data + TID & User area data
I4: All data in the TID area (Only when the U2 module is used.)
I5: User area data (Only when the U2 module is used.)
This is dependent on parameter N (the number of bytes to be read) and parameter A (address of data to be read.)

As the readability of the TID & User area differs depending on the tag manufacturers, refer to the memory map of each tag.
Example)

- In the case of OMRON’s Gen2 tag
  4-byte TID area is readable, and the user area is read/write protected.
- In the case of HITACHI’s Gen2 tag (Hibiki)
  8-byte TID area is readable/writable and 30-byte user area is readable/writable.

(4) The format of information to be returned to the host is as follows.

SOH	01H	Header of the status block
STX	02H	
"F"	46H	
Tag type	30H	30H30H: Read error 31H31H: I-Code 31H32H: Tag-it 31H33H: C220 31H34H: ISO15693 31H35H: C210 31H36H: C240 31H37H: C320 32H34H: EPC Class 1 Generation 2
	30H	
Data	---	Tag data (0 bytes to 9999 bytes)
ETX	03H	Footer 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 data read failed.]

Header		"F"	Tag type		Footer			
01H	02H	46H	30H	30H	03H	04H	0DH	0AH

Read error

[When a data read succeeded. (When RFID read mode=1 or omitted.)]

Header		"F"	Tag type		User data (32 bytes)								Footer			
01H	02H	46H	31H	34H	41H	42H	43H	xxH	xxH	44H	45H	46H	03H	04H	0DH	0AH

Read data "ABC···DEF"

Tag type: ISO15693

[When a data read succeeded. (When RFID read mode=2.)]

Header		"F"	Tag type		Tag ID (8 bytes)								Footer			
01H	02H	46H	31H	34H	31H	32H	33H	34H	35H	36H	37H	38H	03H	04H	0DH	0AH

Read data "12345678"

Tag type: ISO15693

[When a data read succeeded. (When RFID read mode=3.)]

Header		"F"	Tag type		Tag ID + User data (8 bytes + 32 bytes)								Footer			
01H	02H	46H	31H	34H	31H	32H	xxH	xxH	xxH	44H	45H	46H	03H	04H	0DH	0AH

Read data "123···678ABC···DEF"

Tag type: ISO15693

Notes

A status is returned to the all connected and enabled interfaces.

5.18.3 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) Even after the void pattern is printed, the print data image is retained.

(3) This void pattern is printed when data cannot be properly written onto the RFID tag due to damaged RFID chip or some other reasons. Printing the void pattern on the media surface enables visually indicating the embedded 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 when writing data onto the RFID tag failed while the RFID module is manually controlled to issue RFID labels by using the BASIC interpreter or the Pass Through Command.

(5) The media voided by this command is cut one by one.

(6) The status code 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, the void pattern image is not cleared.

5.18.4 RFID DATA WRITE COMMAND [ESC] @012

Function

Writes specified data onto an RFID tag. At this time, no printing is performed.
The result of a data write is notified by returning a detailed status.

Format

[ESC]@012;a(,Abbb)(,Mc)(,Pd)(,Fe)(,Tff)(,Dgg)(,Gh)(,Riiiiiiii)(,Kjjjjjjjj)(,Lkk
or ,Labcde)(,Jllllllll)(,Vm)(,Bnn)(,Hopppppppp · · ·)(,Qqrstuvw · · ·)(,Xxyyyyyyyy · · ·)(,Uc)
=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.
This parameter is ignored when the tag type is Gen2 tags and the parameter Bnn (area where the data is written) is set to 01 (Bank1) or omitted.

Mc: Format of U-Code V1.19 (Omissible)
0: SGTIN 96 format
1: SSCC96 format
2: (Reserved)
When the format of U-Code V1.19 is designated, the specified address, where the data is written, will become invalid.
When this parameter is omitted, the U-Code V1.19 format is not used.
When 2: (Reserved) is selected, operations are not guaranteed.

Pd: Partition number (Omissible)
0 to 6
This parameter is effective only when U-Code V1.19 or EPC format is designated. When omitted, 5 will be set.

Fe: Filter number (Omissible)
0 to 7
This parameter is effective only when U-Code V1.19 or EPC format is designated. When omitted, 0 will be set.

Tff: Tag type (Omissible)
00: None
11: I-Code
12: Tag-it
13: C220
14: ISO15693
15: C210
16: C240
17: C320
21: Reserved
22: Reserved
23: Reserved
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.
The tag type specified by this command will be reflected in the system mode setting.
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 (Default)
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: Data is set in ASCII and encoded in hexadecimal. (Default)
1: Data is set in binary and encoded in hexadecimal.
2: Data is set and encoded in hexadecimal.
3: Data is set in ASCII and encoded in hexadecimal. (Reserved)
4: Data is set in binary and encoded in hexadecimal. (Reserved)
5: Data is set and encoded in hexadecimal. (Reserved)

Riiiiiiii: Access password setting (Omissible)
Fixed to 8-digit hexadecimal number
00000000 to FFFFFFFF
Sets a password for tags.
This parameter is effective only for EPC Class 1 Generation 2 tag type.

Kjjjjjjjj: Kill password setting (Omissible)
Fixed to 8-digit hexadecimal number
00000000 to FFFFFFFF
Sets a kill password for tags.
This parameter is effective only for EPC Class 1 Generation 2 tag type.

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
64	(Reserved)				

Designates the areas to be locked. When omitted, no areas are locked.
This parameter is effective only for EPC Class 1 Generation 2 tag type.
Permanent lock: Areas are permanently non-writable.
Permanent unlock: Areas are permanently non-lockable.

<In the case of Labcde (5 digits)> (Supported by U2 module's firmware version #00T or later and the U4 module.)

Labcde: Lock/unlock setting (Omissible)

a: Kill password
0: None
1: Unlock
2: Permanent unlock
3: Lock
4: Permanent lock

b: Access password
0: None
1: Unlock
2: Permanent unlock
3: Lock
4: Permanent lock

c: EPC bank
0: None
1: Unlock
2: Permanent unlock
3: Lock
4: Permanent lock

d: TID bank
0: None
1: Unlock
2: Permanent unlock
3: Lock
4: Permanent lock

e: User data
0: None
1: Unlock
2: Permanent unlock
3: Lock
4: Permanent lock

When parameters "a" to "e" are all set to 0, nothing is performed.
Example) To set the EPC to Lock and the user data to permanent lock:
,L00304

Designates the areas to be locked. When omitted, no areas are locked.
This parameter is effective only for EPC Class 1 Generation 2 tag type.
Permanent lock: Areas are permanently non-writable.
Permanent unlock: Areas are permanently non-lockable.

JIIIIIIII: Access password entry (Omissible)
Fixed to 8-digit hexadecimal number
00000000 to FFFFFFFF
Enables accesses to the password-protected tags.
This parameter is effective only for EPC Class1 Generation 2 tag type.

Vm: Reserved.

Bnn: Reserved.

Qqrstuvw: Reserved.

Xxyyyyyyyy: Reserved.

Uc: EPC data write

0: Only EPC data is written. (Default)

1: PC + EPC are written.

The EPC data size shown in the PC must be the same as the actual EPC data size. (Proper data write is not guaranteed when they are different.)

Example:

{@012;w,T24,G2,B01,U1=3000112233445566778899 00AABB|}

{@012;w,T24,G2,B01,U1=4800112233445566778899 00AABBCCDDEEFF1122|}

NOTE: When only PC is specified with this parameter set to 1, NULL will be written in the excess part.

Example:

When PC+EPC data is 3000112233445566778899 00AABBCCDDEEFF1122…:

Sending the command {@012;w,T24,G2,B01,U1=4800|} results in the writing PC+EPC data of 4800112233445566778899 00AABB000000000000…

2: PC + EPC are written

Data is written even if EPC data size shown in the PC differs from the actual EPC.

Example:

{@012;w,T24,G2,B01,U2=3000112233445566778899 00AABBCCDDEEFF1122|}

{@012;w,T24,G2,B01,U2=4800112233445566778899 00AABB|}

It is possible to write PC only.

Example:

{@012;w,T24,G2,B01,U2=3000|}

{@012;w,T24,G2,B01,U2=4800|}

NOTE: This parameter is effective in the following cases:

- EPC Class1 Generation 2 tag type
- 01 (EPC area) is selected for parameter B (area where the data is written).

When this parameter is set, parameters M and D become invalid.

ooo---ooo: Print data string (Omissible)
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	Header 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 number of labels to be printed (0000 to 9999)
	30H	
	30H	
	30H	
ETX	03H	Terminator of the status block.
EOT	04H	
CR	0DH	
LF	0AH	

Notes

A status is returned to the all connected and enabled interfaces.

5.19 COMMANDS RELATED TO REAL TIME CLOCK (RTC)

Function

Sets a date (year, month, date) and a time (hour, minute, second) for the real time clock. (Automatic adjustment for leap years is provided.)
The date and time are saved and updated even when the power is turned off as long as the real time clock is connected with a battery.

Notes

(1) Whenever the RTC data is used, the battery must be loaded.

(2) If the battery is not loaded or the battery voltage is low, the RTC data is erased when the printer is turned off.

(3) When using the RTC function, the low battery check shall be set to ON.

(4) When the low battery check function has been enabled, the printer stops at a power on time due to a “LOW BATTERY” error if the battery voltage is 1.9V or less.

(5) The factory default setting for the low battery check function is OFF.

(6) When the low battery check is disabled, the RTC function is usable even in a low battery state. However, the setting and check of the real time clock is required each time the power is turned on.

(7) When the RTC data renewal timing is set to “PAGE” and if print data includes a value to be incremented/decremented or time data, the printer ignores the on-the-fly issue. And printing is stopped one by one even if the number of labels to print is specified as more than one by an Issue Command.

5.19.1 REAL TIME CLOCK (RTC) SET COMMAND [ESC] JT

Function Sets a date and a time of the real time clock.

Format [ESC]JT;aabbccddeeff[LF][NUL]

Term

aa: Year (last 2 digits)
2 digits (fixed) 00 – 99

bb: Month
2 digits (fixed) 01 – 12

cc: Day
2 digits (fixed) 01 – 31 (An error will result if the day set is not correct for the year and month already set.)

dd: Hour
2 digits (fixed) 00 – 23

ee: Minute
2 digits (fixed) 00 – 59

ff: Second
2 digits (fixed) 00 – 59

Explanation

(1) Immediately after a date and a time are set with this command, the RTC data starts to be updated using the date and the time adjusted as a reference.

(2) Since the RTC data at the time of shipment may be incorrect, an RTC setting must be performed before use.

(3) If the year is multiples of 4, it is regarded as leap year and the date is automatically adjusted.

(4) The RTC data cannot be cleared by a parameter clear.

Example In the case of 15:20:59 on February 8, 2006

[ESC]JT;060208152059[LF][NUL]

Method for printing the RTC data

The RTC data can be printed by specifying a link field with the following commands. The INC/DEC or zero suppression shall not be specified.

- Bit Map Font Format Command [ESC]PC
- Outline Font Format Command [ESC]PV
- Bar Code Font Format Command [ESC]XB

Format

[ESC]PCaaa;·····;ss_1,ss_2,ss_3,------,ss_{20})[LF][NUL]

[ESC]PVaaa;·····;ss_1,ss_2,ss_3,------,ss_{20})[LF][NUL]

[ESC]XBaaa;·····;ss_1,ss_2,ss_3,------,ss_{20})[LF][NUL]

Term

ss: D01: Monday (DD)
D02: Month (MM)
D03: Year (YY)
T01: Hour (HH)
T02: Minute (MM)
T03: Second (SS)

It is possible to print the RTC data together with characters by using a link field format.

Example

In the case of 15:20:29 on February 28, 2001

[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

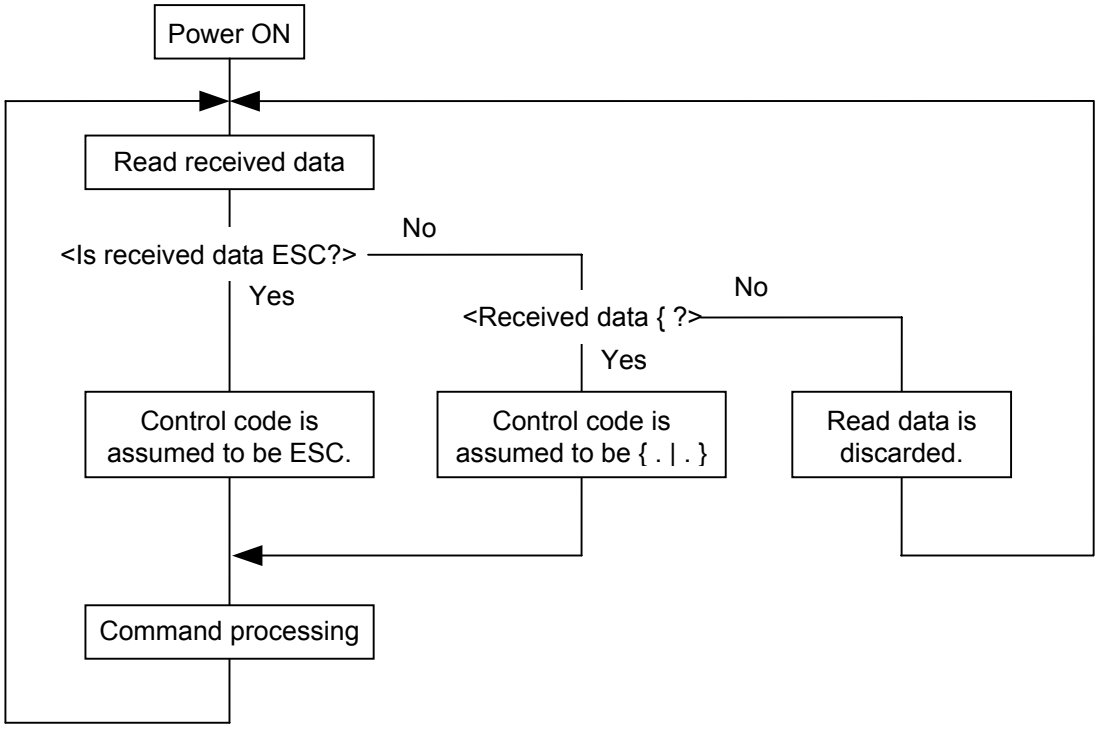
* When the same parameter appears in the link data more than once, the latest parameter will become effective.

6. CONTROL CODE SELECTION

6.1 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 data 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 selection is made for every command. If the first command is [ESC] ~ [LF] [NUL], followed by [ESC], the control code becomes [ESC]. [LF]. [NUL], and if it is followed by { , the control code for the next command becomes { . | . }. When { . | . } is a control code, the data of 00H to 1FH in { ~ | } 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. When { . | . } is the control code, { . | . } cannot be used in the data of the Data Command or the Message Display Command.



6.2 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.

6-3 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. When { . | . } is used as the control code, { . | . } cannot be used in the data of the Data Command or the Message Display Command.

6.4 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 shall 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.

7. ERROR PROCESSING

If the printer detects any of the following errors, it will display the error message (LCD, LED), makes status response (serial interface, parallel interface), and stops its operation.
* For details of the status response, refer to Section 8 STATUS RESPONSE.

7.1 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 results if the Format Command of a field is not transmitted and its Data Command is transmitted. When attempting to call a PC Save Command of a save identifier which is not saved, an error results. An undefined command is not detected as an error, and data is discarded until [ESC] or [{] is received.

(2) Hardware Errors

An error results if a framing error or parity error is found during receiving data via the serial interface (RS-232C).

* At the moment when a command error or hardware error occurs, the printer shows the error message and makes status response before stopping. The Status Request Command and Reset Command only can be processed and other commands 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.

7.2 ERRORS IN ISSUING OR FEEDING

(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) does not satisfy the following formula, an error will result:
$(A) \times 50\% \leq (B) \leq (A) \times 150\%$

<Causes of a paper jam>

- A paper jam has occurred during a paper feed.
- Paper is not placed properly.
- The actually used label does not match the type of the sensor.
- The sensor position is not aligned with the black mark.
- The actual label size does not meet the programmed label length.
- No label-to-label gap is detected due to pre-prints.
- The sensor is not properly adjusted.
  (The sensor is not adjusted for the label to be used.)

② If a stripped label is not detected by the strip sensor when printing or feeding is completed in the strip mode, an error will result.

③ If a gap or black mark cannot be detected with the Media Load enabled even if 1500-mm media is fed, an error will result.

(2) Cutter Error

① Rotary cutter

- When the cutter does not move from the cutter home position even if 40 msec. or more have passed since the cutter solenoid was driven, an error will result.
- The cutter does not return to the home position even if 150 msec. have passed since it moved from the home position.

② Disc cutter

- When there is any error with the cutter home position sensor at a start of the printer, an error occurs.
- When the cutter home position cannot be detected at a start of the printer, the disc cutter tries to detect the home position (restoration). If the home position cannot be detected even if it takes 1.2 times as long time as the disc cutter moves between the home position sensors*, an error occurs.
- .When the cutter home position cannot be detected prior to printing, an error occurs.
- When the home position on the opposite side cannot be detected even if it takes 1.2 times as long time as the disc cutter moves between the home position sensors*, the disc cutter retries in the same direction. If the home position cannot be detected during the retry even if it takes 1.2 times as long time as the disc cutter moves between the home position sensors*, an error occurs.

* The speed of the disc cutter movement during restoration and retry is lower than that of the cut operation.

(3) Label End

Error processing differs depending on the setting of label end/ribbon end processing in the system mode.

① When TYP1 is selected. (default):

- When the transmissive sensor or the reflective sensor detects a continuous 5-mm long label end state, an error will result.
- When an issue, a feed, or an ejection is attempted in a printer stop state while the transmissive sensor or the reflective sensor detects the label end state, an error will result.

② When TYP2 is selected. (effective only when the ribbon saving function is not used.):

- When the transmissive sensor or the reflective sensor detects a continuous 5-mm long label end state, the printer completes the printing of half-finished label, and then an error will result when the next label is at the home position.
- When an issue, a feed, or an ejection is attempted in a printer stop state while the transmissive sensor or the reflective sensor detects the label end state, an error will result.

(4) Ribbon End

Error processing differs depending on the setting of label end/ribbon end process in the system mode.

① When TYP1 is selected. (default):

- With the ribbon transfer printing being selected, when the ribbon end sensor detects a continuous 5-mm long ribbon end state, an error will result.
- With the ribbon transfer printing being selected, when an issue, a feed, or an ejection is attempted in a printer stop state while the ribbon end sensor detects the ribbon end state, an error will result.

② When TYP2 is selected. (effective only when the ribbon saving function is not used.)

- With the ribbon transfer printing being selected, when the ribbon end sensor detects a continuous 5-mm long ribbon end state, the following processing depends on the unfinished label length as follows.
  - When unfinished label length is 30 mm or more, an error results after the printer prints the label for 20 mm.
  - When unfinished label length is less than 30 mm, the printer completes the half-finished label and stops printing when the next label is at the home position.
- With the ribbon transfer printing being selected, when an issue, a feed, or an ejection is attempted in a printer stop state while the ribbon end sensor detects the ribbon end state, an error will result.

(5) Head Open Error

① If the head open sensor detects an open state for continuous 5-mm label length, an error will result.

② If the head open sensor detects an 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 (lock) sensor detects a continuous 5-mm head-up state, an error will result.

④ If the head-up (lock) sensor detects a head-up state when an issue, a feed, or an ejection is attempted in a printer stop state, an error will result.
However, the [FEED] key on the printer and the issue and feed signals on the expansion I/O become invalid during a head open state (a head open state detected by the head open sensor or a head up state detected by the head-up (lock) sensor.)

(6) Thermal Head Error

① A broken dot error has occurred in the thermal head.

② An error has occurred in the thermal head driver.

(7) Thermal Head Excessive Temperature

① When the ambient temperature detection thermistor detects an excessively high temperature (65°C or more), an error will result.

② When the thermal head temperature detection thermistor detects an excessively high temperature (75°C or more), an error will result.

(8) Ribbon Error

① When the ribbon take-up motor sensor and ribbon back tension motor sensor do not detect any status change even if twice the prescribed time has passed, an error will result.

<Causes of a ribbon error>

- An abnormal condition has occurred on the sensor for determining the ribbon motor torque.
- A ribbon jam has occurred.
- The ribbon has been broken.
- The ribbon has not been installed.

(9) Rewinder Overflow

① If the rewinder overflow sensor detects an overflow state for continuous 5-mm media when the strip issue mode or the built-in rewinder is specified, an error will result.

② If the Rewinder overflow sensor detects an overflow state when an issue, a feed, or an ejection is attempted in a printer stop state after the strip issue mode or the built-in rewinder is specified, an error will result.

7.3 ERRORS IN WRITABLE CHARACTER AND PC COMMAND SAVE MODES

(1) Write Error

• An error has occurred while writing to the memory for storage.

(2) Format Error

• An erase error has occurred while formatting the memory for storage.

(3) Memory Full

• No more storage is allowed due to the insufficient free space in the memory for storage.

* At the moment when an error occurs, the printer shows the error message, sends a status response, then stops. Only the Status Request Command and the Reset Command can be processed, and other commands are not. Restoration with the [RESTART] key is disabled.

7.4 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.

(5) EEPROM Error

• The EEPROM for back-up cannot be read/written properly.

* At the moment when an error occurs, the printer shows the error message, then stops. (None of the commands and key operations will be processed.)

7.5 RTC LOW BATTERY ERROR

When the low battery check is set to ON, a low battery error will result if the battery voltage is 1.9V or less at power on. Restoration with the [RESTART] key is disabled.

7.6 RESET PROCESSING

When the [RESTART] key is held down for more than 3 seconds during the error which can be cleared by the [RESTART] key or during a pause state, the printer enters the user system mode.

7.7 RFID ERROR

(1) RFID Write Error

If writing data onto an 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 when an error occurs, the printer shows the error message, sends a status response, then stops. Only the Status Request Command and the Reset Command can be processed, and other commands are not. Restoration with the [RESTART] key is enabled. (The printer resumes printing the label at which the error occurred.)

(2) RFID Error

If a problem has occurred when the printer communicates with the RFID module, an RFID error will result.

8. STATUS RESPONSE

8.1 FUNCTIONS

There are three kinds of status response functions on the printer.

(1) Status transmission at the end of a normal transmission and the occurrence of an error (auto status transmission)

- This function is available when the RS-232C interface, socket communication (online) or the mail function is enabled.
- When the “with status response” has been selected for the status response type, the printer sends a status to the host computer when the printer performs a feed media or completes an issue normally (For the batch/cut mode: after the designated number of labels is printed, For the strip mode: after one label is printed).
- In the online mode, the head up/down status is sent to the host computer.
- When errors occur, the respective status is sent to the host computer.
- The remaining count in the status response indicates the remaining number of labels to be printed in the batch currently being printed. No remaining count in the batch waiting to be printed is transmitted.

(2) Status transmission in response to status request (Status Request Command)

- This function is available when the RS-232C, USB, Centronics interfaces, or socket communication is enabled.
- Upon requested to send a status by the Status Request Command, the printer sends the latest printer status to the host computer, whether or not “with status response” has been selected for the status response type.
- The remaining count in the status response indicates the remaining number of labels to be printed in the batch currently being printed. No remaining count in the batch waiting to be printed is transmitted.
- This command is executed immediately after being received, not stored in the receive buffer.

(3) Receive buffer free space status transmission in response to status request (Receive Buffer Free Space Status Request Command)

- This function is available when the RS-232C, USB, Centronics interfaces, or socket communication is enabled.
- Upon requested to send a status by the Receive Buffer Free Space Status Request Command, the printer sends the latest printer status and the receive buffer free space size to the host computer, whether or not “with status response” has been selected for the status response type.
- The remaining count in the status response indicates the remaining number of labels to be printed in the batch currently being printed. No remaining count in the batch waiting to be printed is transmitted.
- This command is executed immediately after being received, not stored in the receive buffer.

<Status waiting for removal of printed label>

The conditions to send a status waiting for removal of printed label (=peel-off wait status) (05H) in response to the Status Request Command depend on the system mode setting.

(1) When the peel-off wait status is set to “OFF” in the system mode:

When a label is on the strip shaft (for example, while idling, after feeding a label, or after executing all print jobs), the printer returns (00H) to the host in response to the Status Request Command.

(2) When the peel-off wait status is set to “ON” in the system mode:

When a label is on the strip shaft (for example, while idling, after feeding a label, or after executing all print jobs), the printer returns (05H) to the host in response to the Status Request Command. When the Status Request Command is sent to the printer while printing is in progress, the peel-off wait status (05H) is returned regardless of the parameter setting.

<USB Interface>

The conditions to send a status automatically or in response to the Status Request Command via USB interface depend on the system mode setting and the interface to be used.

(1) When the ”Status transmission via USB” is enabled in the system mode:

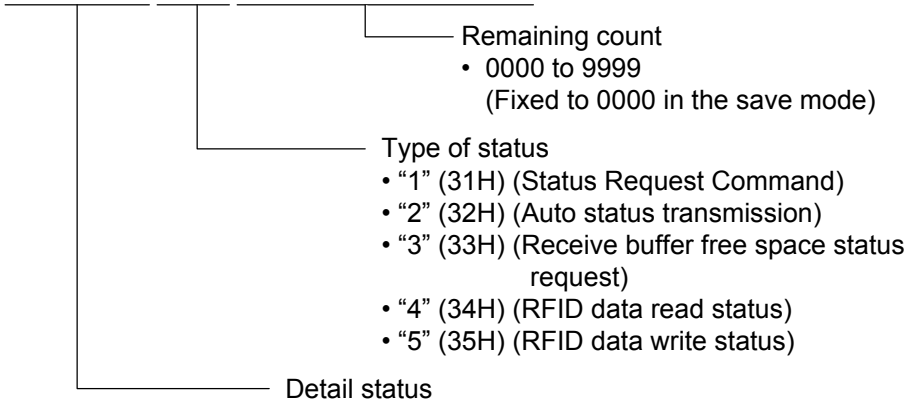
A status is unconditionally sent to the USB interface. If the host computer does not receive data sent via USB interface and the receive buffer becomes full, the printer waits until the receive buffer has a free space.

(2) When the ”Status transmission via USB” is disabled in the system mode:

A status is sent to the USB interface only when the host sent the Status Request Command to the printer via USB interface. If the host computer does not receive data sent via USB interface and the send buffer becomes full, the printer does not send a status.

8.1.1 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 sent in response to the Receive Buffer Free Space Status Request Command

SOH	01H	Indicates the header of the status block
STX	02H	
Status	3XH	Printer status
	3XH	* Details are described later.
Status type	33H	Indicates the status is including the receive buffer free space size.
Remaining count	3XH	Remaining number of labels to be printed
	3XH	* Details are described later.
	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
	3XH	"00000" (0 Kbyte) to "99999" (99999 Kbytes)
	3XH	However, the maximum value shall be the total capacity of the receive buffer.
	3XH	
	3XH	
Receive buffer total capacity	3XH	Total capacity of the receive buffer
	3XH	"00000" (0 Kbyte) to "99999" (99999 Kbytes)
	3XH	However, the maximum value differs depending on the models.
	3XH	
	3XH	
CR	0DH	Indicates the terminator of the status block.
LF	0AH	

8.1.2 DETAIL STATUS

LCD Message of 2nd line (English)	Printer Status	Detail Status	
		Auto Status Transmission	Status Request Command
ON LINE	The head was closed with the head open.	00	00
HEAD OPEN	The head was opened in the online mode.	01	01
ON LINE	Operating (Analyzing command, drawing, printing, feeding)	–	02
PAUSE ****	In a pause state	–	04
ON LINE	Waiting for stripping	–	05
Display of error message (See ***NOTE* 1**.)	A command error was found in analyzing the command.	06	06
COMMS ERROR	A parity error or framing error occurred during communication by RS-232C	07	07
PAPER JAM ****	A paper jam occurred during a paper feed.	11	11
CUTTER ERROR******	An abnormal condition occurred at the cutter.	12	12
NO PAPER ******	The label 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 head open (except the [FEED] key)	15	15
HEAD ERROR ******	A broken dot error has occurred in the thermal head.	17	17
EXCESS HEAD TEMP	The thermal head temperature has become excessively high.	18	18
RIBBON ERROR******	An abnormal condition occurred in the sensor for determining the torque for the ribbon motor.	21	21
REWIND FULL ******	An overflow error has occurred in the rewinder.	22	22
ON LINE	Ribbon near end state (Online)	–	27
PAUSE	Ribbon near end state (In a pause state)	–	28
ON LINE	Ribbon near end state (Operating)	–	29
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 ####KB/&&&&KB **SAVING %,%%%.%%%KB**	Writable character or PC command save mode	–	55
FORMAT ####KB/&&&&KB **FORMAT %,%%%,%%%KB**	The storage area is being initialized.	–	55
MEMORY WRITE ERR.	An error has occurred in writing data into memory for storage.	50	50
FORMAT ERROR	An erase error has occurred in formatting memory for storage.	51	51
MEMORY FULL	Saving failed because of the insufficient capacity of memory for storage.	54	54
INITIALIZING…	The storage memory is being initialized. (Initialization is performed for approx. 15 seconds.)		
POWER FAILURE	A momentary power interruption has occurred.	–	–

LCD Message of Upper Line (English)	Printer Status	Detail Status	
		Auto Status Transmission	Status Request Command
EEPROM ERROR	An EEPROM for back up cannot be read/written properly.	–	–
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.	–	–
LOW BATTERY	Low battery level of the real time clock	36	36
–	A void pattern printing is completed. 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 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.	---	---
–	Writing data onto an RFID tag failed. When a data write, performed by an RFID Data Write Command (@012), failed, this status is returned.	---	---
INPUT PASSWORD	The printer is waiting for a password to be entered.	---	---
PASSWORD INVALID	Wrong password was entered for consecutively three times.	---	---
RFID CONFIG ERR	B-EX700-RFID-U2-US-R only RFID module's destination code is not specified	65	65

8.1.3 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 (Status transmission enabled)	Automatic status transmission	13 bytes
	Reception of [ESC] WS [LF] [NUL]	13 bytes
	Reception of [ESC] WB [LF] [NUL]	23 bytes
USB (Status transmission disabled) *1	Automatic status transmission	13 bytes
	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
E-mail function	Automatic status transmission	Varies depending on the setting.

*1: Only when the command is sent from the host via USB interface.

8.1.4 DESTINATION OF STATUS RESPONSE

Supported by the B-EX4T1-TS25-R V2.0C or later.

Outline The printer returns a status in response to a request from the host. The response may be returned to the host via multiple interfaces. Details are described in the following sections.

8.1.4.1 Status Response Function for Each Interface

Usually, the printer returns a status via the same interface that the host used to send a status request. The normal behaviors for status response are described in Section 8.1.4.2.
In this section, exceptional behaviors are explained.

■ USB Function Interface

1) When the host does not receive data

If the host does not receive data from the printer, which is connected via a USB cable, the status will be stored in the USB receive buffer of the printer. Once the host starts to receive data sent via USB, the stored data will be sent to the host at one time. (For example, when the host sends a WB command on the condition that the automatic status responses are stored in the printer buffer, the host will receive automatic status response.) To prevent this, it is required to restart the printer (by resetting with a Z0 command or key operations or by turning off and on) before the host makes a communication via USB.

2) USB I/F Status

When the USB I/F Status parameter is disabled (factory default) with key operations, statuses in response to real-time commands only are sent via USB function interface. When the USB I/F Status parameter is enabled, statuses in response to batch commands and automatic status responses are sent also via USB function interface. In the case the printer is operated with the USB I/F Status parameter enabled, the host must receive data via USB.

3) Buffer full

When the host does not receive data via USB and the printer transmission buffer becomes full, the printer behavior differs depending on the USB I/F Status parameter setting.

(1) In the case USB I/F Status parameter is disabled
The printer clears and empties the transmission buffer, then stores new status information in the transmission buffer.

(2) In the case USB I/F Status parameter is enabled
The printer waits until the transmission buffer becomes empty. Depending on the data to be sent, the printer stops operation while waiting.

- When the transmission buffer becomes full with automatic status responses or data in response to WS, WB or WN command, the printer stops command analysis, image processing, key operation, refreshing the LCD message, Basic program analysis and execution. Only recovering method is making the host receive all printer statuses of up to 5KB or turning the printer off/on.
- When the transmission buffer becomes full with data sent from BASIC program or data in response to WV, WI, WG, WF or @012 command, the printer stops command analysis, Basic program analysis and execution. Recovering method is making the host receive all printer statuses of up to 5KB, turning the printer off/on, or resetting the printer in the user system mode.

■ LAN

1) Scope

LAN includes wired LAN interface and wireless LAN interface. The interface is exclusively used: When the printer is equipped with a wireless LAN board and the “WLAN” or “AUTO” is selected for the network

interface, the wireless LAN interface will be enabled. When the wireless LAN board is not installed in the printer or the “LAN” is selected for the network interface, the wired LAN interface will be enabled.

2) Socket communication
LAN communication types include socket communication, LPR, FTP, POP3, SMTP, HTTP and SNMP. Status response is performed only by the socket communication.

3) Establishment of socket link
To enable sending status responses via LAN, a socket communication is required to be established between the host and the printer IP address and port No. Also, socket port needs to be enabled on the printer. The printer will not return a status unless a socket link is established. Even if a socket link is established while the printer is sending a response via other interface, the printer does not use the LAN interface from the middle of the response, but from the next response.

4) When the host does not receive data
If the host does not receive data from the printer via LAN interface while a socket link is established, the status will be stored in the socket receive buffer of the host. Once the host starts to receive data sent via LAN, the host will receive the stored data at one time. (For example, when the host sends a WB command on the condition that the automatic status responses are stored in the buffer, the host will receive automatic status response.) To prevent this, it is required to disconnect the socket link and connect it again before the host makes a communication via LAN.

5) Buffer full
When the host does not receive data via LAN and the printer transmission buffer becomes full, the printer waits until the transmission buffer becomes empty. Depending on the data to be sent, the printer stops operation while waiting.

(1) When the transmission buffer becomes full with automatic statuses or data in response to WS, WB or WN command, the printer stops command analysis, image processing, key operation, refreshing the LCD message, Basic program analysis and execution. Recovering method is making the host receive all printer statuses, terminating the socket communication, or turning the printer off/on.
(2) When the transmission buffer becomes full with data sent from BASIC program or data in response to WV, WI, WG, WF or @012 command, the printer stops command analysis, Basic program analysis and execution. Recovering method is making the host receive all printer responses, turning the printer off/on, terminating the socket communication, or resetting the printer in the user system mode.

■ RS-232C
1) When the host does not receive data
If the host does not receive data from the printer, which is connected via an RS-232C cable, the status will be stored in the RS-232C transmission buffer of the printer. Once the host starts to receive data sent via RS-232C, the stored data will be sent to the host at one time. (For example, when the host sends a WB command on the condition that the automatic status responses are stored in the printer buffer, the host will receive automatic status response.) To prevent this, it is required to restart the printer (by resetting with a Z0 command or key operations or by turning off and on) before the host makes a communication via RS-232C.

2) Buffer full
When the host does not receive data via RS-232C and the printer transmission buffer becomes full, the printer clears and empties the transmission buffer, then stores new status information in the transmission buffer.

■ IEEE1284

1) When the host does not receive data

If the host sends a Status Request Command via IEEE1284 but does not receive data via IEEE1284, the status flag in the printer stays enabled. When the host sends another Status Request Command after that, an improper status may be returned. (For details, refer to the after-mentioned *2) Timing and order of response*.) To prevent this, it is required to restart the printer (by resetting with a Z0 command or key operations or by turning the printer off and on) before the host makes a communication via IEEE1284.

2) Timing and order of response

When using IEEE1284 interface, statuses in response to real-time status request commands (WS, WB and WN). The printer returns a response at the time it receives a transmission request from the host. In the case the printer receives a few different commands, it returns a response per command at each transmission request. In this case, a response will be sent in response to WS, WB and WN, in order, regardless of the command receipt order. Even if the printer receives a same command for multiple times, it returns a response only once.

8.1.4.2 Status Response Specification for Each Interface

■ Condition for connection

The following are conditions for connection via LAN and RS-232C.

a) When using LAN interface

Host		Printer	Communication method	Transmission to the host
PC	When LAN ON, WLAN OFF	Main Board (with LAN)	Socket (Socket open)	Enabled
			Socket (Socket close)	Disabled
PC	When LAN ON, WLAN OFF	Main Board (with LAN)	Socket (Socket open)	Disabled
			Socket (Socket close)	Disabled

- When the host and the printer are connected with LAN and a communication is made via socket communication (socket open), there is no problem with the transmission to the host as long as the application normally receives data.
- Even if the host and the printer are connected with LAN, a communication cannot be established if the socket communication (socket close) is selected. Therefore, transmission to the host is disabled.
- When the host and the printer are not connected, transmission to the host is disabled, regardless of the communication method.

b) When using RS-232C interface

The conditions for connection via RS-232C are shown below.

Host	Printer	Transmission to the host
PC — RS-232C board	Main Board	Enabled
PC — RS-232C board	Main Board	Enabled
PC	Main Board	Disabled

- When the host and the printer are connected via the RS-232C board, there is no problem with the transmission to the host as long as the application normally receives data.
- When the printer is connected to the RS-232C board but not to the host, data will be stored in the transmission buffer, regardless of whether the printer is connected to the host or not.
- When the RS-232C board is not installed in the printer, no data will be stored in the transmission buffer.

■ Status response specification

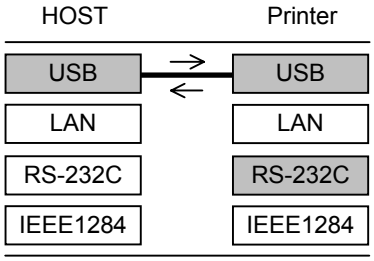
On the following pages, specification of the automatic status response for each command (WS, WB, WN, WV, WI, WG, WF and @012) and interface (USB function interface, LAN, RS-232C and IEEE1284) are described.

[Explanation of diagram]

• Lines show a cable connection between the host and the printer.
• Shades show the state that a data transmission (arrow) is attempted. (E.g. USB)
• Arrows show the condition and direction of data transmission.

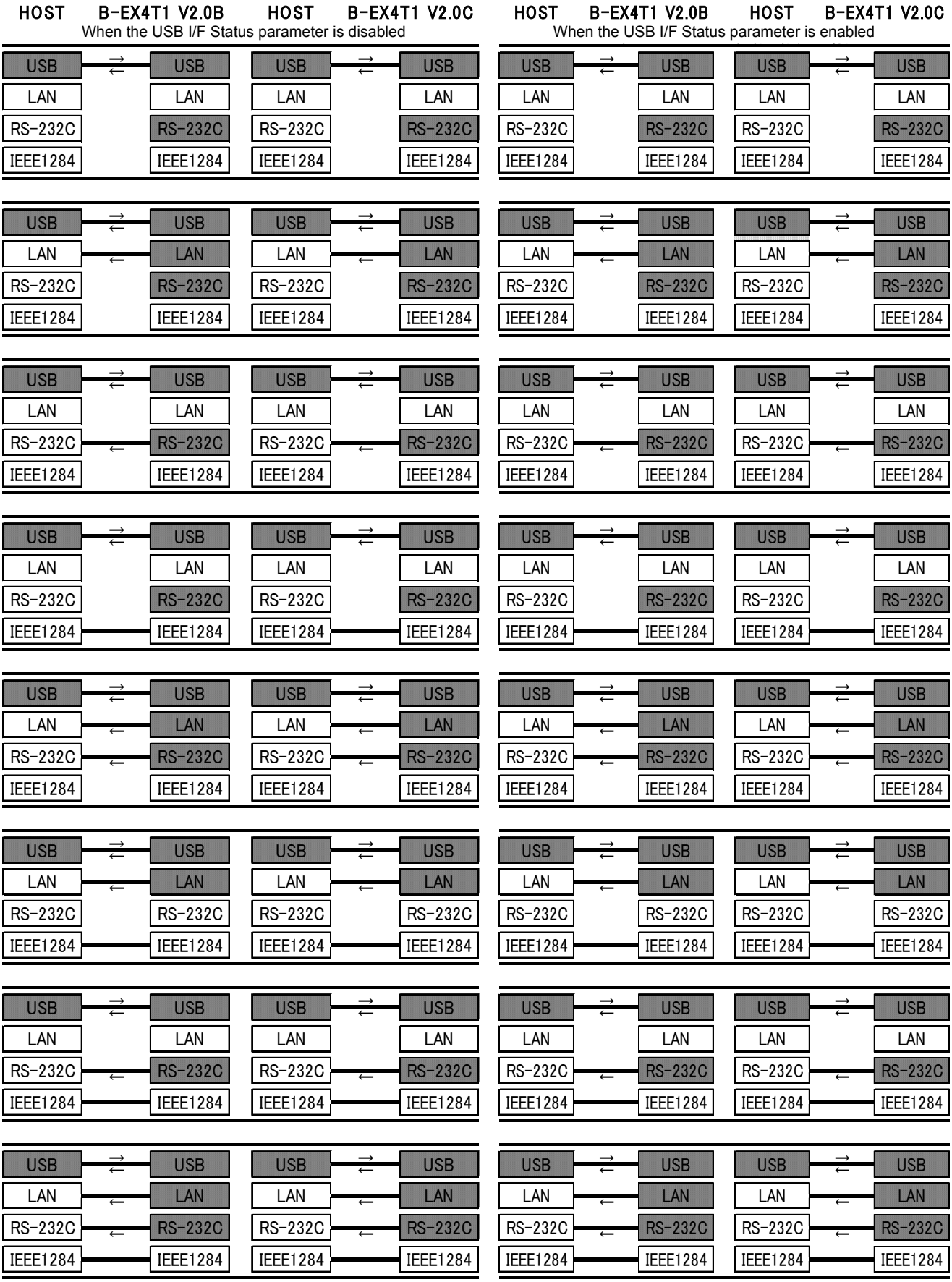
When taking the diagram on the right for example:

1. The host sends a status request to the printer via USB.
2. The printer returns a status to the host via USB.
3. The printer attempts to send a status via RS-232C, but the status is stored in the transmission buffer because the printer and the host are not connected via RS-232C.

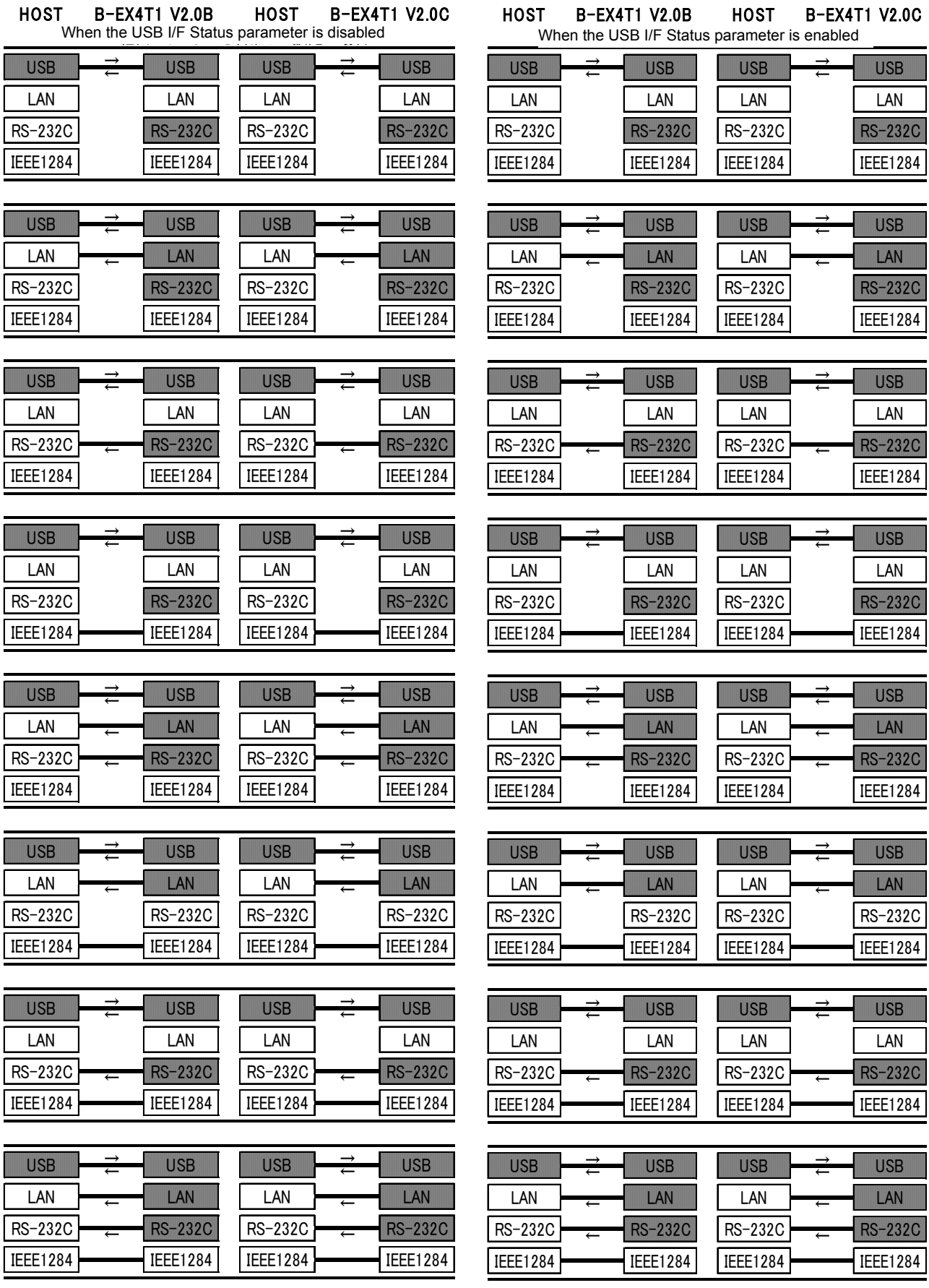


1) USB Function

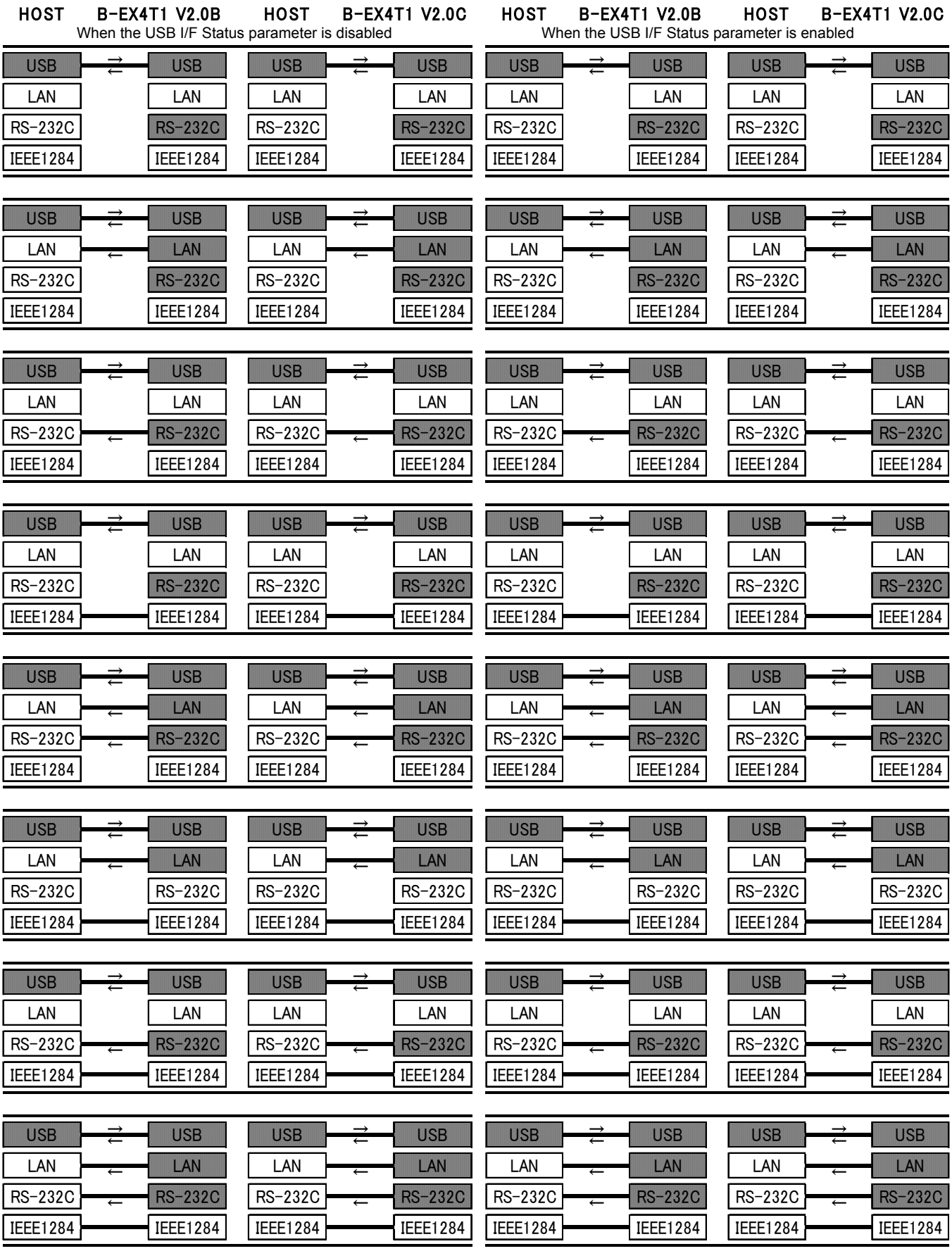
- WS command



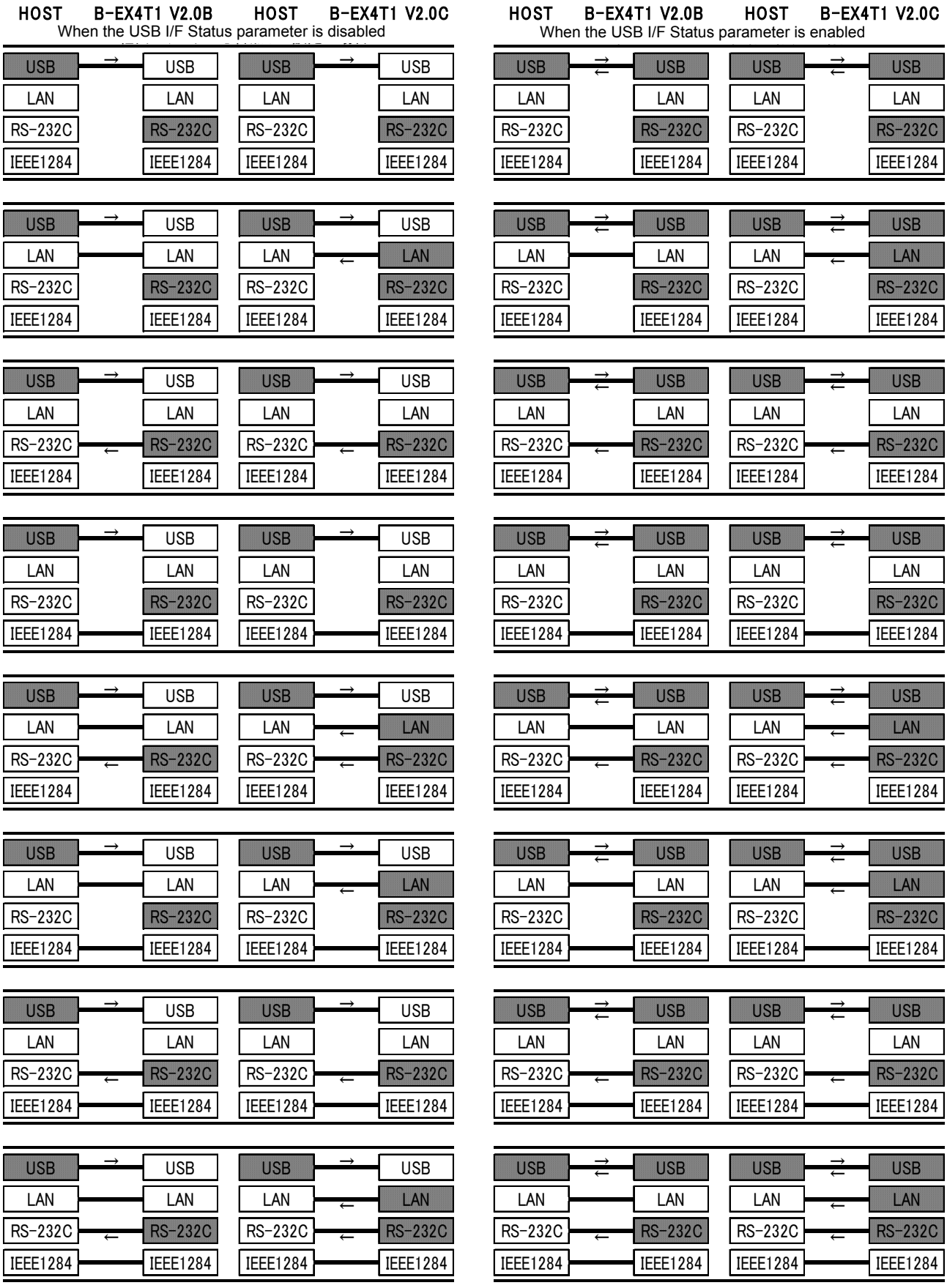
- WB command


HOST
B-EX4T1 V2.0B
HOST
B-EX4T1 V2.0C
When the USB I/F Status parameter is disabled
HOST
B-EX4T1 V2.0B
HOST
B-EX4T1 V2.0C
When the USB I/F Status parameter is enabled
USB
LAN
RS-232C
IEEE1284

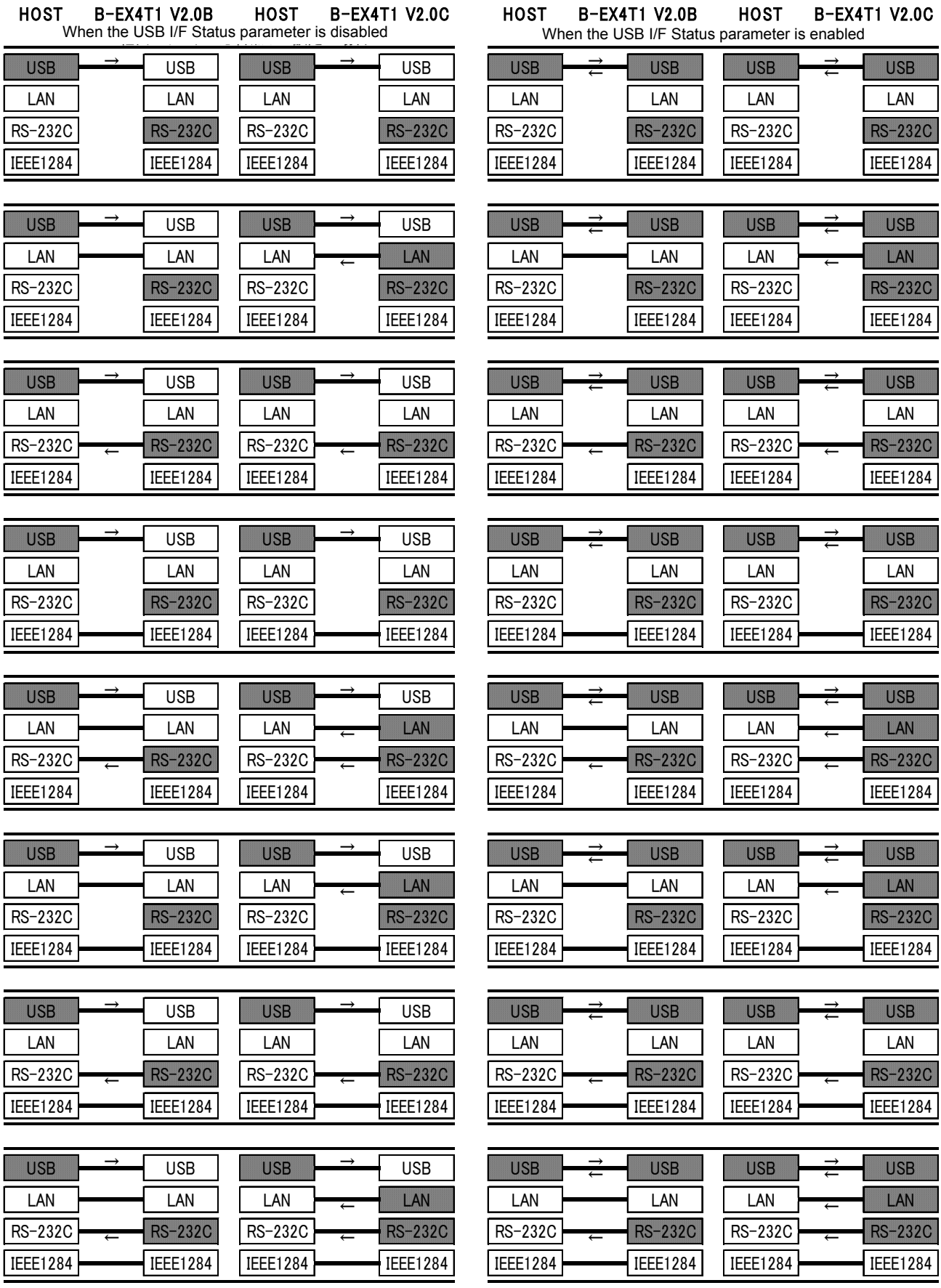
- WN command


HOST
B-EX4T1 V2.0B
HOST
B-EX4T1 V2.0C
When the USB I/F Status parameter is disabled
When the USB I/F Status parameter is enabled
USB
LAN
RS-232C
IEEE1284

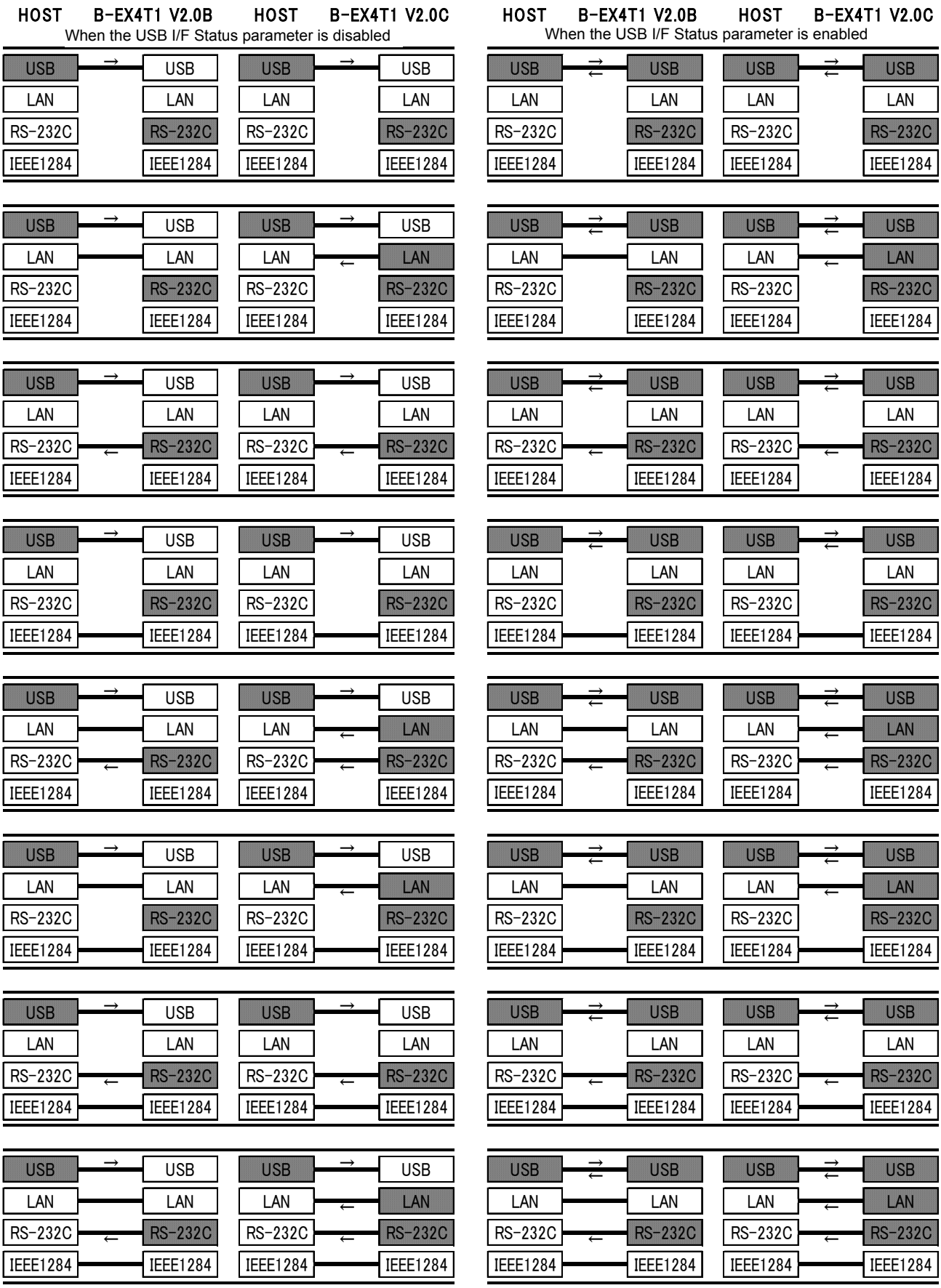
- WV command


HOST
B-EX4T1 V2.0B
HOST
B-EX4T1 V2.0C
When the USB I/F Status parameter is disabled
When the USB I/F Status parameter is enabled
USB
LAN
RS-232C
IEEE1284

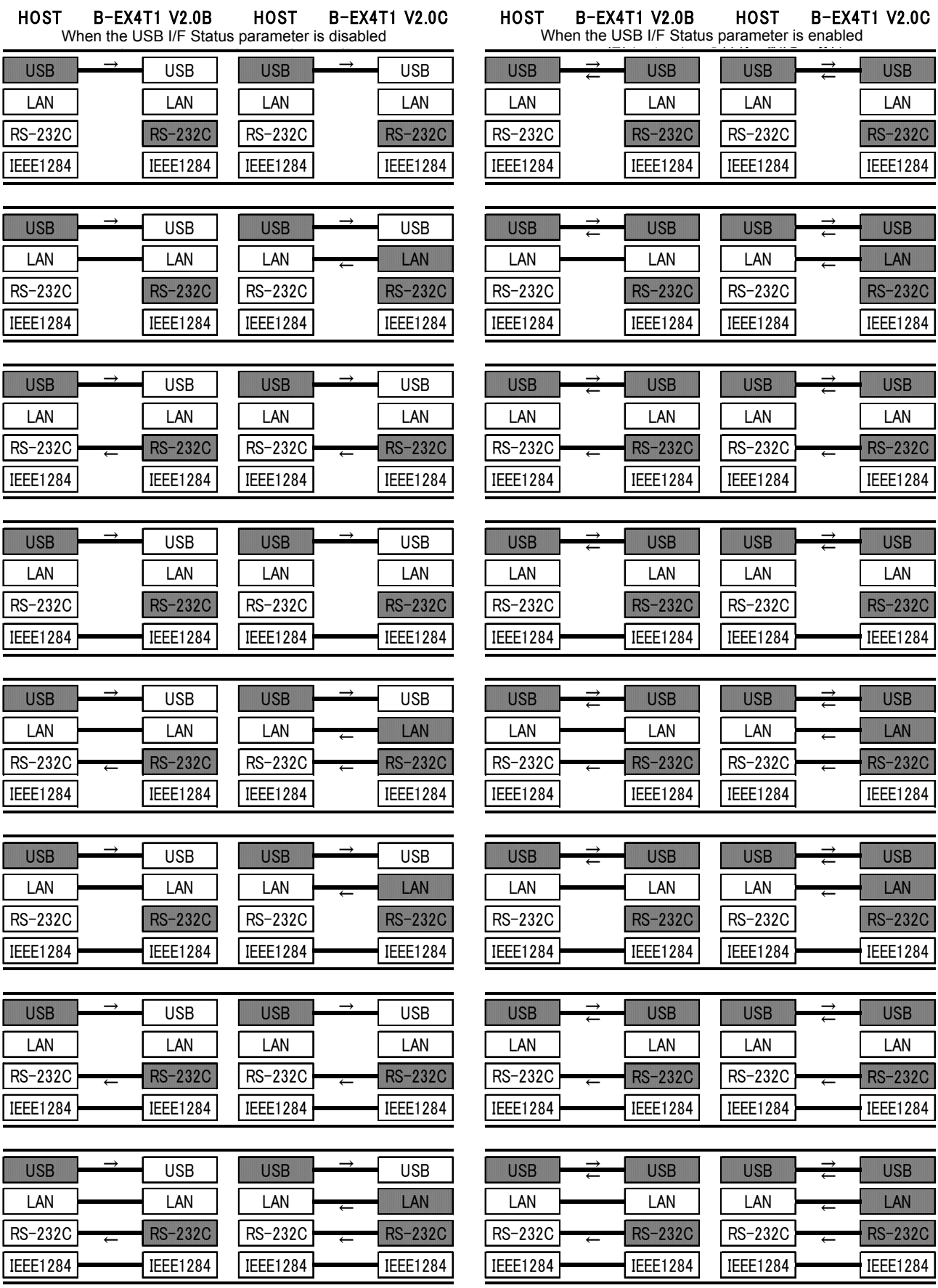
- WI command


HOST
B-EX4T1 V2.0B
HOST
B-EX4T1 V2.0C
When the USB I/F Status parameter is disabled
When the USB I/F Status parameter is enabled
USB
LAN
RS-232C
IEEE1284

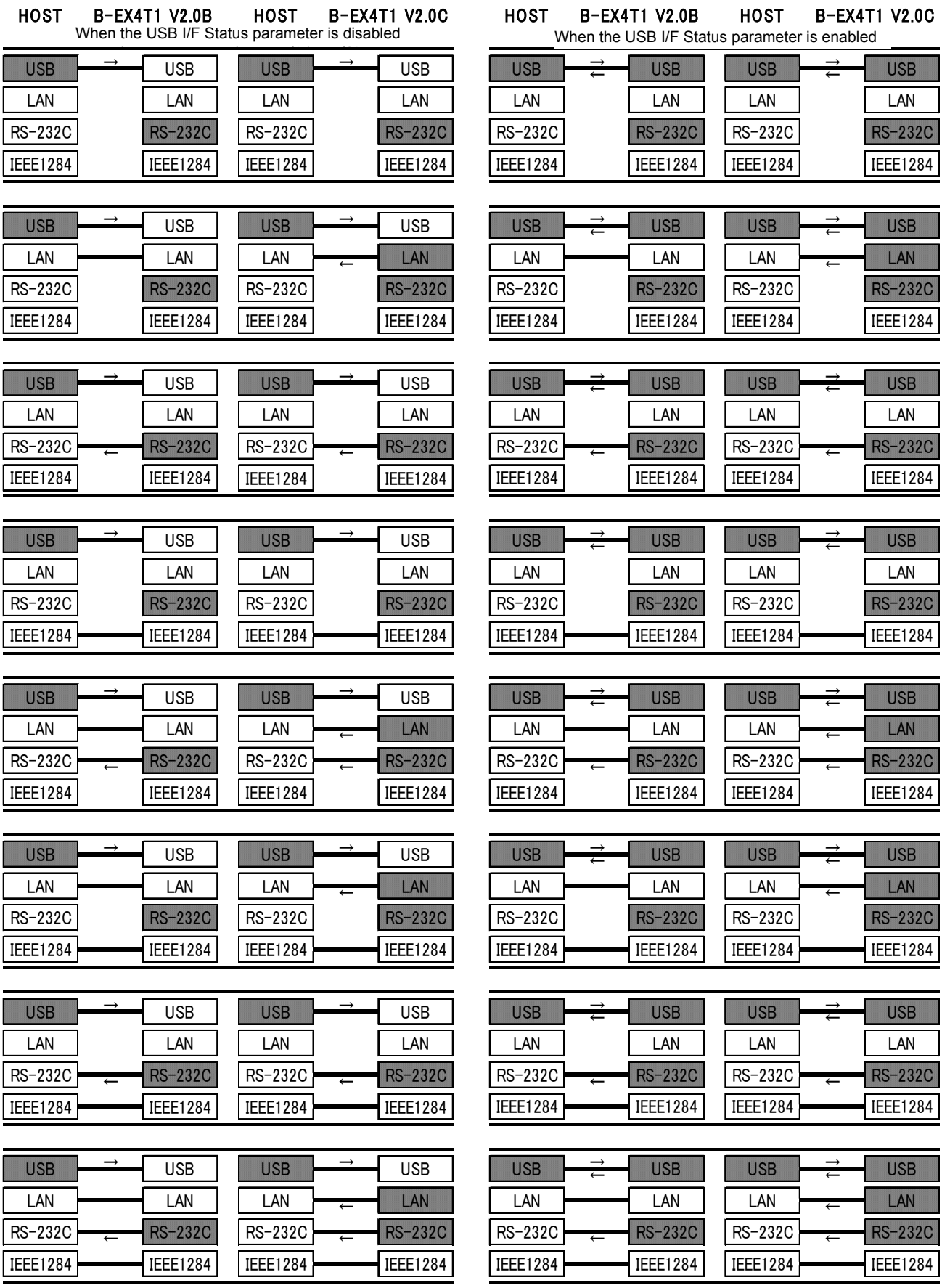
- WG command


HOST
B-EX4T1 V2.0B
HOST
B-EX4T1 V2.0C
When the USB I/F Status parameter is disabled
When the USB I/F Status parameter is enabled
USB
LAN
RS-232C
IEEE1284

- WF command

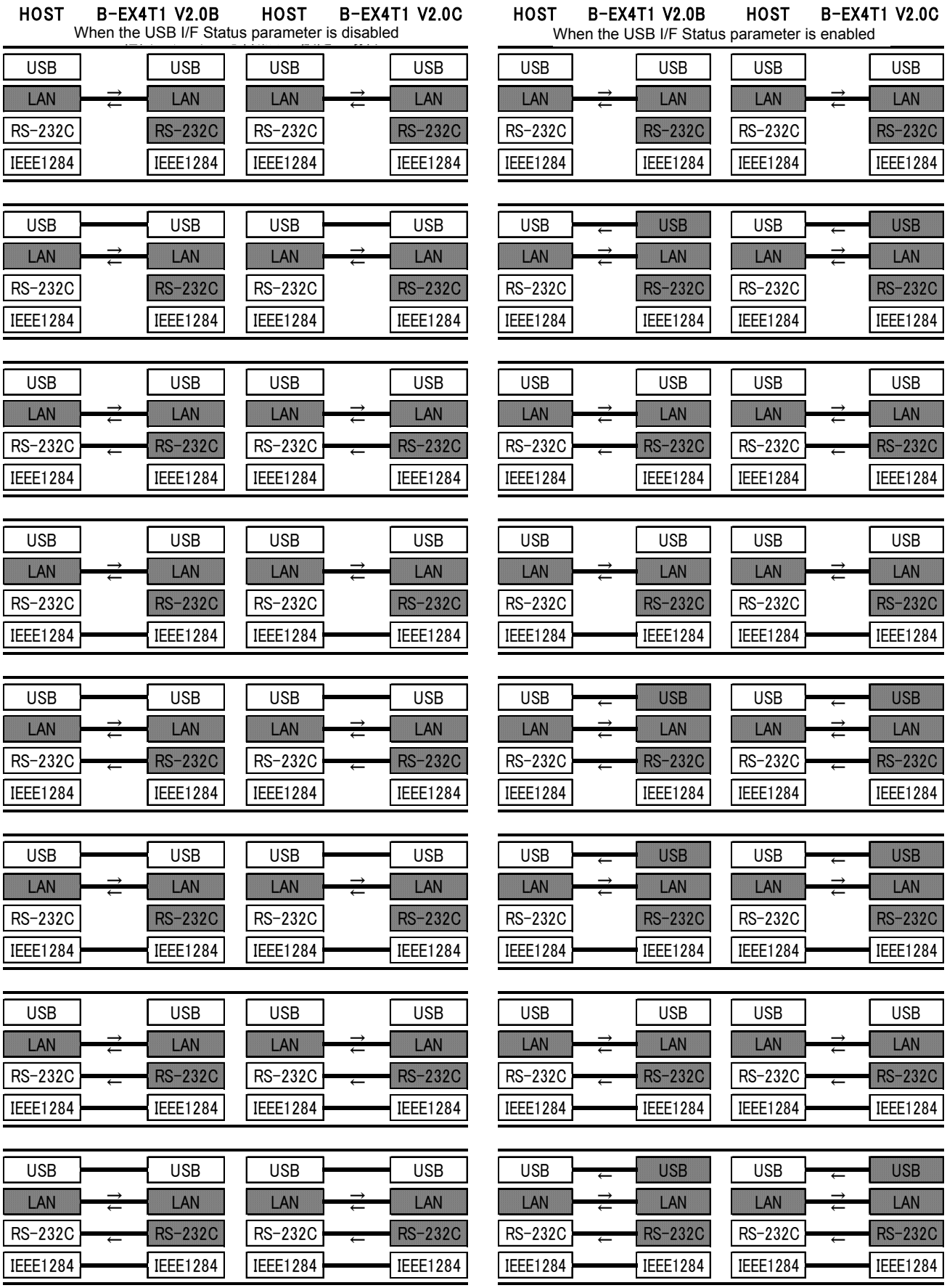

HOST
B-EX4T1 V2.0B
HOST
B-EX4T1 V2.0C
When the USB I/F Status parameter is disabled
When the USB I/F Status parameter is enabled
USB
LAN
RS-232C
IEEE1284

- @012 command

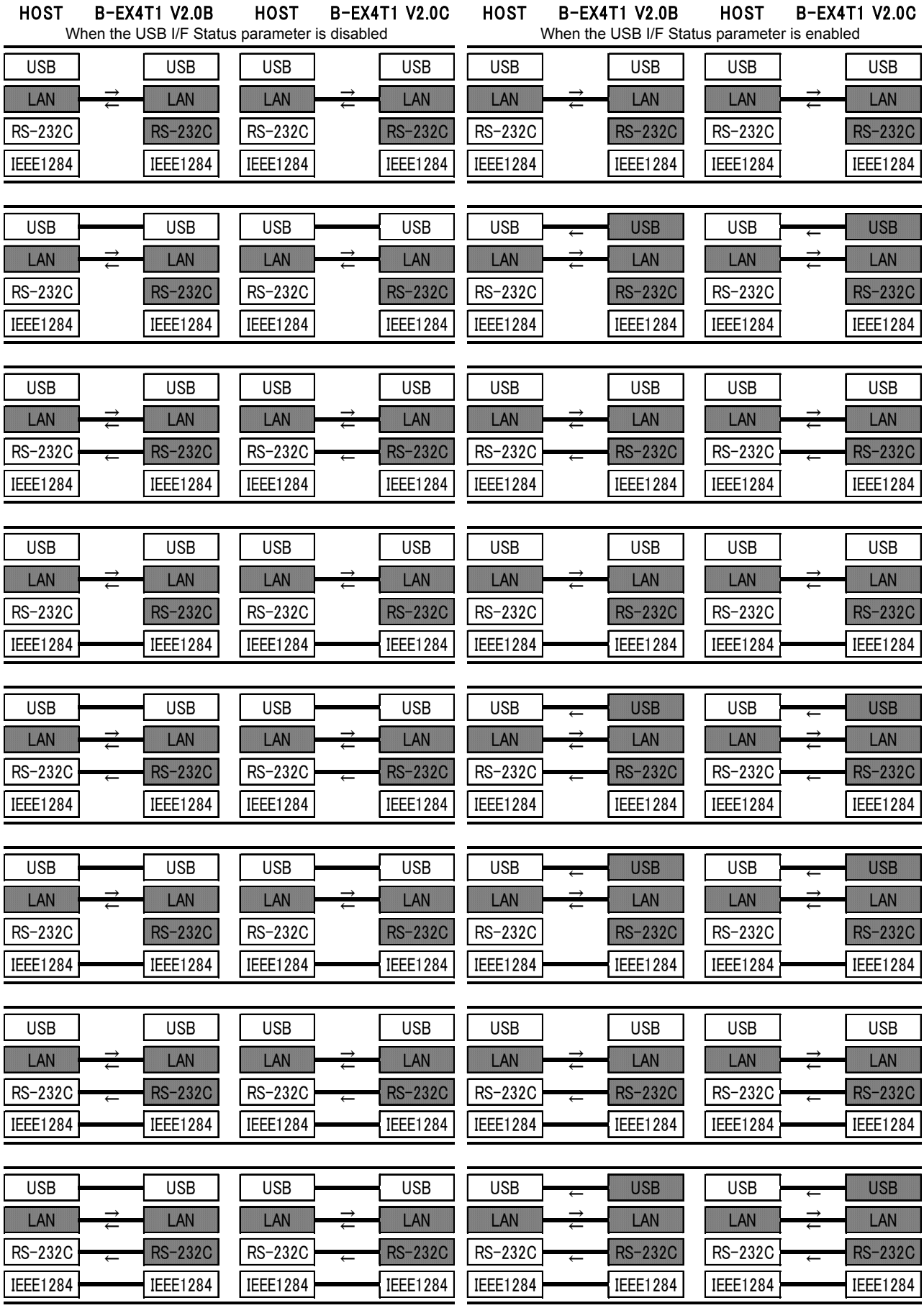

HOST
B-EX4T1 V2.0B
HOST
B-EX4T1 V2.0C
When the USB I/F Status parameter is disabled
When the USB I/F Status parameter is enabled
USB
LAN
RS-232C
IEEE1284

2) LAN

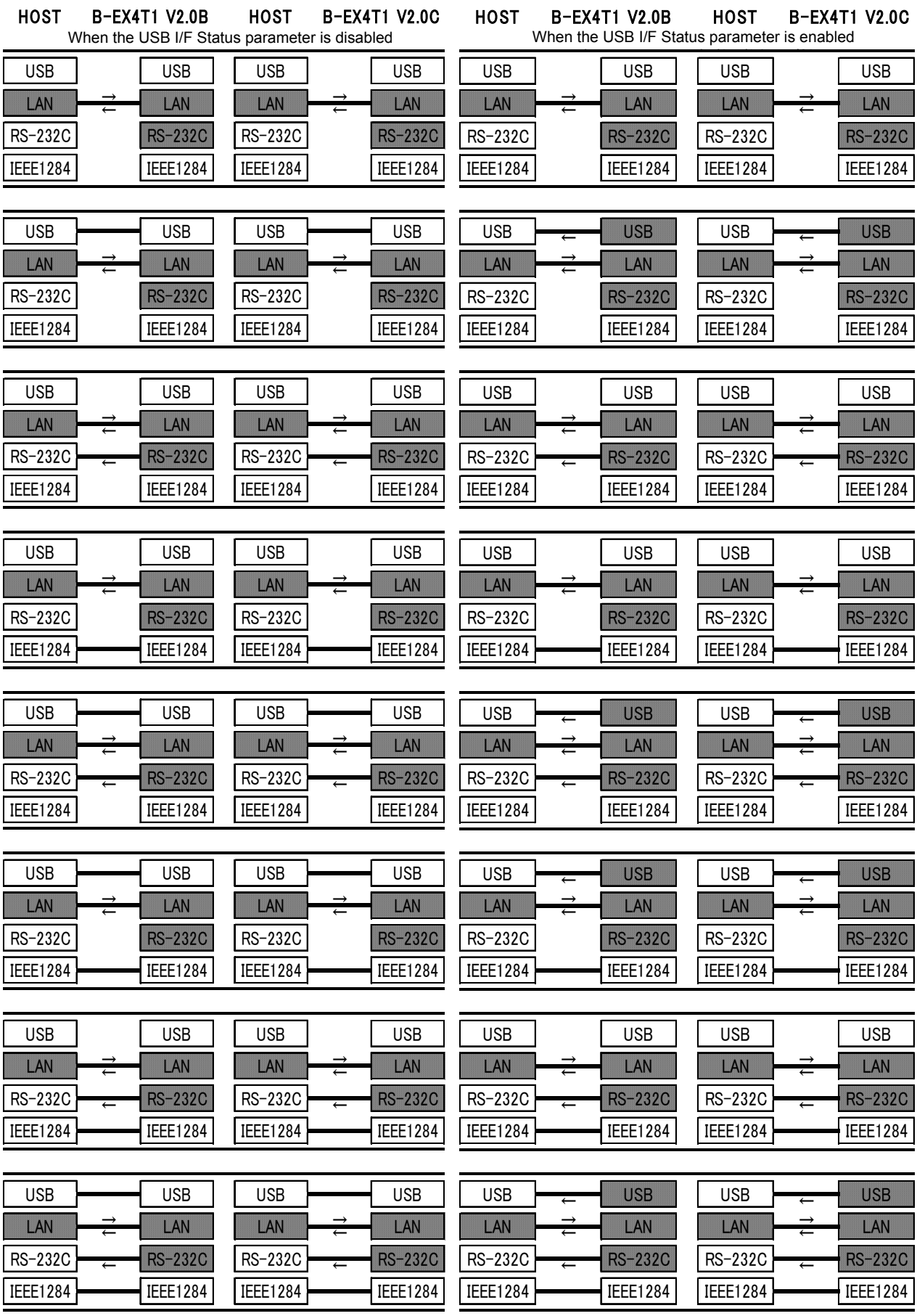
- WS command



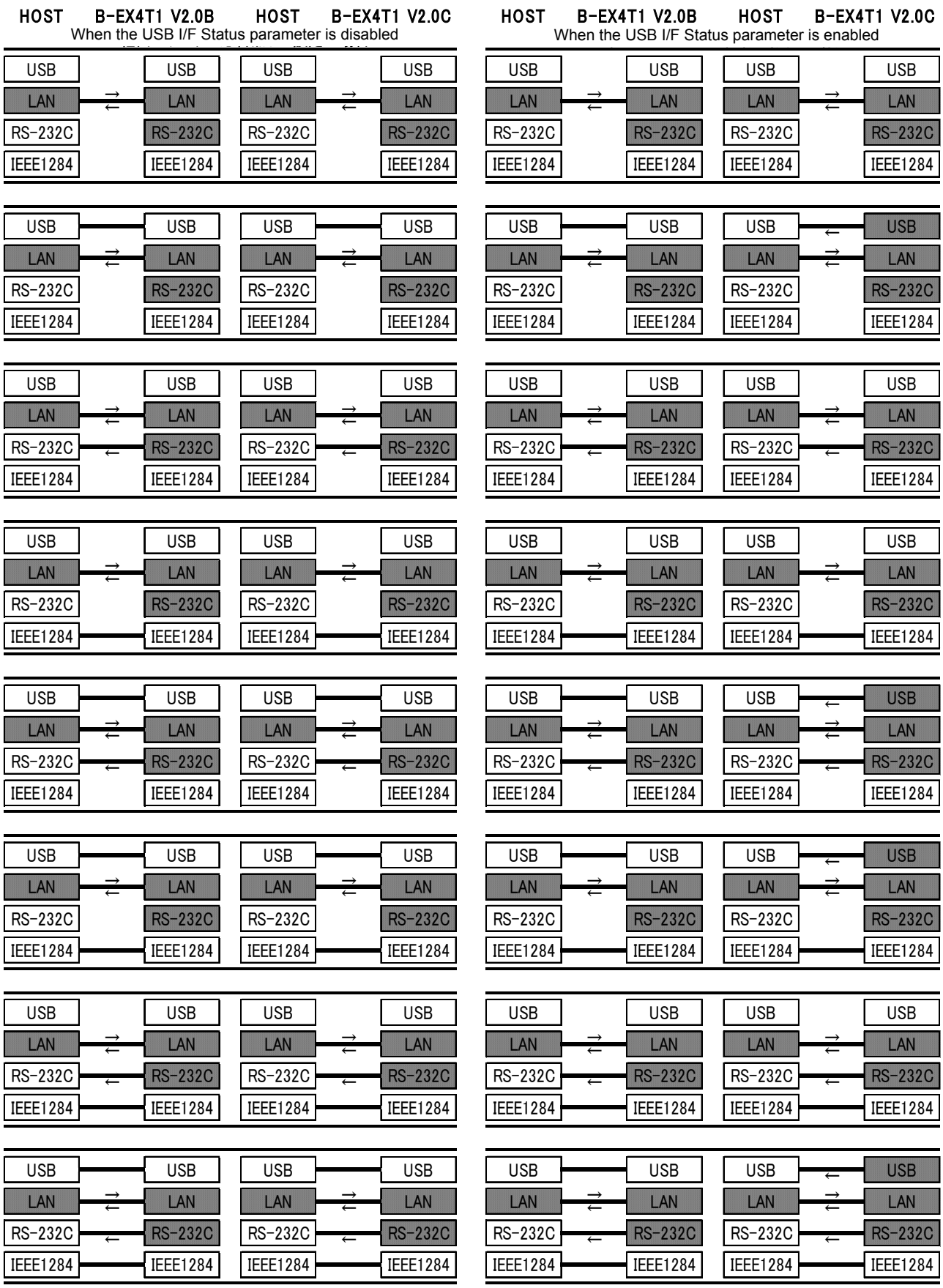
- WB command


HOST
B-EX4T1 V2.0B
HOST
B-EX4T1 V2.0C
When the USB I/F Status parameter is disabled
When the USB I/F Status parameter is enabled
USB
LAN
RS-232C
IEEE1284

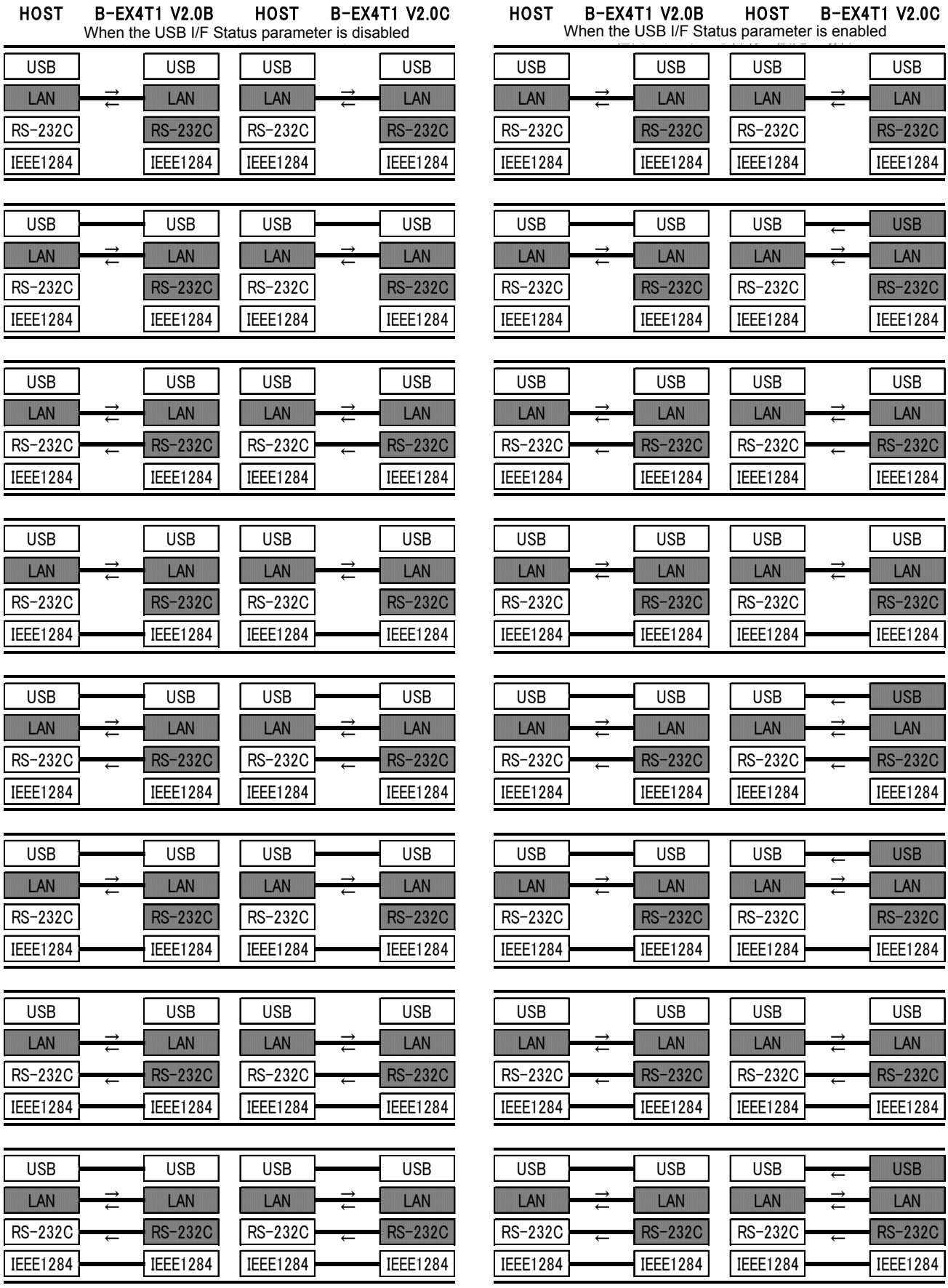
- WN command


HOST
B-EX4T1 V2.0B
HOST
B-EX4T1 V2.0C
When the USB I/F Status parameter is disabled
When the USB I/F Status parameter is enabled
USB
LAN
RS-232C
IEEE1284

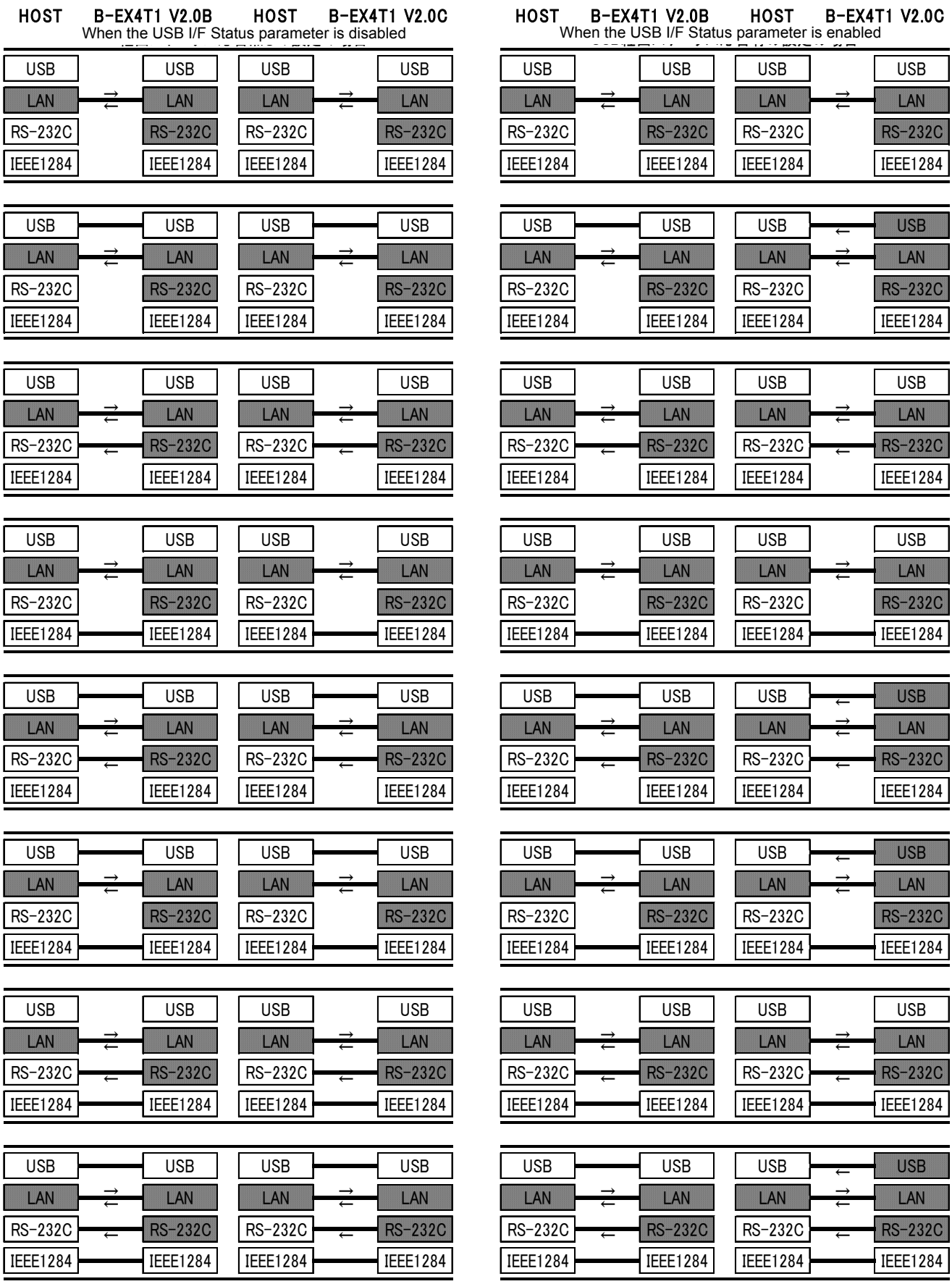
- WV command


HOST
B-EX4T1 V2.0B
HOST
B-EX4T1 V2.0C
When the USB I/F Status parameter is disabled
When the USB I/F Status parameter is enabled
USB
LAN
RS-232C
IEEE1284

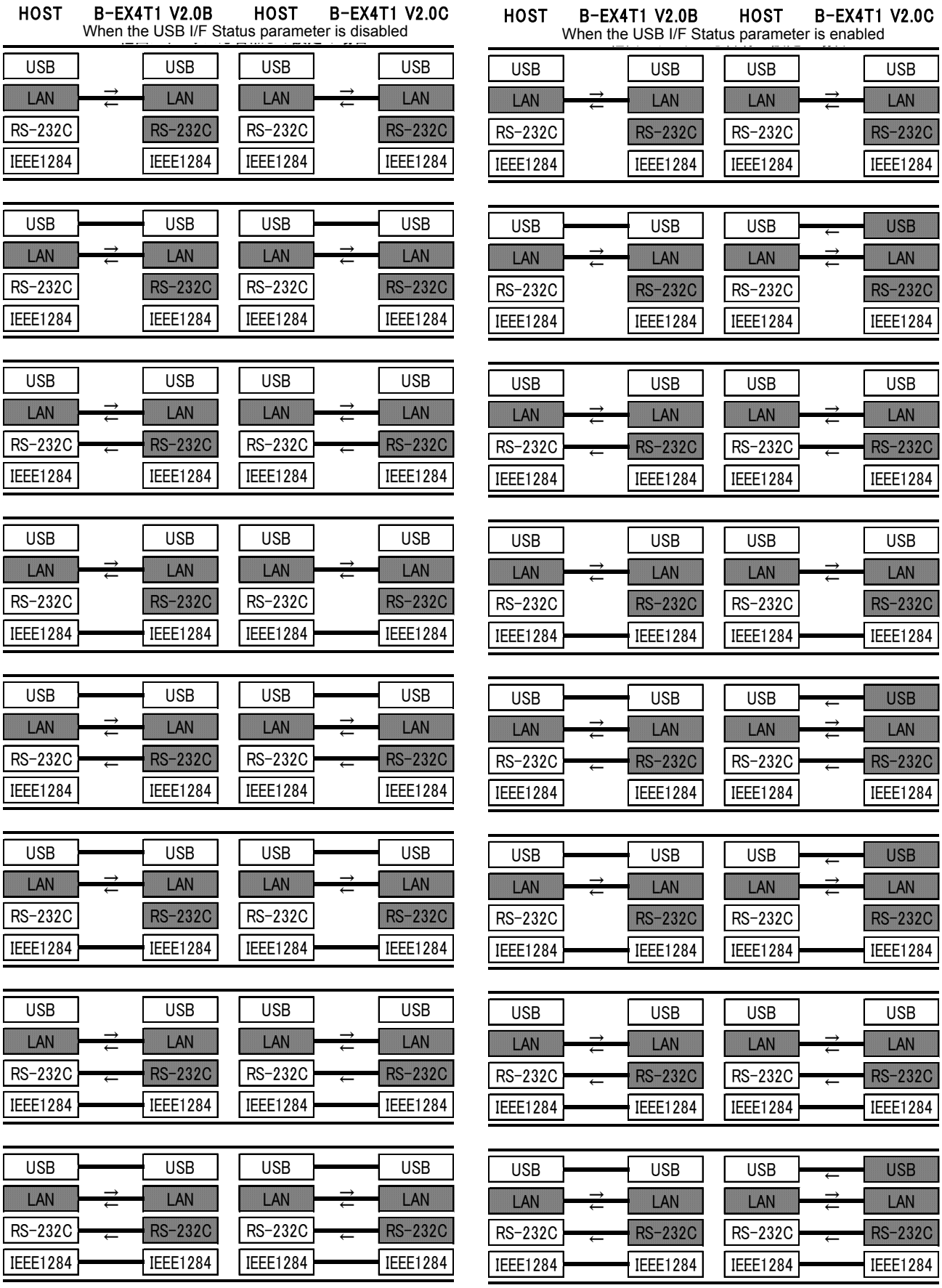
- WI command


HOST
B-EX4T1 V2.0B
HOST
B-EX4T1 V2.0C
When the USB I/F Status parameter is disabled
When the USB I/F Status parameter is enabled
USB
LAN
RS-232C
IEEE1284

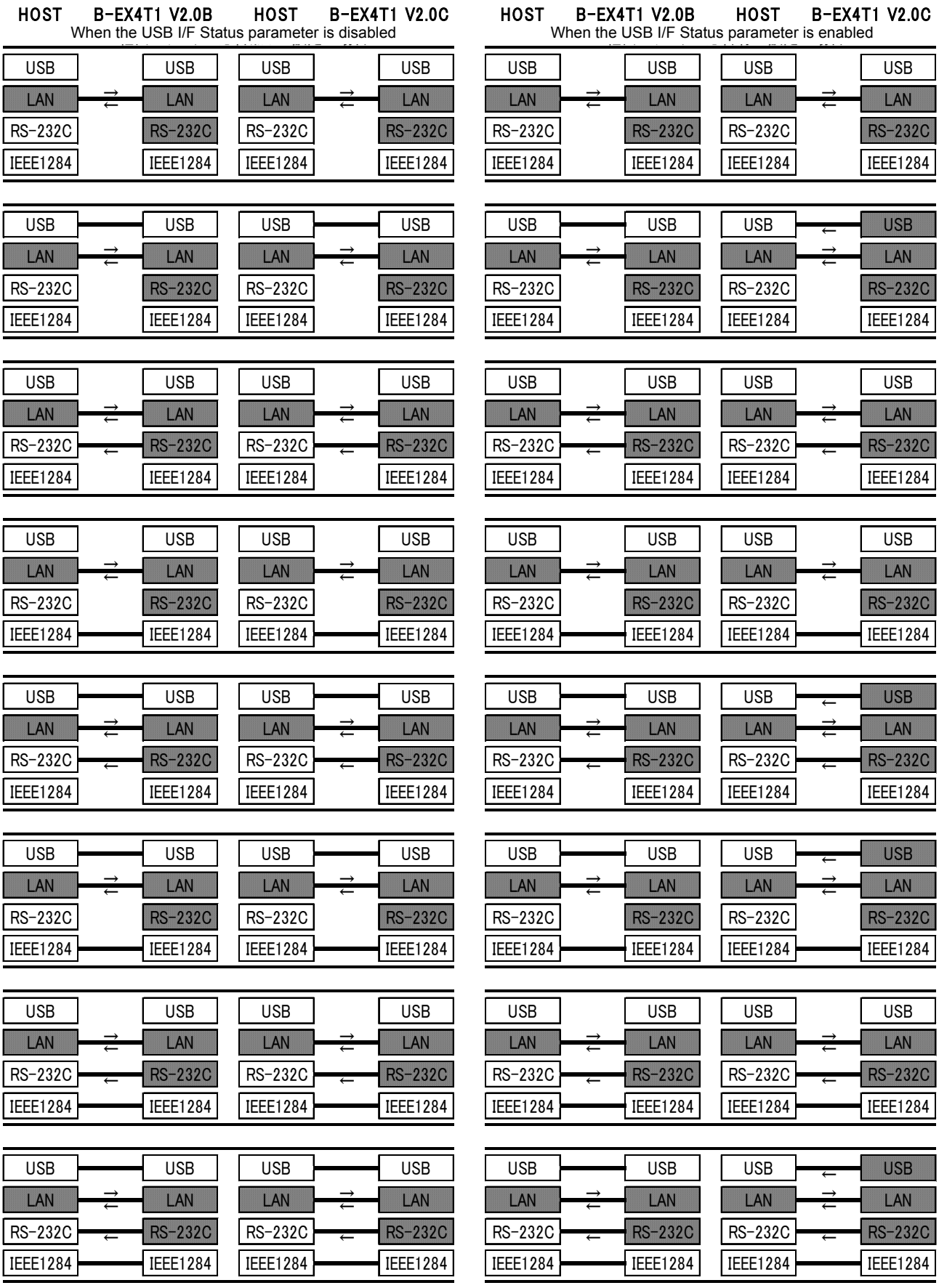
- WG command


HOST
B-EX4T1 V2.0B
HOST
B-EX4T1 V2.0C
When the USB I/F Status parameter is disabled
When the USB I/F Status parameter is enabled
USB
LAN
RS-232C
IEEE1284

- WF command

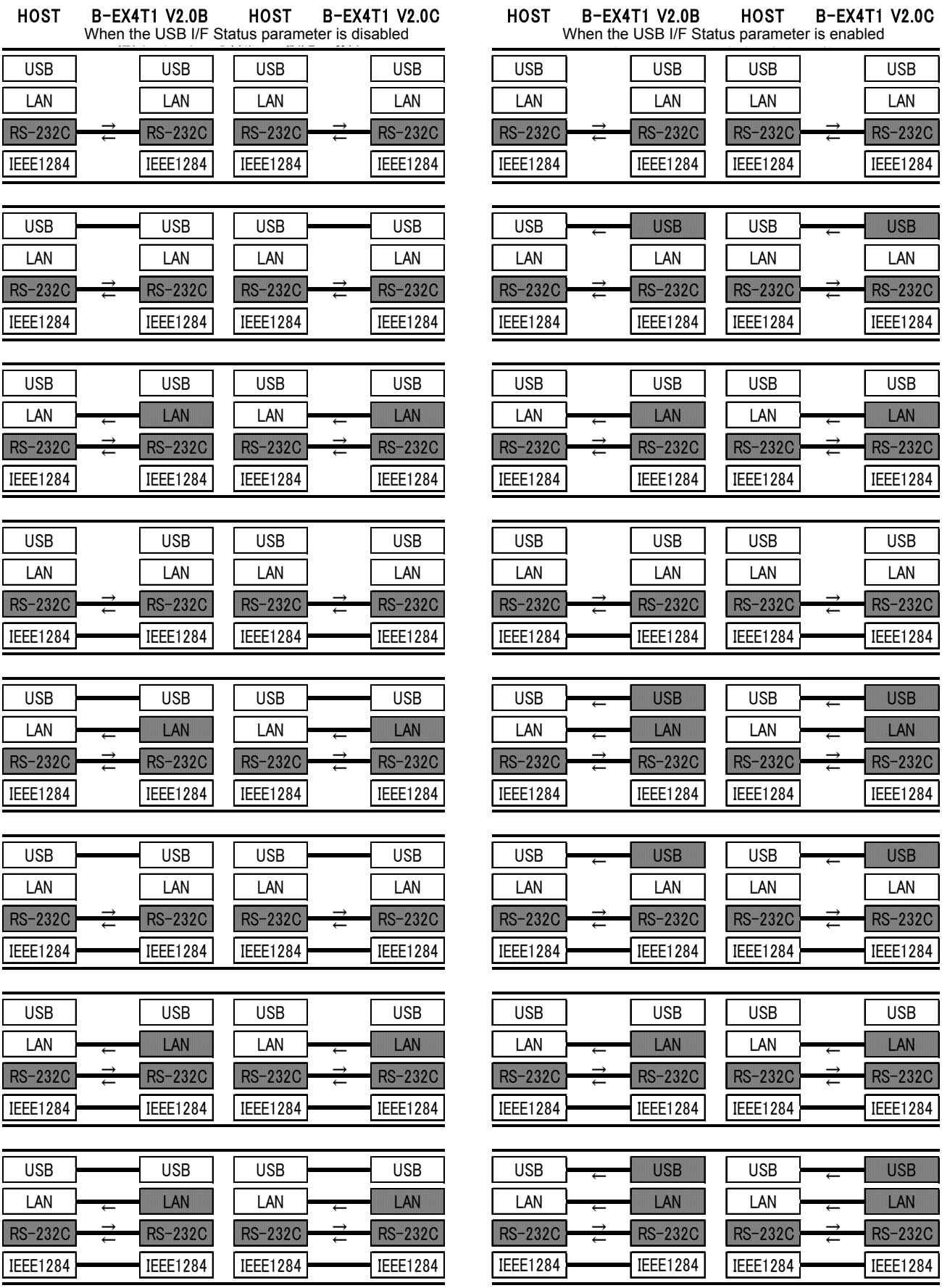

HOST
B-EX4T1 V2.0B
HOST
B-EX4T1 V2.0C
When the USB I/F Status parameter is disabled
When the USB I/F Status parameter is enabled
USB
LAN
RS-232C
IEEE1284

- @12 command

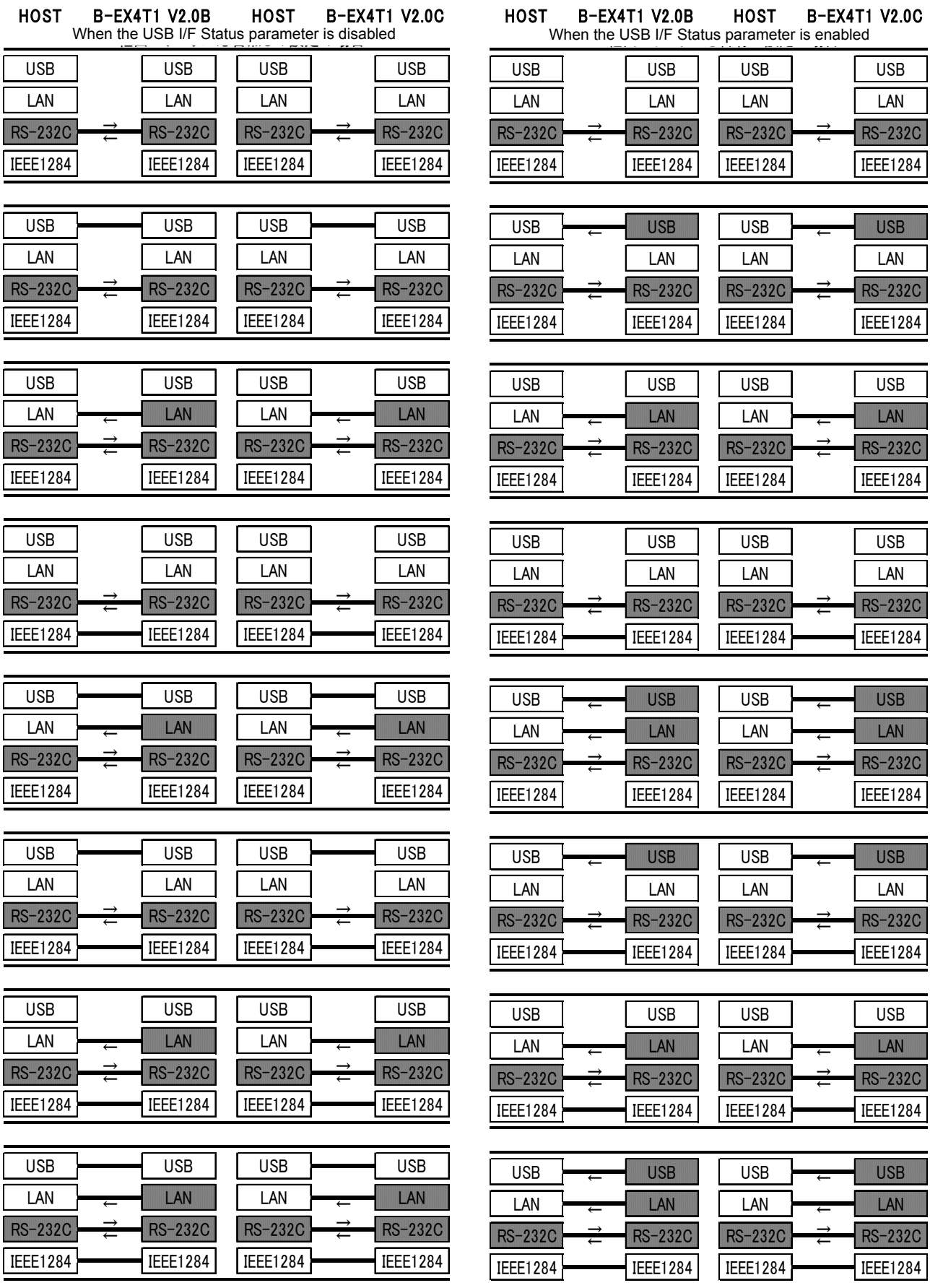

HOST
B-EX4T1 V2.0B
HOST
B-EX4T1 V2.0C
When the USB I/F Status parameter is disabled
HOST
B-EX4T1 V2.0B
HOST
B-EX4T1 V2.0C
When the USB I/F Status parameter is enabled
USB
LAN
RS-232C
IEEE1284

3) RS-232C

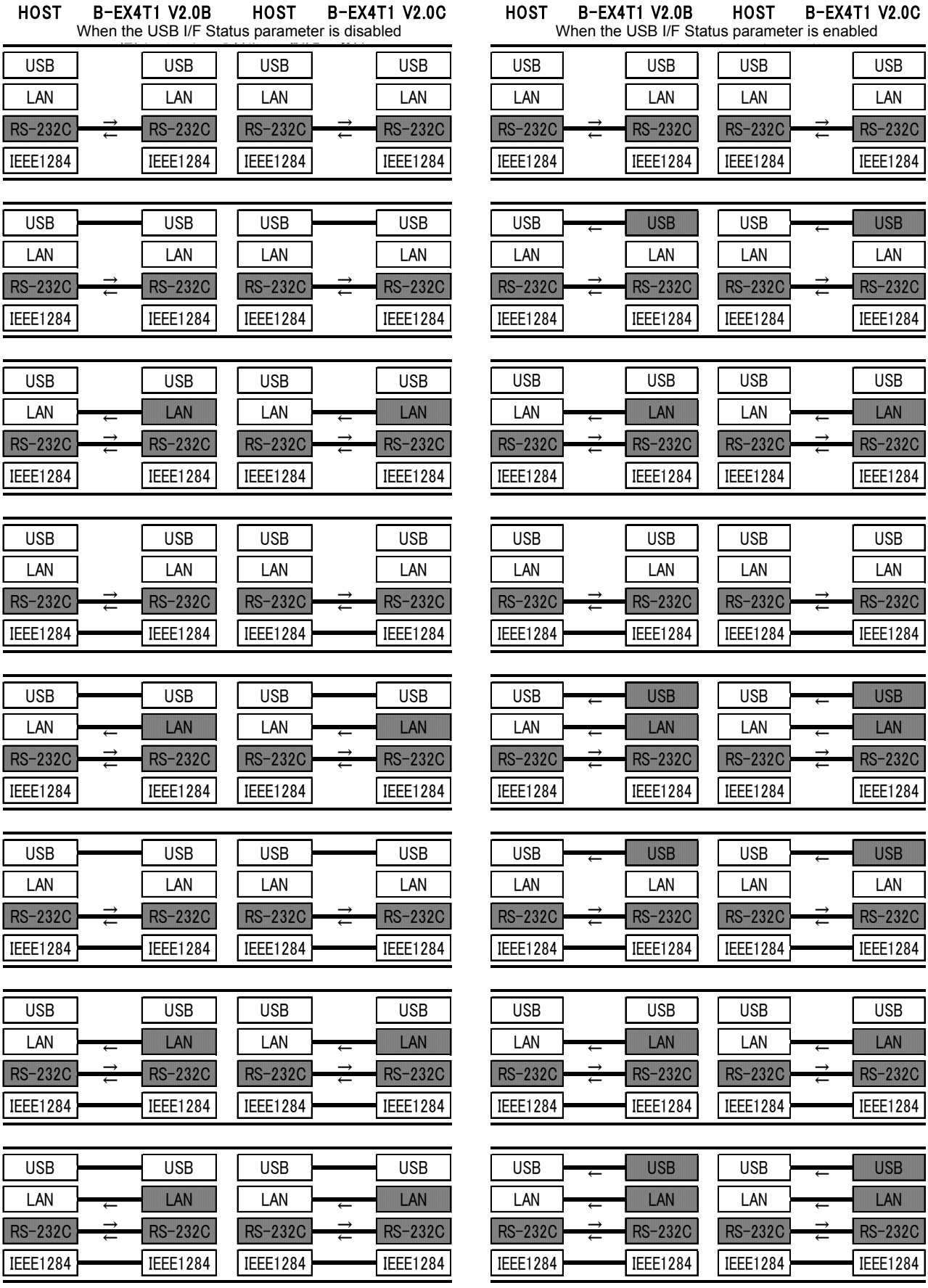
- WS command



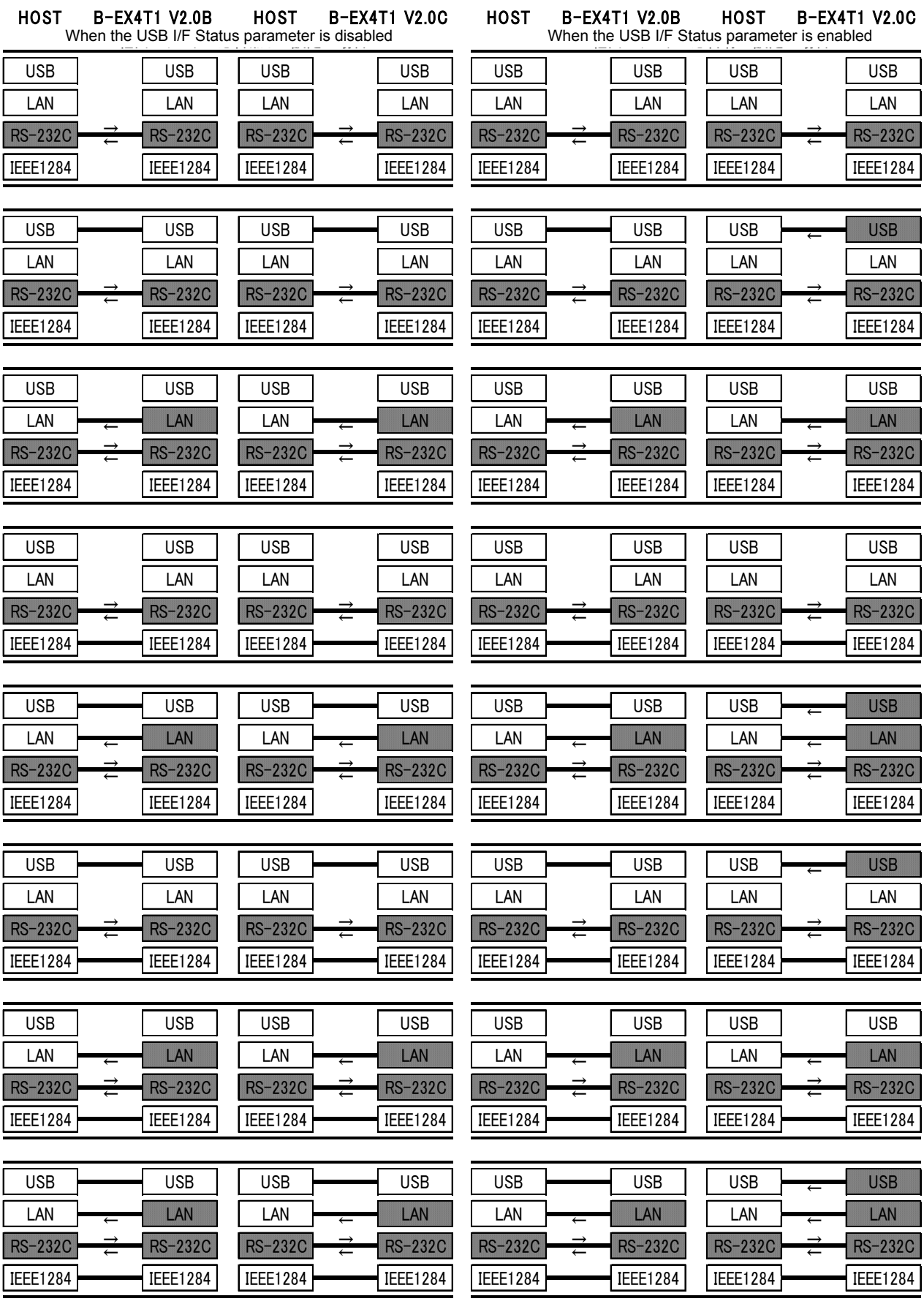
- WB command


HOST
B-EX4T1 V2.0B
HOST
B-EX4T1 V2.0C
When the USB I/F Status parameter is disabled
When the USB I/F Status parameter is enabled
USB
LAN
RS-232C
IEEE1284

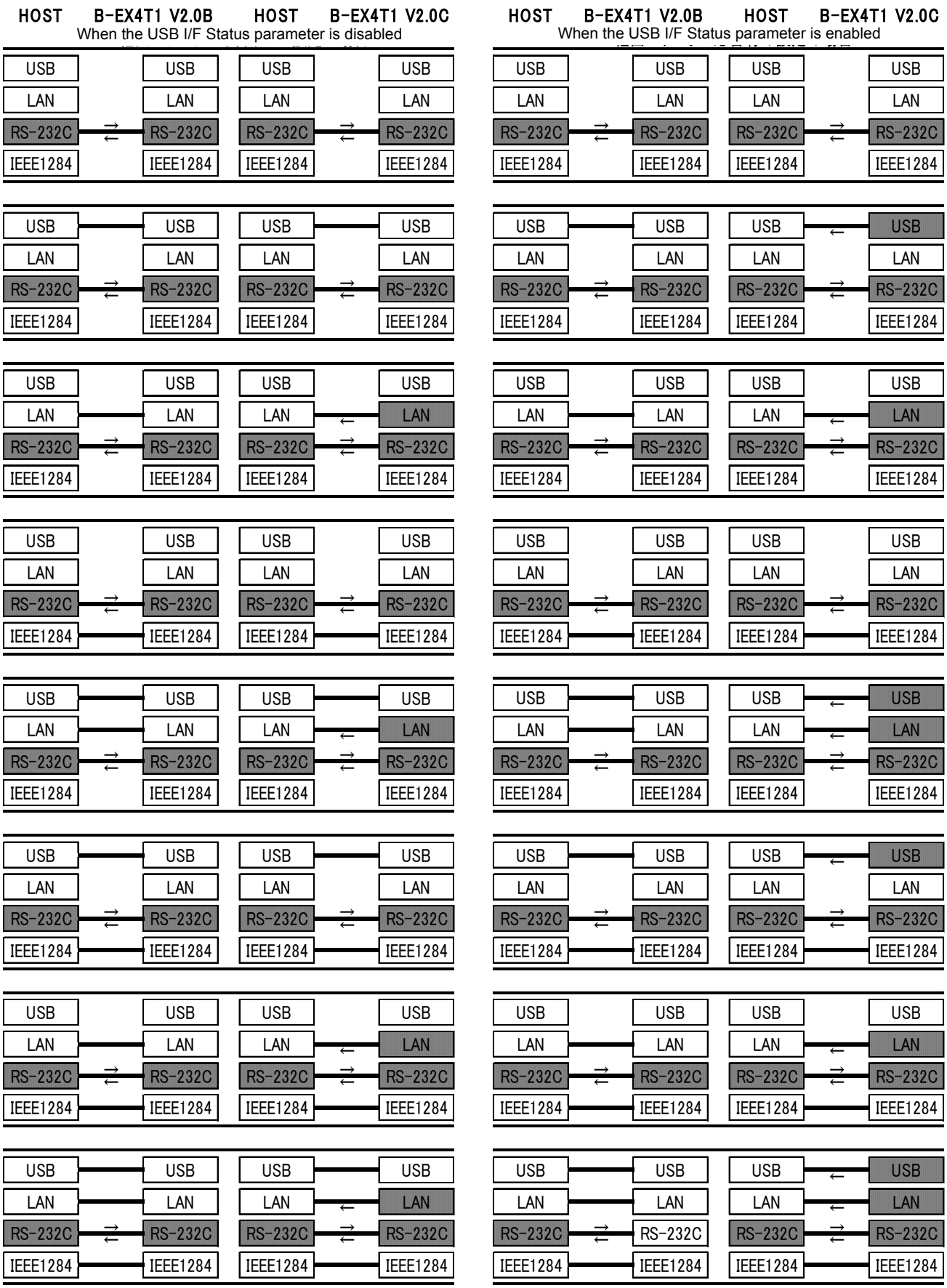
- WN command


HOST
B-EX4T1 V2.0B
HOST
B-EX4T1 V2.0C
When the USB I/F Status parameter is disabled
When the USB I/F Status parameter is enabled
USB
LAN
RS-232C
IEEE1284

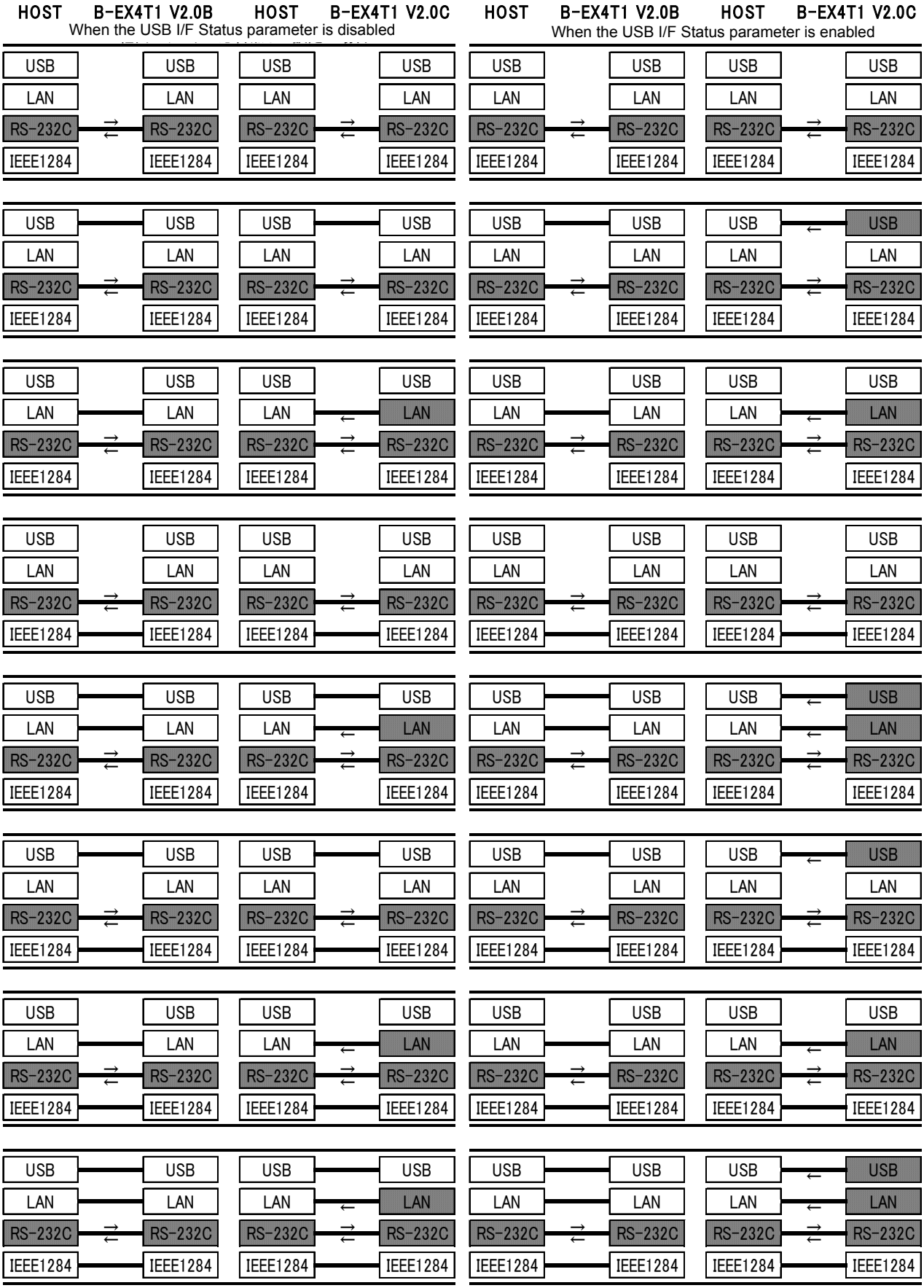
- WV command


HOST
B-EX4T1 V2.0B
HOST
B-EX4T1 V2.0C
When the USB I/F Status parameter is disabled
When the USB I/F Status parameter is enabled
USB
LAN
RS-232C
IEEE1284

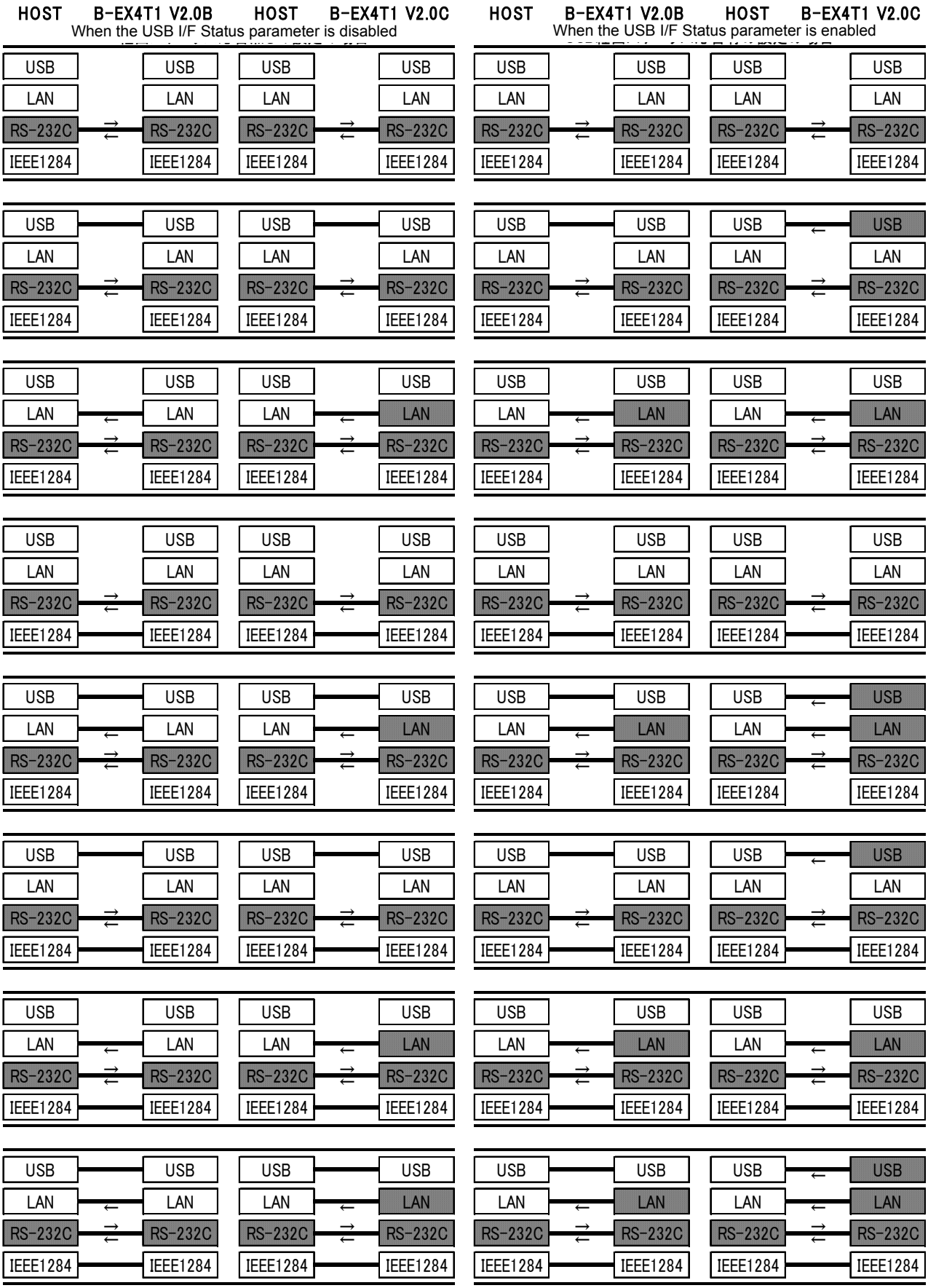
- WI command


HOST
B-EX4T1 V2.0B
HOST
B-EX4T1 V2.0C
When the USB I/F Status parameter is disabled
When the USB I/F Status parameter is enabled
USB
LAN
RS-232C
IEEE1284

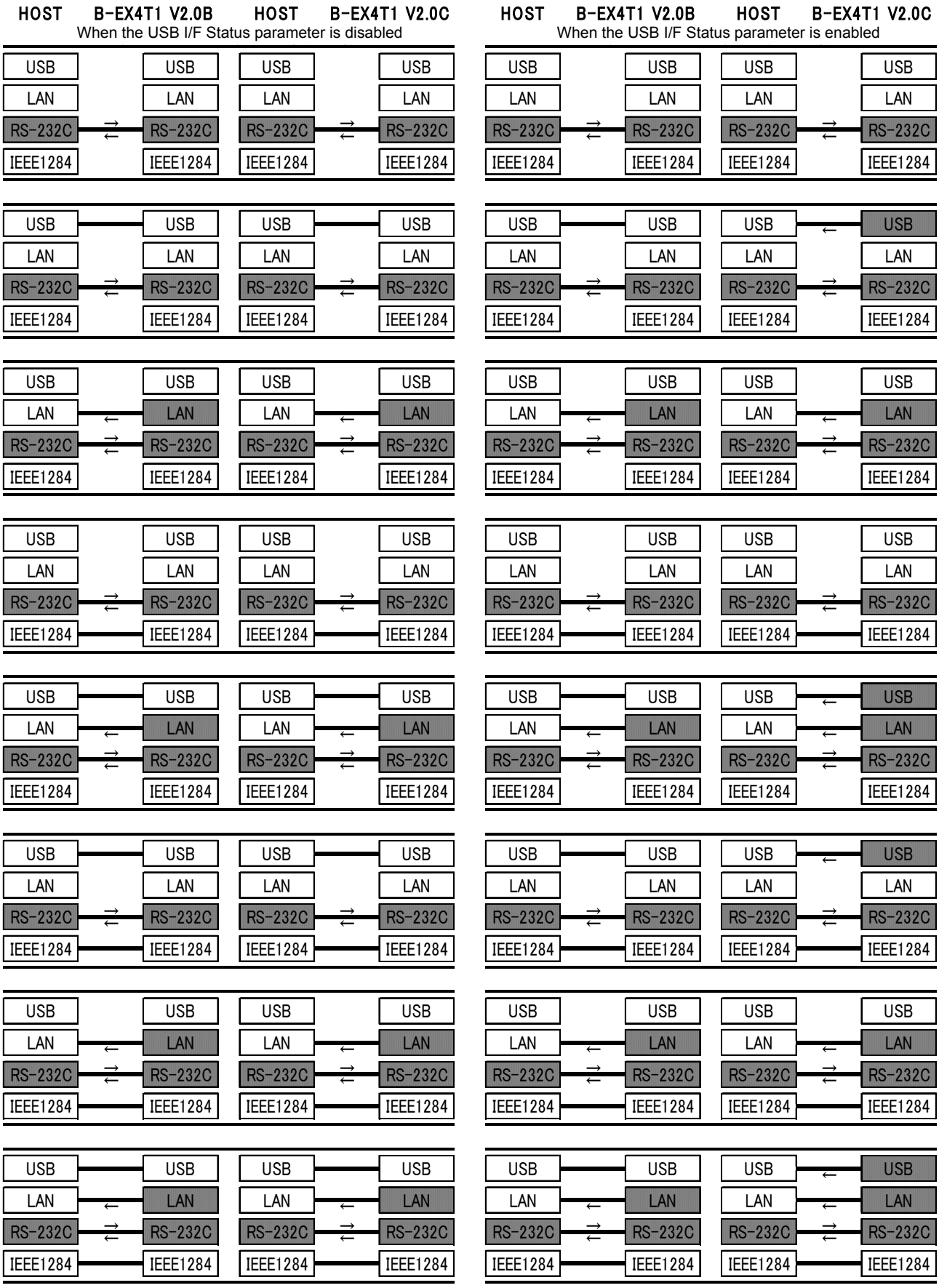
- WG command


HOST
B-EX4T1 V2.0B
HOST
B-EX4T1 V2.0C
When the USB I/F Status parameter is disabled
When the USB I/F Status parameter is enabled
USB
LAN
RS-232C
IEEE1284

- WF command

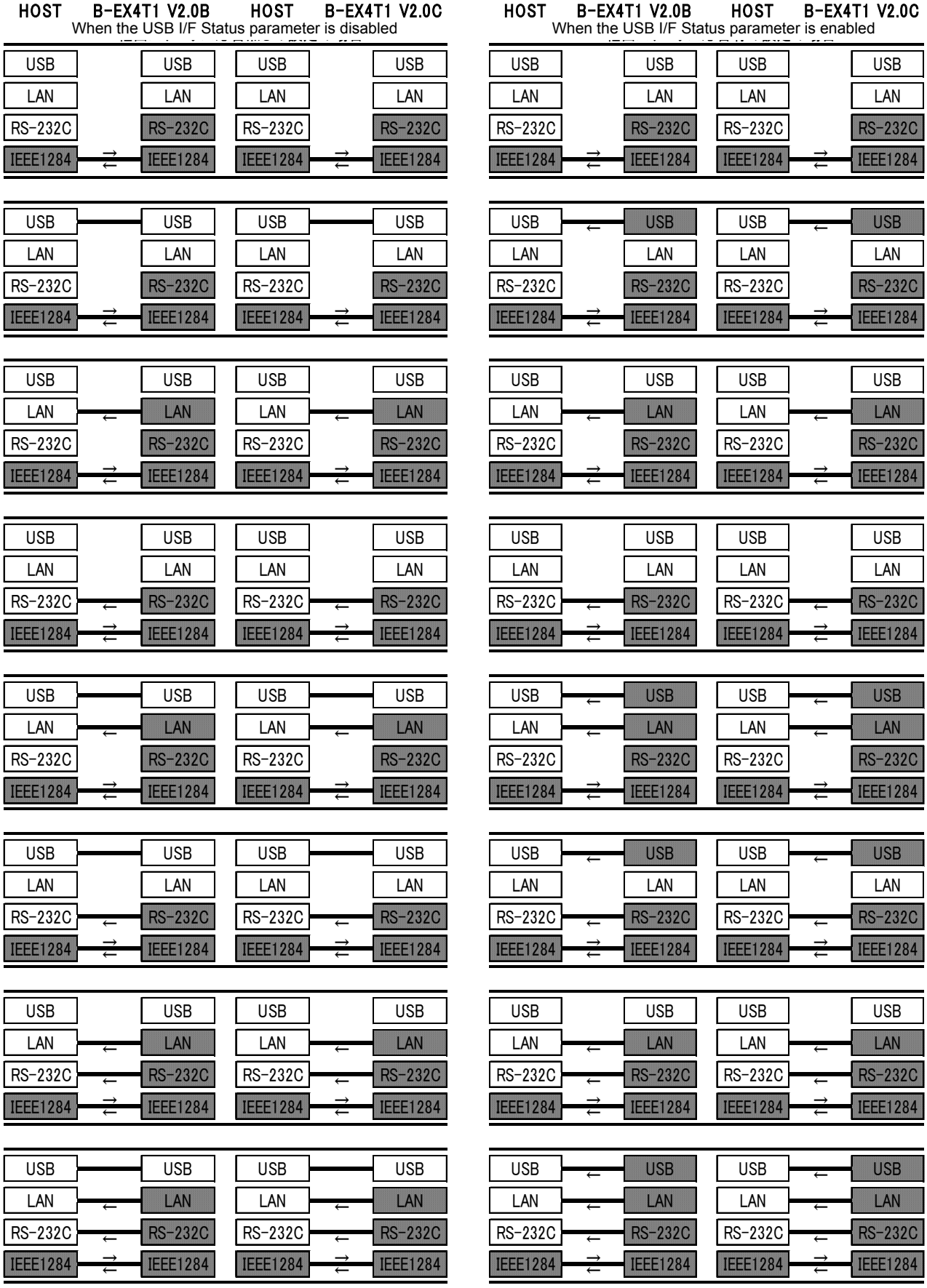

HOST
B-EX4T1 V2.0B
HOST
B-EX4T1 V2.0C
When the USB I/F Status parameter is disabled
When the USB I/F Status parameter is enabled
USB
LAN
RS-232C
IEEE1284

- @12 command

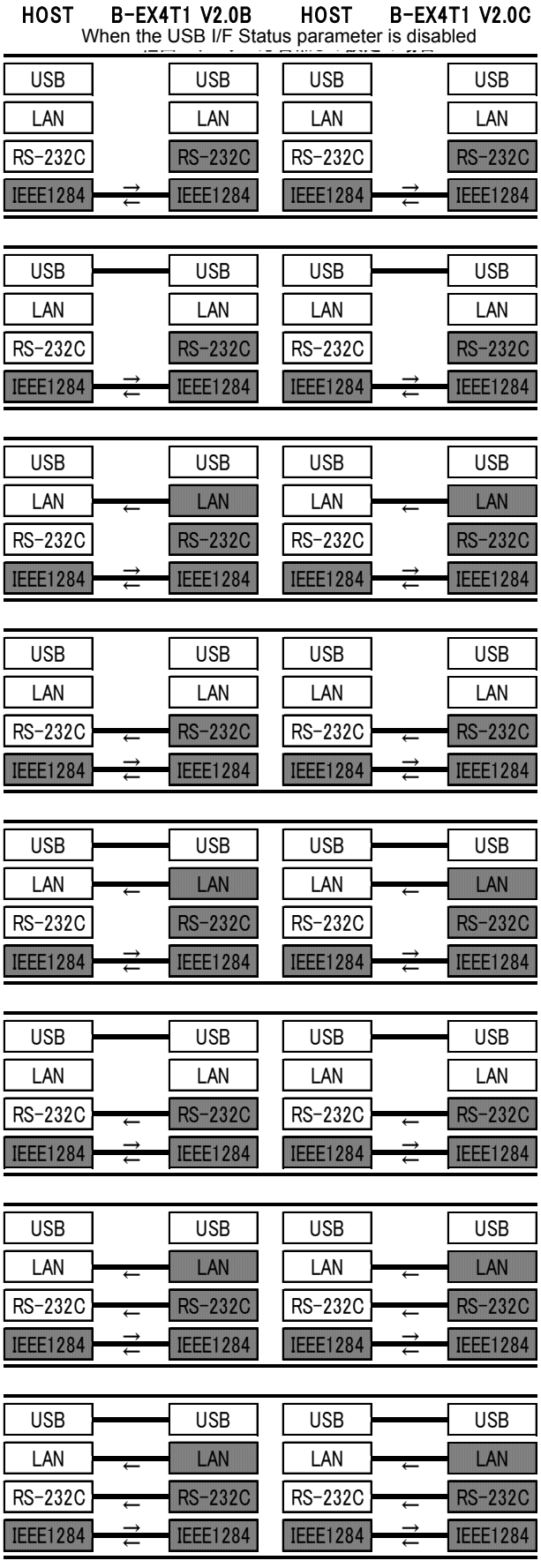

HOST
B-EX4T1 V2.0B
HOST
B-EX4T1 V2.0C
When the USB I/F Status parameter is disabled
When the USB I/F Status parameter is enabled
USB
LAN
RS-232C
IEEE1284

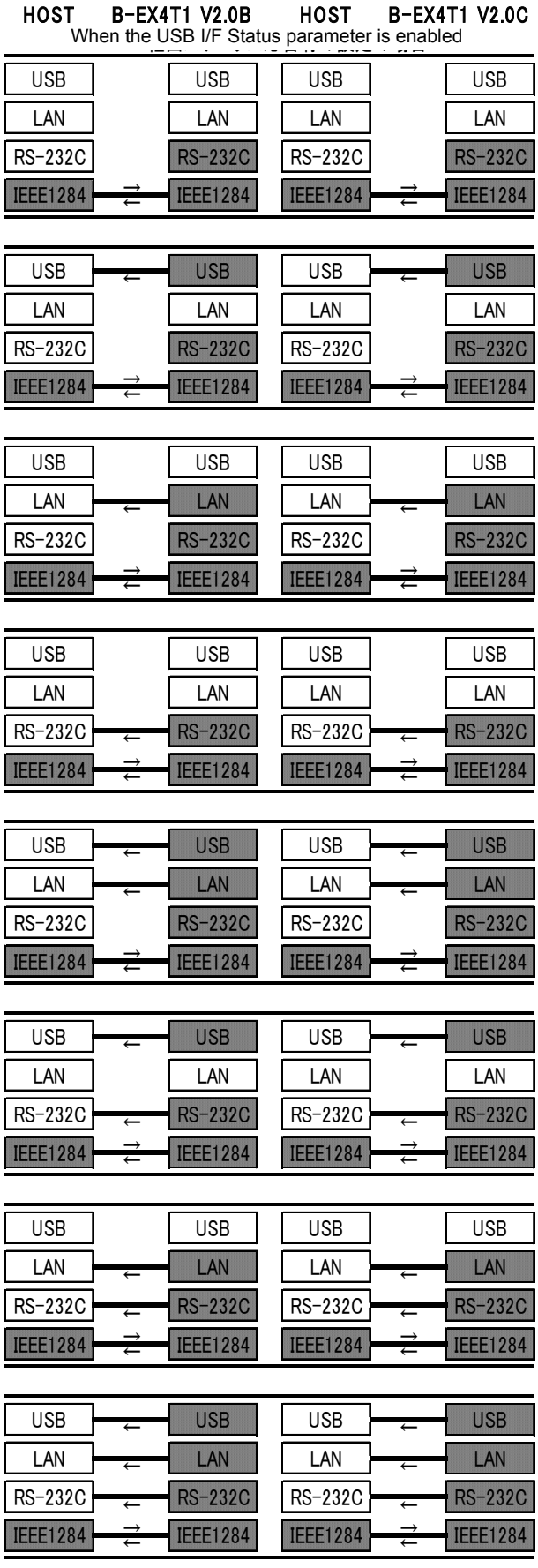
4) IEEE1284

- WS command

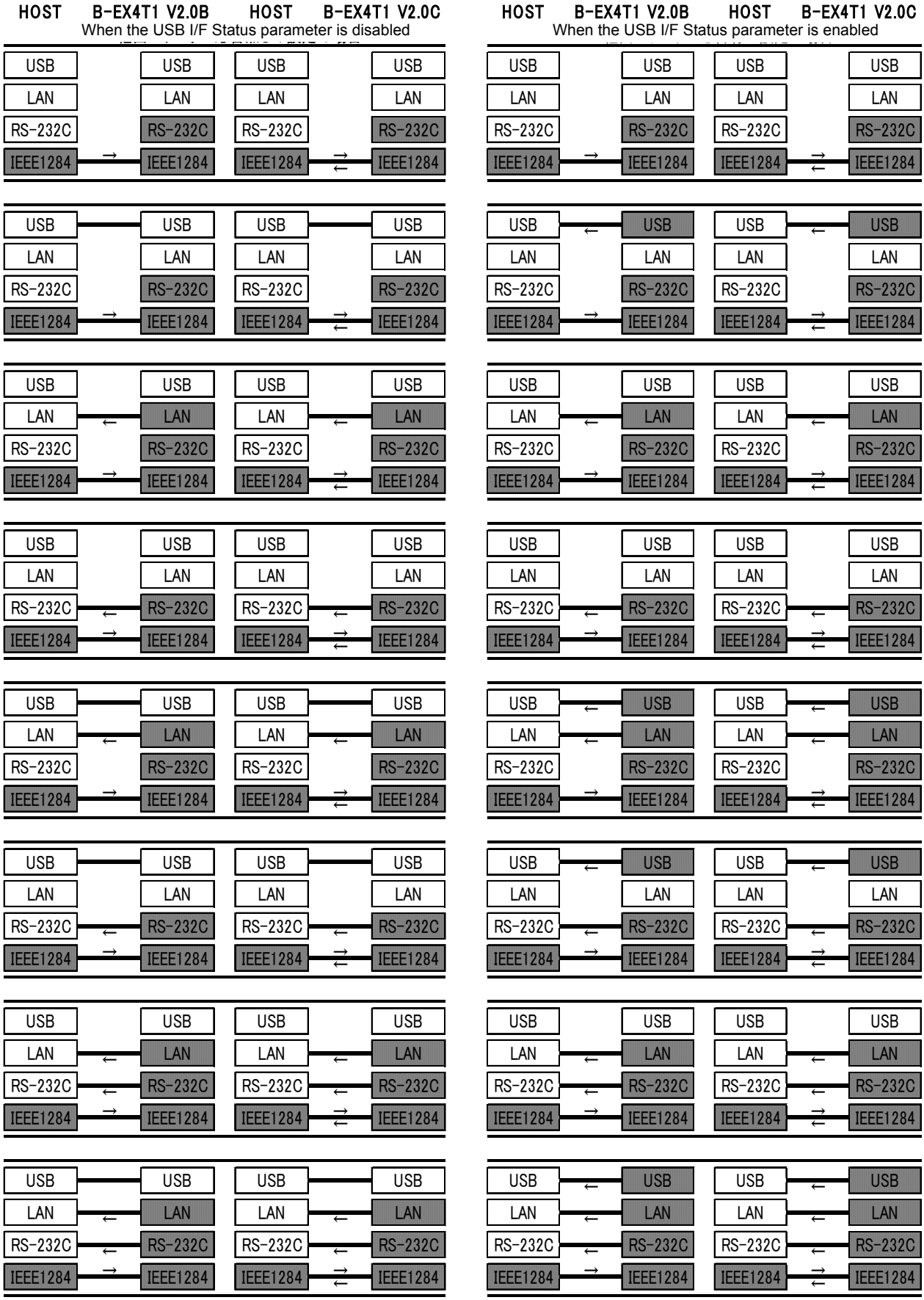


- WB command

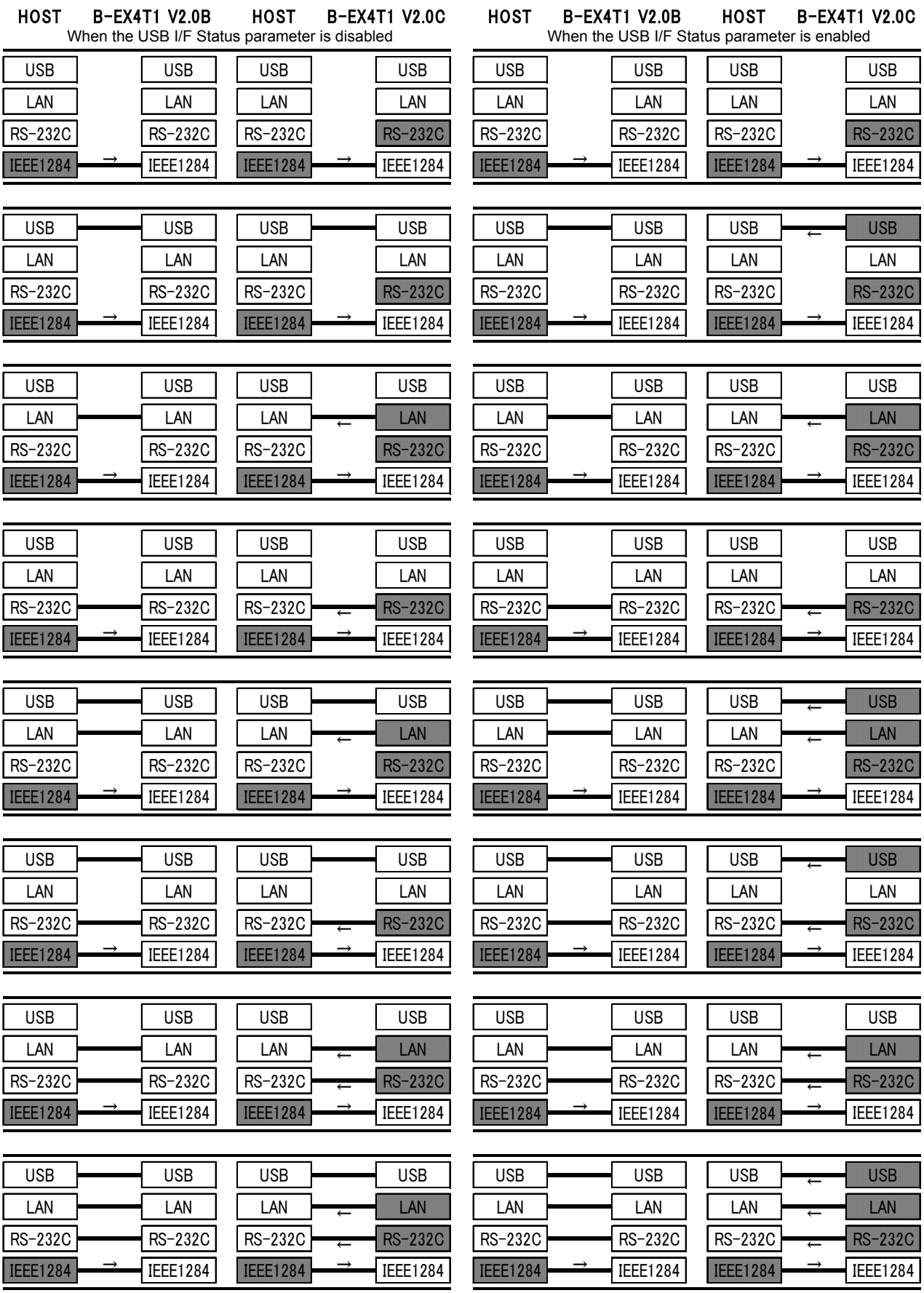

HOST
B-EX4T1 V2.0B
HOST
B-EX4T1 V2.0C
When the USB I/F Status parameter is disabled
USB
LAN
RS-232C
IEEE1284


HOST
B-EX4T1 V2.0B
HOST
B-EX4T1 V2.0C
When the USB I/F Status parameter is enabled
USB
LAN
RS-232C
IEEE1284

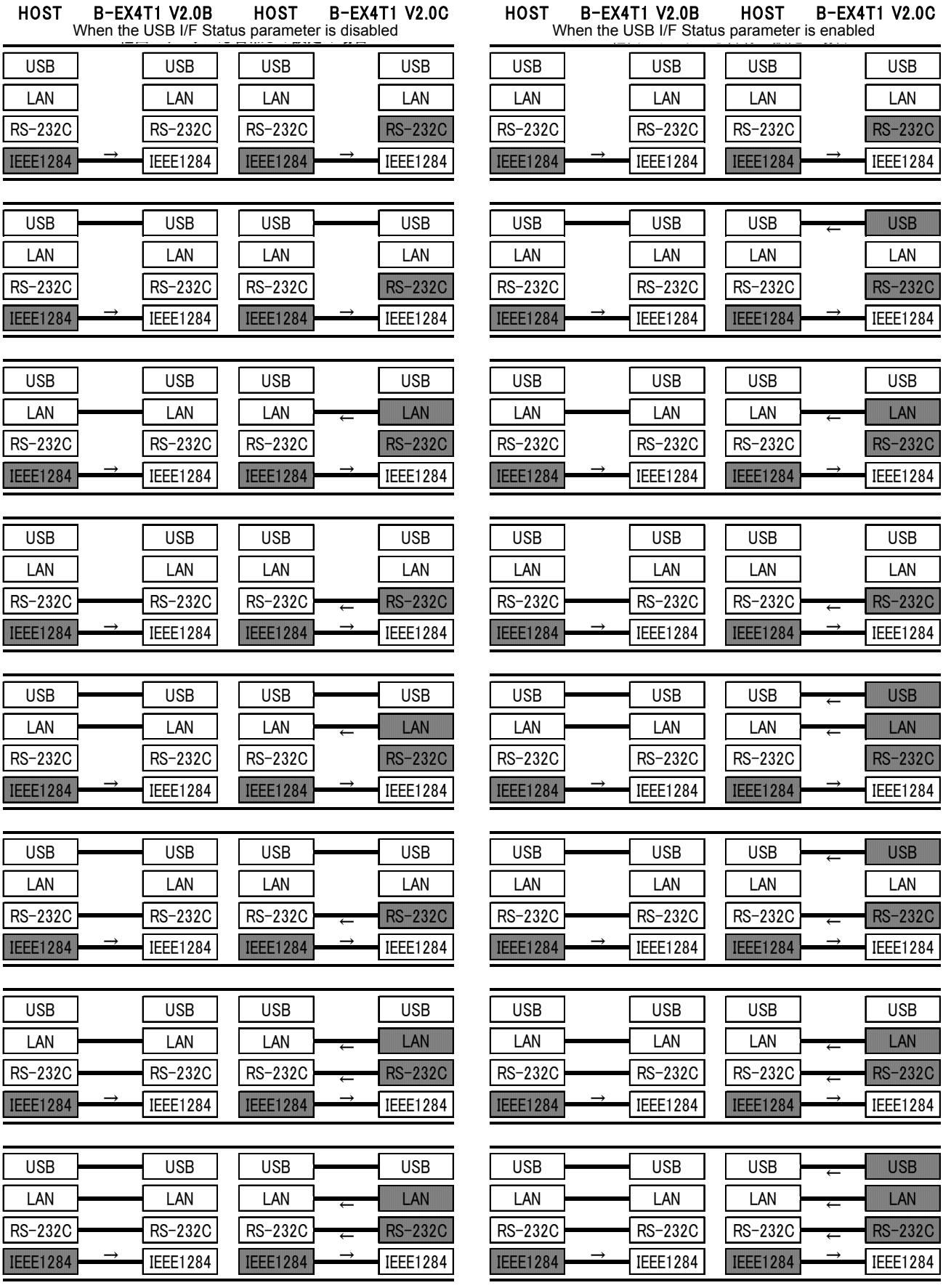
- WN command


HOST
B-EX4T1 V2.0B
HOST
B-EX4T1 V2.0C
When the USB I/F Status parameter is disabled
When the USB I/F Status parameter is enabled
USB
LAN
RS-232C
IEEE1284

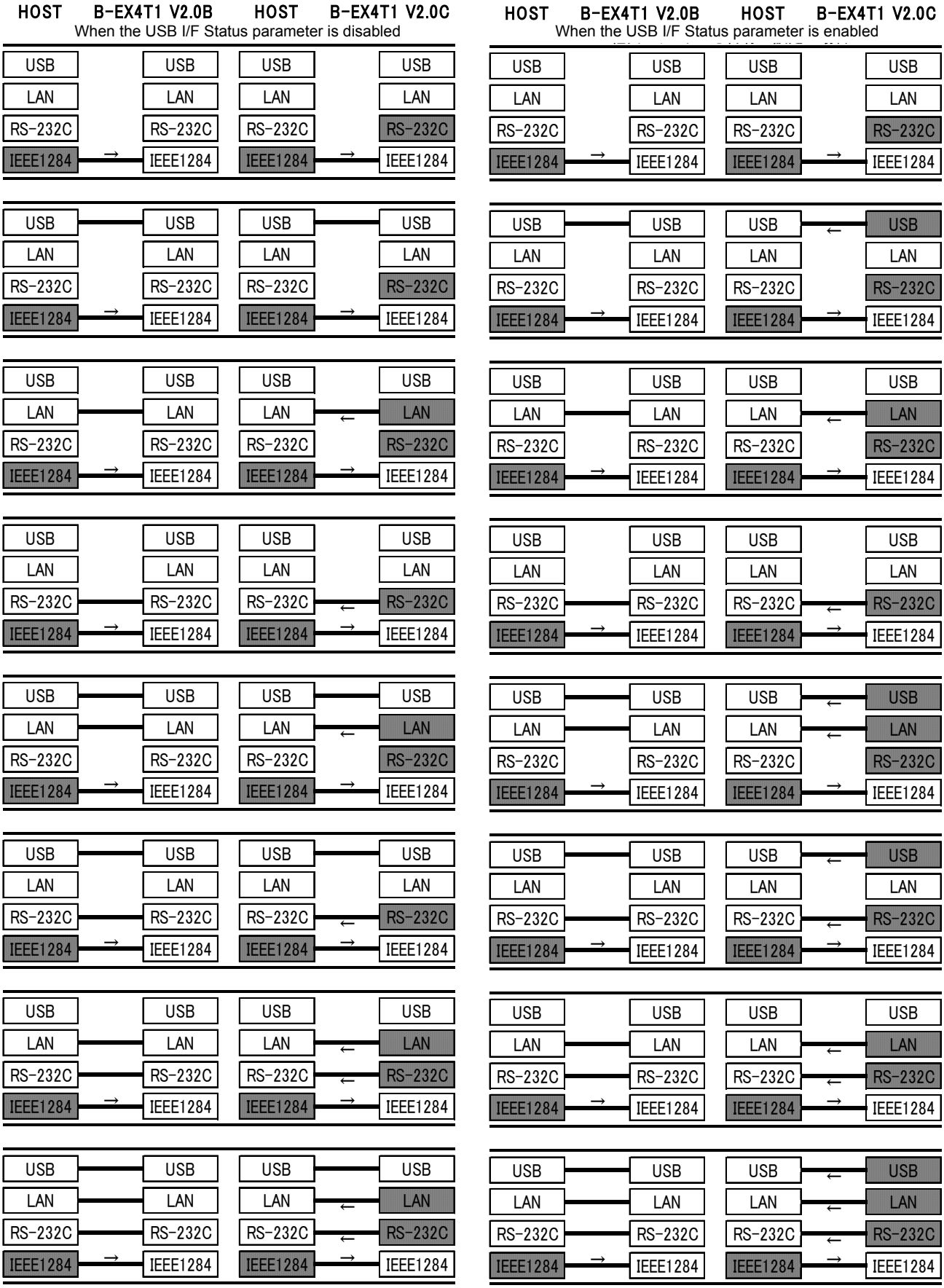
- WV command


HOST
B-EX4T1 V2.0B
HOST
B-EX4T1 V2.0C
When the USB I/F Status parameter is disabled
When the USB I/F Status parameter is enabled
USB
LAN
RS-232C
IEEE1284

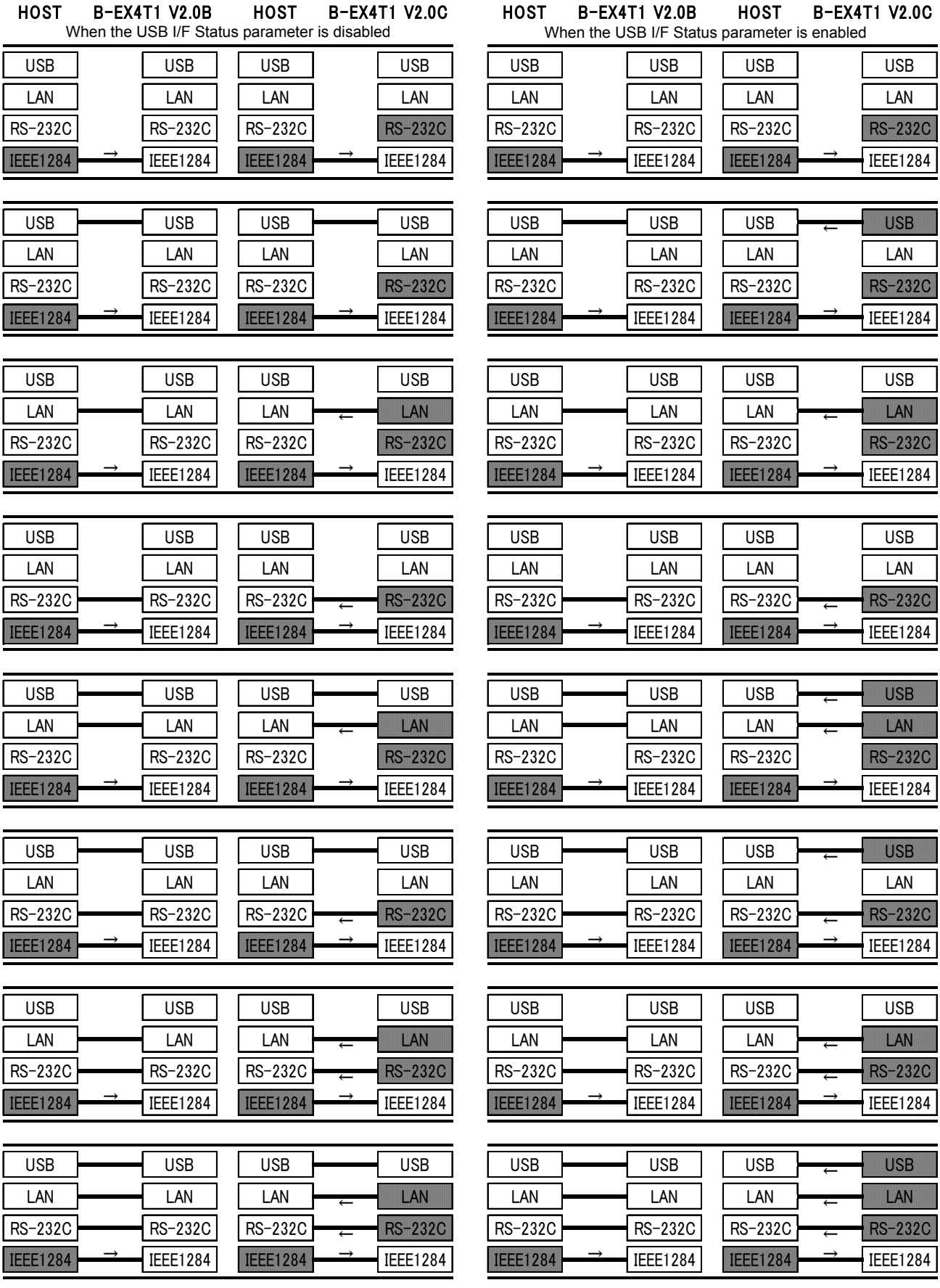
- WI command


HOST
B-EX4T1 V2.0B
HOST
B-EX4T1 V2.0C
When the USB I/F Status parameter is disabled
When the USB I/F Status parameter is enabled
USB
LAN
RS-232C
IEEE1284

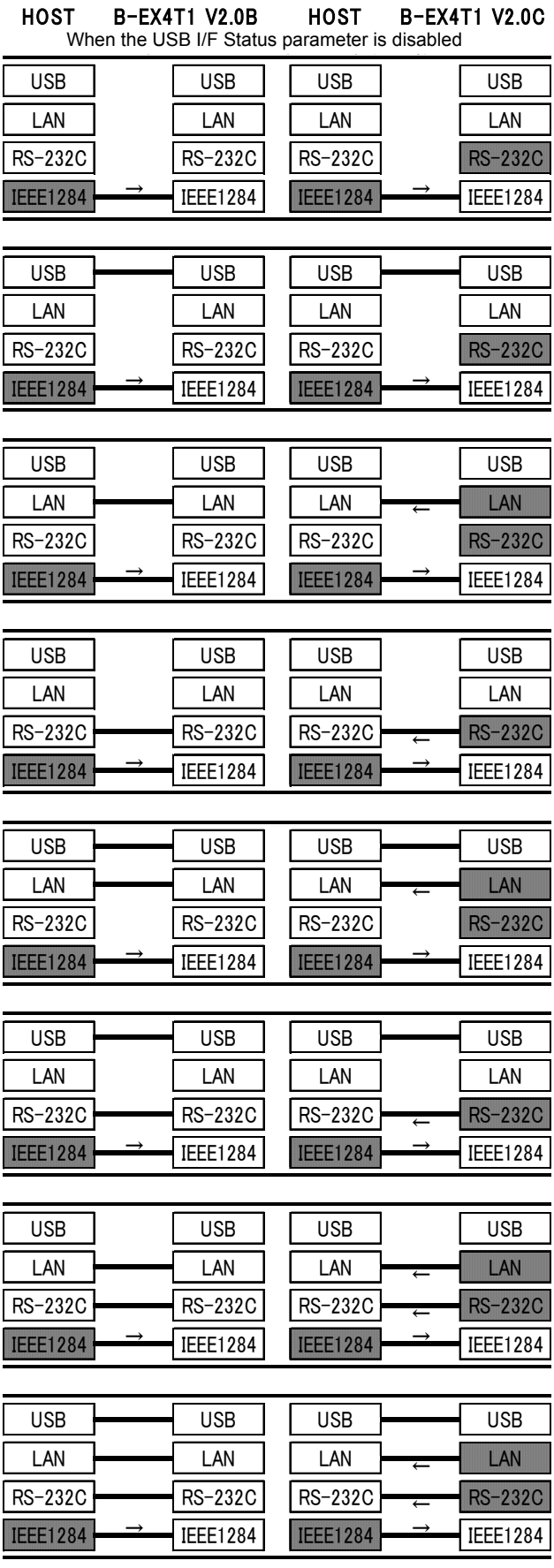
- WG command

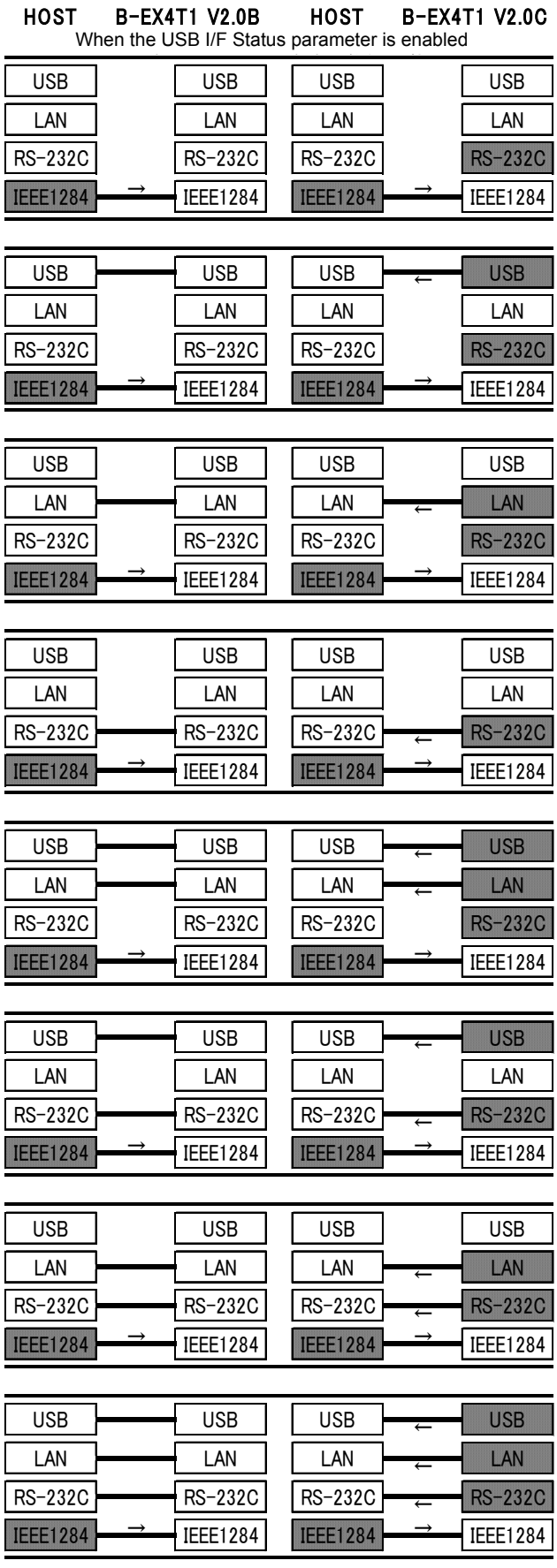

HOST
B-EX4T1 V2.0B
HOST
B-EX4T1 V2.0C
When the USB I/F Status parameter is disabled
When the USB I/F Status parameter is enabled
USB
LAN
RS-232C
IEEE1284

- WF command

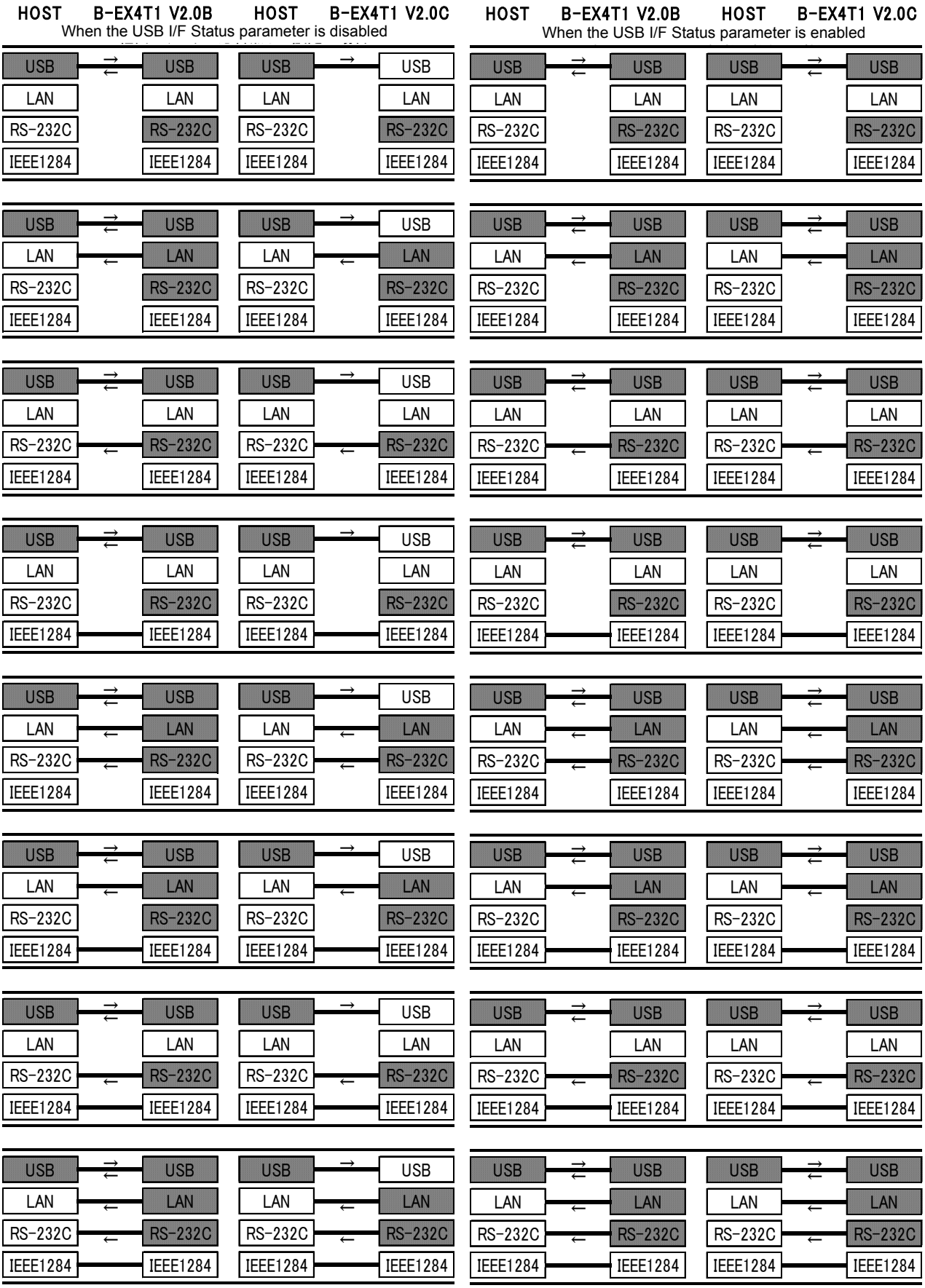

HOST
B-EX4T1 V2.0B
HOST
B-EX4T1 V2.0C
When the USB I/F Status parameter is disabled
When the USB I/F Status parameter is enabled
USB
LAN
RS-232C
IEEE1284

- @012 command

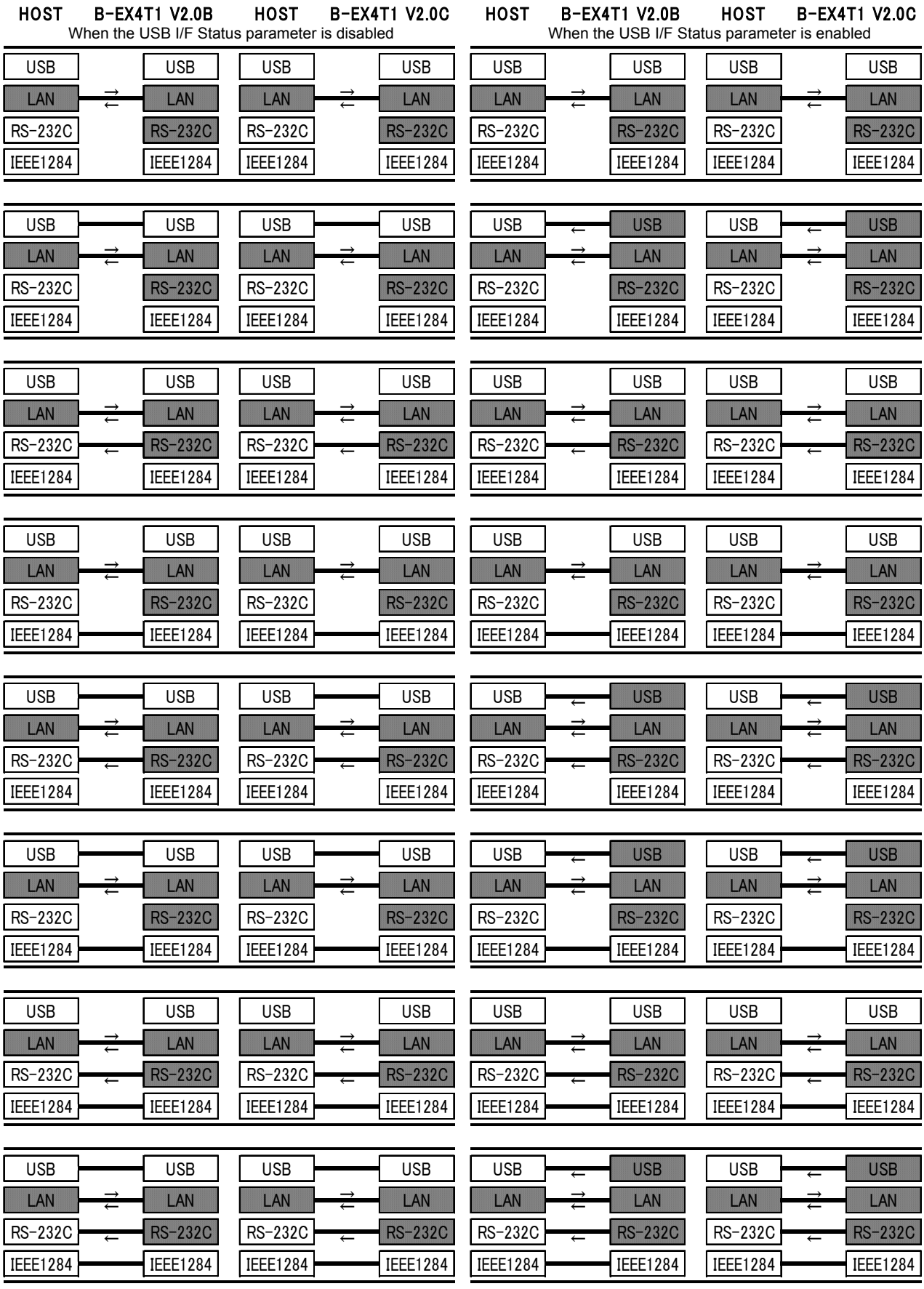

HOST
B-EX4T1 V2.0B
HOST
B-EX4T1 V2.0C
When the USB I/F Status parameter is disabled
USB
LAN
RS-232C
IEEE1284


HOST
B-EX4T1 V2.0B
HOST
B-EX4T1 V2.0C
When the USB I/F Status parameter is enabled
USB
LAN
RS-232C
IEEE1284

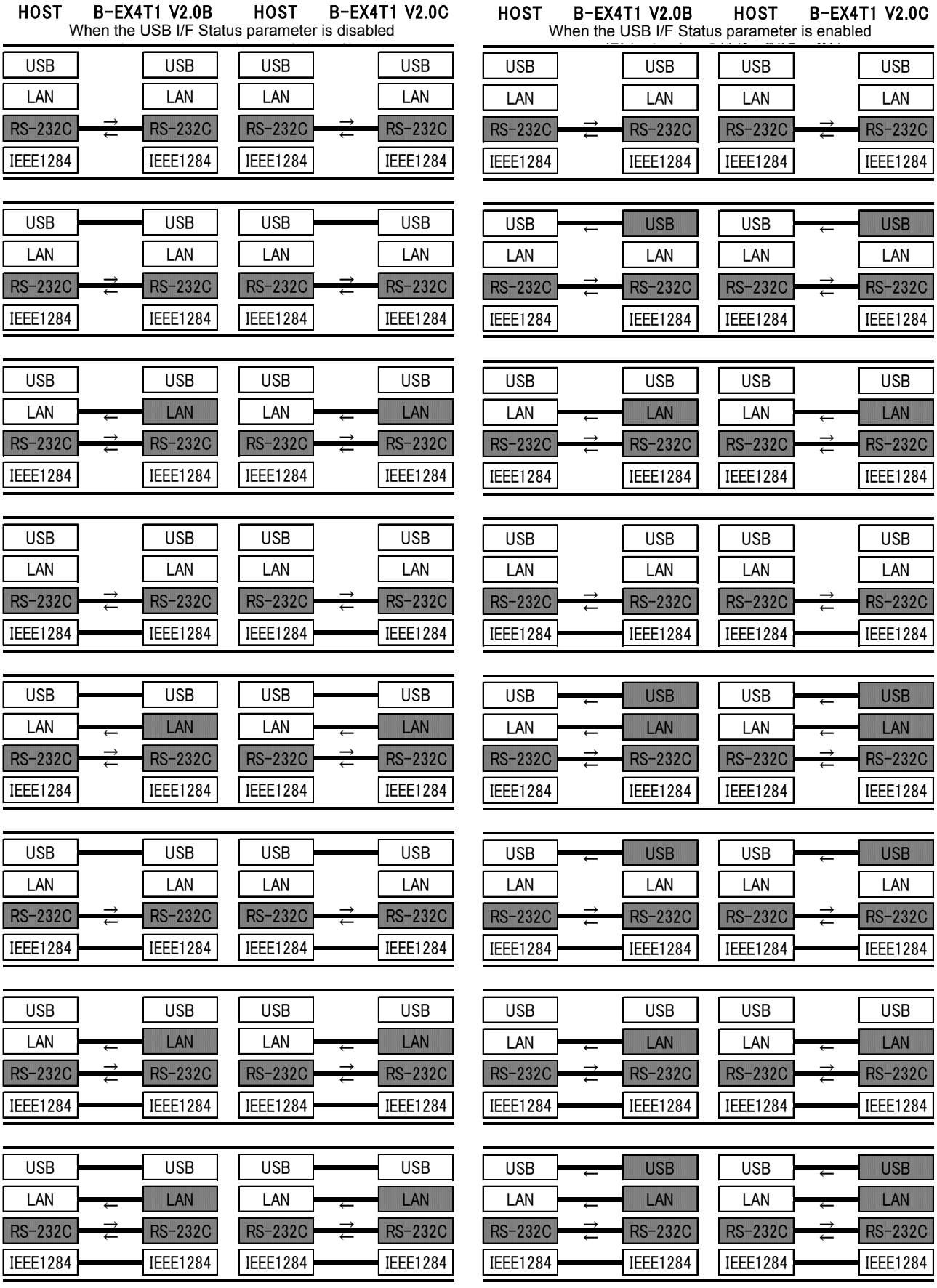
- Automatic status response
  USB Function



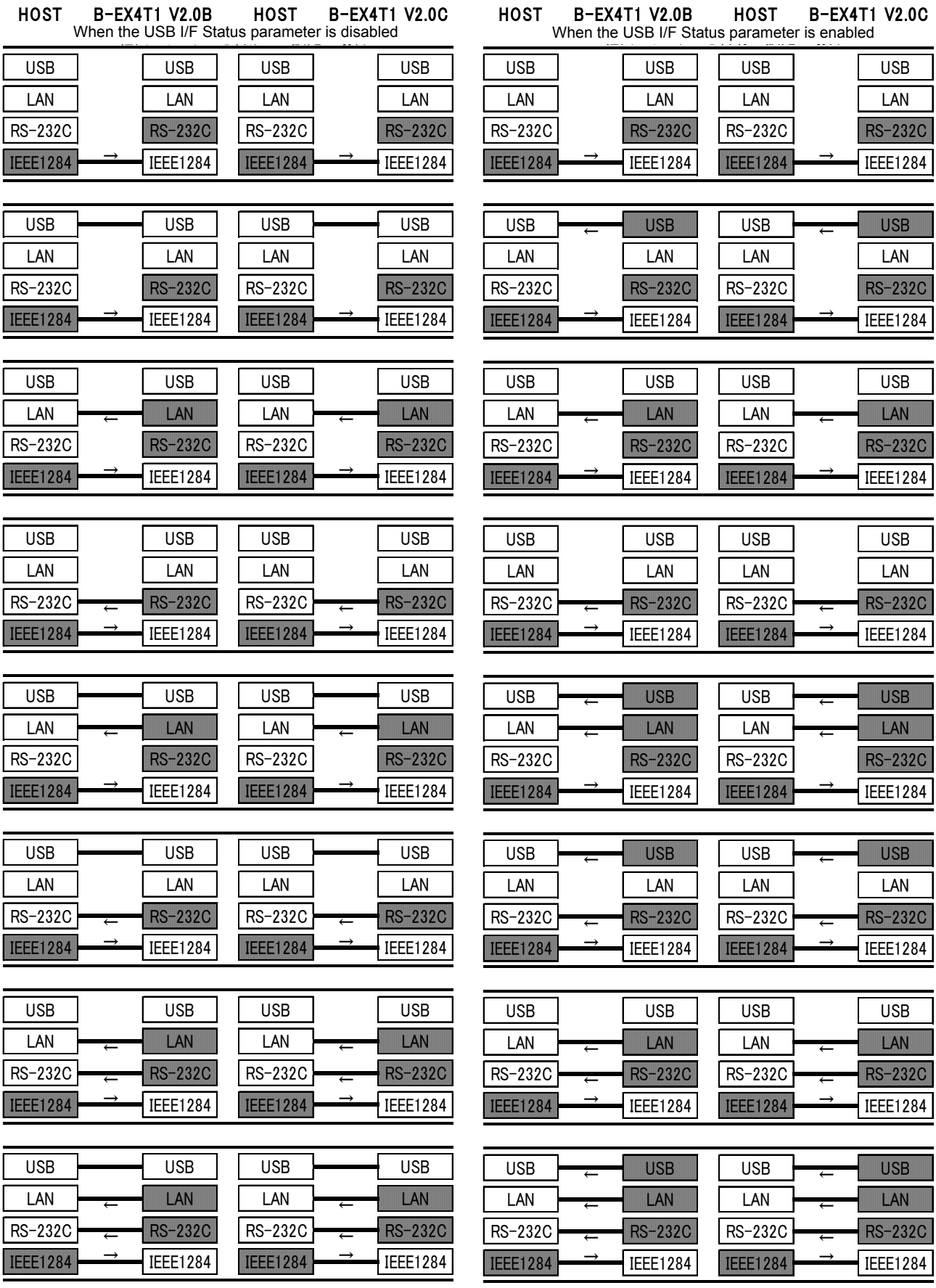
LAN


HOST
B-EX4T1 V2.0B
HOST
B-EX4T1 V2.0C
When the USB I/F Status parameter is disabled
When the USB I/F Status parameter is enabled
USB
LAN
RS-232C
IEEE1284

RS-232C


HOST
B-EX4T1 V2.0B
HOST
B-EX4T1 V2.0C
When the USB I/F Status parameter is disabled
When the USB I/F Status parameter is enabled
USB
LAN
RS-232C
IEEE1284

IEEE1284


HOST
B-EX4T1 V2.0B
HOST
B-EX4T1 V2.0C
When the USB I/F Status parameter is disabled
When the USB I/F Status parameter is enabled
USB
LAN
RS-232C
IEEE1284

8.2 PARALLEL INTERFACE SIGNALS

8.2.1 COMPATIBILITY MODE

LCD Messages of 2nd 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)	L, H	H	H	L
HEAD OPEN	The head was opened in the online mode.	H	L	L	L
PAUSE ****	In a pause state	H	L	L	L
ON LINE	Data was set from the host with the receive buffer full.	H	H	H	L
ON LINE	After data was sent from the host with the receive buffer full, some data is processed and room becomes available.	L	H	H	L
ON LINE	Initialize process in execution (After the power is turned on or the nInit signal is received)	H	L	L	L
Display of error command	A command error has occurred in analyzing the command.	H	L	L	L
PAPER JAM ****	A paper jam occurred during a paper feed.	H	L	L	L
CUTTER ERROR******	An abnormal condition occurred at the cutter.	H	L	L	L
NO PAPER ******	The label 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 head opened. (except the [FEED] key)	H	L	L	L
HEAD ERROR ******	A broken dot error has occurred in the thermal head.	H	L	L	L
EXCESS HEAD TEMP	The thermal head temperature has become excessively high.	H	L	L	L
RIBBON ERROR******	An abnormal condition occurred in the sensor for determining the torque for the ribbon motor.	H	L	L	L
REWIND FULL ******	An overflow error has occurred in the rewinder.	H	L	L	L
ON LINE	Ribbon near end state (Online)	L	H	H	L
PAUSE	Ribbon near end state (In a pause state)	H	L	L	L
ON LINE	Ribbon near end state (Operating)	L	H	H	L
SAVING ####KB/&&&&KB **SAVING %,%%%,%%%KB**	Wwritable character or PC command save mode	L	H	H	L
FORMAT ####KB/&&&&KB **FORMAT %,%%%,%%%KB**	The storage area is being initialized.	L	H	H	L
MEMORY WRITE ERR.	An error has occurred in writing data into memory for storage.	H	L	L	L
FORMAT ERROR	An erase error has occurred in formatting memory for storage.	H	L	L	L
MEMORY FULL	Saving failed because of the insufficient capacity of memory for storage.	H	L	L	L
INITIALIZING...	The storage memory is being initialized. (Initialization is performed for approx. 15 seconds.)	H	L	L	L

LCD Messages of 2nd Line (English)	Printer Status	Output Signal			
		Busy	Select	nFault	PError
POWER FAILURE	A momentary power interruption has occurred.	H	L	L	L
EEPROM ERROR	An EEPROM for back-up cannot be read/written properly.	H	L	L	L
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
LOW BATTERY	Low battery level of the real time clock	L	H	H	L
RFID WRITE ERROR	Writing data onto the RFID tag continuously failed for the maximum number of RFID write retries.	H	L	L	L
RFID ERROR	The printer cannot communicate with the RFID module.	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 for consecutively three times.	H	L	L	L
RFID CONFIG ERR	B-EX700-RFID-U2-US-R only RFID module's destination code is not specified	H	L	L	L

NOTE: While a help message is displayed, the same signal with that for the previously displayed message is output.

8.3 E-MAIL

The printer is able to notify the host of the printer status by e-mail. The statuses to be notified by e-mail are the same as the detailed statuses notified through the serial interface. For details, refer to the Network Specification.

9. LCD MESSAGES AND LED INDICATIONS

For details, refer to the Key Operation Specification.

For details of the B-EX6T1/T3, refer to the Key Operation Specification version 2 for the B-EX Series.

10. CHARACTER CODE TABLE

10.1 GENERAL DESCRIPTION

Character code tables are provided in this section. Note that the characters which can be printed are different according to the character type.

10.2 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			Đ	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.

10.3 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.

10.4 OCR-A (Bit map font type: S)

(1) PC-850, PC-857

① 203 dpi

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

When Japanese message is selected in the system mode, code 5CH indicates "¥".

② 300 dpi/305 dpi/600 dpi

	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

① 203 dpi

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0				0		P	ｱ									
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											

When Japanese message is selected in the system mode, code 5CH indicates "¥".

② 300 dpi/305 dpi/600 dpi

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0				0	@	P	ｱ	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	ｿﾟ								
F			/	?	O	ｳ	o	▉								

When Japanese message is selected in the system mode, code 5CH indicates "¥".

(3) PC-852

① 203 dpi

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

When Japanese message is selected in the system mode, code 5CH indicates "¥".

② 300 dpi/305 dpi/600 dpi

	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

① 203 dpi

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0				0		P	ｱ									
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											

When Japanese message is selected in the system mode, code 5CH indicates "¥".

② 300 dpi/305 dpi/600 dpi

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0				0	@	P	ｱ	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	ｿﾞ								
F			/	?	O	ｳ	o	▮								

When Japanese message is selected in the system mode, code 5CH indicates "¥".

(5) PC-1252, PC-1254

① 203 dpi

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

When Japanese message is selected in the system mode, code 5CH indicates "¥".

② 300 dpi/305 dpi/600 dpi

	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 "¥".

(6) PC-1253

① 203 dpi

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

When Japanese message is selected in the system mode, code 5CH indicates "¥".

② 300 dpi/305 dpi/600 dpi

	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	Ｙ	o	▌								

When Japanese message is selected in the system mode, code 5CH indicates "¥".

(7) LATIN9

① 203 dpi

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

When Japanese message is selected in the system mode, code 5CH indicates "¥".

② 300 dpi/305 dpi/600 dpi

	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 "¥".

10.5 OCR-B (Bit map font type: T)

(1) PC-850, PC-857

① 203 dpi

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0				0		P			0							-
1				1	A	Q			1							
2			"	2	B	R			2							
3				3	C	S			3							
4			$	4	D	T			4							
5				5	E	U			5							
6				6	F	V			6							
7				7	G	W			7							
8				8	H	X			8							
9				9	I	Y			9							
A					J	Z										
B			+		K											
C				<	L											
D			-		M											
E			.	>	N							¥				
F			/		O											

When Japanese message is selected in the system mode, code 5CH indicates "¥".

The size of the numerals of codes 80h to 89h are reduced to 80%.

② 300 dpi/305 dpi/600 dpi

	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	▌								

When Japanese message is selected in the system mode, code 5CH indicates "¥".

The size of the numerals of codes 80h to 89h are reduced to 80%.

(2) PC-8

① 203 dpi

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0				0		P			0							
1				1	A	Q			1							
2			"	2	B	R			2							
3				3	C	S			3							
4			$	4	D	T			4							
5				5	E	U			5							
6				6	F	V			6							
7				7	G	W			7							
8				8	H	X			8							
9				9	I	Y			9							
A					J	Z										
B			+		K											
C				<	L											
D			-		M					¥						
E			.	>	N											
F			/		O											

When Japanese message is selected in the system mode, code 5CH indicates "¥".

The size of the numerals of codes 80h to 89h are reduced to 80%.

② 300 dpi/305 dpi/600 dpi

	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	▌								

When Japanese message is selected in the system mode, code 5CH indicates "¥".

The size of the numerals of codes 80h to 89h are reduced to 80%.

(3) PC-852

① 203 dpi

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0				0		P			0							-
1				1	A	Q			1							
2			"	2	B	R			2							
3				3	C	S			3							
4			$	4	D	T			4							
5				5	E	U			5							
6				6	F	V			6							
7				7	G	W			7							
8				8	H	X			8							
9				9	I	Y			9							
A					J	Z										
B			+		K											
C				<	L											
D			-		M											
E			.	>	N											
F			/		O											

When Japanese message is selected in the system mode, code 5CH indicates "¥".

The size of the numerals of codes 80h to 89h are reduced to 80%.

② 300 dpi/305 dpi/600 dpi

	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	▌								

When Japanese message is selected in the system mode, code 5CH indicates "¥".

The size of the numerals of codes 80h to 89h are reduced to 80%.

(4) PC-851, PC-855, PC-1250, PC-1251, PC-1257, Arabic

① 203 dpi

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0				0		P			0							
1				1	A	Q			1							
2			"	2	B	R			2							
3				3	C	S			3							
4			$	4	D	T			4							
5				5	E	U			5							
6				6	F	V			6							
7				7	G	W			7							
8				8	H	X			8							
9				9	I	Y			9							
A					J	Z										
B			+		K											
C				<	L											
D			-		M											
E			.	>	N											
F			/		O											

When Japanese message is selected in the system mode, code 5CH indicates "¥".

The size of the numerals of codes 80h to 89h are reduced to 80%.

② 300 dpi/305 dpi/600 dpi

	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									

When Japanese message is selected in the system mode, code 5CH indicates "¥".

The size of the numerals of codes 80h to 89h are reduced to 80%.

(5) PC-1252, PC-1254, LATIN9

① 203 dpi

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0				0		P			0							
1				1	A	Q			1							
2			"	2	B	R			2							
3				3	C	S			3							
4			$	4	D	T			4							
5				5	E	U			5		¥					
6				6	F	V			6							
7				7	G	W			7							
8				8	H	X			8	~						
9				9	I	Y			9							
A					J	Z										
B			+		K											
C				<	L											
D			-		M											
E			.	>	N											
F			/		O											

When Japanese message is selected in the system mode, code 5CH indicates "¥".

The size of the numerals of codes 80h to 89h are reduced to 80%.

② 300 dpi/305 dpi/600 dpi

	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	▌								

When Japanese message is selected in the system mode, code 5CH indicates "¥".

The size of the numerals of codes 80h to 89h are reduced to 80%.

(6) PC-1253

① 203 dpi

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0				0		P			0							
1				1	A	Q			1							
2			"	2	B	R			2							
3				3	C	S			3							
4			$	4	D	T			4							
5				5	E	U			5		¥					
6				6	F	V			6							
7				7	G	W			7							
8				8	H	X			8							
9				9	I	Y			9							
A					J	Z										
B			+		K											
C				<	L											
D			-		M											
E			.	>	N											
F			/		O											

When Japanese message is selected in the system mode, code 5CH indicates "¥".

The size of the numerals of codes 80h to 89h are reduced to 80%.

② 300 dpi/305 dpi/600 dpi

	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									

When Japanese message is selected in the system mode, code 5CH indicates "¥".

The size of the numerals of codes 80h to 89h are reduced to 80%.

10.6 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.

10.7 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			/													

10.8 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			Đ	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	ŗ	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				€		Đ	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.

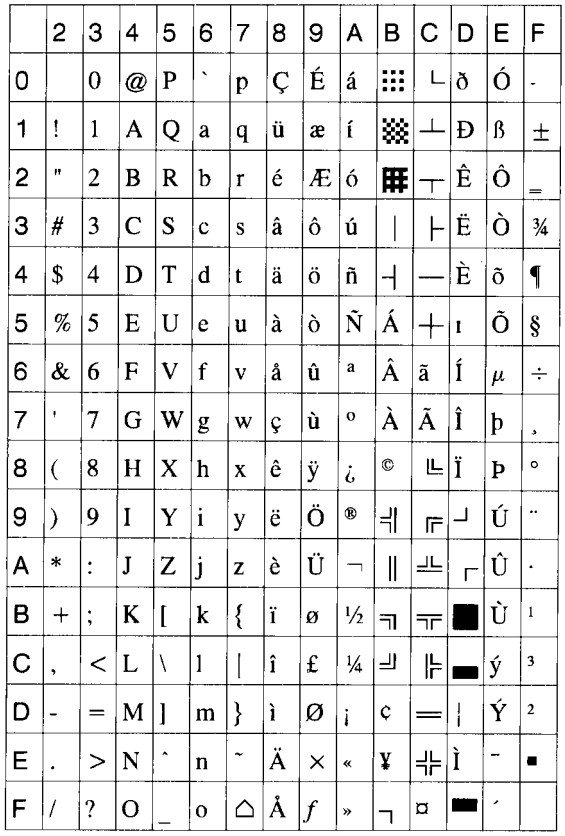
10.9 GB2312-80 (CHINESE KANJI)

(1) GB2312-80 (Chinese characters)

	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									

10.10 TrueType FONT

(1) PC-850

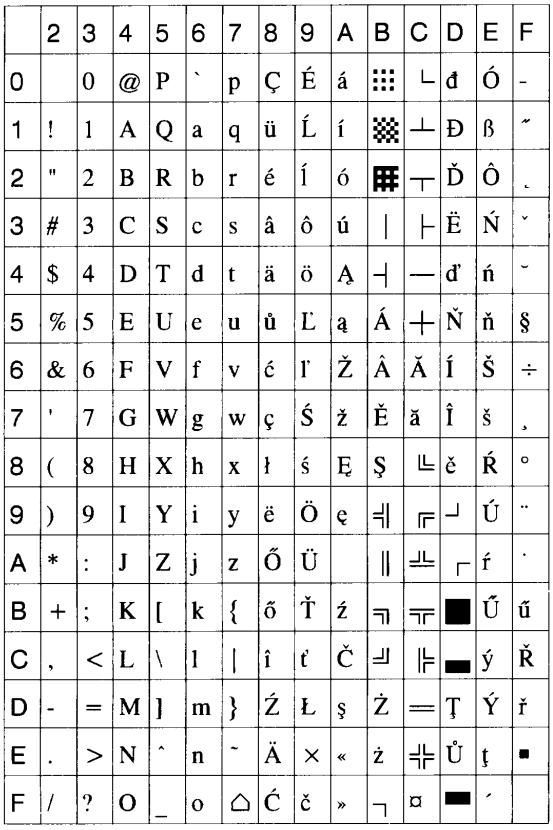


	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0		0	@	P	`	p	Ç	É	á	▒	└	ð	Ó	-
1	!	1	A	Q	a	q	ü	æ	í	▓	┴	Ð	ß	±
2	"	2	B	R	b	r	é	Æ	ó	▓	┬	Ê	Ô	‗
3	#	3	C	S	c	s	â	ô	ú	│	├	Ë	Ò	¾
4	$	4	D	T	d	t	ä	ö	ñ	┤	—	È	õ	¶
5	%	5	E	U	e	u	à	ò	Ñ	Á	┼	ı	Õ	§
6	&	6	F	V	f	v	å	û	ª	Â	ã	Í	µ	÷
7	'	7	G	W	g	w	ç	ù	º	À	Ã	Î	þ	¸
8	(	8	H	X	h	x	ê	ÿ	¿	©	╚	Ï	Þ	°
9	)	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

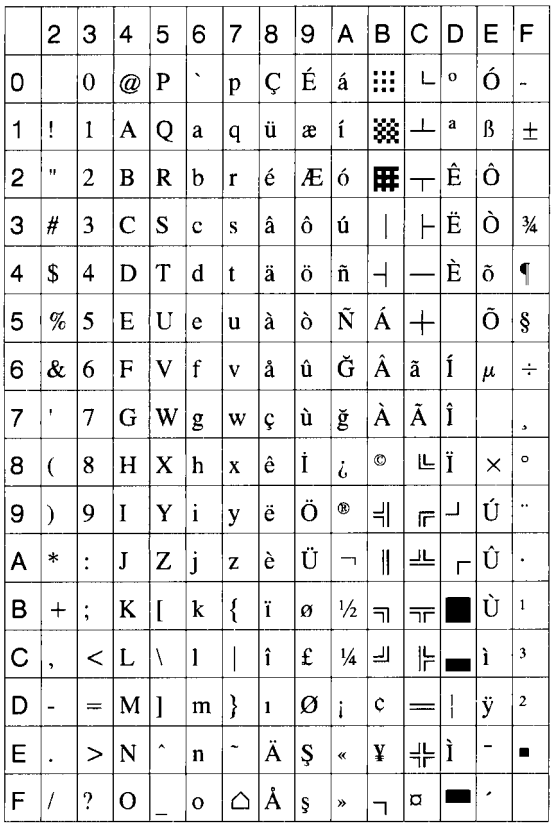
	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0		0	@	P	`	p	Ç	É	á	▒	└	╨	α	≡
1	!	1	A	Q	a	q	ü	æ	í	▓	┴	╤	ß	±
2	"	2	B	R	b	r	é	Æ	ó	▓	┬	╥	Γ	≥
3	#	3	C	S	c	s	â	ô	ú	│	├	╙	π	≤
4	$	4	D	T	d	t	ä	ö	ñ	┤	—	╘	Σ	⌠
5	%	5	E	U	e	u	à	ò	Ñ	╡	┼	╒	σ	⌡
6	&	6	F	V	f	v	å	û	ª	╢	╞	╓	µ	÷
7	'	7	G	W	g	w	ç	ù	º	╖	╟	╫	τ	≈
8	(	8	H	X	h	x	ê	ÿ	¿	╕	╚	╪	Φ	°
9	)	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	¨
A	*	:	J	Z	j	z	Ő	Ü		‖	╩	┌	ř	·
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	»	┐	¤	▀	´	

(4) PC-857



	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	}	ı	Ø	¡	¢	═	¦	ÿ	²
E	.	>	N	^	n	~	Ä	Ş	«	¥	╬	Ì	¯	■
F	/	?	O	_	o	⌂	Å	ş	»	┐	¤	▀	´	

(5) PC-851

	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0		0	@	P	`	p	Ç	Ί	ï	▒	└	T	ζ	-
1	!	1	A	Q	a	q	ü		ΐ	▓	┴	Y	η	±
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	§
6	&	6	F	V	f	v	Ά	û	Γ	Λ	Π	α	μ	ψ
7	'	7	G	W	g	w	ç	ù	Δ	M	P	β	ν	¸
8	(	8	H	X	h	x	ê	Ώ	E	N	╚	γ	ξ	°
9	)	9	I	Y	i	y	ë	Ö	Z	╣	╔	┘	ο	¨
A	*	:	J	Z	j	z	è	Ü	H	‖	╩	┌	π	ω
B	+	;	K	[	k	{	ï	ά	½	╗	╦	▒	ρ	ΰ
C	,	<	L	\	l	|	î	£	Θ	╝	╠	▄	σ	ΰ
D	-	=	M	]	m	}	Έ	έ	I	Ξ	═	δ	ς	ώ
E	.	>	N	^	n	~	Ä	ή	«	O	╬	ε	τ	■
F	/	?	O	_	o	⌂	Ή	ί	»	┐	Σ	▀	΄	

(6) PC-855

	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0		0	@	P	`	p	ђ	љ	a	▒	└	л	Я	-
1	!	1	A	Q	a	q	Ђ	Љ	А	▓	┴	Л	р	ы
2	"	2	B	R	b	r	ѓ	њ	б	▓	┬	м	Р	Ы
3	#	3	C	S	c	s	Ѓ	Њ	Б	|	├	М	с	з
4	$	4	D	T	d	t	ё	ћ	ц	┤	—	н	С	З
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
A	*	:	J	Z	j	z	i	ц	ф	‖	╩	┌	Ж	Щ
B	+	;	K	[	k	{	I	Ц	Ф	╗	╦	▒	в	ч
C	,	<	L	\	l	|	ї	ю	г	╝	╠	▄	В	Ч
D	-	=	M	]	m	}	Ї	Ю	Г	й	═	П	ь	§
E	.	>	N	^	n	~	j	ъ	«	Й	╬	я	Ь	■
F	/	?	O	_	o	⌂	J	Ъ	»	┐	¤	▀	№	

(7) PC-1250

	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0		0	@	P	`	p	€			°	Ŕ	Đ	ŕ	đ
1	!	1	A	Q	a	q		‘	ˇ	±	Á	Ń	á	ń
2	"	2	B	R	b	r	,	’	˘	˛	Â	Ň	â	ň
3	#	3	C	S	c	s		“	Ł	ł	Ă	Ó	ă	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	{	‹	›	«	»	Ë	Ű	ë	ű
C	,	<	L	\	l	|	Ś	ś	¬	Ľ	Ě	Ü	ě	ü
D	-	=	M	]	m	}	Ť	ť	-	˝	Í	Ý	í	ý
E	.	>	N	^	n	~	Ž	ž	®	ľ	Î	Ţ	î	ţ
F	/	?	O	_	o	▩	Ź	ź	Ż	ż	Ď	ß	ď	˙

(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	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			€	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	ا	،	‘	ﺗ	\	ﻌ				ى	ؤ	ـ	ﱞ	
1	ﺂ	-	=	ﺜ	]	ﻊ			ﻟ	ى	ﻻ	ً	ﱟ	
2	ﺄ	.	’	ﺛ	,	ع			ل	ء	ﻼ	ٌ	ﱠ	
3	ﺈ	/	؟	ﺟ	-	ﻐ			ﻣ	ﺋ	ﻷ	ٍ	ﱡ	
4		٠	—	ﺞ	ز	ﻐ			م	ئ	ﻸ	ً	ﱢ	
5	!	١	ا	ج	ﺴ	ﻎ			ﻧ	0	ﻵ	ُ		
6	"	٢	ﺎ	ﺣ	س	غ			ﻫ	1	ﻶ	َ	ﷲ	
7	«	٣	أ	ﺤ	ﺸ	ﻓ			ﻬ	2	ﻹ	ـَ	ن	
8	»	٤	ﺄ	ح	ش	ﻔ			ﻪ	3	ﻺ	ُ		
9	٪	٥	آ	ﺧ	ﺻ	ﻒ			ه	4	ـِ	ْ		
A	×	٦	ﺂ	ﺨ	ﺼ	ﻗ			و	5	،	َ		
B	÷	٧	إ	خ	ﺿ	ﻘ			ﺑ	6	ْ	ٌ		
C	(	٨	ﺈ	د	ﻀ	ق			ﻲ	7	َ	ّ		
D	)	٩	ب	ذ	ﻃ	ﻛ			ي	8	ٌ	ِ		
E	*	:	ﺐ	ر	ﻇ	ﻜ			ة	9	ً	ٍ		
F	+	؛	ﺖ	[	ﻋ				ﺔ	ﺊ	ِ	ٍ		

11. BAR CODES

11.1 BAR CODE TABLE

(1) WPC (JAN, EAN, UPC)
ITF, MSI, UCC/EAN128, Industrial 2 of 5
GS1 DataBar/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	Alphanumerals, symbols	0 to 9 A to Z space . , - /
4	Alphanumerals	0 to 9 A to Z space
5	ASCII (7-bit)	00H to 7FH
6	ISO (8-bit)	00H to FFH (Kanji)

[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)
FNC1 >1 (3EH, 31H)

③ How to send a Kanji code:

Shift JIS
JIS hexadecimal
(For details, refer to the section for the Bar Code Data Command.)

(8) PDF417

The following modes are automatically selected according to the code used.

Mode	Code	Details
EXC mode	Alphanumerals, symbol	0 to 9 A to Z a to z space ! ” # $ % & ’ ( ) * + , - . / : ; < = > ? @ [\ ] ^ _ ` { | }△ ~ CR HT
Binary/ASCII Plus mode	Binary International Character Set	00H to FFH (Kanji)
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)

③ How to send a Kanji code:

Shift JIS
JIS hexadecimal
(For details, refer to the section for the Bar Code Data Command.)

(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 (Kanji)
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)

③ How to send a Kanji code:

Shift JIS
JIS hexadecimal
(For details, refer to the section for the Bar Code Data Command.)

(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 alphanumerals, symbols, and Kanji. However, since the data compression rate varies according to codes, the code to be used shall be designated by selecting the mode.

Mode	Code	Details
N	Number	0 to 9
A	Alphanumerals, symbols	A to Z 0 to 9 space $ % * + - . / :
B	Binary (8-bit)	00H to FFH
K	Kanji	Shift JIS, JIS hexadecimal

When 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:

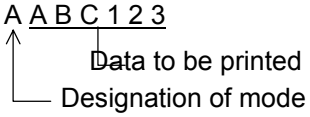
> (3EH) → >0 (3EH, 30H)

③ How to send a Kanji code:

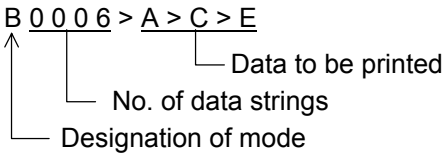
Shift JIS
JIS hexadecimal
(For details, refer to the section for the Bar Code Data Command.)

Examples of data designation for QR code

① Alphanumeric mode: ABC123

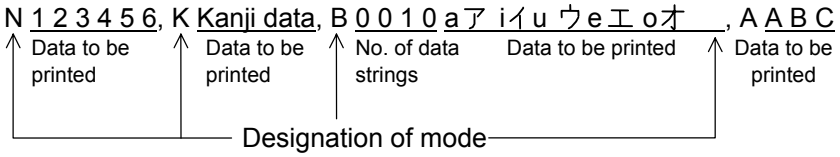


② Binary mode: 01H, 03H, 05H



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	

* “(” or “)” 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]	

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)

③ How to send a Kanji code:

Shift JIS
JIS hexadecimal
(For details, refer to the section for the Bar Code Data Command.)

NOTE: *"NUL" code in the table cannot be used though it can be designated. 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 the case of LF (0AH) data:

LF (0AH) → □ J (FFH, 4AH)

(Note 2) In the 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)

③ How to send a Kanji code:

Shift JIS
JIS hexadecimal
(For details, refer to the section for the Bar Code Data Command.)

(14) GS1 DataBar Expanded/GS1 DataBar Expanded Stacked

● Linear bar code symbol

GS1 DataBar, GS1 DataBar Stacked, GS1 DataBar Stacked Omnidirectional, GS1 DataBar Limited, UPC-A, UPC-E, EAN-13, EAN-8

[Transfer Code]

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

● Linear bar code symbol

GS1 DataBar Expanded, GS1 DataBar Expanded Stacked

● Composite Component

CC-A or CC-B or CC-C

[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									

● Linear bar code symbol

UCC/EAN-128 with CC-A or CC-B or CC-C

[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	Δ								

Note: "|(7CH)" cannot be used because it is regarded as a separator for a composite component.

① How to send control code data:

* In the case of UCC/EAN-128 with CC-A or CC-B or CC-C

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)

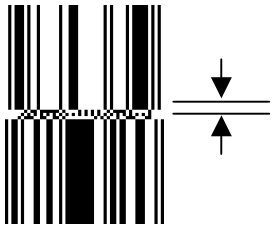
① Separator

In the case of the stacked bar code (GS1 DataBar Stacked, GS1 DataBar Stacked Omnidirectional, GS1 DataBar Expanded Stacked), the separator is positioned between the stacked bar codes.

In the case of composite component, the separator is positioned between the linear bar code and the 2D code.

The height is different depending on the versions of bar code, and fixed.

(Example) Height of the separator for the stacked bar code



(Example)

Version of bar code	Height of separator
GS1 DataBar Stacked	Module width
GS1 DataBar Stacked Omnidirectional	Module width x 3 layers
GS1 DataBar Expanded Stacked	Module width x 3 layers

(Example) Height of the separator for the composite component

Version of bar code	Height of separator
GS1 DataBar	Module width
GS1 DataBar Truncated	Module width
GS1 DataBar Stacked	Module width
GS1 DataBar Stacked Omnidirectional	Module width
GS1 DataBar Limited	Module width
GS1 DataBar Expanded	Module width
GS1 DataBar Expanded Stacked	Module width
UPC-A	Module width x 2 x 3 layers
UPC-E	Module width x 2 x 3 layers
EAN-13	Module width x 2 x 3 layers
EAN-8	Module width x 2 x 3 layers
UCC/EAN-128 with CC-A or CC-B	Module width
UCC/EAN-128 with CC-C	Module width

② Recommended bar code height

Bar code version	Height *1
GS1 DataBar	33x or above
GS1 DataBar Truncated	13x
GS1 DataBar Stacked	5x/7x
GS1 DataBar Stacked Omnidirectional	33x or above
GS1 DataBar Limited	10x or above
GS1 DataBar Expanded	33x or above
GS1 DataBar Expanded Stacked	33x or above
UPC-A	74x
UPC-E	74x
EAN-13	74x
EAN-8	60x
UCC/EAN-128 with CC-A or CC-B	25x
UCC/EAN-128 with CC-C	25x

*1: x = 1 module size

③ Bar code height calculation method

Example) In the following conditions:
203-dpi print head, Module width: 02, Recommended bar code height: 33x

(25.4 mm / 203 dpi) x 2 dots x 33x ≈ 8.25 mm

Since the height is specified in units of 0.1 mm, “0082” or “0083” is to be set as 8.25 mm.

④ Max. number of data digits

Version of bar code	Max. number of digits
GS1 DataBar	13 digits (Numeral only)
GS1 DataBar Truncated	13 digits (Numeral only)
GS1 DataBar Stacked	13 digits (Numeral only)
GS1 DataBar Stacked Omnidirectional	13 digits (Numeral only)
GS1 DataBar Limited	13 digits (Numeral only)
GS1 DataBar Expanded	74 digits (Numeral only) *1 41 digits (Alphabet only)
GS1 DataBar Expanded Stacked	74 digits (Numeral only) *1 41 digits (Alphabet only)
UPC-A	12 digits (Numeral only)
UPC-E	10 digits (Numeral only)
EAN-13	12 digits (Numeral only)
EAN-8	7 digits (Numeral only)
UCC/EAN-128 with CC-A or CC-B	48 digits
UCC/EAN-128 with CC-C	48 digits
Composite component CC-A or CC-B *4	Max. 338 digits *2
Composite component CC-C	Max. 2000 digits *3

*1: Max. 74 digits/41 digits, including AI and FID.

In the following cases, the print results vary in spite of the same number of digits.

Non printable: “1A2B3C4D5E6F7G8H9I0J1K2L3M4N5O6P7Q8R9S0T1U2V3W”
Printable: “ABCDEFGHIJKLMNOPQRSTUVW12345678901234567890123”

*2: Conditions to enable printing 1184 > X (See the following formula.)
When data includes only numbers: 1184 > (No. of numeric characters x 3.5)
This is just a rough formula and different depending on the way characters are included.

*3: Conditions to enable printing 8264 > X (See the following formula.)
When data includes only numbers: 8264 > (No. of numeric characters x 3.5)
This is just a rough formula and different depending on the way characters are included.
The number of digits including the data for the liner symbols must not exceed 2000.
Exceeded data is ignored.

*4: Selection between CC-A (MicroPDF417 variant) and CC-B (MicroPDF417) is automatically performed.

- GS1 DataBar Stacked, GS1 DataBar Stacked Omnidirectional, GS1 DataBar limited, UPC-E, EAN-8
  CC-A: 167 > X (See the following formula.)
  CC-B: 168 ≤ X (See the following formula.)
- GS1 DataBar, GS1 DataBar Expanded, GS1 DataBar Expanded Stacked, UPC-A, EAN-13, UCC/EAN-128 with CC=A or CC-B
  CC-A: 197 > X (See the following formula.)
  CC-B: 198 ≤ X (See the following formula.)

[How to calculate "X"]

X = (No. of numeric characters x 5)+(No. of capitals x 6)+(No. of small letters x 7)+(No. of symbols x 8)

*5: When UCC/EAN-128 with CC-A or CC-B is specified:
Encoding data exceeding 44 digits into MicroPDF (CC-A or CC-B) is not allowed due to the specification. The number of digits per line is restricted depending on the data volume for UCC/EAN-128. Generally, the bar code with the more data digits can take the more number of digits per line. To secure the more number of data digits for MicroPDF, data volume for UCC/EAN-128 need to be reduced. The printer will not draw a bar code if the number of data digits exceeds this specification.

*6: When UCC/EAN-128 with CC-C is specified:
Encoding data exceeding 90 digits into MicroPDF (CC-C) is not allowed due to the specification. The number of digits per line is restricted depending on the data volume for UCC/EAN-128. Generally, the bar code with the more data digits can take the more number of digits per line. To secure the more number of data digits for MicroPDF, data volume for UCC/EAN-128 need to be reduced. The printer will not draw a bar code if the number of data digits exceeds this specification.

*7: When GS1 Databar Expanded is specified:
It is possible for GS1Databar Expanded to encode 74-digit numeral and 41-digit alphabet. But if the number of elements of the encoding result exceeds 235 elements (*1) or the maximum number of modules (*2) exceeds 543 modules, the printer will not draw a bar code.
(*1) Element: The number of spaces and bars
The spaces at both sides of a bar code symbol are counted in.
(*2) Number of modules: Total number of space dots and bar dots
In the case 1 module equals to 1 dot, the bar code symbol is comprised of 543 dots at the maximum.

	Left guard	Check Chara.	Finder pattern 1	Data chara. 1	Data chara. 2	Finder pattern 2	Data chara. 3	. . .	Data chara. 20	Finder pattern 11	Data chara.21	Right guard
Element	2	8	5	8	8	5	8	. . .	8	5	8	2
Module	2	17	15	17	17	15	17	. . .	17	15	17	2

⑤ Check digit exclusively for each bar code version

Version of bar code	Check digit
GS1 DataBar (Truncated)	MOD79
GS1 DataBar Stacked	MOD79
GS1 DataBar Stacked Omnidirectional	MOD79
GS1 DataBar Limited	MOD89
GS1 DataBar Expanded	MOD211
GS1 DataBar Expanded Stacked	MOD211

For the check digit calculation method, refer to ISO 24724 or AIM ITS 99-001.

(15) RFID

[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	DEL								

All codes can be used. (00H to FFH)

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)

11.2 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 check digit affixed

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

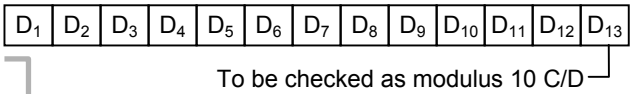
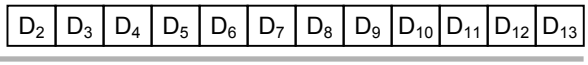
No. of Input Digits		
8 digits	Input Data	D_1 D_2 D_3 D_4 D_5 D_6 D_7 D_8 — To be checked as modulus 10 C/D
	Drawing Data	D_1 D_2 D_3 D_4 D_5 D_6 D_7 D_8
Other than 8 digits		Not to be drawn

(3) Auto affix of modulus 10

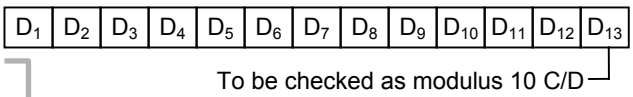
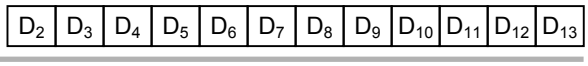
No. of Input Digits		
7 digits	Input Data	D_1 D_2 D_3 D_4 D_5 D_6 D_7
	Drawing Data	D_1 D_2 D_3 D_4 D_5 D_6 D_7 C/D — Affix a modulus 10 C/D.
Other than 7 digits		Not to be drawn

Type of Bar Code: JAN13, EAN13

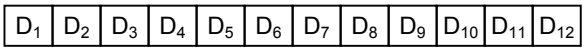
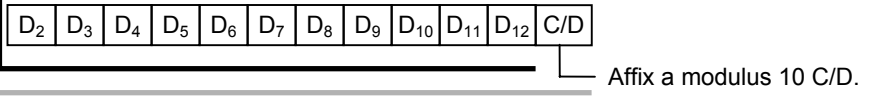
(1) No check digit affixed

No. of Input Digits		
13 digits	Input Data	
	Drawing Data	
Other than 13 digits		Not to be drawn

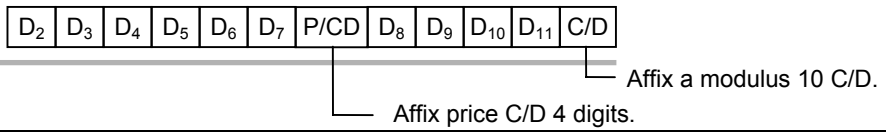
(2) Modulus 10 check

No. of Input Digits		
13 digits	Input Data	
	Drawing Data	
Other than 13 digits		Not to be drawn

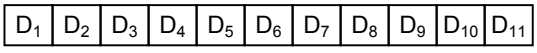
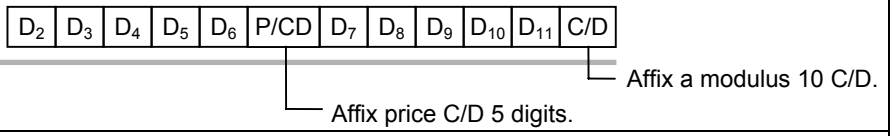
(3) Auto affix of modulus 10

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

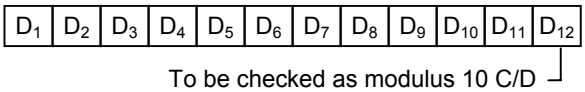
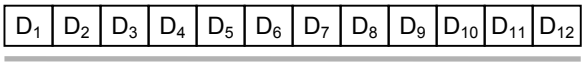
No. of Input Digits		
11 digits	Input Data	
	Drawing Data	
Other than 11 digits		Not to be drawn

(5) Auto affix of modulus 10 + Price C/D 5 digits

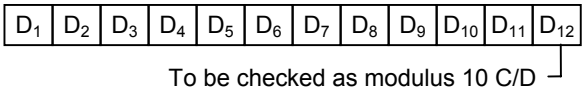
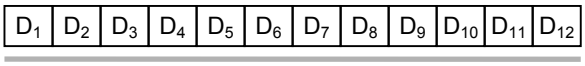
No. of Input Digits		
11 digits	Input Data	
	Drawing Data	
Other than 11 digits		Not to be drawn

Type of Bar Code: UPC-A

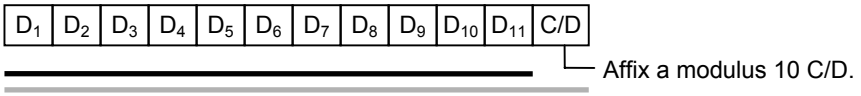
(1) No check digit affixed

No. of Input Digits		
12 digits	Input Data	
	Drawing Data	
Other than 12 digits		Not to be drawn

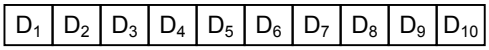
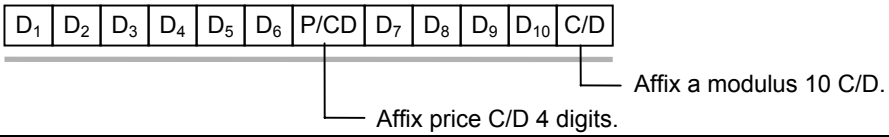
(2) Modulus 10 check

No. of Input Digits		
12 digits	Input Data	
	Drawing Data	
Other than 12 digits		Not to be drawn

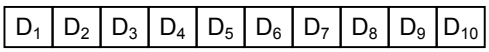
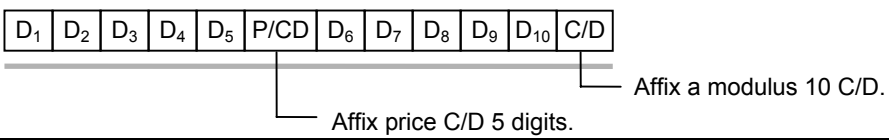
(3) Auto affix of modulus 10

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 check digit affixed

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

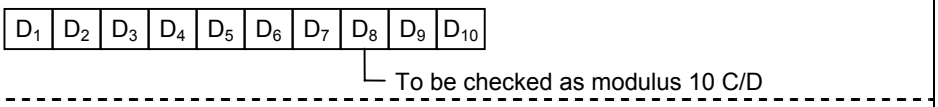
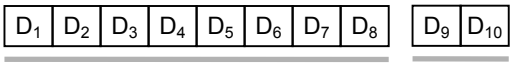
No. of Input Digits		
7 digits	Input Data	D_1 D_2 D_3 D_4 D_5 D_6 D_7 — To be checked as modulus 10 C/D
	Drawing Data	0 D_1 D_2 D_3 D_4 D_5 D_6 D_7
Other than 7 digits		Not to be drawn

(3) Auto affix of modulus 10

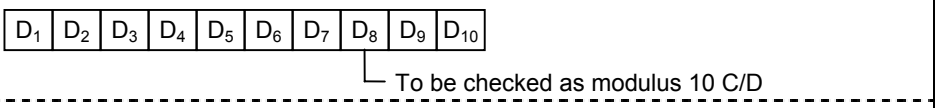
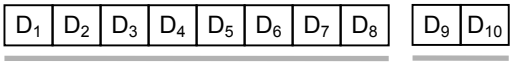
No. of Input Digits		
6 digits	Input Data	D_1 D_2 D_3 D_4 D_5 D_6 Calculate and reflect modulus 10 in the bar code.
	Drawing Data	0 D_1 D_2 D_3 D_4 D_5 D_6 C/D
Other than 6 digits		Not to be drawn

Type of Bar Code: JAN8 + 2 digits, EAN8 + 2 digits

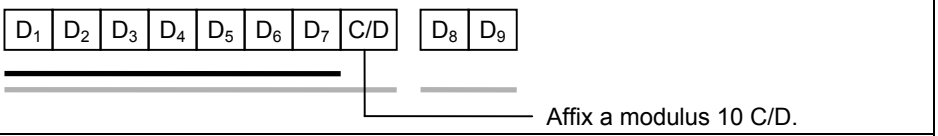
(1) No check digit affixed

No. of Input Digits		
10 digits	Input Data	
	Drawing Data	
Other than 10 digits		Not to be drawn

(2) Modulus 10 check

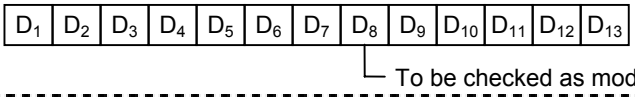
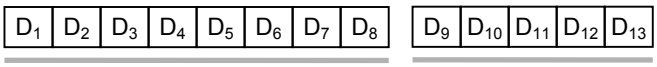
No. of Input Digits		
10 digits	Input Data	
	Drawing Data	
Other than 10 digits		Not to be drawn

(3) Auto affix of modulus 10

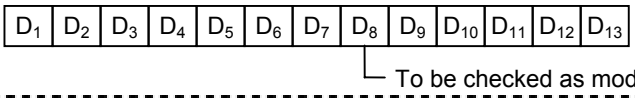
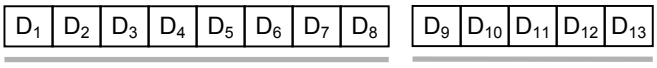
No. of Input Digits		
9 digits	Input Data	
	Drawing Data	
Other than 9 digits		Not to be drawn

Type of Bar Code: JAN8 + 5 digits, EAN8 + 5 digits

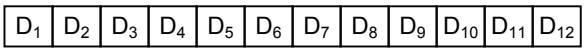
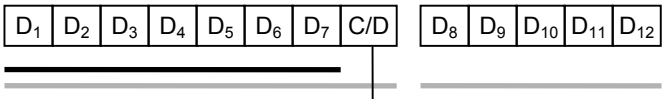
(1) No check digit affixed

No. of Input Digits		
13 digits	Input Data	
	Drawing Data	
Other than 13 digits		Not to be drawn

(2) Modulus 10 check

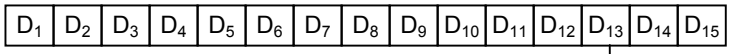
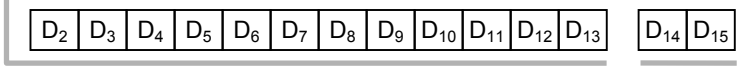
No. of Input Digits		
13 digits	Input Data	
	Drawing Data	
Other than 13 digits		Not to be drawn

(3) Auto affix of modulus 10

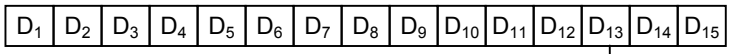
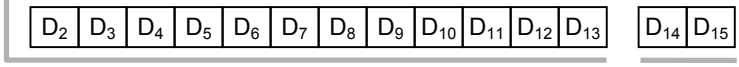
No. of Input Digits		
12 digits	Input Data	
	Drawing Data	
Other than 12 digits		Not to be drawn

Type of Bar Code: JAN13 + 2 digits, EAN13 + 2 digits

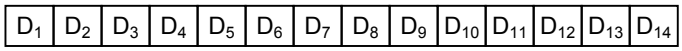
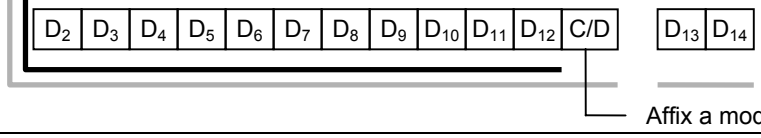
(1) No check digit affixed

No. of Input Digits		
15 digits	Input Data	
	Drawing Data	
Other than 15 digits		Not to be drawn

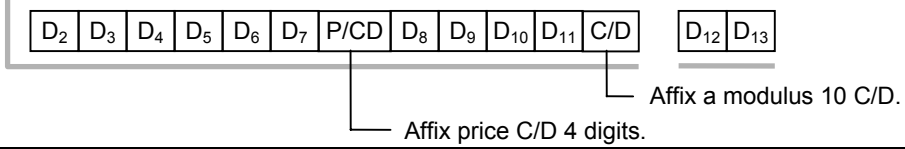
(2) Modulus 10 check

No. of Input Digits		
15 digits	Input Data	
	Drawing Data	
Other than 15 digits		Not to be drawn

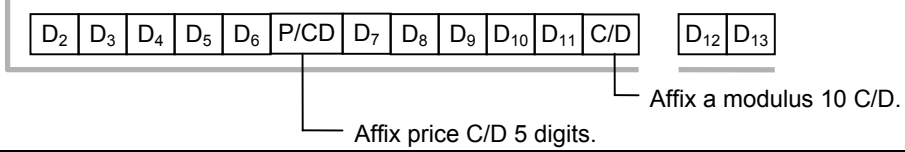
(3) Auto affix of modulus 10

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

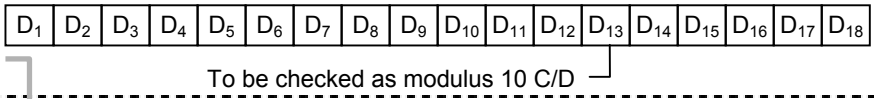
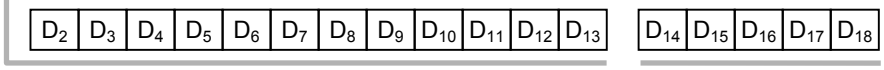
No. of Input Digits		
13 digits	Input Data	
	Drawing Data	
Other than 13 digits		Not to be drawn

(5) Auto affix of modulus 10 + Price C/D 5 digits

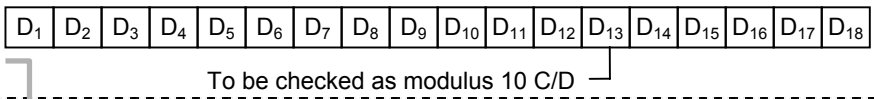
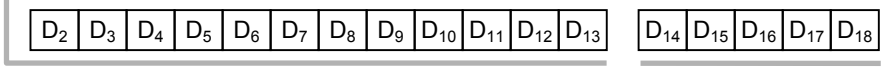
No. of Input Digits		
13 digits	Input Data	
	Drawing Data	
Other than 13 digits		Not to be drawn

Type of Bar Code: JAN13 + 5 digits, EAN13 + 5 digits

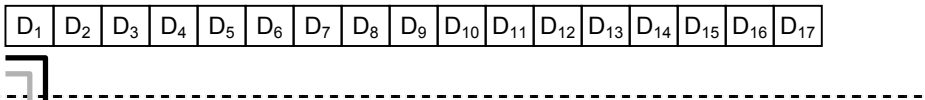
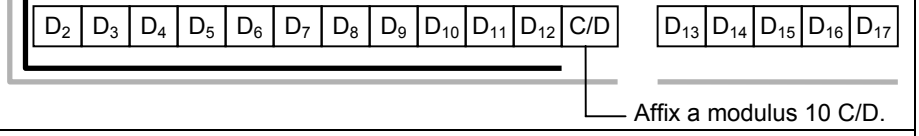
(1) No check digit affixed

No. of Input Digits		
18 digits	Input Data	
	Drawing Data	
Other than 18 digits		Not to be drawn

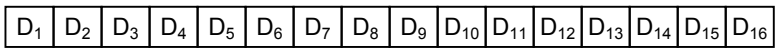
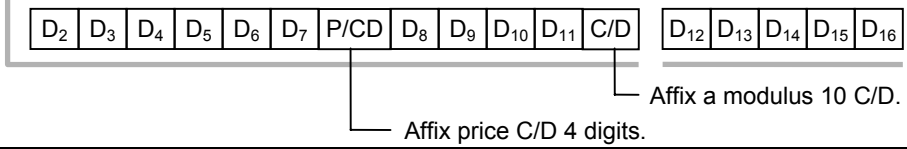
(2) Modulus 10 check

No. of Input Digits		
18 digits	Input Data	
	Drawing Data	
Other than 18 digits		Not to be drawn

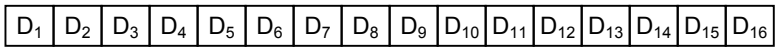
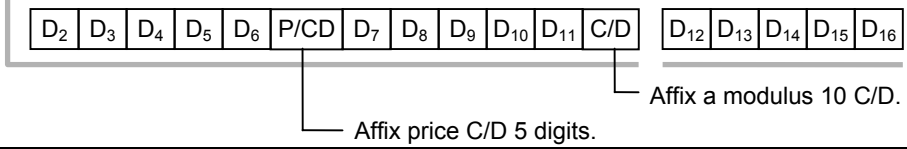
(3) Auto affix of modulus 10

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

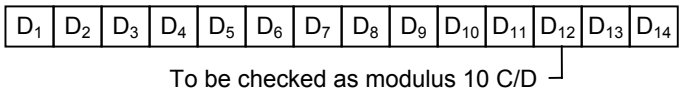
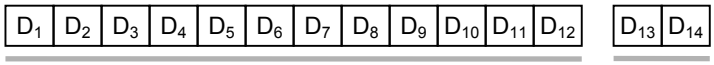
No. of Input Digits		
16 digits	Input Data	
	Drawing Data	
Other than 16 digits		Not to be drawn

(5) Auto affix of modulus 10 + Price C/D 5 digits

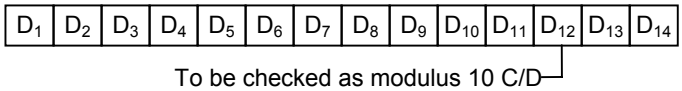
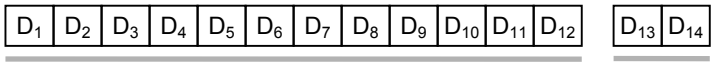
No. of Input Digits		
16 digits	Input Data	
	Drawing Data	
Other than 16 digits		Not to be drawn

Type of Bar Code: UPC-A + 2 digits

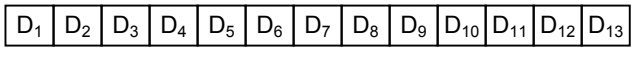
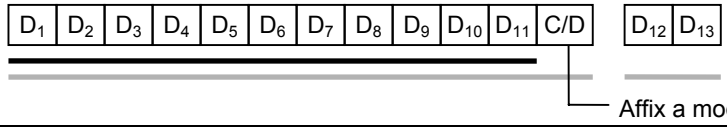
(1) No check digit affixed

No. of Input Digits		
14 digits	Input Data	
	Drawing Data	
Other than 14 digits		Not to be drawn

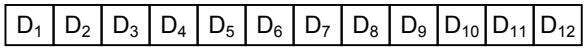
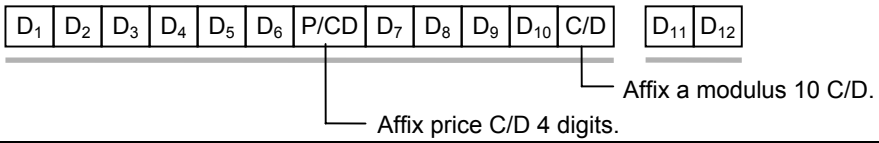
(2) Modulus 10 check

No. of Input Digits		
14 digits	Input Data	
	Drawing Data	
Other than 14 digits		Not to be drawn

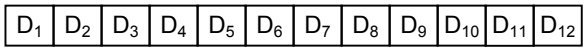
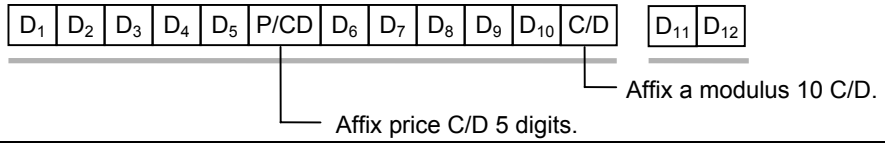
(3) Auto affix of modulus 10

No. of Input Digits		
13 digits	Input Data	
	Drawing Data	
Other than 13 digits		Not to be drawn

(4) Auto affix of modulus 10 + Price C/D 4 digits

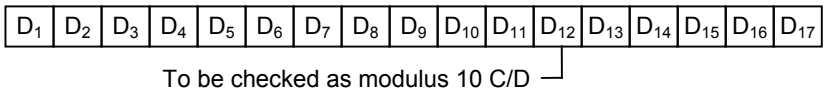
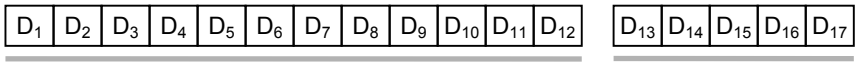
No. of Input Digits		
12 digits	Input Data	
	Drawing Data	
Other than 12 digits		Not to be drawn

(5) Auto affix of modulus 10 + Price C/D 5 digits

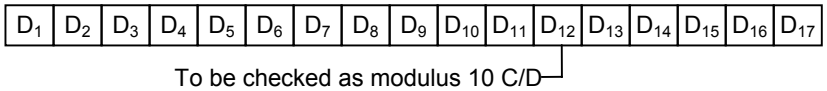
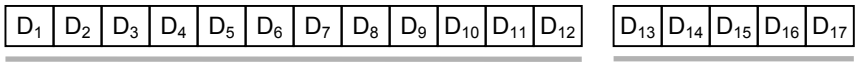
No. of Input Digits		
12 digits	Input Data	
	Drawing Data	
Other than 12 digits		Not to be drawn

Type of Bar Code: UPC-A + 5 digits

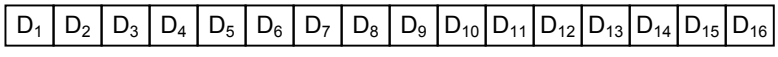
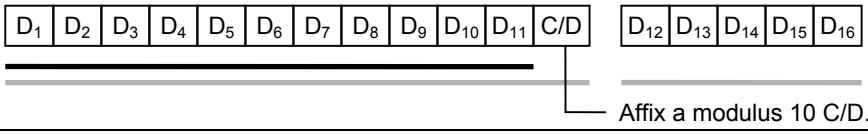
(1) No check digit affixed

No. of Input Digits		
17 digits	Input Data	
	Drawing Data	
Other than 17 digits		Not to be drawn

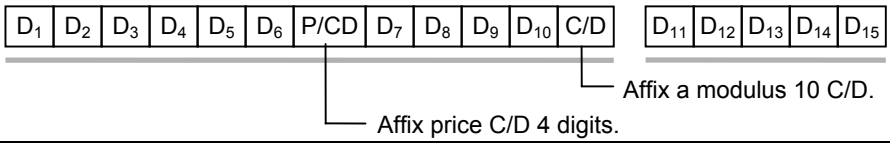
(2) Modulus 10 check

No. of Input Digits		
17 digits	Input Data	
	Drawing Data	
Other than 17 digits		Not to be drawn

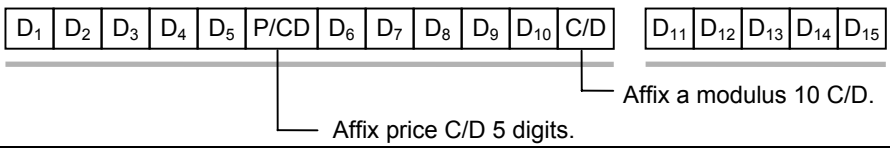
(3) Auto affix of modulus 10

No. of Input Digits		
16 digits	Input Data	
	Drawing Data	
Other than 16 digits		Not to be drawn

(4) Auto affix of modulus 10 + Price C/D 4 digits

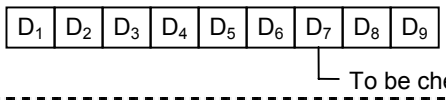
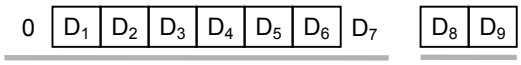
No. of Input Digits		
15 digits	Input Data	
	Drawing Data	
Other than 15 digits		Not to be drawn

(5) Auto affix of modulus 10 + Price C/D 5 digits

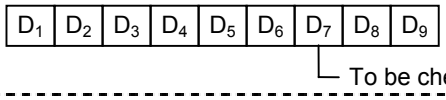
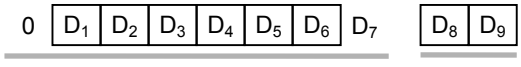
No. of Input Digits		
15 digits	Input Data	
	Drawing Data	
Other than 15 digits		Not to be drawn

Type of Bar Code: UPC-E + 2 digits

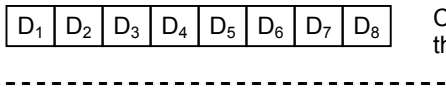
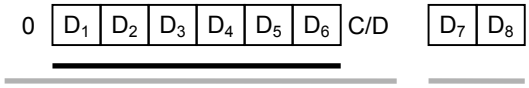
(1) No check digit affixed

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	
	Drawing Data	
Other than 8 digits		Not to be drawn

Type of Bar Code: UPC-E + 5 digits

(1) No check digit affixed

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 check digit affixed

No. of Input Digits		
Max. 15 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	D_1 D_2 D_3 D_4 D_5 D_6 D_7 D_8 D_9
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	D_1 D_2 D_3 D_4 D_5 D_6 D_7 D_8 D_9 D_{10} — To be checked as IBM modulus 10
	Drawing Data	D_1 D_2 D_3 D_4 D_5 D_6 D_7 D_8 D_9 D_{10}
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	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 IBM modulus 10.
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	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_1 C/D_2 — Affix IBM modulus 10. — Affix IBM modulus 10.
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	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_1 C/D_2 — Affix IBM modulus 10. — Affix IBM modulus 11.
14 digits or more		Not to be drawn

Type of Bar Code: Interleaved 2 of 5

(1) No check digit affixed

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

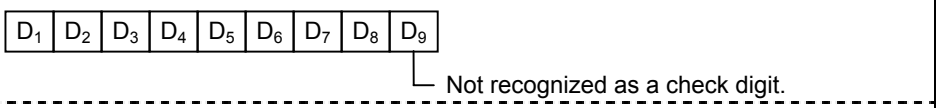
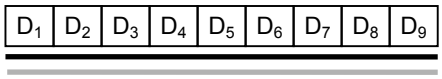
No. of Input Digits		
Max. 125 digits	Input Data	D_1 D_2 D_3 D_4 D_5 D_6 D_7 D_8 D_9
	Drawing Data	D_1 D_2 D_3 D_4 D_5 D_6 D_7 D_6 D_9 C/D — Affix a modulus 10 C/D.
126 digits or more		Not to be drawn

(4) Auto affix of DBP modulus 10

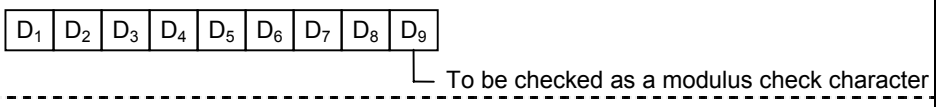
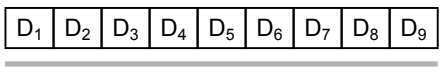
No. of Input Digits		
Max. 125 digits	Input Data	D_1 D_2 D_3 D_4 D_5 D_6 D_7 D_8 D_9
	Drawing Data	D_1 D_2 D_3 D_4 D_5 D_6 D_7 D_6 D_9 C/D — Affix a DBP modulus 10 C/D.
126 digits or more		Not to be drawn

Type of Bar Code: Industrial 2 of 5

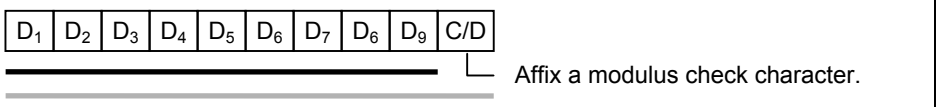
(1) No check digit affixed

No. of Input Digits		
Max. 126 digits	Input Data	
	Drawing Data	
127 digits or more		Not to be drawn

(2) Modulus check character check

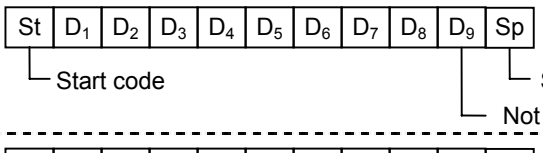
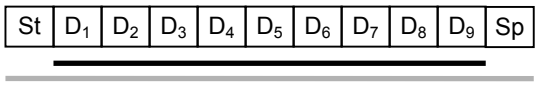
No. of Input Digits		
Min. 2 digits Max. 126 digits (including C/D)	Input Data	
	Drawing Data	
1 digit 127 digits or more		Not to be drawn

(3) Auto affix of modulus check character

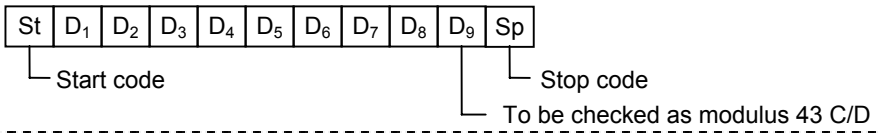
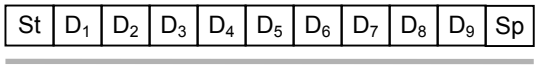
No. of Input Digits		
Max. 125 digits	Input Data	
	Drawing Data	
126 digits or more		Not to be drawn

Type of Bar Code: CODE39 (Standard)

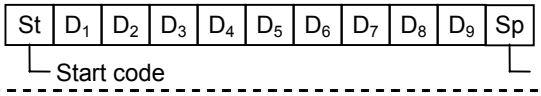
(1) No check digit affixed

No. of Input Digits		
Max. 123 digits	Input Data	
	Drawing Data	
124 digits or more		Not to be drawn

(2) Modulus 43 check

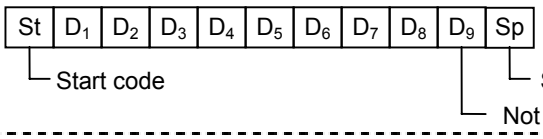
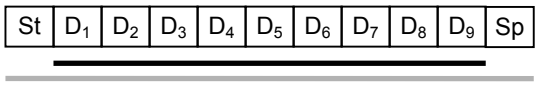
No. of Input Digits		
Min. 2 digits Max. 123 digits (including C/D)	Input Data	
	Drawing Data	
1 digit 124 digits or more		Not to be drawn

(3) Auto affix of modulus 43

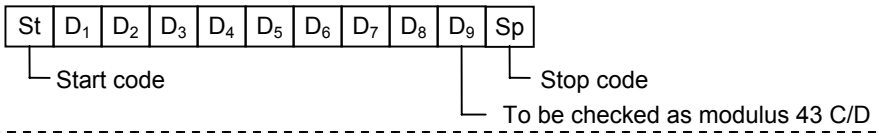
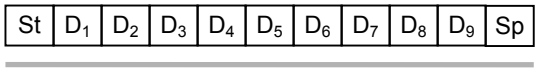
No. of Input Digits		
Max. 122 digits	Input Data	
	Drawing Data	
123 digits or more		Not to be drawn

Type of Bar Code: CODE39 (Full ASCII)

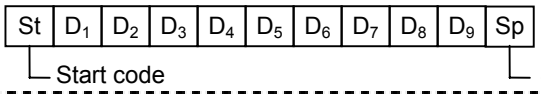
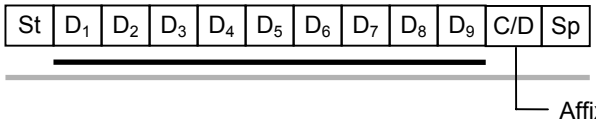
(1) No check digit affixed

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

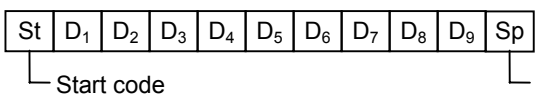
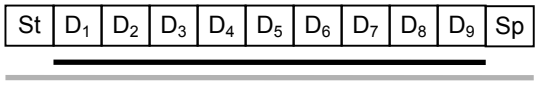
(3) Auto affix of modulus 43

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 check digit affixed
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 check digit affixed
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 check digit affixed
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 check digit affixed
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 Start code Affix a modulus 47 "C" C/D. Affix a modulus 47 "K" C/D. Stop code
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 check digit affixed
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 C/D Sp Fr D_6 D_7 D_8 D_9 D_{10} D_{11} C/D Fr Start code Frame Frame Stop code 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 check digit affixed

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, 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		
Up to 74 digits	Input Data	D_1 D_2 D_3 D_4 D_5 ▪ ▪ ▪ D_{70} D_{71} D_{72} D_{73} D_{74}
	Drawing Data	D_1 D_2 D_3 D_4 D_5 ▪ ▪ ▪ D_{70} D_{71} D_{72} D_{73} D_{74} C/D Dedicated check digit
75 digits or more		Not to be drawn ***NOTE:*** *Some data cannot be drawn even if the number of input digits is less than 74.*

Type of Bar Code: (GS1 DataBar family) UPC-A

(1) Auto affix of Modulus 10

No. of Input Digits		
Less than 11 digits	Input Data	D_1 D_2 D_3 D_4 D_5 D_6 D_7 D_8
	Drawing Data	0 0 0 D_1 D_2 D_3 D_4 D_5 D_6 D_7 D_8 C/D Zero-filled — Modulus 10 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	D_1 D_2 D_3 D_4 D_5 D_6 D_7 D_8 D_9 D_{10} D_{11} C/D Modulus 10 check digit
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 D_7 D_8 D_9 D_{10} D_{11} D_{12} C/D Modulus 10 check digit
13 digits or more		Not to be drawn.

Type of Bar Code: (GS1 DataBar family) UPC-E

(1) Auto affix of Modulus 10

No. of Input Digits		
Less than 3 digits	Input Data	D_1 D_2
	Drawing Data	0 0 0 D_1 D_2 0 C/D Zero-filled — Modulus 10 check digit
10 digits	Input Data	D_1 D_2 0 0 0 0 0 D_3 D_4 D_5 **AB**000 - 00**XYZ** **AB**100 - 00**XYZ** **AB**200 - 00**XYZ** **ABC**00 - 000**YZ** **ABCD**0 - 0000**Z** **ABCDE** - 0000**Z** Note: "Z" is replaceable only with any of 5 to 9.
	Drawing Data	0 D_1 D_2 D_3 D_4 D_5 0 C/D Modulus 10 check digit
Others		Not to be drawn.

Type of Bar Code: (GS1 DataBar family) EAN-8

(1) Auto affix of Modulus 10

No. of Input Digits		
Less than 7 digits	Input Data	D_1 D_2 D_3
	Drawing Data	0 0 0 0 D_1 D_2 D_3 C/D Zero-filled Modulus 10 check digit
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 Modulus 10 check digit
8 digits or more		Not to be drawn

Type of Bar Code: (GS1 DataBar family) EAN13

(1) Auto affix of Modulus 10

No. of Input Digits		
Less than 12 digits	Input Data	D_1 D_2 D_3
	Drawing Data	0 0 0 0 0 0 0 0 0 D_1 D_2 D_3 C/D Zero-filled Modulus 10 check digit
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 D_7 D_8 D_9 D_{10} D_{11} D_{12} C/D Modulus 10 check digit
13 digits or more		Not to be drawn.

Type of Bar Code: (GS1 DataBar family) UCC/EAN128

(1) Auto affix of C/D

No. of Input Digits		
Up to 48 digits	Input Data	D_1 D_2 D_3 D_4 D_5 D_6 --- D_{43} D_{44} D_{45} D_{46} D_{47} D_{48}
	Drawing Data	St FNC1 D_1 D_2 D_3 D_4 D_5 D_6 --- D_{43} D_{44} D_{45} D_{46} D_{47} D_{48} C/D_1 Sp Start code Modulus 10 check digit Stop code
49 digits or more		Not to be drawn.

11.3. 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