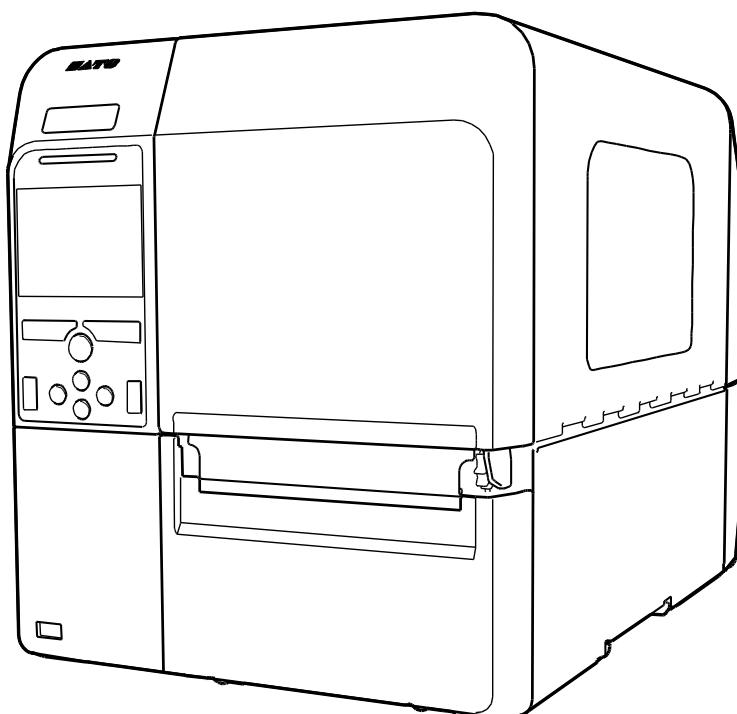




Programming Reference

For printer model:

CL4NX
CL6NX



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Part 1 Programming Reference

1 List of Commands

The following are the commands specified in the Specification for Command.

Yes: Available / No: Not available

Control

No.	Command	Function	CL4NX	CL6NX	On page	
5.1	ESC+A	<A>	Start Code	Yes	Yes	10
5.2	ESC+Z	<Z>	Stop Code	Yes	Yes	11
5.3	ESC+Q	<Q>	Print Quantity	Yes	Yes	12
5.4	ESC+ID	<ID>	Job ID Number	Yes	Yes	13
5.5	ESC+WK	<WK>	Job Name	Yes	Yes	14
5.6	ESC+CR	<CR>	Status 5 Reply Check Setting	Yes	Yes	15

Print Position

No.	Command	Function	CL4NX	CL6NX	On page	
6.1	ESC+H	<H>	Horizontal Print Position	Yes	Yes	16
6.2	ESC+V	<V>	Vertical Print Position	Yes	Yes	17

Modification

No.	Command	Function	CL4NX	CL6NX	On page	
7.1	ESC+P	<P>	Character Pitch	Yes	Yes	18
7.2	ESC+L	<L>	Enlargement	Yes	Yes	19
7.3	ESC+PS	<PS>	Proportional Pitch	Yes	Yes	20
7.4	ESC+PR	<PR>	Release Proportional Pitch	Yes	Yes	21
7.5	ESC+%	<%>	Rotation	Yes	Yes	22
7.6	ESC+F	<F>	Sequential Number	Yes	Yes	24
7.7	ESC+FW	<FW>	Ruled / Grid Line Print	Yes	Yes	25
7.8	ESC+FC	<FC>	Print Circle	Yes	Yes	26
7.9	ESC+FT	<FT>	Print Triangle	Yes	Yes	27
7.10	ESC+(<>	Reverse Color Print	Yes	Yes	28
7.11	ESC+KC	<KC>	Kanji Code	Yes	Yes	29
7.12	ESC+&	<&>	Store Form Overlay	Yes	Yes	30
7.13	ESC+/-	</>	Recall Form Overlay	Yes	Yes	31
7.14	ESC+0	<0>	Partial Edit	Yes	Yes	32
7.15	ESC+WD	<WD>	Partial Copy	Yes	Yes	33
7.16	ESC+J	<J>	Journal Print	Yes	Yes	34
7.17	ESC+RF	<RF>	Recall Font & Logo	Yes	Yes	35
7.18	ESC+RM	<RM>	Mirror Image	Yes	Yes	36
7.19	ESC+KS	<KS>	Kanji Set	Yes	Yes	38
7.20	ESC+AL	<AL>	Field Alignment	Yes	Yes	39

Font

No.	Command	Function	CL4NX	CL6NX	On page	
8.1	ESC+X20	<X20>	X20 Font(Basic size 5X9 dots)	Yes	Yes	45
8.2	ESC+X21	<X21>	X21 Font(Basic size 17X17 dots)	Yes	Yes	47
8.3	ESC+X22	<X22>	X22 Font(Basic size 24X24 dots)	Yes	Yes	49
8.4	ESC+X23	<X23>	X23 Font(Basic size 48X48 dots)	Yes	Yes	51
8.5	ESC+X24	<X24>	X24 Font(Basic size 48X48 dots)	Yes	Yes	53
8.6	ESC+XU	<XU>	XU Font(Basic size 5X9 dots)	Yes	Yes	55
8.7	ESC+XS	<XS>	XS Font(Basic size 17X17 dots)	Yes	Yes	57
8.8	ESC+XM	<XM>	XM Font(Basic size 24X24 dots)	Yes	Yes	59
8.9	ESC+XB	<XB>	XB Font(Basic size 48X48 dots)	Yes	Yes	61
8.10	ESC+XL	<XL>	XL Font(Basic size 48X48 dots)	Yes	Yes	63
8.11	ESC+OA	<OA>	OCR-A Font	Yes	Yes	65
8.12	ESC+OB	<OB>	OCR-B Font	Yes	Yes	67
8.13	ESC+U	<U>	U Font(Basic size 5X9 dots)	Yes	Yes	69
8.14	ESC+S	<S>	S Font(Basic size 8X15 dots)	Yes	Yes	71
8.15	ESC+M	<M>	M Font(Basic size 13X20 dots)	Yes	Yes	73
8.16	ESC+WB	<WB>	WB Font(Basic size 18X30 dots)	Yes	Yes	75
8.17	ESC+WL	<WL>	WL Font(Basic size 28X52 dots)	Yes	Yes	77
8.18	ESC+\$	<\$>	Outline Font Design	Yes	Yes	79
8.19	ESC+\$=	<\$=>	Outline Font Print	Yes	Yes	81
8.20	ESC+RD	<RD>	CG Font	Yes	Yes	83
8.21	ESC+RG	<RG>	Multiple Language	Yes	Yes	87
8.22	ESC+RH	<RH>	Scalable Font	Yes	Yes	91

8.23	ESC+K1	<K1>	16x16 dots Kanji in Horizontal line	Yes	Yes	94
8.24	ESC+K2	<K2>	24x24 dots Kanji in Horizontal Line	Yes	Yes	95
8.25	ESC+K3	<K3>	22x22 dots Kanji in Horizontal Line	Yes	Yes	96
8.26	ESC+K4	<K4>	32x32 dots Kanji in Horizontal Line	Yes	Yes	97
8.27	ESC+K5	<K5>	40x40 dots Kanji in Horizontal Line	Yes	Yes	98
8.28	ESC+K8	<K8>	16x16 dots Kanji in Horizontal Line with 1-byte Character	Yes	Yes	99
8.29	ESC+K9	<K9>	24x24 dots Kanji in Horizontal Line with 1-byte Character	Yes	Yes	100
8.30	ESC+KA	<KA>	22x22 dots Kanji in Horizontal Line with 1-byte Character	Yes	Yes	101
8.31	ESC+KB	<KB>	32x32 dots Kanji in Horizontal Line with 1-byte Character	Yes	Yes	102
8.32	ESC+KD	<KD>	40x40 dots Kanji in Horizontal Line with 1-byte Character	Yes	Yes	103
8.33	ESC+k1	<k1>	16x16 dots Kanji in Vertical Line	Yes	Yes	104
8.34	ESC+k2	<k2>	24x24 dots Kanji in Vertical Line	Yes	Yes	105
8.35	ESC+k3	<k3>	22x22 dots Kanji in Vertical Line	Yes	Yes	106
8.36	ESC+k4	<k4>	32x32 dots Kanji in Vertical Line	Yes	Yes	107
8.37	ESC+k5	<k5>	40x40 dots Kanji in Vertical Line	Yes	Yes	108
8.38	ESC+k8	<k8>	16x16 dots Kanji in Vertical Line with 1-byte Character	Yes	Yes	109
8.39	ESC+k9	<k9>	24x24 dots Kanji in Vertical Line with 1-byte Character	Yes	Yes	110
8.40	ESC+KA	<KA>	22x22 dots Kanji in Vertical Line with 1-byte Character	Yes	Yes	111
8.41	ESC+KB	<KB>	32x32 dots Kanji in Vertical Line with 1-byte Character	Yes	Yes	112
8.42	ESC+KD	<KD>	40x40 dots Kanji in Vertical Line with 1-byte Character	Yes	Yes	113
8.43	ESC+T1	<T1>	16x16 dots External Font Registration	Yes	Yes	114
8.44	ESC+T2	<T2>	24x24 dots External Font Registration	Yes	Yes	116
8.45	ESC+K1(K2)	<K1(K2)>	Recall Horizontal Writing External Character	Yes	Yes	118
8.46	ESC+k1(k2)	<k1(k2)>	Recall Vertical Writing External Character	Yes	Yes	120

Barcode

No.	Command	Function	CL4NX	CL6NX	On page	
9.1	ESC+B		Barcode (Ratio 1:3)	Yes	Yes	126
9.2	ESC+D	<D>	Barcode (Ratio 1:2)	Yes	Yes	128
9.3	ESC+D to ESC+d	<D>~<d>	Barcode (with HRI)	Yes	Yes	130
9.4	ESC+BD	<BD>	Barcode (Ratio 2:5)	Yes	Yes	131
9.5	ESC+BT	<BT>	Barcode Ratio Registration	Yes	Yes	133
9.6	ESC+BW	<BW>	Print of Barcode by Specified Ratio	Yes	Yes	134
9.7	ESC+BC	<BC>	CODE 93 Barcode	Yes	Yes	137
9.8	ESC+BF	<BF>	UPC Add-on (Book land)	Yes	Yes	139
9.9	ESC+BG	<BG>	CODE128 Barcode	Yes	Yes	141
9.10	ESC+BI	<BI>	GS1-128(UCC/EAN 128)(Standard Carton ID Only)	Yes	Yes	145
9.11	ESC+BP	<BP>	Post net	Yes	Yes	147
9.12	ESC+BS	<BS>	USPS Barcode	Yes	Yes	149
9.13	ESC+EU	<EU>	Composite Symbol	Yes	Yes	151
9.14	ESC+BL	<BL>	UPC-A Barcode (Without HRI)	Yes	Yes	155
9.15	ESC+BL to ESC+d	<BL>~<d>	UPC-A Barcode (Without HRI)	Yes	Yes	156
9.16	ESC+BM	<BM>	UPC-A Barcode (With HRI)	Yes	Yes	158
9.17	ESC+BZ	<BZ>	Customer Barcode	Yes	Yes	159

2D code

No.	Command	Function	CL4NX	CL6NX	On page	
10.1	ESC+2D10	<2D10>	PDF417	Yes	Yes	161
10.2	ESC+2D12	<2D12>	Micro PDF417	Yes	Yes	164
10.3	ESC+2D20	<2D20>	MAXI Code	Yes	Yes	167
10.4	ESC+2D30	<2D30>	QR Code(Model 2)	Yes	Yes	169
10.5	ESC+2D31	<2D31>	QR Code(Model 1)	Yes	Yes	173
10.6	ESC+2D32	<2D32>	Micro QR Code	Yes	Yes	176
10.7	ESC+2D50	<2D50>	Datamatrix(ECC200)	Yes	Yes	201
10.8	ESC+2D51	<2D51>	GS1 Data matrix	Yes	Yes	204
10.9	ESC+2D70	<2D70>	Aztec Barcode	Yes	Yes	207
10.10	ESC+BQ	<BQ>	QR Code(Compatible Commands)	Yes	Yes	211
10.11	ESC+BV	<BV>	Maxi Code(Compatible Commands)	Yes	Yes	236
10.12	ESC+BK	<BK>	PDF417(Compatible Commands)	Yes	Yes	238
10.13	ESC+BX	<BX>	Data matrix (ECC200) (Compatible Commands)	Yes	Yes	241
10.14	ESC+DC	<DC>	Data matrix (ECC200) Data Specify(Compatible Commands)	Yes	Yes	242
10.15	ESC+FX	<FX>	Data matrix (ECC200) Sequential Number(Compatible Commands)	Yes	Yes	243
10.16	ESC+QV	<QV>	QR Code Version	Yes	Yes	245

Graphic

No.	Command	Function	CL4NX	CL6NX	On page
11.1	ESC+G <G>	Graphic Print	Yes	Yes	246
11.2	ESC+GM <GM>	BMP File Print	Yes	Yes	247
11.3	ESC+GP <GP>	PCX File Print	Yes	Yes	248

System

No.	Command	Function	CL4NX	CL6NX	On page
12.1	ESC+CS <CS>	Print Speed	Yes	Yes	249
12.2	ESC+#F <#F>	Print Darkness	Yes	Yes	250
12.3	ESC+#E <#E>	Print Darkness (Compatible Command)	Yes	Yes	251
12.4	ESC+A1 <A1>	Media Size	Yes	Yes	252
12.5	ESC+A3 <A3>	Base Reference Point	Yes	Yes	254
12.6	ESC+EP <EP>	Print End Position	Yes	Yes	255
12.7	ESC+~ <~>	Multiple Cut	Yes	Yes	257
12.8	ESC+CT <CT>	Cut Number Unit	Yes	Yes	258
12.9	ESC+NC <NC>	Eject and Cut	Yes	Yes	259
12.10	ESC+~A <~A>	Cut Number Unit	Yes	Yes	260
12.11	ESC+~B <~B>	Eject and Cut	Yes	Yes	261
12.12	ESC+* <*>	Memory Clear	Yes	Yes	262
12.13	ESC+@ <@>	Offline	Yes	Yes	263
12.14	ESC+C <C>	Reprint	Yes	Yes	264
12.15	ESC+E <E>	Auto Line Feed	Yes	Yes	265
12.16	ESC+PO <PO>	Offset	Yes	Yes	266
12.17	ESC+IG <IG>	Sensor Type	Yes	Yes	267
12.18	ESC+PH <PH>	Print Method	Yes	Yes	268
12.19	ESC+PM <PM>	Print Mode	Yes	Yes	269
12.20	ESC+KM <KM>	Mincho (Kanji)	Yes	Yes	270
12.21	ESC+KG <KG>	Gothic (Kanji)	Yes	Yes	271
12.22	ESC+CE <CE>	European Code Page	Yes	Yes	272
12.23	ESC+TK <TK>	Forced Tear-Off	Yes	Yes	274
12.24	ESC+TW <TW>	Option Waiting Time	Yes	Yes	275
12.25	ESC+CL <CL>	Delete CR/LF	Yes	Yes	276

Calendar Command

No.	Command	Function	CL4NX	CL6NX	On page
13.1	ESC+WT <WT>	Calendar Setup(*1)	Yes	Yes	277
13.2	ESC+WP <WP>	Calendar Arithmetic (Add) (*1)	Yes	Yes	278
13.3	ESC+WA <WA>	Calendar Print(*1)	Yes	Yes	279

(*1) Option: Calendar IC

Memory Card

No.	Command	Function	CL4NX	CL6NX	On page
14.1	ESC+CC <CC>	Card Slot for Use	Yes	Yes	281
14.2	ESC+FM <FM>	Memory Card Initialization	Yes	Yes	282
14.3	ESC+BJF <BJF>	Memory Card Initialization	Yes	Yes	283
14.4	ESC+FP <FP>	Memory Card Status Print	Yes	Yes	284
14.5	ESC+BJS <BJS>	Memory Card Status Print	Yes	Yes	285
14.6	ESC+&S <&S>	Form Overlay Registration	Yes	Yes	286
14.7	ESC+&R <&R>	Form Overlay Call	Yes	Yes	288
14.8	ESC+YS <YS>	Format Registration	Yes	Yes	289
14.9	ESC+<N>	Registration of Field	Yes	Yes	292
14.10	ESC+YR <YR>	Format Call	Yes	Yes	293
14.11	ESC+D <D>	Print of Field	Yes	Yes	294
14.12	ESC+GI <GI>	Registration of Graphic	Yes	Yes	295
14.13	ESC+GR <GR>	Graphic Call	Yes	Yes	296
14.14	ESC+GT <GT>	BMP File Registration	Yes	Yes	297
14.15	ESC+GC <GC>	BMP File Call	Yes	Yes	298
14.16	ESC+PI <PI>	PCX File Registration	Yes	Yes	299
14.17	ESC+PY <PY>	PCX File Call	Yes	Yes	300
14.18	ESC+* <*>	Memory Card Clear	Yes	Yes	301
14.19	ESC+T1 <T1>	Memory Card 16x16 dots External Font Registration	Yes	Yes	302
14.20	ESC+T2 <T2>	Memory Card 24x24 dots External Font Registration	Yes	Yes	304
14.21	ESC+K1 ESC+K2 <K1> <K2>	Horizontal Writing External Font Call	Yes	Yes	306
14.22	ESC+K1 ESC+K2 <K1> <K2>	Vertical Writing External Font Call	Yes	Yes	307
14.23	ESC+BL ESC+BJD <BJ> <BJD>	True Type Font Registration(Compatible Commands)	Yes	Yes	308
14.24	ESC+BJT <BJT>	True Type Font Call(Compatible Commands)	Yes	Yes	309

Intelligent

No.	Command	Function	CL4NX	CL6NX	On page	
15.1	ESC+IK	<IK>	Label Feed Control	Yes	Yes	310

RFID

No.	Command	Function	CL4NX	CL6NX	On page	
16.1	ESC+IP0	<IP0>	EPC Code Write(UHF) (*1)	Yes	No	313
16.2	ESC+F	<F>	EPC Sequential Number(UHF) (*1)	Yes	No	324
16.3	ESC+IP5	<IP5>	Antenna Output Power(UHF) (*1)	Yes	No	325
16.4	ESC+TM	<TM>	Trademark Print(UHF) (*1)	Yes	No	327
16.5	ESC+TU	<TU>	Printing Tag Data(UHF) (*1)	Yes	No	328
16.6	ESC+RU	<RU>	EPC/TID Return(UHF) (*1)	Yes	No	331
16.7	ESC+RK	<RK>	RFID Write(ISO/IEC15693) (*1)	Yes	No	336
16.8	ESC+TU	<TU>	Printing Tag Data (ISO/IEC15693) (*1)	Yes	No	343
16.9	ESC+RU	<RU>	UID Return(ISO/IEC15693) (*1)	Yes	No	345
16.10	ESC+RK	<RK>	RFID Write(ISO/IEC14443 TypeA) (*1)	Yes	No	349
16.11	ESC+TU	<TU>	Printing Tag Data (ISO/IEC14443 TypeA) (*1)	Yes	No	374
16.12	ESC+RU	<RU>	UID Return(ISO/IEC14443 TypeA) (*1)	Yes	No	376
16.13	ESC+RK	<RK>	RFID Write(FeliCa) (*1)	Yes	No	380
16.14	ESC+TU	<TU>	Printing Tag Data (FeliCa) (*1)	Yes	No	394
16.15	ESC+RU	<RU>	IDm Return(FeliCa) (*1)	Yes	No	397

(*1) Option: RFID

Common Commands for All Languages

No.	Command	Function	CL4NX	CL6NX	On page
17.1	DC2+PA	Printer Setting Command	Yes	Yes	403
17.2	DC2+PB	Printer Setting Information Acquisition	Yes	Yes	427
17.3	DC2+PC	Printer Device Information Acquisition	Yes	Yes	429
17.4	DC2+PD	Each Sensor Information Acquisition	Yes	Yes	433
17.5	DC2+PG	Printer Status Information Acquisition	Yes	Yes	435
17.6	DC2+PH	Cancel Request	Yes	Yes	438
17.7	DC2+PI	Application Change	Yes	Yes	439
17.8	DC2+PJ	EPC Code Read(UHF) (*1)	Yes	No	441
17.9	DC2+PK	EPC/TID Return Request(UHF) (*1)	Yes	No	444
17.10	DC2+PJ	RFID Read(ISO/IEC15693) (*1)	Yes	No	446
17.11	DC2+PK	UID Return Request (ISO/IEC15693) (*1)	Yes	No	451
17.12	DC2+PJ	RFID Read(ISO/IEC14443 TypeA) (*1)	Yes	No	453
17.13	DC2+PK	UID Return Request (ISO/IEC14443 TypeA) (*1)	Yes	No	457
17.14	DC2+PJ	RFID Read(FeliCa) (*1)	Yes	No	459
17.15	DC2+PK	IDm Return(FeliCa) (*1)	Yes	No	465
17.16	DC2+PN	Request to Return Label Pitch Size	Yes	Yes	468
17.17	DC2+DB	Initialization	Yes	Yes	470
17.18	DC2+DC	Reset	Yes	Yes	472
17.19	DC2+DD	Power Off	Yes	Yes	473
17.20	DC2+DE	File Download	Yes	Yes	474
17.21	DC2+DF	File Name Information Acquisition	Yes	Yes	476
17.22	DC2+DG	File Information Acquisition	Yes	Yes	478
17.23	DC2+DH	File Deletion	Yes	Yes	480

(*1) Option: RFID

2 Initial Value of Operation Settings

The initial values of operation setting are as follows:

Item	8 dots/mm	12 dots/mm	24dots/mm
Print speed	6 inch/s Range: 2, 3, 4, 5, 6, 7, 8, 9, 10	6 inch/s Range: 2, 3, 4, 5, 6, 7, 8	4 inch/s Range: 2, 3, 4, 5, 6
Range of print darkness	A	A	A
Print darkness	5 Range: 1, 2, 3, 4, 5, 6, 7, 8, 9, 10	5 Range: 1, 2, 3, 4, 5, 6, 7, 8, 9, 10	5 Range: 1, 2, 3, 4, 5, 6, 7, 8, 9, 10
Start point correction	+0	+0	+0
Designation of proportional pitch	Proportional pitch	Proportional pitch	Proportional pitch

3 List of Fonts

When using internal fonts, specify [ESC + Command of Font Types].

Font name	Font Type	Pitch
OCR A(8dots/mm)	Bitmap[OCR-A font]	15x22 dots
OCR B(8 dots/mm)	Bitmap[OCR-B font]	20x24 dots
OCR A(12dots/mm)	Bitmap[OCR-A font]	22x33 dots
OCR B(12 dots/mm)	Bitmap[OCR-B font]	30x36 dots
OCR A(24dots/mm)	Bitmap[OCR-A font]	44x66 dots
OCR B(24dots/mm)	Bitmap[OCR-B font]	60x72 dots
XU	Bitmap[Helvetica type]	5x 9 dots
XS	Bitmap[Univers Condensed Bold type]	17x17 dots
XM	Bitmap[Univers Condensed Bold type]	24x24 dots
XB	Bitmap[Univers Condensed Bold type]	48x48 dots
XL	Bitmap[Sans Serif]	48x48 dots
U	Bitmap[U font]	5x9 dots
S	Bitmap[S font]	8x15 dots
M	Bitmap[M font]	13x20 dots
WB	Bitmap[WB font]	18x30 dots
WL	Bitmap[WL font]	28x52 dots
X20	Bitmap[X20 font]	5x9 dots
X21	Bitmap[X21 font]	17x17 dots
X22	Bitmap[X22 font]	24x24 dots
X23	Bitmap[X23 font]	48x48 dots
X24	Bitmap[X24 font]	48x48 dots
K1(k1)	Bitmap[Kanji font]	16x16 dots
K2(k2)	Bitmap[Kanji font]	24x24 dots
K3(k3)	Bitmap[Kanji font]	22x22 dots
K4(k4)	Bitmap[Kanji font]	32x32 dots
K5(k5)	Bitmap[Kanji font]	40x40 dots
K8(k8)	Bitmap[Kanji font]	16x16 dots
K9(k9)	Bitmap[Kanji font]	24x24 dots
KA(kA)	Bitmap[Kanji font]	22x22 dots
KB(kB)	Bitmap[Kanji font]	32x32 dots
KD(kD)	Bitmap[Kanji font]	40x40 dots
\$ (shape)	Outline font	Fixed / Proportional
\$(print)	Kanji Outline font	Fixed
RD	CG font[SATO CG Sleek]	Fixed / Proportional
	CG font[SATO CG Stream]	Fixed / Proportional
RG	Multiple language font	Fixed / Proportional
RH	Scalable font	Fixed / Proportional

Expanded font

Font can be expanded by a factor of 1 to 36.

Internal bitmap fonts can also be expanded with a factor of 1 to 36.

Example: A font in a size of 5 dots of width and 9 dots of height is expanded by a factor of 3. The resulting font has a width of 15 dots and a height of 27 dots.

The input of expansion factors (height x expansion factor, width x expansion factor) for characters to be printed is done as described below:

Width x expansion factor= width parameter setting value

Height x expansion factor= height parameter setting value

The command <L> decides the expansion of the character. This parameter is set as factor.

Example: If setting the factor to: <L>0304, the character is expanded by a factor of 3 in horizontal direction (width) and a factor of 4 in vertical direction (height)

If an expansion factor is specified, also the pitch between the characters is automatically determined.

Fixed pitch / proportional pitch

There are fonts which can select both the fixed pitch and the proportional pitch. You can set the proportional pitch by <PS> command and release it by <PR> command on the printer screen.

Depending on the font type, the width of the proportional pitch does differ. Kata-kana is not affected by the proportional pitch, but the side space of characters will be narrowed.

At the fixed pitch, the character width is according to the relevant font size selected.

Difference between outline font and bitmap font

Regarding the bitmap font, the height and the width of the font are predefined. The height of the bitmap font is a little bit larger than the width.

The bitmap font is the largest in the font matrix.

For the font type and size refer to the font list on the previous page.

Regarding the outline font, if the height and the width of the font are set properly, the smooth scaling algorithm of the printer allows a well balanced font. It is also possible to define some style options like a gray scale and a shadow setting.

Setting change of Euro code

See below for the valid range of font command and Euro code and Code Page that is enabled when you change the Euro code settings in GUI or DC2 commands.

The values for ESC, ENQ, SOH, STX, ETX, CAN, DEL, DC1, DC2 in standard mode

and ESC, ENQ, SOH, STX, ETX, CAN, DEL, DC1, DC2 in non-standard mode is out of valid range.

Command	Command name	The range of Euro code	Code Page
<XU>	XU font(Basic size 5x9 dots)	Euro code shall be 00H-FFH for compatibility.	DOS 857
<XS>	XS font(Basic size 17x17 dots)		DOS 858
<XM>	XM font(Basic size 24x24 dots)		For compatibility DOS 737 DOS 852 DOS 866
<XB>	XB font(Basic size 48x48 dots)		
<XL>	XL font(Basic size 48x48 dots)		
<U>	U font(Basic size 5x9 dots)		
<S>	S font(Basic size 8x15 dots)		
<M>	M font(Basic size 13x20 dots)		
<WB>	WB font(Basic size 18x30 dots)		
<WL>	WL font(Basic size 28x52 dots)		
<\$=>	Outline Font Print		DOS 858
<RD>	CG Font	Euro code shall be 00H-FFH considering the use of GID (Glyph Index).	DOS 857 DOS 858
<RG>	Multiple language	Euro code shall be 20H-FFH because the range of character code is more than 20H. Note: A space will be printed in case if less than 20H is specified.	
<RH>	Scalable font	Euro code shall be 00H-FFH considering the use of GID (Glyph Index).	

4 Example of Command Reference

7.2 Modification		1	2	3																																																																		
Enlargement			ESC+L																																																																			
4	Hexadecimal code	ESC $<1B>_{16}$	L $<4C>_{16}$	Parameter aabb																																																																		
6	Initial value	aa = 01, bb = 01																																																																				
7	Valid range and term of command			When the power switch is OFF The set parameter is not maintained. Valid range within items The set parameter is valid until next specification is made. Valid range between items The set parameter becomes initial value at the next item $<A>$.																																																																		
8	[Function] Specifying the enlargement ratio of print font.																																																																					
9	[Format] $<L>aabb$																																																																					
	• Parameter aa [Horizontal enlargement ratio]=Valid range: 01 to 36 bb [Vertical enlargement ratio] =Valid range: 01 to 36																																																																					
10	[Coding Example] Horizontal enlargement ratio: 4 times, Vertical enlargement ratio: 3 times $<A>$ $<V>100<H>200<P>3<L>\underline{0403}<XM>ABCD$ $<Q>2$ $<Z>$																																																																					
11	[Supplementary Explanation] Enlarges the character pitch as well. When Character Pitch $<P>$ is used at the same time, the parameter value of horizontal enlargement ratio specified in Enlargement $<L>$ will be reflected in the subsequent specification $<P>$.																																																																					
12	[Note] If increasing the enlargement ratio, design the print format that does not exceed print area.																																																																					
13	[Valid Commands]																																																																					
	<table border="1"> <tbody> <tr> <td>Font</td> <td>$<XU>$</td><td>$<TU>$</td><td>$<TU>$</td><td>$<XB>$</td><td>$<XL>$</td><td>$<OA>$</td><td>$<OB>$</td><td>$<RD>$</td><td>$<K1>$</td><td>$<K2>$</td></tr> <tr> <td></td><td>$<K3>$</td><td>$<K4>$</td><td>$<K5>$</td><td>$<K8>$</td><td>$<K9>$</td><td>$<KA>$</td><td>$<KB>$</td><td>$<KD>$</td><td>$<k1>$</td><td>$<k2>$</td></tr> <tr> <td></td><td>$<k3>$</td><td>$<k4>$</td><td>$<k5>$</td><td>$<k8>$</td><td>$<k9>$</td><td>$<kA>$</td><td>$<kB>$</td><td>$<kD>$</td><td>$<U>$</td><td>$<S>$</td></tr> <tr> <td>Modification</td><td>$<M>$</td><td>$<WB>$</td><td>$<WL>$</td><td>$<X20>$</td><td>$<X21>$</td><td>$<X22>$</td><td>$<X23>$</td><td>$<X24>$</td><td></td><td></td></tr> <tr> <td>Graphic</td><td>$<G>$</td><td>$<GM>$</td><td>$<GP>$</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr> <td>Memory Card</td><td>$<TU>$</td><td>$<GC>$</td><td>$<PY>$</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> </tbody> </table>				Font	$<XU>$	$<TU>$	$<TU>$	$<XB>$	$<XL>$	$<OA>$	$<OB>$	$<RD>$	$<K1>$	$<K2>$		$<K3>$	$<K4>$	$<K5>$	$<K8>$	$<K9>$	$<KA>$	$<KB>$	$<KD>$	$<k1>$	$<k2>$		$<k3>$	$<k4>$	$<k5>$	$<k8>$	$<k9>$	$<kA>$	$<kB>$	$<kD>$	$<U>$	$<S>$	Modification	$<M>$	$<WB>$	$<WL>$	$<X20>$	$<X21>$	$<X22>$	$<X23>$	$<X24>$			Graphic	$<G>$	$<GM>$	$<GP>$								Memory Card	$<TU>$	$<GC>$	$<PY>$							
Font	$<XU>$	$<TU>$	$<TU>$	$<XB>$	$<XL>$	$<OA>$	$<OB>$	$<RD>$	$<K1>$	$<K2>$																																																												
	$<K3>$	$<K4>$	$<K5>$	$<K8>$	$<K9>$	$<KA>$	$<KB>$	$<KD>$	$<k1>$	$<k2>$																																																												
	$<k3>$	$<k4>$	$<k5>$	$<k8>$	$<k9>$	$<kA>$	$<kB>$	$<kD>$	$<U>$	$<S>$																																																												
Modification	$<M>$	$<WB>$	$<WL>$	$<X20>$	$<X21>$	$<X22>$	$<X23>$	$<X24>$																																																														
Graphic	$<G>$	$<GM>$	$<GP>$																																																																			
Memory Card	$<TU>$	$<GC>$	$<PY>$																																																																			

1. Indicates the classification of commands such as:
[Control], [Print Position], [Modification], [Font], [Barcode], [2D code], [Graphic], [System], [Memory Card] and [Calendar], [RFID], [CommonCommands for All Languages]
2. Indicates command name.
3. Indicates command code.
4. Indicates command in Hexadecimal code.

5. Indicates parameter to be described in command.

6. Indicates initial value for command.

7. Indicates valid range of command.

When power switch is OFF;

- 1) The set parameter is maintained.
- 2) The set parameter is not maintained.
- 3) The set command is not maintained.

Valid range within item

- 1) The set parameter is valid until the next specification is made.
- 2) The set parameter becomes invalid.
- 3) The set command becomes invalid.

Valid range between items;

- 1) The set parameter becomes initial value at the next item <A>.
- 2) The set parameter is valid until the next specification is made.
- 3) The set parameter becomes invalid.
- 4) The set command becomes invalid.

8. Explains the function of command.

9. Explains the command and required parameter.

<L>aabb indicates the command ESC+L(<1B>16<4C>16) and two types of parameters such as "aa" and "bb".

10. Shows the example of how the command is used.

This is the coding example programmed in BASIC output to the printer connected with RS-232C.

```
10  ESC$=CHR$(&H1B)
20  OPEN  "COM1:9600, N, 8, 1, RS, BIN" FOR OUTPUT AS #1
30  PRINT #1, ESC$ ; "A" ;
40  PRINT #1, ESC$ ; "V100" ; ESC$ ; "H200" ;
50  PRINT #1, ESC$ ; "P3" ; ESC$ ; "L0403" ;
60  PRINT #1, ESC$ ; "XMABCD" ;
70  PRINT #1, ESC$ ; "Q2" ;
80  PRINT #1, ESC$ ; "Z" ;
90  CLOSE  #1
100 END
```

11. Provides the supplemental information of command function and parameter.

12. Provides notes and restriction for the use of command.

13. Shows the commands that come under the influence of used commands.

5 Control Command

5.1 Control			
Start Code			ESC+A
Hexadecimal code	ESC	A	Parameter
	<1B> ₁₆	<41> ₁₆	Nil
Initial value	Nil		
Valid range and term of command	When the power switch is OFF		The set command is not maintained.
	Valid range within items		The set command becomes invalid.
	Valid range between items		The set command becomes invalid.

[Function]

Specifying the start of data transmission.

[Format]

<A>

[Coding Example]

<A>
<V>100<H>200<P>2<L>0202<XM>ABCD
<Q>2
<Z>

[Supplementary Explanation]

1. Indicates the start of item and to be placed at the head of item.
2. Use <A> and End of Data Transmission <Z> as a pair of commands.

[Notes]

1. Setting value of all commands excluding a part of system commands will be set to default.
2. If this command is not specified, printing will not be performed.

5.2 Control

Stop Code

ESC+Z

Hexadecimal code	ESC <1B> ₁₆	Z <5A> ₁₆	Parameter Nil
Initial value	Nil		

Valid range and term of command	When the power switch is OFF	The set command is not maintained.
	Valid range within items	The set command becomes invalid.
	Valid range between items	The set command becomes invalid.

[Function]

Specifying the end of data transmission.

[Format]

<Z>

[Coding Example]

<A>
<V>100<H>200<P>2<L>0202<XM>ABCD
<Q>2
<Z>

[Supplementary Explanation]

1. Indicates the end of item and to be placed at the tail of item.
2. Use Start of Data Transmission <A> and <Z> as a pair of commands.

[Note]

If this command is not specified, printing will not be performed.

5.3 Control

Print Quantity

ESC+Q

Hexadecimal code	ESC <1B> ₁₆	Q <51> ₁₆	Parameter aaaaaaa
Initial value	aaaaaaa=1		

Valid range and term of command	When the power switch is OFF	The set parameter is not maintained.
	Valid range within items	The set parameter becomes invalid.
	Valid range between items	The set parameter becomes invalid.

[Function]

Specifying the number of labels to print.

[Format]

<Q>aaaaaa

• Parameter

a[Number of labels to print] = Valid range: 1 to 999999

[Coding Example] Number of labels: 2

```
<A>
<V>100<H>200<P>2<L>0202<XM>ABCD
<Q>2
<Z>
```

[Supplementary Explanation]

1. Print contents specified by Start of Data Transmission <A> and End of Data Transmission <Z> are regarded as 1 label, and the number of reprints can be specified.
2. Use this command prior to End of Data Transmission <Z>.

[Note]

1. Reprint will be performed based on the specified print quantity. If specifying sequential numbering command <F>, the value of sequential number that was set up for that field portion will print.
2. When this command is used in combination with Multiple Cutting <~>, the specified print quantity multiplied by specified value for cutting becomes the number of labels to print.

[Initial value of parameter and Valid range]

Model	Initial value	Valid range
CL4NX/CL6NX	1	1 ~ 999999

5.4 Control

Job ID Number

ESC+ID

Hexadecimal code	ESC	ID	Parameter
	<1B> ₁₆	<49> ₁₆ <44> ₁₆	aa aaaaa
Initial value	a=<20> ₁₆		

Valid range and term of command	When the power switch is OFF	The set parameter is not maintained.
	Valid range within items	The set parameter is valid until the next valid setting.
	Valid range between items	The set command becomes invalid.

[Function]

Specifying job ID number for status return.

[Format]

<ID>aa
<ID>aaaaa

• Parameter

a[Job ID number] = Valid range: 00 to 99 (2digits)
***** or 00000 to 99999 (5digits)

[Coding Example] Job ID number: 01

<A>
<ID>01
<V>200<H>100<P>0<\$>B,100,100,6
<\$=>SATOPRINTER
<Q>2
<Z>

[Supplementary Explanation]

1. When status return is used for interface protocol, the specified job ID No. can be set to the telegraphic status.
2. Status can be confirmed sending status request (ENQ).
3. Include this command within items and use between start code <A> and stop code <Z>.
4. When Status 5 is used, the valid range of job ID becomes "00000 to 99999" and "*****". If "*****" is specified, the item will not be managed by Job ID number.

[Notes]

1. In status return interface protocol, this command becomes valid when status request (ENQ) is received while printing (QTY≠0, includes at the time of Offline and Error).
2. In status return communication protocol, if status request (ENQ) is received when printing is not in progress (QTY=0, No received data when power is ON), space (20H) will be set to status and returned.
3. When Job ID Number <ID> is used more than twice within the items of <A> and <Z>, the last specified value becomes valid.

5.5 Control

Job Name

ESC+WK

Hexadecimal code	ESC	WK	Parameter
	<1B> ₁₆	<57> ₁₆ <4B> ₁₆	aaaaaaaaaaaaaaaaaa
Initial value	aaaaaaaaaaaaaaaaaa = <20> ₁₆		

Valid range and term of command	When the power switch is OFF	The set parameter is not maintained.
	Valid range within items	The set parameter is valid until the next valid setting.
	Valid range between items	The set command becomes invalid.

[Function]

Specifying job name for status return.

[Format]

<WK>aaaaaaaaaaaaaaa

• Parameter

a[Job Name] = ASCII code 16-digit, Shift JIS Kanji 8-digit

[Coding Example] Job name: SATO

```

<A>
<ID>01
<WK>SATO
<V>200<H>100<P>0<$>B,100,100,6
<$=>SATOPRINTER
<Q>2
<Z>
```

[Supplementary Explanation]

1. When Status4 is used for interface protocol, specified job name can be set to the telegraphic status.
2. Status can be confirmed sending status request (ENQ).
3. Include this command within items and use between start of data transmission <A> and end of data transmission <Z>.
4. This command can be used in combination with Job ID Number <ID>.

[Notes]

1. In status return interface protocol, this command becomes valid when status request (ENQ) is received while printing (QTY≠0, includes at the time of Offline and Error).
2. In status return communication protocol, if status request (ENQ) is received when printing is not in progress (QTY=0, No received data when power is ON), space (20H) will be set to status and returned.
3. When Job ID Number <ID> is used more than twice within the items of <A> and <Z>, the last specified value becomes valid.
4. For more information, refer to the "Interface Specifications".

5.6 Control

Status 5 Reply Check Setting

ESC+CR

Hexadecimal code	ESC <1B> ₁₆	CR <43> ₁₆ <52> ₁₆	Parameter a,b
Initial value	a=0		

Valid range and term of command	When the power switch is OFF	The set parameter is maintained.
	Valid range within items	The set parameter is valid until the next valid setting.
	Valid range between items	The set command becomes invalid.

[Function]

The BCC check of return and the item number check function are set up of the status 5.

[Format]

<CR>a,b

• Parameter

a[BCC check]	=	0 : BCC check disable (initial value)
		1 : BCC check enable

b [Item number check]	=	0 : Not checked(fixed value)
-----------------------	---	------------------------------

[Coding Example]

<A>
<ID>*****
<CR>1,0
<Z>

[Supplementary Explanation]

1. [item number check] is a fixed value
2. This command cannot be used at the same time the print data
3. Use is possible only during status 5 protocol

6 Print Position Command

6.1 Print Position

Horizontal Print Position

ESC+H

Hexadecimal code	ESC	H	Parameter
	<1B> ₁₆	<48> ₁₆	aaaa
Initial value	aaaa=1		

Valid range and term of command	When the power switch is OFF	The set parameter is not maintained.
	Valid range within items	The set parameter is valid until the next valid setting.
	Valid range between items	The set parameter becomes initial value at the next item <A>.

[Function]

Specifying horizontal print position from its start point by dot.

[Format]

<H>aaaa

•Parameter

aaaa[Horizontal Print Position] = Refer to the table below.

[Coding Example] Horizontal print position: 200 dots

<A>
<V>100<H>200<P>2<L>0202<XM>ABCD
<Q>2
<Z>

[Supplementary Explanation]

Specifying the start of horizontal position for the print of text, barcode, ruled line and graphic.

[Note]

Any contents such as text, barcode, graphic exceed printable area will not print.

[Initial Value and Valid Range of Parameter]

Model		Initial value	Valid range (dots)
CL4NX	203dpi	1	1 to 832
	305dpi	1	1 to 1248
	609dpi	1	1 to 2496
CL6NX	203dpi	1	1 to 1216 (*1) 1 to 1340 (*2)
	305dpi	1	1 to 1984 (*1) 1 to 2010 (*2)

(*1) Valid range for "Standard" in "Head Base Position" setting.

(*2) Valid range for "Left-justify" in "Head Base Position" setting.

6.2 Print Position

Vertical Print Position

ESC+V

Hexadecimal code	ESC <1B> ₁₆	V <56> ₁₆	Parameter aaaaaa
Initial value	aaaaaa=1		

Valid range and term of command	When the power switch is OFF	The set parameter is not maintained.
	Valid range within items	The set parameter is valid until the next valid setting.
	Valid range between items	The set parameter becomes initial value at the next item <A>.

[Function]

Specifying vertical print position from its start point by dot.

[Format]

<V>aaaaaa

• Parameter

a [Vertical Print Position] = Refer to the table below.

[Coding Example] Vertical print position: 100 dots

```
<A>
<V>100<H>200<P>2<L>0202<XM>ABCD
<Q>2
<Z>
```

[Supplementary Explanation]

Specifying the start of vertical position for the print of text, barcode, ruled line and graphics.

[Note]

Any contents such as text, barcode and graphic exceed printable area will not print.

[Initial Value and Valid Range of Parameter]

Model	Initial value	Valid range (dots)
CL4NX	203dpi	1 to 20000
	305dpi	1 to 18000
	609dpi	1 to 9600
CL6NX	203dpi	1 to 20000
	305dpi	1 to 18000

7 Modification Command

7.1 Modification

Character Pitch

ESC+P

Hexadecimal code	ESC	P	Parameter
	<1B> ₁₆	<50> ₁₆	aa
Initial value	aa=02		

Valid range and term of command	When the power switch is OFF	The set parameter is not maintained.
	Valid range within items	The set parameter is valid until the next valid setting.
	Valid range between items	The set parameter becomes initial value at the next item <A>.

[Function]

Specifying character pitch by dot.

[Format]

<P>aa

• Parameter

aa[Character pitch] = Valid range: 00 to 99 dots

[Coding Example]

Character pitch: 10

```
<A>
<V>100<H>200<P>10<L>0202<XM>ABCD
<Q>2
<Z>
```

[Supplementary Explanation]

1. Character pitch means the character gap or font gap when selecting font or barcode.
 2. Specified character pitch will be widened based on the ratio of Enlargement <L>.
 3. Even if linefeed code [CR] is specified in Auto Linefeed <E>, it remains the same without returning to initial value.
Start of Data Transmission <A> can be used to reset to the initial value.
 4. By specifying Character Pitch <P> just before the barcode specification, pitch command becomes valid for barcode module.
- Object barcode: NW-7, CODE39, Industrial 2 of 5, Matrix 2 of 5
For more information, see (3) Intercharacter Gap in [9. Barcode Specification].
5. Data specification except numeric value or specification of over-digit will give the initial value.

[Valid Command]

Font	<XU>	<XS>	<XM>	<XB>	<XL>	<OA>	<OB>	<RD>	<\$=>	<K1>
	<K2>	<K3>	<K4>	<K5>	<K8>	<K9>	<KA>	<KB>	<KD>	<k1>
	<k2>	<k3>	<k4>	<k5>	<k8>	<k9>	<kA>	<kB>	<kD>	<U>
	<S>	<M>	<WB>	<WL>	<X20>	<X21>	<X22>	<X23>	<X24>	
	Barcode		<D>	<D><d>	<BD>	<BT>	<BW>	<BM>		
Modification	<RF>									

7.2 Modification

Enlargement

ESC+L

Hexadecimal code	ESC <1B> ₁₆	L <4C> ₁₆	Parameter aabb
Initial value	aa=01, bb=01		

Valid range and term of command	When the power switch is OFF	The set parameter is not maintained.
	Valid range within items	The set parameter is valid until the next valid setting.
	Valid range between items	The set parameter becomes initial value at the next item <A>.

[Function]

Specifying the enlargement ratio of font.

[Format]

<L>aabb

• Parameter

aa[Horizontal enlargement ratio]	=	Valid range: 01 to 36
bb[Vertical enlargement ratio]	=	Valid range: 01 to 36

[Coding Example]

Horizontal enlargement ratio: 4 times, Vertical enlargement ratio: 3 times

```
<A>
<V>100<H>200<P>3<L>0403<XM>ABCD
<Q>2
<Z>
```

[Supplementary Explanation]

Enlarges the character pitch as well. When Character Pitch <P> is used at the same time, the parameter value of horizontal enlargement ratio specified in Enlargement <L> will be reflected in the subsequent specification <P>.

[Note]

If increasing the enlargement ratio, design the print format that does not exceed print area.

[Valid Command]

Font	<XU>	<XS>	<XM>	<XB>	<XL>	<OA>	<OB>		<K1>	<K2>
	<K3>	<K4>	<K5>	<K8>	<K9>	<KA>	<KB>	<KD>	<k1>	<k2>
	<k3>	<k4>	<k5>	<k8>	<k9>	<kA>	<kB>	<kD>	<U>	<S>
	<M>	<WB>	<WL>	<X20>	<X21>	<X22>	<X23>	<X24>		
Modification	<P>	<RF>								
Graphic	<G>	<GM>	<GP>							
Memory card	<GR>	<GC>	<PY>							

7.3 Modification

Proportional Pitch

ESC+PS

Hexadecimal code	ESC <1B> ₁₆	PS <50> ₁₆ <53> ₁₆	Parameter Nil
Initial value	Nil		

Valid range and term of command	When the power switch is OFF	The set command is not maintained.
	Valid range within items	The set parameter is valid until the next valid setting.
	Valid range between items	The set parameter becomes initial value at the next item <A>.

[Function]

Specifying the proportional pitch.

[Format]

<PS>

[Coding Example]

```

<A>
<PS>
<V>100<H>200<P>2<L>0202<XM>ABCD
<Q>2
<Z>

```

[Supplementary Explanation]

1. If data other than specified is set, proportional print will not be performed.
2. Initial value is "Proportional pitch" enabled by <PS> command.

[Valid Command]

Font	<XU>	<XS>	<XM>	<XB>	<XL>	<RD>	<RG>	<RH>		
	<X20>	<X21>	<X22>	<X23>	<X24>	<\$><\$=>				
Modification	<RF>									

7.4 Modification

Release Proportional Pitch

ESC+PR

Hexadecimal code	ESC <1B> ₁₆	PR <50> ₁₆ <52> ₁₆	Parameter Nil
Initial value	Nil		

Valid range and term of command	When the power switch is OFF	The set command is not maintained.
	Valid range within items	The set parameter is valid until the next valid setting.
	Valid range between items	The set parameter becomes initial value at the next item <A>.

[Function]

Specifying the release of proportional pitch.

[Format]

<PR>

[Coding Example]

```

<A>
<PR>
<V>100<H>200<P>2<L>0202<XM>ABCD
<Q>2
<Z>

```

[Supplementary Explanation]

Initial value is "Proportional pitch" enabled by <PS> command.

[Valid Command]

Font	<XU>	<XS>	<XM>	<XB>	<XL>	<RD>			
	<X21>	<X22>	<X23>	<X24>					
Modification	<RF>								

7.5 Modification

Rotation

**ESC+%
ESC+%**

Hexadecimal code	ESC <1B> ₁₆	% <25> ₁₆	Parameter a
Initial value	a=0		

Valid range and term of command	When the power switch is OFF	The set parameter is not maintained.
	Valid range within items	The set parameter is valid until the next valid setting.
	Valid range between items	The set parameter becomes initial value at the next item <A>.

[Function]

Specifying the counter-clockwise rotation of font and barcode.

[Format]

<%>a

• Parameter

- | | |
|-------------------------|----------------------------|
| a[Rotative direction] = | 0: Parallel 1 (0 degree) |
| | 1: Serial 1 (90-degree) |
| | 2: Parallel 2 (180-degree) |
| | 3: Serial 2 (270-degree) |

[Coding Example] Font rotation: Parallel 2 (180-degree), Barcode rotation: 1: Serial 1 (90-degree)

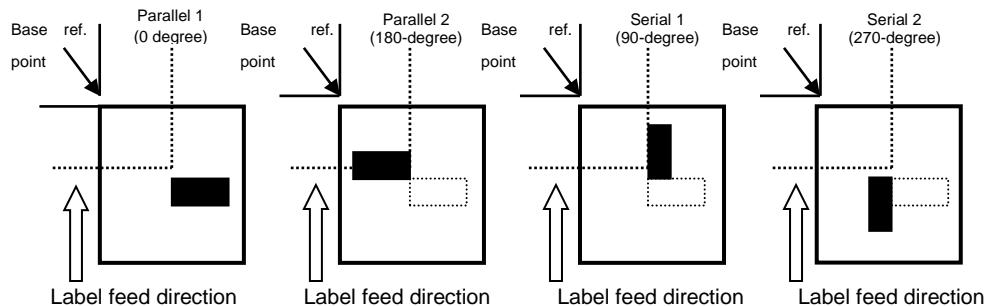
```

<A>
<%>2
<V>100<H>400<P>3<L>0403<XM>ABCD
<%>1
<V>400<H>200<BD>103160*123*
<Q>2
<Z>

```

[Supplementary Explanation]

1. Position specification of Vertical Print Position <V> and Horizontal Print Position <H> are the absolute value from its base reference point.
2. When the value of parameter "a" is between 4 and 9, it will be processed as a command error and ignored. When the value other than numeric is specified, this will be ignored and printing at 0 degree.
3. Print of barcode using Serial 1 or Serial 2 may cause blur. Drop the print speed for rotation print of Serial 1 and Serial 2 for better performance.



[Valid Command]

	<XU>	<XS>	<XM>	<XB>	<XL>	<OA>	<OB>	<RD>	<\$=>	<K1>
Font	<K2>	<K3>	<K4>	<K5>	<K8>	<K9>	<KA>	<KB>	<KD>	<k1>
	<k2>	<k3>	<k4>	<k5>	<k8>	<k9>	<kA>	<kB>	<kD>	<U>
	<S>	<M>	<WB>	<WL>	<X20>	<X21>	<X22>	<X23>	<X24>	
Barcode		<BC>	<BG>	<BI>	<D>	<D><d>	<BD>	<BT>	<BW>	<BP>
	<BF>	<BS>	<BL>	<BL><d>	<BM>					
2D code	<2D10>	<BK>	<2D12>	<2D20>	<BV>	<2D30>	<2D31>	<2D32>	<BQ>	
	<2D50>	<BX>	<2D51>	<2D70>						
Composite Symbol	<EU>									
Graphic	<G>	<GM>	<GP>							
System	<E>									
Modification	<RF>	<FW>	<FC>	<FT>	<(>	<RM>				
Memory card	<GR>	<GC>	<PY>							
Calendar *1	<WA>									

*1 This command requires optional calendar IC and it is not usable without IC.

7.6 Modification

Sequential Number

ESC+F

Hexadecimal code	ESC <1B> ₁₆	F <46> ₁₆	Parameter aaaabcccc(dd,ee,f)
Initial value	Nil		

Valid range and term of command	When the power switch is OFF	The set parameter is not maintained.
	Valid range within items	The set parameter becomes invalid.
	Valid range between items	The set parameter becomes invalid.

[Function]

Specifying prior to the data specification command of font or barcode, and printing specified data in a sequential order.

[Format]

<F>aaaabcccc(dd,ee,f)

• Parameter

a [Print quantity specification of identical contents]	= Valid range : 1 to 9999
b [Increasing and decreasing specification]	= + : Addition
	= - : Subtraction
c [Setting of increasing and decreasing value]	= Valid range : 1 to 9999
d [Valid digit number for sequential number]	= Valid range : 1 to 99 When omitted 8 (ommissible)
e [Low-order invalid digit number]	= Valid range : 0 to 99 When omitted 0 (ommissible)
f [Specification of Decimal/Hex sequential number]	= 0 : Decimal number When omitted 0 (ommissible)
	1 : Hexadecimal

[Coding Example] Print quantity specification of identical contents: 1, Increasing and decreasing specification: +
Setting of increasing and decreasing value: 1, Valid digit number for sequential number: 5
Low-order invalid digit number: 0

```
<A>
<V>100<H>100<P>2<L>0202
<F>1+1,5,0<X20>,10000
<Q>2
<Z>
```

[Supplementary Explanation]

1. Sequential number can be specified up to 8 points per format.
2. Next print data from <F> command will be the initial value of sequential number.
3. Specify the required number of digits for sequential number to print it properly.
4. Specification of Black/White Reverse Print <(> is not valid for sequential numbered data.
5. Auto Linefeed <E> is not available.
6. Need to print font or barcode to print sequential number.
7. Digit number of sequential number should correspond to that of font/barcode data command. If the digit number of sequential number is larger, sequential number printing will not be performed.
8. If the print data immediately after the sequential number command <F> becomes the sequential number invalid command, the sequential number will be invalid.

[Valid Command]

Font	<XU>	<XS>	<XM>	<XB>	<XL>	<OA>	<OB>	<RD>	<\$=>	<U>
	<S>	<M>	<WB>	<WL>	<J>	<X20>	<X21>	<X22>	<X23>	<X24>
Barcode		<BC>	<BG>	<BI>	<D>	<D><d>	<BD>	<BT>	<BW>	<BP>
	<BF>	<BS>	<BL>	<BL><d>	<BM>					
2D code	<2D50>	<2D51>								

7.7 Modification

Ruled / Grid Line Print

ESC+FW

Hexadecimal code	ESC	FW	Parameter
	<1B> ₁₆	<46> ₁₆ <57> ₁₆	Ruleaabcccc Gridabbccccchdddd
Initial value	Nil		

Valid range and term of command	When the power switch is OFF	The set parameter is not maintained.
	Valid range within items	The set parameter becomes invalid.
	Valid range between items	The set parameter becomes invalid.

[Function]

Specifying the ruled / grid line.

[Format]

<FW>aabcccc

Print of ruled line

• Parameter

a[Line width]	=	Valid range	:	02 to 99 dots
b[Horizontal/vertical direction]	=	H	:	Horizontal direction
c[Ruled line length]	=	V	:	Vertical direction

= Valid range : Refer to the table below.

<FW>aabbVccccHdddd

Print of grid line

• Parameter

a[Vertical line width]	=	Valid range	:	02 to 99 dots
b[Horizontal line width]	=	Valid range	:	02 to 99 dots
c[Vertical line length]	=	Valid range	:	Refer to the table below.
d[Horizontal line length]	=	Valid range	:	Refer to the table below.

[Coding Example 1] Ruled line print, Line width: 4, Horizontal direction, Ruled line length: 400

Grid line print, Vertical line width: 8, Horizontal line width: 8, Vertical line length: 300, Horizontal line length: 400

<A>

<V>100<H>200<FW>**04H400**

<V>300<H>200<FW>**0808V300H400**

<Q>2

<Z>

[Supplementary Explanation]

1. When the print start position exceeds the printable area, the printing is not executed. (It doesn't raise a command error.)

2. Set line width according to the table below so the horizontal line width is more than 0.166mm.

Head density	Line width
8 dots/mm (203 dpi)	2 dots or more
12 dots/mm (305 dpi)	2 dots or more
24dots/mm (609dpi)	4 dots or more

3. If setting the vertical line width wider, it will be widened to the right side against media feed direction. If setting the horizontal line width wider, it will be widened to the lower side against media feed direction.

4. If setting the grid line wider, it will be widened inward.

[Valid Range]

Model	Valid range (dots)	
	Horizontal line length	Vertical line length
CL4NX	203dpi	1 to 832
	305dpi	1 to 1248
	609dpi	1 to 2496
CL6NX	203dpi	1 to 1216 (*1) 1 to 1340 (*2)
	305dpi	1 to 1984(*1) 1 to 2010(*2)

(*1) Valid range for "Standard" in "Head Base Position" setting.

(*2) Valid range for "Left-justify" in "Head Base Position" setting.

Refer to the operator manual for further information of the setting.

7.8 Modification

Print Circle

ESC+FC

Hexadecimal code	ESC <1B> ₁₆	FC <46> ₁₆ <43> ₁₆	Parameter ,aaa,bbb(,c,d)
Initial value	Nil		

Valid range and term of command	When the power switch is OFF	The set parameter is not maintained.
	Valid range within items	The set parameter becomes invalid.
	Valid range between items	The set parameter becomes invalid.

[Function]

Specifying the print of circle.

[Format]

<FC>,aaa,bbb(,c,d)

• Parameter

- | | |
|---------------------|--|
| a[Radius] | = Valid range: 5 to 999 dots |
| b[Line width] | = Valid range: 1 to 999 dots |
| c[Sectional number] | = Valid range: 0 to 8 When omitted: 0 (omissible)
See the details listed below. |
| d[Pattern] | = Valid range: 0 to 3 When omitted: 0 (omissible)
0: Solid line (black)
1: Gray 1
2: Gray 2
3: ray 3 |

• Sectional number

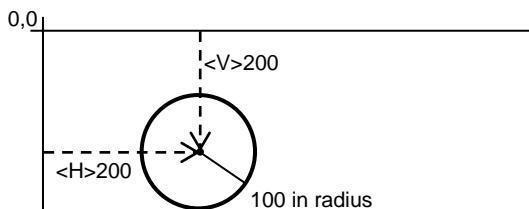


[Coding Example] Solid line circle of 100 dots in radius, 8 dots in line width

```
<A>
<V>200<H>200
<FC>,100,8,0,0
<Q>1
<Z>
```

[Supplementary Explanation]

1. When the value outside of the range is specified for sectional number, it will be processed as "0". In this case, this will not be a command error.
2. When the value outside of the range is specified for the designation of pattern, it will be processed as "0". In this case, this will not be a command error.
3. When the print start position exceeds the printable area, the printing is executed. (This raises a command error.)
4. This command sets the base reference point to the center of a circle.



5. This command can be registered to the format.
6. If setting the glid line wider, it will be widened inward.

[Valid Range]

Model	Valid range (dot)	
	Radius	Line width
CL4NX CL6NX	5 to 999	1 to 999

7.9 Modification

Print Triangle

ESC+FT

Hexadecimal code	ESC <1B> ₁₆	FT <46> ₁₆ <54> ₁₆	Parameter ,aaaa,bbbb,(cccc,d)
Initial value	Nil		

Valid range and term of command	When the power switch is OFF	The set parameter is not maintained.
	Valid range within items	The set parameter becomes invalid.
	Valid range between items	The set parameter becomes invalid.

[Function]

Specifying the print of triangle.

[Format]

<FT>,aaaa,bbbb,(cccc,d)

• Parameter

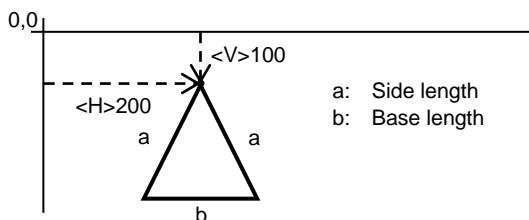
- | | |
|---------------------|---|
| a [Length of sides] | = Valid range: 10 to 2000 dots |
| b [Line width] | = Valid range: 1 to 1000 dots |
| c [Length of base] | = Valid range: 10 to 2000 dots (ommissible)
When omitted, its value will be equal to the length of sides. |
| d [Pattern] | = Valid range: 0 to 3 When omitted: 0 (ommissible)
0: Solid line (black)
1: Gray 1
2: Gray 2
3: Gray 3 |

[Coding Example] Length of sides: 100 dots, Line width: 8 dots, Length of base: 100 dots

```
<A>
<V>100<H>200
<FT>,100,8,100.0
<Q>1
<Z>
```

[Supplementary Explanation]

1. When the value outside of the range is specified for pattern, it will be processed as "0". In this case, this will not be a command error.
2. When the print start position exceeds the printable area, the printing is executed. (This raises a command error.)
(When the print start position exceeds the printable area in the vertical direction, the label will be fed.)
3. When the side length is not equal to the base length, printing will not be performed due to command error.
4. This command sets the base reference point to the apex of a triangle.



5. This command can be registered to the format.
6. If setting the line wider, it will be widened inward.
7. If the base length is odd number, +1 will be added automatically to make even number.

[Valid number]

Model	Valid range (dots)		
	Side length	Line width	Base length
CL4NX CL6NX	10 to 2000	1 to 1000	10 to 2000

7.10 Modification

Reverse Color Print

ESC+(

Hexadecimal code	ESC <1B> ₁₆	(<28> ₁₆	Parameter aaaa,bbbb
Initial value	Nil		

Valid range and term of command	When the power switch is OFF	The set parameter is not maintained.
	Valid range within items	The set parameter becomes invalid.
	Valid range between items	The set parameter becomes invalid.

[Function]

Specifying black and white reverse print.

[Format]

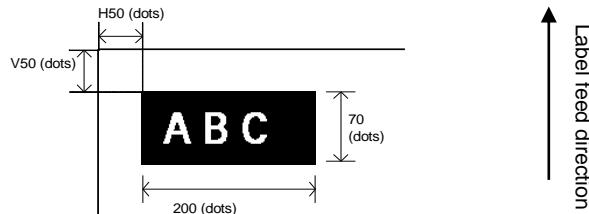
<(>aaaa, bbbbb

•Parameter

a[Specification of reverse area in horizontal direction] = Valid range: Refer to the table below
 b[Specification of reverse area in vertical direction] = Valid range: Refer to the table below

[Coding Example] Reverse area in horizontal direction: 200, Reverse area in vertical direction: 70

```
<A>
<V>50<H>50<P>2<L>0202<X22>,ABC
<V>50<H>50<(>200,70
<Q>2
<Z>
```



[Supplementary Explanation]

1. Set this command next after the firm data string to be inverted. If it is set prior to the firm data the data will be printed in black without inverse.
2. To set print start position, specify Horizontal Print Position <H> and Vertical Print Position <V> prior to this command.
3. When the print start position is outside of printable area, printing will not be performed due to command error.
4. Do not check the range of parameters.

[Note]

For setting, keep the black print area under 30% of overall label.

[Valid Range]

Model	Valid range (dots)	
	Reverse area in horizontal direction	Reverse area in vertical direction
CL4NX	203 dpi	8 to 832
	305 dpi	8 to 1248
	609dpi	8 to 2496
CL6NX	203 dpi	8 to 1216 (*1) 8 to 1340 (*2)
	305 dpi	8 to 1984 (*1) 8 to 2010 (*2)

(*1) Valid range for "Standard" in "Head Base Position" setting.

(*2) Valid range for "Left-justify" in "Head Base Position" setting.

Refer to the operator manual for further information of the setting.

7.11 Modification

Kanji Code

ESC+KC

Hexadecimal code	ESC	KC	Parameter
	<1B> ₁₆	<4B> ₁₆ <43> ₁₆	a
Initial value	a=0		

Valid range and term of command	When the power switch is OFF	The set parameter is not maintained.
	Valid range within items	The set parameter is valid until the next valid setting.
	Valid range between items	The set parameter becomes initial value at the next item <A>.

[Function]

This command allows temporary switch-over between Kanji codes. Normally it is specified by User mode of printer LCD settings.

[Format]

<KC>a

• Parameter

- | | | |
|---------------|---|-------------------|
| a[Kanji code] | = | 0: JIS code |
| | | 1: Shift JIS code |
| | | 2: Unicode |

[Coding Example 1] For Shift JIS

```
<A>
<KC>1
<V>100<H>200<P>2<L>0202
<K1>H81698A94816A83548367815B
<Q>2
<Z>
```

[Coding Example 2] For JIS

```
<A>
<KC>0
<V>100<H>200<P>2<L>0202
<K1>H214A3374214B25352548213C
<Q>2
<Z>
```

[Coding Example 3] For Unicode

```
<A>
<KC>2
<V>100<H>200<P>2<L>0202
<K1>HFF08682AFF0930B530C830FC
<Q>2
<Z>
```

[Supplementary Explanation]

1. There is no necessity to specify this command in the normal label printing.
2. To set Shift JIS as initial value, use User mode of printer LCD setting.
3. It is possible to specify multiple Kanji codes within 1 item.

7.12 Modification

Store Form Overlay

ESC+&

Hexadecimal code	ESC <1B> ₁₆	& <26> ₁₆	Parameter (aab~b)
Initial value	Nil		

Valid range and term of command	When the power switch is OFF	The set command is not maintained.
	Valid range within item	The set parameter is valid until the next valid setting.
	Valid range between items	The set parameter is valid until the next valid setting.

[Function]

Specifying the registration of form overlay.

[Format]

<&>(aab~b)

• Parameter

a [Registration key]	=	Valid range: 01 to 99 (Omissible)
b [Comment]	=	Max. 16 bytes (Omissible)

[Coding Example]

```

<A>
<V>100<H>50<FW>1010V800H750
<V>100<H>50<FW>0505V760H710
<V>150<H>100<XB>0MODEL
<&>01DATA1
<Z>

```

[Supplementary Explanation]

1. This command saves fixed print contents to the printer and then, Form Overlay Call </> combines the contents with drawing of general data to print out.
2. Specify this command at the end of data string that is to be stored. Drawing valid range in form overlay registration is same as printable area.
3. This command can register only one format. Use any code from 01 to 99 as a registration key.
4. To change contents, specify Form Overlay Clear <*>&, and then register new storage data.
5. Invoke registered contents by Form Overlay Call</>.
6. When specifying Label Size <A1>, it will be extracted in the specified area.

[Valid Commands]

Print position	<V>	<H>							
Font	<XU>	<XS>	<XM>	<XB>	<XL>	<OA>	<OB>	<RD>	<\$=>
	<K2>	<K3>	<K4>	<K5>	<K8>	<K9>	<KA>	<KB>	<KD>
	<k2>	<k3>	<k4>	<k5>	<k8>	<k9>	<kA>	<kB>	<kD>
	<S>	<M>	<WB>	<WL>	<X20>	<X21>	<X22>	<X23>	<X24>
Barcode		<BC>	<BG>	<BI>	<D>	<D><d>	<BD>	<BT>	<BW>
	<BF>	<BS>	<BL>	<BL><d>	<BM>				<BP>
2D code	<2D10>	<BK>	<2D12>	<2D20>	<BV>	<2D30>	<2D31>	<2D32>	<BQ>
	<2D50>	<BX>	<2D51>	<2D70>					
Composite Symbol	<EU>								
Modification	<WD>	<FW>	<(>	<RF>			<RM>		
Graphic	<G>	<GM>	<GP>						

7.13 Modification

Recall Form Overlay

**ESC+/
/**

Hexadecimal code	ESC <1B> ₁₆	/ <2F> ₁₆	Parameter (aa)
Initial value	Nil		

Valid range and term of command	When the power switch is OFF	The set command is not maintained.
	Valid range within items	The set parameter is valid until the next valid setting.
	Valid range between items	The set parameter is valid until the next valid setting.

[Function]
Invoking form overlay.

[Format]
</>(aa)

- Parameter
a[Registration key] = Valid Range : 01 to 99 (Omissible)

[Coding Example]

```

<A>
</>01
<V>200<H>100<P>0<$>B,100,100,6
<$=>SATOPRINTER
<V>720<H>150<B>102100*95000012345*
<Q>2
<Z>

```

[Supplementary Explanation]

1. This command invokes the contents registered by Registration of Form Overlay <&> to print.
2. When detecting this command in normal print data, it will be combined with drawing stored in form overlay and printed.
3. The registration key is not checked, so that specifying wrong registration key doesn't raise an error.

7.14 Modification

Partial Edit

ESC+0

Hexadecimal code	ESC	0	Parameter
	<1B> ₁₆	<30> ₁₆	Nil
Initial value	Nil		

Valid range and term of command	When the power switch is OFF	The set command is not maintained.
	Valid range within items	The set command becomes invalid.
	Valid range between items	The set command becomes invalid.

[Function]

Editing the portion in the previous print data.

[Format]

<0>

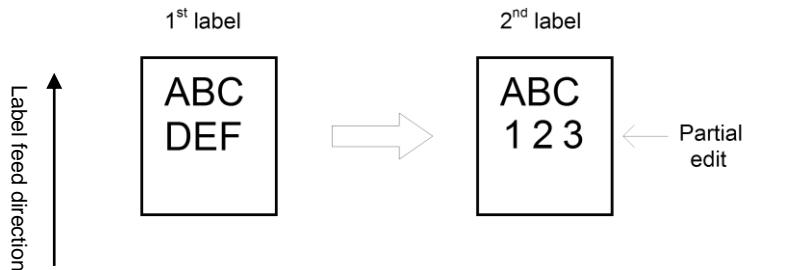
[Coding Example] [DEF], a part of print data, is changed to [123].

```
<A>
<V>100<H>200<P>2<L>0202<XM>,ABC
<V>200<H>200<P>2<L>0202<XM>,DEF
<Q>1
<Z>
```

```
<A>
<0>
<V>200<H>200<P>2<L>0202<XM>,123
<Q>1
<Z>
```

} First label

} Second label



[Supplementary Explanation]

1. Use this command to edit only one part of previous print data.
2. Invoke the previous print data with this command to edit and print out. In this case, specify the part of previous data to edit, and send change data to it.
3. Specified portion in the previous data will be cleared.
4. If Rotation <%> is included in the specified editing portion, keep it for partial editing.
5. Use this command with fixed pitch, same font or same digit number.

7.15 Modification

Partial Copy

ESC+WD

Hexadecimal code	ESC <1B>16	WD <57>16<44>16	Parameter VaaaaaHbbbbYccccccXdddd
Initial value	Nil		

Valid range and term of command	When the power switch is OFF	The set parameter is not maintained.
	Valid range within items	The set command becomes invalid.
	Valid range between items	The set parameter becomes invalid.

[Function]

Copying specified area to another place.

[Format]

<WD>VaaaaaHbbbbYccccccXdddd

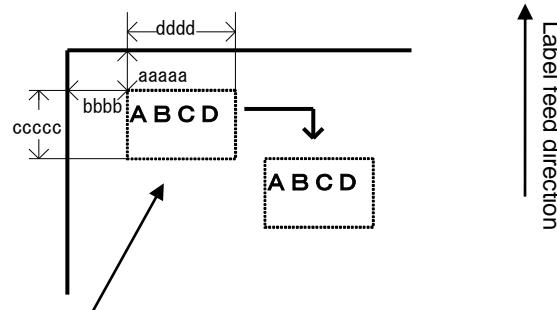
• Parameter

- a[Vertical start point of original data] = Valid range: See the table below.
- b[Horizontal start point of original data] = Valid range: See the table below.
- c[Vertical dot size of original data] = Valid range: See the table below.
- d[Horizontal dot size of original data] = Valid range: See the table below.

[Coding Example] Vertical start point of original data: 50 Horizontal start point of original data: 50

Vertical dot size of original data: 200 Horizontal dot size of original data: 400

<A>
<V>50<H>50<P>2<L>0202<XM>ABCD
<V>300<H>100<WD>V50H50Y200X400
<Q>2
<Z>



Dotted line part indicates the copied area.
Actual print portion is "ABCD".

[Supplementary Explanation]

1. To locate the destination of copy, specify Vertical Print Position <V> and Horizontal Print Position <H> prior to this command.
2. Destination of copy has to be outside of specified original data.
3. When the print start position of the copied area is outside of printable area, printing will not be performed due to command error.

[Valid Range]

Model	Valid range (dots)		
	Horizontal start point of original data	Vertical start point of original data	Horizontal dot size of original data
CL4NX	203 dpi	1 to 832	1 to 20000
	305 dpi	1 to 1248	1 to 18000
	609dpi	1 to 2496	1 to 9600
CL6NX	203 dpi	1 to 1216 (*1) 1 to 1340 (*2)	1 to 20000
	305 dpi	1 to 1984 (*1) 1 to 2010 (*2)	1 to 18000

(*1) Valid range for "Standard" in "Head Base Position" setting.

(*2) Valid range for "Left-justify" in "Head Base Position" setting.

* Even if the specified parameter is within a valid range, it may get out of the valid range depending on its print start position, base position of copy or dot size. In that case, command error will occur.

Refer to the operator manual for further information of the setting.

7.16 Modification

Journal Print

ESC+J

Hexadecimal code	ESC <1B> ₁₆	J <4A> ₁₆	Parameter a~a+CR<0D> ₁₆
Initial value	Nil		

Valid range and term of command	When the power switch is OFF	The set parameter is not maintained.
	Valid range within items	The set parameter becomes invalid.
	Valid range between items	The set parameter becomes invalid.

[Function]

Specifying the print of journal

[Format]

<J>a~a + CR

•Parameter

a[Journal print column] = Print data
CR[Control code (0DH)]

[Coding Example]

<A>
<J>
ABCD+CR
EFGH+CR
<Z>

[Supplementary Explanation]

1. Starts journal print from vertical position of 2 dots and horizontal position of 2 dots.
2. Character pitch is set to 2 dots and line pitch is set to 16 dots.
3. Prints in 2 x 2 times of XS font.
4. Use of this command in combination with other commands excluding Reprint <C> and Reverse Color Print <(> is invalid.
5. This command performs the line feed regardless of setting of CR/LF deletion.

[Font type]

Model	Font type	Magnification ratio
CL4NX CL6NX	XS font	2 x 2

7.17 Modification

Recall Font & Logo

ESC+RF

Hexadecimal code	ESC <1B> ₁₆	RF <52> ₁₆ <46> ₁₆	Parameter aabbbb,n~n
Initial value	aa=01, bbbb=1		

Valid range and term of command	When the power switch is OFF	The set parameter is not maintained.
	Valid range within items	The set parameter becomes invalid.
	Valid range between items	The set parameter becomes invalid.

[Function]

Invoking and printing the font and logo downloaded with exclusive tool.

[Format]

<RF>aabbbb, n~n

• Parameter

a[Font ID number]	=	Valid range: 01 to 99
b[Print digit]	=	Valid range: 1 to 9999
n[Print data]	=	data

[Coding Example 1] To print [AB] in half size character with this command [Font ID No.: 01, Print digit: 4]

(Unicode A: <0041>₁₆B: <0042>₁₆)

```
<A>
<PS>
<V>100<H>100<L>0101
<RF>010004,<0041>16<0042>16
<Z>
```

[Coding Example 2] When calling and printing logo [Font ID No.: 02 Print digit: 2]

```
<A>
<V>100<H>100<L>0101<RF>020002, <826B>16
<Z>
```

[Supplementary Explanation]

- 1.Specify the value of print data putting Unicode(UTF-16BE).
2. When calling and printing logo, specify [Print digit: 0002], [Print data: <6B82>16].
Note that <826B>16 is the value of Shift JIS code of L.

7.18 Modification

Mirror Image

ESC+RM

Hexadecimal code	ESC	RM	Parameter
	<1B>16	<52>16<4D>16	aaaa,bbbb
Initial value	Nil		

Valid range and term of command	When the power switch is OFF	The set parameter is not maintained.
	Valid range within items	The set parameter becomes invalid.
	Valid range between items	The set parameter becomes invalid.

[Function]

Performing mirror rotation of print data.

[Format]

<RM>aaaa, bbbbb

•Parameter

a[Horizontal range of mirror rotation specification]
b[Vertical range of mirror rotation specification]

= Valid range: Refer to the table below.

= Valid range: Refer to the table below.

[Coding Example 1] When the range of mirror rotation is specified:

```
<A>
<H>100<V>200<XS>12345
<H>100<V>200<RM>0200,0080
<Q>1
<Z>
```

[Coding Example 2] When the range of mirror rotation is not specified:

```
<A>
<H>100<V>200<XS>12345
<RM>
<Z>
```

[Supplementary Explanation]

1. When the parameter "aaaa" and "bbbb" are not specified, all print data specified prior to this command will be rotated.
2. Data outside of print area will not rotate.
3. If specifying this command for the item that does not contain print data, the command error will occur.
4. This command cannot be used in combination with the commands that associated with reedition of print data. Refer to the invalid command for the list below. When invalid commands are specified, printing may not be correct.
5. This command cannot be used in combination with some registration commands. Refer to the invalid command for the list below. When the command that cannot use in combination with is specified, print result is not guaranteed.
6. This command cannot be used together with some of the modification commands. Refer to the invalid command for the list below. When the command that cannot use in combination with is specified, print result is not guaranteed.
7. This command print the mirror image of the print data put before the mirror rotation command is specified. The data after the command don't rotate. Note that specifying this command several times results rotating the data several times.
8. When the mirror image is applied for the barcode, reading of the barcode and the head damage check are not guaranteed.
9. When executing the mirror image, the head damage check will be performed for all the areas where rotated.

[Valid Range for start position of mirroring]

Model		Valid Range (dots)	
		Horizontal start position of mirror rotation specification	Vertical start position of mirror rotation specification
CL4NX	203 dpi	1 to 832	1 to 20000
	305 dpi	1 to 1248	1 to 18000
	609dpi	1 to 2498	1 to 9600
CL6NX	203 dpi	1 to 1216 (*1) 1 to 1340 (*2)	1 to 20000
	305 dpi	1 to 1984 (*1) 1 to 2010 (*2)	1 to 18000

(*1) Valid range for "Standard" in "Head Base Position" setting.

(*2) Valid range for "Left-justify" in "Head Base Position" setting.

Refer to the operator manual for further information of the setting.

[Valid Range for mirror rotation]

Model		Valid Range (dots)			
		Horizontal range of mirror rotation		Vertical range of mirror rotation	
CL4NX	203 dpi	8 to 832		8 to 20000	
	305 dpi	8 to 1248		8 to 18000	
	609dpi	8 to 2498		8 to 9600	
CL6NX	203 dpi	0 to 1216 (*1) 8 to 1340 (*2)		8 to 20000	
	305 dpi	1 to 1984 (*1) 8 to 2010 (*2)		8 to 18000	

(*1) Valid range for "Standard" in "Head Base Position" setting.

(*2) Valid range for "Left-justify" in "Head Base Position" setting.

Refer to the operator manual for further information of the setting.

[Command that cannot use in combination with]

Command that associated with reediting.	<WD>	<F>	<(>	<0>	<WA>				
Registration	<GI>	<GT>	<PI>						
Modification	<%>	<R>							

7.19 Modification

Kanji Set

ESC+KS

Hexadecimal code	ESC <1B> ₁₆	KS <4B> ₁₆ <53> ₁₆	Parameter a
Initial value	a=3		

Valid range and term of command	When the power switch is OFF	The set parameter is maintained.
	Valid range within items	The set parameter is in effect until a new specification is made.
	Valid range between items	The set parameter is in effect until a new specification is made.

[Function]

Setting the kanji set.

[Format]

<KS>a

•Parameter

Symbol	Parameter name	Valid range
a	Kanji set	0: Japan, Compatible Kanji (JISX208) 1: Japan, JIS208 Kanji (JISX208) 2: Japan, JIS213 Kanji (JISX213) 3: China, Simplified Chinese characters (GB18030) 4: Reserved 5: China, Traditional Chinese characters (BIG5) 6: Korean (KSX1001)

[Coding Example] Specifying GB18030

<A>
<KS>3
<Z>

[Supplementary Explanation]

Select the kanji set to be printed by using <K1>16 x 16 dots horizontal writing kanji command, <K2>24 x 24 dots horizontal writing command, <k1>16 x 16 dots vertical writing kanji command and <k2>24 x 24 dots vertical dots command.

7.20 Modification

Field Alignment

ESC+AL

Hexadecimal code	ESC <1B>16	AL <4B>16<4C>16	Parameter a
Initial value	a=1		

Valid range and term of command	When the power switch is OFF	The set parameter is not maintained.
	Valid range within items	The set parameter is valid until the next valid setting.
	Valid range between items	The set parameter becomes initial value at the next item <A>.

[Function]

The base reference point specified with print positioning commands <H>, <V> is equal to the “Alignment position” of this command. The field’s base reference points are changeable with “Alignment position”. The supported fields are all text fields, barcode, 2D code, graphics, ruled lines and boxes etc.

[Format]

<AL>a

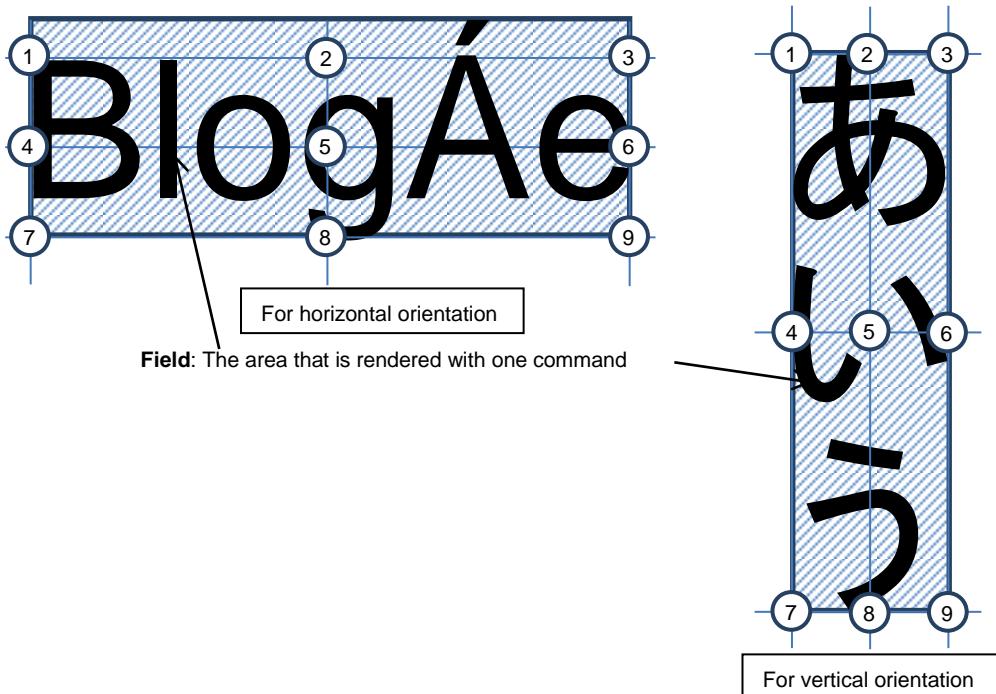
• Parameter

a Alignment position =

- 1: Top left
- 2: Top center
- 3: Top right
- 4: Middle left
- 5: Middle center
- 6: Middle right
- 7: Bottom left
- 8: Bottom center
- 9: Bottom right

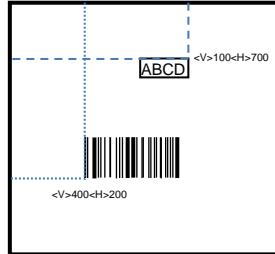
[Field and alignment positions (in case of font command)]

The number inside the circle indicate the value of parameter a, “Alignment position (the positions specified with print positioning commands <H>, <V>)”.



[Coding Example] Font's alignment position: Top Right, barcode alignment position: Bottom left

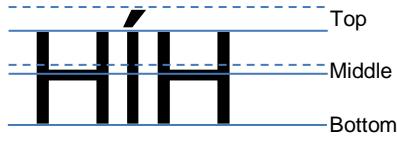
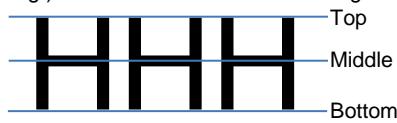
```
<A>
<AL>3
<V>100<H>700<P>3<L>0403<X22>,ABCD
<AL>7
<V>400<H>200<BD>103160*123*
<Q>2
<Z>
```



[Supplementary Explanation]

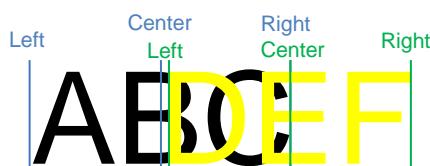
1. The alignment position will ignore anything that was set, and sets the default "Top left" if the value for parameter *a* was 0 or a non-numeric value.
2. If you select Middle or Bottom, the position may vary depending on the ascender line and descender line of each field. Ascender/descender lines depend on each font, so not all fonts may show like in the examples as below.

E.g.) Cases with and without 'í' and 'g'



3. Make sure to specify <H> and <V> to the field when you select Center and Right. If they are not specified when specifying for the 2nd field, the trailing edge of the 1st field becomes the base reference point of the 2nd field, which means that the parts of the 1st and 2nd field will overlap.

E.g.) If <H> and <V> are not specified to the 2nd field when specifying Center

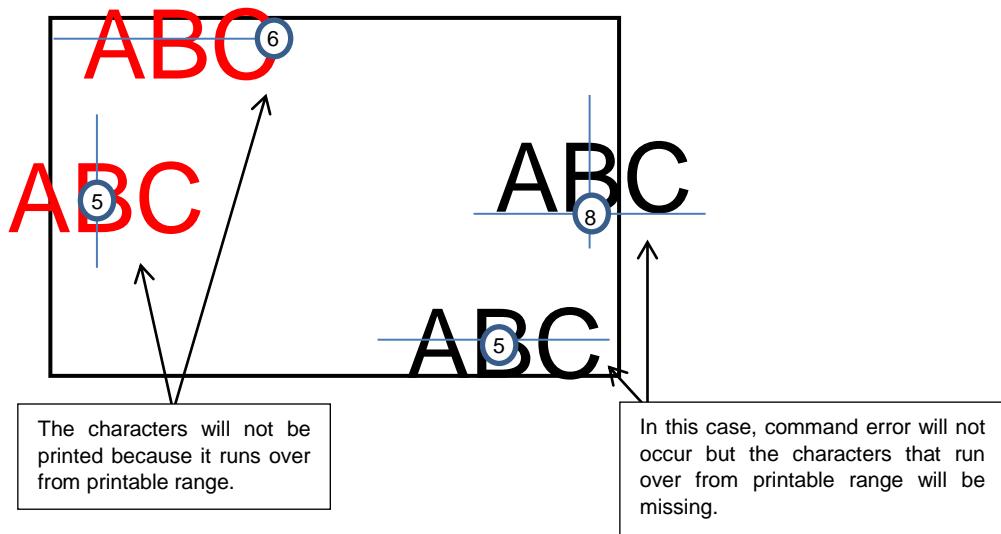


E.g.) If <H> and <V> are not specified to the 2nd field when specifying Right



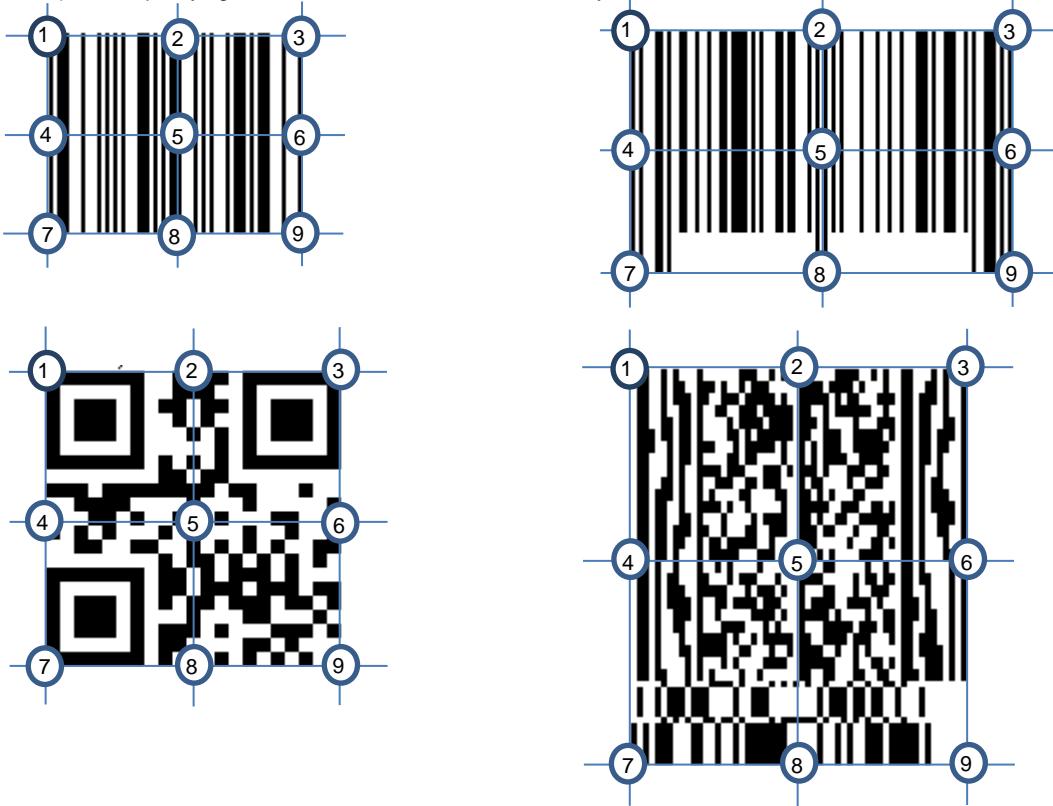
4. Printer does not print if the positions specified with <H> and <V> (equal to "Alignment position") if they are out of printable range.

5. There are cases where the rendered field may run off from printable area depending on "Alignment position" and print position commands <H> and <V>. Command error(Position Error) may occur depending on the conditions as described below.



6. The composition of the field depends on the command when specifying "Alignment position" for barcode and 2D code fields.

Ex.) When specifying barcode, 2D code without automatically attached human readables



Example) When specifying a barcode with automatically attached human readables (<BD>, <BM> <Bl> etc.)



7. The “alignment position (horizontal position of printing <H>)” is different for Top left, Middle left and Bottom left in case of barcodes whose position of automatically applied human readables start printing before the barcodes such as UPC-A for <BD> and <BM> and JAN/EAN-13.



[Notes]

1. Human readables are included in the field of "Field Alignment" for barcode.
2. Printer works as below if the printing runs off printable area as a result of "Alignment position".
 - (1) Position Error will occur and will not print if the top left of the barcode runs off.
 - (2) International models will print if the Top Left of the barcode doesn't run off the paper. However some parts of the barcode will be missing.
 - (3) Barcodes will be printed if human readables run off the Left of the paper. However the human readables will not be printed.



[Available commands]

	<XU>	<XS>	<XM>	<XB>	<XL>	<OA>	<OB>	<U>	<S>	<M>
	<WB>	<WL>	<X20>	<X21>	<X22>	<X23>	<X24>			
	<\$=>	<RD>	<RH>	<RG>						
Font	<K1>	<K2>	<K3>	<K4>	<K5>	<K8>	<K9>	<KA>	<KB>	<KD>
	<k1>	<k2>	<k3>	<k4>	<k5>	<k8>	<k9>	<kA>	<kB>	<kD>
	<K1> (<K2>)	<k1> (<k2>)								
Barcode		<BC>	<BG>	<BI>	<D>	<D><d> *1	<BD>	<BW>	<BP>	<BM>
	<BF> *2	<BS> *3	<BL>	<BL><d> *1	<BZ>					
2D code	<2D10>	<2D12>	<2D20>	<2D30>	<2D31>	<2D32>	<2D50>	<2D51>	<2D33>	
	<BX>	<BK>	<BV>	<BQ>	<FX>					
Composite barcode	<EU>									
Graphics	<G>	<GM>	<GP>							
System	<E>									
Modification	<FW>	<F>	<%>	<RF>	<L>	<P>	<PS>	<PR>		
Memory card	<GR>	<GC>	<PY>	<BJT>						
Calendar	<WA>									

*1 The position depends on the specified human readable type and data. Make sure to specify just the right number of characters for human readables data. Printing is not guaranteed if there are excess or insufficient human readables.

*2 <BF>: Book land is a barcode which uses multiple commands such as <BD> and <BF>, <D>~<d> and <BF>. Please arrange so that they are printed in expected positions since alignment positions are calculated by each field for this command.

*3 <BS>: USPS Barcode has the same position as specifying Middle position in this command without specifying this command. When you specify Middle position with this command, it prints to an alignment position equivalent to Bottom position.

Example) Top left



Example) Middle left



Example) Bottom left



8 Font Command

8.1 Font			
X20 Font (Basic size 5x9 dots)		ESC+X20	
Hexadecimal code	ESC <1B> ₁₆	X20 <58> ₁₆ <32> ₁₆ <30> ₁₆	Parameter ,n~n
Initial value	Nil		
Valid range and term of command	When the power switch is OFF Valid range within items Valid range between items	The set parameter is not maintained. The set parameter becomes invalid. The set parameter becomes invalid.	

[Function]

Font with the basic size of: width 5 dots, height 9 dots is specified.

[Format]

<X20>,n - n

• Parameter

n[Print data] = Data

[Coding example]

<A>
<V>100<H>200<P>2<L>0304<X20>,ABCDE
<Q>2
<Z>

[Notes]

The X20 font only allows the setting of a fixed pitch.

[Valid Command]

Print position	<V>	<H>								
Modification	<P>	<L>	<%>	<F>	<&>	</>	<0>	<WD>		
Barcode	<D><d>	<BL><d>								
Calendar ^{*1}	<WA>									

*1 This command requires optional calendar IC and it is not usable without IC.

X20 font character set

Basic size is 5 x 9 dots (width x height)

X20 FONT(L0303) 203DPI

	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0		0	0	P		p			-	タ	ミ			
1	1	1	A	Q	a	q			フ	チ	ム			
2	"	2	B	R	b	r			イ	ツ	ヌ			
3	#	3	C	S	c	s			ウ	テ	モ			
4	\$	4	D	T	d	t			リ	ト	リ			
5	%	5	E	U	e	u		.	オ	ナ	イ			
6	&	6	F	V	f	v			ヨ	カ	ニ	ヨ		
7	'	7	G	W	g	w			キ	ヌ	ラ			
8	<	8	H	X	h	x			ク	ネ	リ			
9)	9	I	Y	i	y			ケ	ノ	ル			
A	*	:	J	Z	j	z			コ	ム	レ			
B	+	;	K	¢	k	-			サ	ヒ	ロ			
C	,	<	L	¥	l	-			シ	フ	ワ			
D	-	=	M		m				ズ	ヘ	ン			
E	.	>	N		n				セ	ホ	ン			
F	/	?	O		o				ソ	マ	。			

The print sample shown above is issued with a head density of 8dots/mm and an expansion factor of 3 (vertical/horizontal). The data from 00 (H) to 1F (H) are control codes and you cannot use them.

8.2 Font

X21 Font (Basic size 17x17 dots)

ESC+X21

Hexadecimal code	ESC	X21	Parameter
	<1B> ₁₆	<58> ₁₆ <32> ₁₆ <31> ₁₆	,n~n
Initial value	Nil		

Valid range and term of command	When the power switch is OFF	The set parameter is not maintained.
	Valid range within items	The set parameter becomes invalid.
	Valid range between items	The set parameter becomes invalid.

[Function]

Font with the basic size of: width 17 dots, height 17 dots is specified.

[Format]

<X21>,n - n

- Parameter
n[Print data] = Data

[Coding example]

```
<A>
<V>100<H>200<P>2<L>0304<X21>,ABCDE
<Q>2
<Z>
```

[Supplementary Explanation]

1. The X21 font allows the setting of a fixed pitch or the setting of a proportional pitch.
2. Font pitch (fixed/proportional) can be selected via command or LCD settings.

[Valid Command]

Print position	<V>	<H>								
Modification	<P>	<L>	<%>	<PS>	<PR>	<F>	<&>	</>	<O>	<WD>
Barcode	<D><d>	<BL><d>								
Calendar ¹	<WA>									

*1 This command requires optional calendar IC and it is not usable without IC.

X21 font character set

Basic size is 17 x 17 dots (width x height)

X21 FONT(L0202) 203DPI

	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0	0	@	P	'	p				—	タ	ミ			
1	!	1	A	Q	a	q	.	。	ア	チ	ム			
2	"	2	B	R	b	r		「	イ	ツ	メ			
3	#	3	C	S	c	s		」	ウ	テ	モ			
4	\$	4	D	T	d	t		、	エ	ト	ヤ			
5	%	5	E	U	e	u		・	オ	ナ	ユ			
6	&	6	F	V	f	v		ヲ	カ	ニ	ヨ			
7	'	7	G	W	g	w		ア	キ	ヌ	ラ			
8	(8	H	X	h	x		イ	ク	ネ	リ			
9)	9	I	Y	i	y		ウ	ケ	ノ	ル			
A	*	:	J	Z	j	z		エ	コ	ハ	レ			
B	+	;	K	[k	{		オ	サ	ヒ	ロ			
C	,	<	L	¥	l	:		ヤ	シ	フ	ワ			
D	-	=	M]	m	}		ュ	ス	ヘ	ン			
E	.	>	N	^	n	~		ヨ	セ	ホ	・			
F	/	?	O	_	o			ツ	ソ	マ	・			

The print sample shown above is issued with a head density of 8 dots/mm and an expansion factor of 2 (vertical/horizontal).

The data from 00 (H) to 1F (H) are control codes and you cannot use them.

8.3 Font

X22 Font (Basic size 24x24 dots)

ESC+X22

Hexadecimal code	ESC <1B> ₁₆	X22 <58> ₁₆ <32> ₁₆ <32> ₁₆	Parameter ,n~n
Initial value	Nil		

Valid range and term of command	When the power switch is OFF	The set parameter is not maintained.
	Valid range within items	The set parameter becomes invalid.
	Valid range between items	The set parameter becomes invalid.

[Function]

Font with the basic size of: width 24 dots, height 24 dots is specified.

[Format]

<X22>,n - n

- Parameter
n [Print data] = Data

[Coding example]

```
<A>
<V>100<H>200<P>2<L>0304<X22>,ABCDE
<Q>2
<Z>
```

[Supplementary Explanation]

1. The X22 font allows the setting of a fixed pitch or the setting of a proportional pitch.
2. Font pitch (fixed/proportional) can be selected via command or LCD settings.

[Valid Command]

Print position	<V>	<H>								
Modification	<P>	<L>	<%>	<PS>	<PR>	<F>	<&>	</>	<0>	<WD>
Barcode	<D><d>	<BL><d>								
Calendar ^{*1}	<WA>									

*1 This command requires optional calendar IC and it is not usable without IC.

X22 font character set

Basic size is 24 x 24 dots (width x height)

X22 FONT(L0202) 203DPI

	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0	0	@	P	^	p				—	タ	ミ			
1	!	1	A	Q	a	q		.	ア	チ	ム			
2	"	2	B	R	b	r		「	イ	ツ	メ			
3	#	3	C	S	c	s		」	ウ	テ	モ			
4	\$	4	D	T	d	t		,	エ	ト	ヤ			
5	%	5	E	U	e	u		-	オ	ナ	ユ			
6	&	6	F	V	f	v		ヲ	カ	ニ	ヨ			
7	'	7	G	W	g	w		ア	キ	ヌ	ラ			
8	(8	H	X	h	x		イ	ク	ネ	リ			
9)	9	I	Y	i	y		ウ	ケ	ノ	ル			
A	*	:	J	Z	j	z		エ	コ	ハ	レ			
B	+	;	K	[k	{		オ	サ	ヒ	ロ			
C	,	<	L	¥	l	:		ヤ	シ	フ	ワ			
D	—	=	M]	m	}		ユ	ス	ヘ	ン			
E	.	>	N	^	n	~		ヨ	セ	ホ	・			
F	/	?	O	_	o			ツ	ソ	マ	・			

The print sample shown above is issued with a head density of 8 dots/mm and an expansion factor of 2 (vertical/horizontal).

The data from 00 (H) to 1F (H) are control codes and you cannot use them.

8.4 Font

X23 Font (Basic size 48x48 dots)

ESC+X23

Hexadecimal code	ESC	X23	Parameter
	<1B> ₁₆	<58> ₁₆ <32> ₁₆ <33> ₁₆	,an~n
Initial value	Nil		

Valid range and term of command	When the power switch is OFF	The set parameter is not maintained.
	Valid range within items	The set parameter becomes invalid.
	Valid range between items	The set parameter becomes invalid.

[Function]

Font with the basic size of: width 48 dots, height 48 dots is specified.

[Format]

<X23>,an~n

- Parameter

a[Smoothing]	=	0 : Smoothing disabled
	=	1: Smoothing ON (Only available if expansion factor is between 3 and 12)
n[Print data]	=	Data

[Coding example]

```
<A>
<V>100<H>200<P>2<L>0304<X23>,0ABCDE
<Q>2
<Z>
```

[Supplementary Explanation]

1. The X23 font allows the setting of a fixed pitch or the setting of a proportional pitch.
2. Font pitch (fixed/proportional) can be selected via command or LCD settings.
3. When the smoothing is enabled, and the expansion <L> command is set to 1 or 2 or from 13 to 36, the smoothing function will be ignored.

[Valid Command]

Print position	<V>	<H>								
Modification	<P>	<L>	<%>	<PS>	<PR>	<F>	<&>	</>	<0>	<WD>
Barcode	<D><d>	<BL><d>								
Calendar	<WA>									

*1 This command requires optional calendar IC and it is not usable without IC.

X23 font character set

Basic size is 48 x 48 dots (width x height)

X23 FONT(L0101) 203DPI

	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0	0	0	@	P	`	p			一タミ					
1	!	1	A	Q	a	q	.	。	アチム					
2	"	2	B	R	b	r		』	イツメ					
3	#	3	C	S	c	s		』	ウテモ					
4	\$	4	D	T	d	t		、	エトヤ					
5	%	5	E	U	e	u		-	オナユ					
6	&	6	F	V	f	v		ヲ	カニヨ					
7	'	7	G	W	g	w		ア	キヌラ					
8	(8	H	X	h	x		イ	クネリ					
9)	9	I	Y	i	y		ウ	ケノル					
A	*	:	J	Z	j	z		エ	コハレ					
B	+	;	K	[k	{		オ	サヒロ					
C	,	<	L	¥		:		ヤ	シフワ					
D	-	=	M]	m	}		ュ	スヘン					
E	.	>	N	^	n	~		ヨ	セホ	。				
F	/	?	O	_	o			ツ	ソマ	。				

The print sample shown above is issued with a head density of 8 dots/mm and an expansion factor of 1 (vertical/horizontal).

The data from 00 (H) to 1F (H) are control codes and you cannot use them.

8.5 Font

X24 Font (Basic size 48x48 dots)

ESC+X24

Hexadecimal code	ESC	X24	Parameter
	<1B> ₁₆	<58> ₁₆ <32> ₁₆ <34> ₁₆	,an~n
Initial value	Nil		

Valid range and term of command	When the power switch is OFF	The set parameter is not maintained.
	Valid range within items	The set parameter becomes invalid.
	Valid range between items	The set parameter becomes invalid.

[Function]

Font with the basic size of: width 48 dots, height 48 dots is specified.

[Format]

<X24>,an~n

- Parameter

a [Smoothing]	=	0 : Smoothing OFF
		1 : Smoothing ON
		(Only available if expansion factor is between 3 and 12)
n [Print data]	=	Data

[Coding example]

```
<A>
<V>100<H>200<P>2<L>0304<X24>,0ABCDE
<Q>2
<Z>
```

[Supplementary Explanation]

1. The X24 font allows the setting of a fixed pitch or the setting of a proportional pitch.
2. Font pitch (fixed/proportional) can be selected via command or LCD settings.
3. When the smoothing is enabled, and the expansion <L> command is set to 1 or 2 or from 13 to 36, the smoothing function will be ignored.

[Valid Command]

Print position	<V>	<H>								
Modification	<P>	<L>	<%>	<PS>	<PR>	<F>	<&>	</>	<0>	<WD>
Barcode	<D><d>	<BL><d>								
Calendar ^{*1}	<WA>									

*1 This command requires optional calendar IC and it is not usable without IC.

X24 font character set

Basic size is 48 x 48 dots (width x height)

X24 FONT(L0101) 203DPI

	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0	0	@	P	'	p				一	タ	ミ			
1	!	1	A	Q	a	q		.	ア	チ	ム			
2	"	2	B	R	b	r		「	イ	ツ	メ			
3	#	3	C	S	c	s		」	ウ	テ	モ			
4	\$	4	D	T	d	t		,	エ	ト	ヤ			
5	%	5	E	U	e	u		・	オ	ナ	ユ			
6	&	6	F	V	f	v		ヲ	カ	ニ	ヨ			
7	'	7	G	W	g	w		ア	キ	ヌ	ラ			
8	(8	H	X	h	x		イ	ク	ネ	リ			
9)	9	I	Y	i	y		ウ	ケ	ノ	ル			
A	*	:	J	Z	j	z		エ	コ	ハ	レ			
B	+	;	K	[k	{		オ	サ	ヒ	ロ			
C	,	<	L	¥	l	:		ヤ	シ	フ	ワ			
D	-	=	M]	m	}		ュ	ス	ヘ	ン			
E	.	>	N	^	n	~		ヨ	セ	ホ	"			
F	/	?	O	_	o			ツ	ソ	マ	°			

The print sample shown above is issued with a head density of 8 dots/mm and an expansion factor of 1 (vertical/horizontal).

The data from 00 (H) to 1F (H) are control codes and you cannot use them.

8.6 Font

XU Font (Basic size 5x9 dots)

ESC+XU

Hexadecimal code	ESC	XU	Parameter
	<1B> ₁₆	<58> ₁₆ <55> ₁₆	n~n
Initial value	Nil		

Valid range and term of command	When the power switch is OFF	The set parameter is not maintained.
	Valid range within items	The set parameter becomes invalid.
	Valid range between items	The set parameter becomes invalid.

[Function]

Font with the basic size of: width 5 dots, height 9 dots is specified.

[Format]

<XU> n~n

- Parameter
n[Print data] = Data

[Coding example]

```
<A>
<V>100<H>200<P>2<L>0304<XU>ABCDE
<Q>2
<Z>
```

[Supplementary Explanation]

1. The XU font allows the setting of a fixed pitch or the setting of a proportional pitch.
2. Font pitch (fixed/proportional) can be selected via command or LCD settings.
3. The character set varies according to setting of <CE> command.

[Valid Command]

Print position	<V>	<H>								
Modification	<P>	<L>	<%>	<PS>	<PR>	<F>	<&>	</>	<0>	<WD>
Barcode	<D><d>	<BL><d>								
Calendar ¹	<WA>									

*1 This command requires optional calendar IC and it is not usable without IC.

XU font character set

Basic size is 5 x 9 dots (width x height)

XU FONT(L0303) 203DPI

	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0	0	0	0	P	^	p	ç	é	á	ó		ö	ó	-
1	!	1	A	Q	a	q	ü	æ	i			ð	þ	±
2	"	2	B	R	b	r	é	ë	ó			ë	ó	=
3	#	3	C	S	c	s	á	ö	ú			ë	ó	§
4	\$	4	D	T	d	t	ä	ö	ñ			ë	ó	¶
5	%	5	E	U	e	u	à	ò	ñ	á		€	ó	§
6	&	6	F	V	f	v	à	ô	è	â	ã	í	þ	÷
7	'	7	G	W	g	w	ç	ù	ø	à	ã	í	þ	,
8	<	8	H	X	h	x	ë	ÿ	ô	ø		í	þ	º
9	>	9	I	Y	i	y	ë	ö	ø				ó	"
A	*	:	J	Z	j	z	è	ö	¬				ó	+
B	+	;	K	[k	{	í	ø	%				ó	!
C	,	<	L	\	l		í	£	%				ý	³
D	-	=	M]	m	}	í	ß	í	¢		í	ý	z
E	.	>	N	^	n	-	ñ	×	◊	¥		í	-	
F	/	?	O	-	o	¤	À	f	»		»		'	

The print sample shown above is issued with width 5 x height 9, magnification factor of 3 (vertical/horizontal) and DOS 858.

8.7 Font

XS Font (Basic size 17x17 dots)

ESC+XS

Hexadecimal code	ESC <1B> ₁₆	XS <58> ₁₆ <53> ₁₆	Parameter n~n
Initial value	Nil		

Valid range and term of command	When the power switch is OFF	The set parameter is not maintained.
	Valid range within items	The set parameter becomes invalid.
	Valid range between items	The set parameter becomes invalid.

[Function]

Font with the basic size of: width 17 dots, height 17 dots is specified.

[Format]

<XS>n~n

- Parameter

n[Print data] = Data

[Coding example]

```
<A>
<V>100<H>200<P>2<L>0304<XS>ABCDE
<Q>2
<Z>
```

[Supplementary Explanation]

1. The XS font allows the setting of a fixed pitch or the setting of a proportional pitch.
2. Font pitch (fixed/proportional) can be selected via command or LCD settings.
3. The character set varies according to setting of <CE> command.

[Valid Command]

Print position	<V>	<H>								
Modification	<P>	<L>	<%>	<PS>	<PR>	<F>	<&>	</>	<0>	<WD>
Barcode	<D><d>	<BL><d>								
Calendar ¹	<WA>									

¹*1 This command requires optional calendar IC and it is not usable without IC.

XS font character set

Basic size is 17 x 17 dots (width x height)

XS FONT(L0202) 203DPI

	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0	0	@	P	'	p	ç	é	á	ø		đ	ó	-	
1	!	1	A	Q	a	q	ü	æ	í		đ	ß	±	
2	"	2	B	R	b	r	é	Æ	ó			€	ø	=
3	#	3	C	S	c	s	â	ô	ú			€	ø	¾
4	\$	4	D	T	d	t	ä	ö	ñ			€	õ	¶
5	%	5	E	U	e	u	à	ò	N	A		€	ø	§
6	&	6	F	V	f	v	å	û	ä	â	ã	í	µ	÷
7	'	7	G	W	g	w	ç	ù	ó	À	Ã	í	þ	,
8	(8	H	X	h	x	ê	ÿ	ç	©		Y	þ)
9)	9	I	Y	i	y	ë	ö	®			ú	..	
A	*	:	J	Z	j	z	è	ø	¬			ø	•	
B	+	;	K	[k	{	ï	ø	½			ø	¹	
C	,	<	L	\	l	:	î	ƒ	¼			ý	³	
D	-	=	M]	m	}	ì	ø	i	ø		;	Ý	²
E	.	>	N	^	n	~	Ä	×	«	¥		í	-	
F	/	?	O	-	o	████	Å	f	»		xx		'	

The print sample shown above is issued with width 17 x height 17, magnification factor of 2 (vertical/horizontal) and DOS 858.

8.8 Font

XM Font

(Basic size 24x24 dots)

ESC+XM

Hexadecimal code	ESC <1B> ₁₆	XM <58> ₁₆ <4D> ₁₆	Parameter n~n
Initial value	Nil		

Valid range and term of command	When the power switch is OFF	The set parameter is not maintained.
	Valid range within items	The set parameter becomes invalid.
	Valid range between items	The set parameter becomes invalid.

[Function]

Font with the basic size of: width 24 dots, height 24 dots is specified.

[Format]

<XM>n~n

- Parameter

n[Print data] = Data

[Coding example]

```
<A>
<V>100<H>200<P>2<L>0304<XM>ABCDE
<Q>2
<Z>
```

[Supplementary Explanation]

1. The XM font allows the setting of a fixed pitch or the setting of a proportional pitch.
2. Font pitch (fixed/proportional) can be selected via command or LCD settings.
3. The character set varies according to setting of <CE> command.

[Valid Command]

Print position	<V>	<H>								
Modification	<P>	<L>	<%>	<PS>	<PR>	<F>	<&>	</>	<0>	<WD>
Barcode	<D><d>	<BL><d>								
Calendar ¹	<WA>									

¹*1 This command requires optional calendar IC and it is not usable without IC.

XM font character set

Basic size is 24 x 24 dots (width x height)

XMFONT(L0202) 203DPI

	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0	Ø	ø	@P	`	p	Ç	É	á	Ø	đ	ó	-		
1	!	1	A	Q	a	q	ü	æí			Đ	Þ	±	
2	"	2	B	R	b	r	é	Æó			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	ÑÁ		€	Ö	§	
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	p,	
8	(8	H	X	h	x	ê	ÿ	¿	©	ï	p	º	
9)	9	I	Y	i	y	ë	ö	®			ú	..	
A	*	:	J	Z	j	z	è	Ü	¬			û	•	
B	+	;	K	[k	{	ï	š	½			û	¶	1
C	,	<	L	\	I	:	î	£	¼			ý	³	
D	-	=	M]	m	}	ì	ø	í	¢	:	ÿ	²	
E	.	>	N	^	n	~	Ä	x	<<	¥	í	-		
F	/	?	O	_	o				»		»		‘	

The print sample shown above is issued with width 24 x height 24, magnification factor of 2 (vertical/horizontal) and DOS 858.

8.9 Font

XB Font (Basic size 48x48 dots)

ESC+XB

Hexadecimal code	ESC	XB	Parameter
	<1B> ₁₆	<58> ₁₆ <42> ₁₆	a~n
Initial value	Nil		

Valid range and term of command	When the power switch is OFF	The set parameter is not maintained.
	Valid range within items	The set parameter becomes invalid.
	Valid range between items	The set parameter becomes invalid.

[Function]

Font with the basic size of: width 48 dots, height 48 dots is specified.

[Format]

<XB>a~n

- Parameter

- | | | |
|---------------|---|---|
| a[Smoothing] | = | 0: Smoothing OFF |
| | | 1: Smoothing ON |
| | | (Valid for expansion factors <L> between 3 and 9) |
| n[Print data] | = | Data |

[Coding example]

```
<A>
<V>100<H>200<P>2<L>0304<XB>0ABCDE
<Q>2
<Z>
```

[Supplementary Explanation]

1. XB font allows the setting of a fixed pitch or the setting of a proportional pitch.
2. Font pitch (fixed/proportional) can be selected via command or LCD settings.
3. When the smoothing is enabled, and the expansion <L> command is set to 1 or 2 or from 10 to 36, the smoothing function will be ignored.
4. The character set varies according to setting of <CE> command.

[Valid Command]

Print position	<V>	<H>								
Modification	<P>	<L>	<%>	<PS>	<PR>	<F>	<&>	</>	<0>	<WD>
Barcode	<D><d>	<BL><d>								
Calendar ¹	<WA>									

*1 This command requires optional calendar IC and it is not usable without IC.

XB font character set

Basic size is 48 x 48 dots (width x height)

XB FONT(L0101) 203DPI

	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0	0	0	@	P	`	p	Ç	É	á	ø	ð	ó	-	
1	!	1	A	Q	a	q	ü	æ	í		Đ	þ	±	
2	"	2	B	R	b	r	é	Æ	ó		Ê	ô	=	
3	#	3	C	S	c	s	â	ô	ú		Ë	ò	$\frac{3}{4}$	
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	á	Â	ã	Í	µ	÷
7	'	7	G	Wg	wç	ù	o	À	Ã	î	p	,		
8	(8	H	X	h	x	ê	ÿ	ç	©	Í	P	°	
9)	9	I	Y	i	y	ë	ö	®			Ú	..	
A	*	:	J	Z	j	z	è	Ü	¬			Û	•	
B	+	;	K	[k	{	ï	ø	$\frac{1}{2}$			Ù	¹	
C	,	<	L	\	l	:	î	£	$\frac{1}{4}$			Ý	³	
D	-	=	M]	m	}	ì	ø	i	¢		Í	Ý	²
E	.	>	N	^	n	~	Ä	×	«	¥		í	-	
F	/	?	O	_	o		Å	f	»		¤		'	

The print sample shown above is issued with width 48 x height 48, magnification factor of 1 (vertical/horizontal) and DOS 858.

8.10 Font

XL Font (Basic size 48x48 dots)

ESC+XL

Hexadecimal code	ESC <1B> ₁₆	XL <58> ₁₆ <4C> ₁₆	Parameter an~n
Initial value	Nil		

Valid range and term of command	When the power switch is OFF	The set parameter is not maintained.
	Valid range within items	The set parameter becomes invalid.
	Valid range between items	The set parameter becomes invalid.

[Function]

Font with the basic size of: width 48 dots, height 48 dots is specified.

[Format]

<XL>an~n

- Parameter

a[Smoothing]	=	0: Smoothing OFF
		1: Smoothing ON (Valid for expansion factors <L> between 3 and 9)
n[Print data]	=	Data

[Coding example]

```
<A>
<V>100<H>200<P>2<L>0304<XL>0ABCDE
<Q>2
<Z>
```

[Supplementary Explanation]

1. XL font allows the setting of a fixed pitch or the setting of a proportional pitch.
2. Font pitch (fixed/proportional) can be selected via command or LCD settings.
3. When the smoothing is enabled, and the expansion <L> command is set to 1 or 2 or from 10 to 36, the smoothing function will be ignored.
4. The character set varies according to setting of <CE> command.

[Valid Command]

Print position	<V>	<H>								
Modification	<P>	<L>	<%>	<PS>	<PR>	<F>	<&>	</>	<0>	<WD>
Barcode	<D><d>	<BL><d>								
Calendar ^{*1}	<WA>									

*1 This command requires optional calendar IC and it is not usable without IC.

XL font character set

Basic size is 48 x 48 dots (width x height)

XL FONT(L0101) 203DPI

	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0	0	@	P	'	p	Ç	É	á	Ø		ð	Ó	-	
1	!	1	A	Q	a	q	ü	æí			Ð	Þ	±	
2	"	2	B	R	b	r	é	Æó			Ê	Ô	=	
3	#	3	C	S	c	s	â	ôú			Ë	Ò	$\frac{3}{4}$	
4	\$	4	D	T	d	t	ä	öñ			È	õ	¶	
5	%	5	E	U	e	u	àò	ÑÁ			€	Õ	§	
6	&	6	F	V	f	v	åû	ª	Âã	Í	µ	÷		
7	'	7	G	Wg	wç	ù	º	ÀÃÍþ,						
8	(8	H	X	h	x	êë	ÿ¿	©		Ï	Þº		
9)	9	I	Y	i	y	ë	Ö®					Ú..	
A	*	:	J	Z	j	z	è	Ü¬					Û•	
B	+	;	K	[k	{	ï	ø½					Ù¹	
C ,	<	L	\	I	l	î	£	¼					Ý³	
D -	=	M]	m	}	ì	Øi	¢					Ý²	
E .	>	N	^	n	~	Äx	«	¥					Ì-	
F /	?	O	_	o		Åf	»						'	

The print sample shown above is issued with width 48 x height 48, magnification factor of 1 (vertical/horizontal) and DOS 858.

8.11 Font

OCR-A Font

ESC+OA

Hexadecimal code	ESC <1B> ₁₆	OA <4F> ₁₆ <41> ₁₆	Parameter n~n
Initial value	Nil		

Valid range and term of command	When the power switch is OFF	The set parameter is not maintained.
	Valid range within items	The set parameter becomes invalid.
	Valid range between items	The set parameter becomes invalid.

[Function]
Specifies OCR-A font.

[Format]
<OA>n~n

- Parameter
n[Print data] = Data

[Coding example]

```
<A>
<V>100<H>100<P>2<L>0202<OA>ABC
<Q>2
<Z>
```

[Supplementary Explanation]

Refer to the table below for font size of each head density.

[Font size table]

Head density	Font size (dots)
8 dots/mm (203 dpi)	W15 x H22
12 dots/mm (305 dpi)	W22 x H33
24dots/mm(609dpi)	W44 x H66

[Valid Command]

Print position	<V>	<H>							
Modification	<P>	<L>	<%>	<F>	<&>	</>	<0>	<WD>	
Barcode	<D><d>	<BL><d>							
Calendar ^{*1}	<WA>								

*1 This command requires optional calendar IC and it is not usable without IC.

OCR-A font character set

OCR-A font settings.

OCR-A FONT L0202 203DPI

	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0		□		P										
1		1	A	Q										
2		2	B	R										
3		3	C	S										
4	₧	₪	D	T										
5		5	E	U										
6		₶	F	V										
7		₷	G	W										
8		₸	H	X										
9		₹	I	Y										
A			J	Z										
B			K											
C			L											
D			M											
E	.	>	N											
F	/		◊											

The print sample shown above is issued with a head density of 8 dots/mm, a font size of 15x22, and an expansion factor of 2 (vertical/horizontal).

8.12 Font

OCR-B Font

ESC+OB

Hexadecimal code	ESC <1B>16	OB <4F>16<42>16	Parameter n~n
Initial value	Nil		

Valid range and term of command	When the power switch is OFF	The set parameter is not maintained.
	Valid range within items	The set parameter becomes invalid.
	Valid range between items	The set parameter becomes invalid.

[Function]
Specifying OCR-B font.

[Format]
<OB>n~n

- Parameter
n [Print data] = Data

[Coding Example]

```
<A>
<V>100<H>100<P>2<L>0202<OB>ABC
<Q>2
<Z>
```

[Supplementary Explanation]
Refer to the table below for font size of each head density.

[Font Size]

Head density	Font seize(dots)
8 dots/mm (203 dpi)	W20xH24
12 dots/mm (305 dpi)	W30xH36
24 dots/mm(609dpi)	W60xH72

[Valid Command]

Print position	<V>	<H>							
Modification	<P>	<L>	<%>	<F>	<&>	</>	<0>	<WD>	
Barcode	<D><d>	<BL><d>							
Calendar ^{*1}	<WA>								

*1 This command requires optional calendar IC and it is not usable without IC.

OCR-B font Character Set

OCR-B font specification.

OB FONT(L0202) 203DPI

	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0	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											

The print sample shown above is issued with a head density of 8 dots/mm, a font size of 20x24, and an expansion factor of 2 (vertical/horizontal).

8.13 Font

U Font (Basic size 5x9 dots)

ESC+U

Hexadecimal code	ESC <1B> ₁₆	U <55> ₁₆	Parameter n~n
Initial value	Nil		

Valid range and term of command	When the power switch is OFF	The set parameter is not maintained.
	Valid range within items	The set parameter becomes invalid.
	Valid range between items	The set parameter becomes invalid.

[Function]

Font with the basic size of: width 5 dots, height 9 dots is specified.

[Format]

<U>n~n

- Parameter

n [Print data] = data

[Coding Example]

```
<A>
<V>100<H>200<P>2<L>0304<U>ABCDE
<Q>2
<Z>
```

[Supplementary Explanation]

1. The U font only allows the setting of a fixed pitch.
2. The character set varies according to setting of <CE> command.

[Valid Command]

Print position	<V>	<H>							
Modification	<P>	<L>	<%>	<F>	<&>	</>	<0>	<WD>	
Barcode	<D><d>	<BL><d>							
Calendar ^{*1}	<WA>								

*1 This command requires optional calendar IC and it is not usable without IC.

U font character set

Basic size is 5 x 9 dots (width x height)

U FONT(L0303) 203DPI

	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0		ø	ø	P	‘	p	ç	é	á	ó		§	ó	-
1	!	1	A	Q	a	q	ü	æ	í			ð	þ	±
2	”	2	B	R	b	r	é	æ	ó			è	ò	=
3	#	3	C	S	c	s	á	ö	ú			ë	ò	¤
4	\$	4	D	T	d	t	ä	ö	ñ			è	ø	¶
5	%	5	E	U	e	u	à	ð	ñ	À		€	ø	§
6	€	6	F	V	f	v	á	û	ë	À	ã	í	þ	÷
7	‘	7	G	W	g	w	ç	ù	ø	À	ã	í	þ	,
8	<	8	H	X	h	x	è	ÿ	ô	Ø		í	þ	*
9)	9	I	Y	i	y	ë	ö	»				ó	..
A	*	:	J	Z	j	z	è	ö	”				ó	+
B	+	;	K	[k	{	í	ø	%				ó	!
C	,	<	L	\	l		í	£	%				ÿ	³
D	-	=	M]	m	}	ì	ß	;	¢		í	◊	z
E	.	>	N	^	n	-	À	×	«	¥		í	-	
F	/	?	O	-	o	⌘	À	f	»		»		‘	

The print sample shown above is issued with a head density of 8 dots/mm, magnification factor of 3 (vertical/horizontal) and DOS 858.

8.14 Font

S Font (Basic size 8x15 dots)

ESC+S

Hexadecimal code	ESC <1B> ₁₆	S <53> ₁₆	Parameter n~n
Initial value	Nil		

Valid range and term of command	When the power switch is OFF	The set parameter is not maintained.
	Valid range within items	The set command becomes invalid.
	Valid range between items	The set parameter becomes invalid.

[Function]

Font with the basic size of: width 8 dots, height 15 dots is specified.

[Format]

<S>n~n

- Parameter
n [Print data] = data

[Coding Example]

```
<A>
<V>100<H>200<P>2<L>0304<S>ABCDE
<Q>2
<Z>
```

[Supplementary Explanation]

1. The U font only allows the setting of a fixed pitch.
2. The character set varies according to setting of <CE> command.

[Valid Command]

Print position	<V>	<H>							
Modification	<P>	<L>	<%>	<F>	<&>	</>	<0>	<WD>	
Barcode	<D><d>	<BL><d>							
Calendar *1	<WA>								

*1 This command requires optional calendar IC and it is not usable without IC.

S font character set

Basic size is 8 x 15 dots (width x height)

S FONT(L0303) 203DPI

	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0	0	@	P	'	p	ç	é	á	ó	ð	ó	-		
1	!	1	A	Q	a	q	ü	æ	í	D	þ	±		
2	"	2	B	R	b	r	é	£	ó	E	ô	=		
3	#	3	C	S	c	s	â	ô	ú	œ	ò	¾		
4	\$	4	D	T	d	t	ä	ö	ñ	È	ë	¶		
5	%	5	E	U	e	u	à	ò	ñ	Á	€	ö	§	
6	&	6	F	V	f	v	á	û	a	À	ã	í	÷	
7	'	7	G	W	g	w	ç	ù	ø	À	Ã	î	þ	,
8	(8	H	X	h	x	ê	ÿ	ç	Ø		ï	þ	°
9)	9	I	Y	i	y	ë	ö	®			ú	..	
A	*	:	J	Z	j	z	è	ü	»			ó	•	
B	+	;	K	L	k	l	í	ø	½			ù	!	
C	,	<	M	N	\	l	í	£	¼			ý	³	
D	-	=	J	M	}	}	ì	ø	i	ç		í	¥	²
E	.	>	N	^	n	~	ä	×	«	¥		ì	-	
F	/	?	O	_	o	▀	à	f	»	ø		'		

The print sample shown above is issued with a head density of 8 dots/mm, magnification factor of 3 (vertical/horizontal) and DOS 858.

8.15 Font

M Font (Basic size 13x20 dots)

ESC+M

Hexadecimal code	ESC <1B> ₁₆	M <4D> ₁₆	Parameter n~n
Initial value	Nil		

Valid range and term of command	When the power switch is OFF	The set parameter is not maintained.
	Valid range within item	The set command becomes invalid.
	Valid range between items	The set parameter becomes invalid.

[Function]

Font with the basic size of: width 13 dots, height 20 dots is specified.

[Format]

<M>n~n

- Parameter

n [Print data] = data

[Coding Example]

```
<A>
<V>100<H>200<P>2<L>0304<M>ABCDE
<Q>2
<Z>
```

[Supplementary Explanation]

1. The M font only allows the setting of a fixed pitch.
2. The character set varies according to setting of <CE> command.

[Valid Command]

Print position	<V>	<H>							
Modification	<P>	<L>	<%>	<F>	<&>	</>	<0>	<WD>	
Barcode	<D><d>	<BL><d>							
Calendar *1	<WA>								

*1 This command requires optional calendar IC and it is not usable without IC.

M font character set

Basic size is 13 x 20 dots (width x height)

M FONT(L0202) 203DPI

	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0	Ø	@	P	'	p	Ç	É	á	Ø		õ	ó	-	
1	!	1	A	Q	a	q	ü	æ	í		Đ	Þ	±	
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	Ñ	¶	
5	%	5	E	U	e	u	à	ò	Ñ	Á	€	Ó	§	
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	ÿ	¤	©		Ї	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	!	
C	,	<	L	\	l		î	£	¼			Ý	³	
D	-	=	M]	m	}	ì	ø	i	¢		Í	²	
E	.	>	N	^	n	~	Ä	×	«	¥		Ì	-	
F	/	?	O	_	o	▀	Å	f	»		¤		'	

The print sample shown above is issued with a head density of 8dots/mm, magnification factor of 2 (vertical/horizontal) and DOS 858.

8.16 Font

WB Font (Basic size 18x30 dots)

ESC+WB

Hexadecimal code	ESC <1B> ₁₆	WB <57> ₁₆ <42> ₁₆	Parameter an~n
Initial value	Nil		

Valid range and term of command	When the power switch is OFF	The set parameter is not maintained.
	Valid range within item	The set command becomes invalid.
	Valid range between items	The set parameter becomes invalid.

[Function]

Font with the basic size of: width 18 dots, height 30 dots is specified.

[Format]

<WB>an~n

- Parameter

a [Smoothing]	=	0: Smoothing OFF
		1: Smoothing ON (Valid for expansion factors <L> between 3 and 12)
n [Print data]	=	Data

[Coding Example]

```
<A>
<V>100<H>200<P>2<L>0304<WB>0ABCDE
<Q>2
<Z>
```

[Supplementary Explanation]

1. The WB font only allows the setting of a fixed pitch.
2. When the smoothing is enabled, and the expansion <L> command is set to 1 or 2 or from 10 to 36, the smoothing function will be ignored.
3. The character set varies according to setting of <CE> command.

[Valid Command]

Print position	<V>	<H>							
Modification	<P>	<L>	<%>	<F>	<&>	</>	<0>	<WD>	
Barcode	<D><d>	<BL><d>							
Calendar *1	<WA>								

*1 This command requires optional calendar IC and it is not usable without IC.

WB font character set

Basic size is 18 x 30 dots (width x height)

WB FONT(L0101) 203DPI

	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0	0	@	P	'	p	Ç	É	á	Ø			ð	ó	-
1	!	1	A	Q	a	q	ü	æ	í			D	þ	±
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	ø	¶
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	º	À	Ã	î	þ	,
8	(8	H	X	h	x	ê	ÿ	®			Ї	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	¡	
C	,	<	L	\	l	¡	î	£	¼			Ý	³	
D	-	=	M]	m	}	ì	Ø	í	¢		Í	Ý	²
E	.	>	N	^	n	~	Ä	x	«	¥		í	-	
F	/	?	O	-	o	¤	Å	f	»		¤		,	

The print sample shown above is issued with a head density of 8 dots/mm, magnification factor of 1 (vertical/horizontal) and DOS 858.

8.17 Font

WL Font (Basic size 28x52 dots)

ESC+WL

Hexadecimal code	ESC <1B> ₁₆	WB <57> ₁₆ <4C> ₁₆	Parameter an~n
Initial value	Nil		

Valid range and term of command	When the power switch is OFF	The set parameter is not maintained.
	Valid range within items	The set command becomes invalid.
	Valid range between items	The set parameter becomes invalid.

[Function]

Font with the basic size of: W28 x H52 dots is specified.

[Format]

<WL>an~n

• Parameter

a [Smoothing]	=	0: Smoothing OFF
		1: Smoothing ON (Valid for expansion factors <L> between 3 and 12)
n [Print data]	=	Data

[Coding Example]

```
<A>
<V>100<H>200<P>2<L>0304<WL>0ABCDE
<Q>2
<Z>
```

[Supplementary Explanation]

1. The WL font only allows the setting of a fixed pitch.
2. When the smoothing is enabled, and the expansion <L> command is set to 1 or 2 or from 10 to 36, the smoothing function will be ignored.
3. The character set varies according to setting of <CE> command.

[Valid Commands]

Print position	<V>	<H>							
Modification	<P>	<L>	<%>	<F>	<&>	</>	<0>	<WD>	
Barcode	<D><d>	<BL><d>							
Calendar *1	<WA>								

*1 This command requires optional calendar IC and it is not usable without IC.

WL font character set

Basic size is 28 x 52 dots (width x height)

WL FONT(L0101) 203DPI

	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0	Ø	Ø	@	P	'	p	Ç	É	á	Ø	õ	Ó	-	
1	!	1	A	Q	a	q	ü	æ	í		Đ	Þ	±	
2	"	2	B	R	b	r	é	Æ	ó		Ê	Ô	=	
3	#	3	C	S	c	s	â	ô	ú		Ë	Ò	$\frac{3}{4}$	
4	\$	4	D	T	d	t	ä	ö	ñ		È	Õ	¶	
5	%	5	E	U	e	u	à	ò	Ñ	Á		€	Ը	§
6	&	6	F	V	f	v	å	û	ã	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	{	Ї	Ø	$\frac{1}{2}$			Ù	¹	
C	,	<	L	\	l	¡	î	£	$\frac{1}{4}$			Ý	$\frac{3}{4}$	
D	-	=	M]	m	}	ì	Ø	í	¢		;	Ý	$\frac{1}{2}$
E	.	>	N	^	n	~	Ä	×	«	¥		Ì	-	
F	/	?	O	_	o	¤	Å	f	»	¤		’	‘	

The print sample shown above is issued with a head density of 8 dots/mm, magnification factor of 1 (vertical/horizontal) and DOS 858.

8.18 Font

Outline Font Design

ESC+\$

Hexadecimal code	ESC <1B> ₁₆	\$ <24> ₁₆	Parameter a,bbb,ccc,d
Initial value	a=A,bbb=50,ccc=50,d=0		

Valid range and term of command	When the power switch is OFF	The set parameter is not maintained.
	Valid range within items	The set parameter is valid until the next valid setting.
	Valid range between items	The set parameter becomes initial value at the next item <A>.

[Function]

Specifying the type, size, and shape of font.

[Format]

<\$>a,bbb,ccc,d

• Parameter

- | | | |
|----------------|---|--|
| a [Font type] | = | A: Helvetica bold (Proportional)
B: Helvetica bold (Inter-character pitch fixed)
K: Kanji specified by hexadecimal number *1
L: Kanji specified by binary number *1
k: Kanji (vertical) specified by hexadecimal number *1
l: Kanji(horizontal) specified by hexadecimal number*1 |
| b[Font width] | = | Valid range: 1 to 999 dots |
| c[Font height] | = | Valid range: 1 to 999 dots |
| d[Font design] | = | 0: Normal font (Black)
1: White characters on black background
2: Grey font (Pattern 1)
3: Grey font (Pattern 2)
4: Grey font (Pattern 3)
5: Font with shadow
6: White characters with shadow on black background
7: Mirrored font
8: Normal italic font
9: White italic characters with shadow on black background |

*1 Will specify Kanji outline font

[Coding example] Font type: A, font width: 100 dots, font height: 100 dots, font design: 1

```
<A>
<V>100<H>100<P>2
<$>A,100,100,1<=$=>SATO
<Q>2
<Z>
```

[Supplementary Explanation]

1. Italic characters are tilt in an angle of 15-degree, within their specified width.
2. The outline font printing command <\$=> shall be executed after the outline font design selection <\$>.
3. For the font design 1 thru 9, if the specified dot setting is irregularly small, the font cannot be identified.
4. If the font width / height are very small, there can be cases that the font is squeezed.

[Valid Command]

Font	<\$=>								
------	-------	--	--	--	--	--	--	--	--

Outline Font Design

This is a sample of Outline font.

Outline font0 ABCabc123
Outline font1 ABCabc123
Outline font2 ABCabc123
Outline font3 ABCabc123
Outline font4 ABCabc123
Outline font5 ABCabc123
Outline font6 ABCabc123
Outline font7 ABCabc123
Outline font8 ABCabc123
Outline font9 ABCabc123

The print sample shown above is issued with a head density of 8 dots/mm

8.19 Font

Outline Font Print

ESC+\$=

Hexadecimal code	ESC <1B> ₁₆	\$= <24> ₁₆ <3D> ₁₆	Parameter n~n
Initial value	Nil		

Valid range and term of command	When the power switch is OFF	The set parameter is not maintained.
	Valid range within items	The set parameter becomes invalid.
	Valid range between items	The set parameter becomes invalid.

[Function]
Specifies printing command of outline font

[Format]
<\$=>n~n

•Parameter
n[Print data] = Data

[Coding example] Print data: SATO
 <A>
 <V>100<H>100<P>2
 <\$>A,100,100,1<\$=>SATO
 <Q>2
 <Z>

[Supplementary Explanation]

1. The outline font printing commando <\$=> shall be executed after the outline font design selection <\$>.
2. Font height includes both ascender and descender area. For proportional pitch, the character width of outline font differs depending on the font to be used.
3. Use character pitch command <P> to specify font pitch.
4. Italic characters are tilt in an angle of 15-degree, within their specified width. As for the height specification, both ascender and descender area are included.
5. For the font design 1 thru 9, if the specified dot setting is irregularly small, the font cannot be identified.
6. If the font width / height are very small, there can be cases that the font is squeezed.
7. JIS or Shift JIS can be used for Kanji outline font, which should correspond with the printer settings to proper printing.
Specify Kanji code by <KC> command or LCD setting.

[Valid Command]

Print position	<V>	<H>						
Modification	<P>	<%>	<\$>	<F>				
Calendar *1	<WA>							

*1This command requires optional calendar IC and it is not usable without IC.

Outline Font Character Set

Characters consists of Helvetica bold (character pitch fixed), 50x50 dots, Standard font (Black)

OUTLINE FONT@ 203DPI

	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0	Ø	ø	@	P	'	p	Ç	É	á			ð	Ó	-
1	!	1	A	Q	a	q	ü	æ	í			Đ	Þ	±
2	"	2	B	R	b	r	é	Æ	ó			Ê	Ô	=
3	#	3	C	S	c	s	â	ô	ú			Ë	Ò	%
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	á	Â	ã	Í	µ	÷
7	'	7	G	W	g	w	ç	ù	ó	À	Ã	Î	b	.
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	'	
C	,	<	L	\	l	l	†	£	¼			ý	³	
D	-	=	M]	m	}	ì	Ø	i	¢		Ý	²	
E	.	>	N	^	n	~	Ä	×	«	¥		Ì	-	
F	/	?	O	_	o		Å	f	»			’		

The print sample shown above is issued with a head density of 8 dots/mm

8.20 Font

CG Font

ESC+RD

Hexadecimal code	ESC <1B> ₁₆	RD <52> ₁₆ <44> ₁₆	Parameter abc,ddd,eee,n~n
Initial value	b=0		

Valid range and term of command	When the power switch is OFF	The set parameter is not maintained.
	Valid range within items	The set parameter becomes invalid.
	Valid range between items	The set parameter becomes invalid.

[Function]

Specifying CG font type, font style, font size, and print data.

[Format]

<RD>abc,ddd,eee,n~n

•Parameter

a [Font type]	=	A [SATO CG Sleek]
		B [SATO CG Stream]

Symbol	Parameter name	Setting value	Character set
b	Character encoding selection	-	Character set specified by <CE>
		0	858 (default)
		1	ISO 8859/1 Latin1
		2	ISO 8859/2 Latin 2
		3	ISO 8859/9 Latin 5
		4	CP737 DOS Greek
		5	CP855 DOS Cyrillic
		6	-
		7	-
		8	PC-850 Multilingual
		9	CP852 DOS Central European
		A	CP857 DOS Turkish
		B	CP866 DOS Cyrillic II
		C	CP1250 Windows Central European
		D	CP1251 Windows Cyrillic
		E	CP1252 Windows Western Latin 1
		F	CP1253 Windows Greek
		G	CP1254 Windows Turkish
		H	-
		I	-
		J	CP1257 Windows Baltic
		K	CP869 IBM Greek
		L	-
		M	Japanese X0201 *1
		@	Unicode UTF-8

*1: Specifying X0201 prints ISO 8859-1 Latin 1 character set.

c [Font style] = 0 Standard
1 Bold
2 Italic
3 Bold+Italic

d[Width] = Valid Range: 004 to 999(dots)
Valid Range: P02 to P99 (points)

e[Height] = Valid Range: 004 to 999(dots)
Valid Range: P02 to P99(points)

n[Print data] = Data

[Coding Example1] Font type: SATO CG Sleek, Width: 10 pts, Height: 10 pts

<A>
<V>100<H>100<P>2
<RD>A00.P10.P10.SATO
<Q>2
<Z>

[Supplementary Explanation]

1. The font size is set by [dot number] or [point number].
2. The dot size does vary with printer type. (Refer top table below)

Head density	Size of 1 dot (mm)
8 dots/mm (203 dpi)	0.125
12 dots/mm (305 dpi)	0.083
24 dots/mm (609 dpi)	0.042

3. 1 point is 0.35mm.

[Font size range]

Head density	Valid range:	Valid range:
	Width range (dots)	Height range (dots)
8 dots/mm (203 dpi)	4 to 832	4 to 999
12 dots/mm (305 dpi)	5 to 999	5 to 999
24 dots/mm (609 dpi)	9 to 999	9 to 999

[Valid Command]

Print position	<V>	<H>							
Modification	<P>	<%>	<F>	<PS>	<PR>				

SATO CG Sleek font character set

SATO CG Sleek font settings

SATO CG Sleek FONT 203DPI

Print sample in following condition: Head density: 8 dots/mm, 40x40 point, DOS 858.

SATO CG Stream font character set

SATO CG Stream Font settings

SATO CG Stream FONT 203DPI

Print sample in following condition: Head density: 8 dots/mm, 40x40 point, DOS 858.

8.21 Font

Multiple Language

ESC+RG

Hexadecimal code	ESC <1B> ₁₆	<RG> <52> ₁₆ <47> ₁₆	Parameter a,b,c,ddd,eee,ffff...fff
Initial value	Nil		

Valid range and term of command	When the power switch is OFF	The set parameter is not maintained.
	Valid range within items	The set parameter becomes invalid.
	Valid range between items	The set parameter becomes invalid.

[Function]

Print multiple language fonts.

[Format]

<RG>a,b,c,ddd,eee,ffff...fff

• Parameter

- a : [Character code] Character code of print data to be specified to a parameter f. See the table below.
- b : [Font set] Font type for printing See the table below
- c : [Modification]
 - 0: Standard
 - 1: Italic
 - 2: BOLD
 - 3: BOLD+Italic
- d : [Width] Valid range: 20 to 999 (dots)
- e : [Height] Valid range: P09 to P99 (points)
- f : [Print data] (character code) *One point is 0.35 mm.

[Character code list]

Parameter a	Character code						
0	UNICODE (UTF-8)						
1	UNICODE (UTF-16BE) * Recommended						
2	S-JIS						
3	BIG5						
4	GB18030						
5	KSX 1001(EUC-KR)						
-	Character set specified by <CE>. * If UTF-8 or X201 has been selected by <CE>, it is the value of the following. <table border="1" style="margin-left: 20px;"> <tr> <th><CE></th> <th><RG>Parameter a</th> </tr> <tr> <td>UTF-8</td> <td>0:UTF-8</td> </tr> <tr> <td>X201</td> <td>2:S-JIS</td> </tr> </table>	<CE>	<RG>Parameter a	UTF-8	0:UTF-8	X201	2:S-JIS
<CE>	<RG>Parameter a						
UTF-8	0:UTF-8						
X201	2:S-JIS						

[Font set list]

Parameter b	Font name	Font set	Font type	Character code range (UTF-16BE)
0	SATO Hebe Sans	WGL4	Hebe Serif	0020-FB02
1	SATO Hebe Sans Arabic	Arabic (Farsi) +ISO8859-1	Hebe Serif	0020-00FF, 0600-06FF, FE70-FEFC
2	SATO Hebe Sans Thai	Thai +ISO8859-1	Hebe Serif	0020-00FF, 0E01-0E5B
3	SATO Hebe Sans Hindi	Hindi +ISO8859-1	Hebe Serif	0020-00FF, 0901-097F
4	SATO Gothic Traditional Chinese	WGL4	Hebe Serif	0020-FFE6
		Big5	MobileGothic	
		GB-18030	Crystalzhonghei	
		JISx0208(+NEC) JISx0201	MobileGothic	
		KSX 1001	MobileGothic	
5	SATO Gothic Japanese	WGL4	Hebe Serif	0020-FFE6
		JISx0208(+NEC) JISx0201	MobileGothic	
		KSX 1001	MobileGothic	
		GB-18030	Crystalzhonghei	
		Big5	MobileGothic	
6	SATO Gothic Simplified Chinese	WGL4	Hebe Serif	0020-FFE5
		GB-18030	Crystalzhonghei	
7	SATO Gothic Korean	WGL4	Hebe Serif	0020-FFE6
		KSX 1001	MobileGothic	
		JISx0208(+NEC) JISx0201	MobileGothic	
		GB-18030	Crystalzhonghei	
		Big5	MobileGothic	
8	SATO Silver Serif	WGL4	Silver Serif	0020-FB02
9	SATO Mincho Traditional Chinese	WGL4	Silver Serif	0020-FFE6
		Big5	Mincho	
		GB-18030	Shusong2M	
		JISx0208(+NEC) JISx0201	CrystalMincho	
		KSX 1001	Mincho	
10	SATO Mincho Japanese	WGL4	Silver Serif	0020-FFE6
		JISx0208(+NEC) JISx0201	CrystalMincho	
		KSX 1001	Mincho	
		GB-18030	Shusong2M	
		Big5	Mincho	
11	SATO Mincho Simplified Chinese	WGL4	Silver Serif	0020-FFE5
		GB-18030	Shusong2M	
12	SATO Mincho Korean	WGL4	Silver Serif	0020-FFE6
		KSX 1001	Mincho	
		JISx0208(+NEC) JISx0201	CrystalMincho	
		GB-18030	Shusong2M	
		Big5	Mincho	
13	SATO Roman Arabic	Arabic +ISO8859-1	Roman	0020-00FF, 0600-06FF, FDF2, FE70-FEFC
14	SATO Hebe Sans Hebrew	Hebrew +ISO8859-1	Hebe Serif	0020-00FF, 05B0-05F4, FB1D-FB4F

[Coding example] Character code = UTF16, Font set = SJIS, Modification = Standard, Width = 20 dots, Height = 20 dots
Print data = SATO

```

<A>
<V>100<H>100<P>2
<RG>1,5,0,20,20,<FF33>_16<FF21>_16<FF34>_16<FF2F>_16
<Q>2
<Z>

```

[Notes]

1. When a character code other than UTF-16BE is specified, the character code will be converted into UTF-16BE. If there were codes that cannot be converted, they are replaced by single spaces.
2. When UTF-16BE is specified as a character code or character codes don't exist in the font set after UTF-16BE conversion, these character codes are not printed. When a space or a square are filled in the font set for the character code, these images are printed.
3. Character size may be smaller than parameter, because it takes into account the multi-language
4. UTF-8 supports up to four byte character code. 5 bytes UTF-8 and 6 bytes UTF-8 are not supported.
5. UTF-16BE supports up to two byte character code. 3 bytes UTF-8 and 4 bytes UTF-16BE are not supported.
6. Complex script languages (Arabic, Hindi, Thai) Hebrew are printed with proportional fonts, regardless of setting of font type in order to use the formatter function and the combined font function.
7. The linefeed code cannot be inserted among one word or one character code forming one character for the complex script languages (Arabic, Hindi, Thai). Hebrew. If the linefeed is inserted, the rendering result is not guaranteed.
8. Comply with Unicode 2.1 (note that if the first byte is 0x1b when UTF-16BE is specified, it is judged as a ESC code).
9. When executing sequential number printing in Arabic, Hindi, Thai and Hebrew, the character codes are rendered as a character string and it may not function properly.
10. This command doesn't support partial editing because the complex script languages (Arabic, Hindi, Thai), Hebrew extract the character string for using the formatter function and the combined font function.
11. Complex script languages (Arabic, Hindi, Thai) ,Hebrew render character codes as character strings in order to use the formatter function and the combined font function. Other languages render character codes in character units, so that a gap between fonts is different from that of the complex script languages.
12. Note that when a combination of character codes and font sets is other than below table, the expected character may not be printed.

Font set	Character code
WGL4, Arabic, Thai, Hindi, Hebrew	UNICODE(UTF-16BE),UNICODE(UTF-8)
Big5	UNICODE(UTF-16BE),Big5,UNICODE(UTF-8)
SJIS	UNICODE(UTF-16BE),SJIS ,UNICODE(UTF-8)
GB18030	UNICODE(UTF-16BE),GB18030,UNICODE(UTF-8)
KSX1001(EUC-KR)	UNICODE(UTF-16BE),KSX1001(EUC-KR), UNICODE (UTF-16)

13. SATO Roman Arabic does not correspond to Farsi.

14. Recommended fonts If you specify a “-“.

<CE>		<RG>	
Parameter a	Official name	Parameter b	Font name
858	DOS 858	0	SATO Hebe Sans
88591	ISO 8859/1	8	SATO Silver Serif
88592	ISO 8859/2		
88599	ISO 8859/9		
850	DOS 850		
852	DOS 852		
855	DOS 855		
857	DOS 857		
737	DOS 737		
866	DOS 866		
1250	Win 1250		
1251	Win 1251		
1252	Win 1252		
1253	Win 1253		
1254	Win 1254		
1257	Win 1257		
869	IBM 869		
UTF-8	UTF-8		
201	X0201	5 10	SATO Gothic Japanese SATO Mincho Japanese

[Valid Command]

Print position	<V>	<H>							
Modification	<P>	<%>	<F>	<PS>	<PR>				

Multiple language sample

b	Fontname	Sample
8	SATO Hebe Sans	This is a fontsample.
8	SATO Silver Serif	This is a fontsample.
1	SATO Hebe Sans Arabic	هذا هو عينة من الخط.
13	SATO Roman Arabic	هذا هو عينة من الخط.
2	SATO Hebe Sans Thai	นี้คือตัวอย่างของตัวอักษร
3	SATO Hebe Sans Hindi	इस फॉन्ट का एक नमूना है।
14	SATO Hebe Sans Hebrew	זהו דוגמא של الخط.
4	SATO Gothic Tradional Chinese	這是字體的樣本。
9	SATO Mincho Tradional Chinese	這是字體的樣本。
6	SATO Gothic Simplified Chinese	这是字体的样本。
11	SATO Mincho Simplified Chinese	这是字体的样本。
5	SATO Gothic Japanese	これはフォントのサンプルです。
10	SATO Mincho Japanese	これはフォントのサンプルです。
7	SATO Gothic Korean	이것은 글꼴의 샘플입니다.
12	SATO Mincho Korean	이것은 글꼴의 샘플입니다.

Print sample in following condition: Head density: 8 dots/mm, 28x28 point.

8.22 Font

Scalable Font

ESC+RH

Hexadecimal code	ESC <1B> ₁₆	RH <52> ₁₆ <47> ₁₆	Parameter a,b...b,c,ddd,eee,f...f
Initial value	Nil		

Valid range and term of command	When the power switch is OFF	The set parameter is not maintained.
	Valid range within items	The set parameter becomes invalid.
	Valid range between items	The set parameter becomes invalid.

[Function]

Built-in scalable font and the TTF font downloaded using file download [DC2]DE of a common command are printed.

[Format]

<RH>a,b...b,c,ddd,eee, ffff...fff

- Parameter

a:[Character code]	=	0:UNICODE (UTF-8) 1: UNICODE (UTF-16BE) -: Character set specified by <CE>.
b:[Font set]	=	Valid range: See the table below
c:[Modification]	=	0: Standard 1: Bold 2: Italic 3: Bold + Italic
d : [Width]	=	Valid range: 020 to 999 (dots) Valid range: P09 to P99 (points)
e : [Height]	=	Valid range: 020 to 999 (dots) Valid range: P09 to P99 (points)

*One point is 0.35 mm.

*The valid range of height and width is 832 dots for 203 dpi.

f: [Print Data] = Data

[Built-in font set list]

Parameter	Font name
SATOCGSleek.ttf	SATO CG Sleek
SATOCGStream.ttf	SATO CG Stream
SATOOCR.A.ttf	SATO OCR-A
SATO0.ttf	SATO 0
SATOALPHABC.ttf	Sato Alpha Bold Condensed
SATOBETABI.ttf	Sato Beta Bold Italic
SATOFOLOIOB.ttf	Sato Folio Bold
SATOFUTURAMC.ttf	Sato Futura Medium Condensed
SATOGAMMA.ttf	Sato Gamma
SATOOCR.B.ttf	Sato OCR-B
SATOSANS.ttf	Sato Sans
SATOSERIF.ttf	Sato Serif
SATOSYM.ttf	SATO Symbol Set
SATOVICA.ttf	Sato Vica
SATOWING.ttf	SATO WingBats

[Coding example1] Printing of the built-in (scalable) font

Character code=UTF16BE,Font set=SATO CG Stream,
Modification=Standard, Width=20 dots, Height=20 dots, Print data=SATO

```
<A>
<V>100<H>100<P>2
<RH>1, SATOCGStream.ttf,0,20,20,<FF33>16<FF21>16<FF34>16<FF2F>16
<Q>2
<Z>
```

[Coding example2] Printing of the downloaded True Type font

Character code=UTF16BE,Font set(The downloaded file name)=sample.ttf,
Modification=Standard, Width=40 dots, Height=40 dots, Print data=SATO

```
<A>
<V>100<H>100<P>2
<RH>1,sample.ttf,0,40,40,<FF33>16<FF21>16<FF34>16<FF2F>16
<Q>2
<Z>
```

[Coding example3] Printing of the downloaded True Type font

Character code=UTF16BE,Font set(The downloaded file name)=Sample.TTF,
Modification=Standard, Width=40 dots, Height=40 dots, Print data=SATO

```
<A>
<V>100<H>100<P>2
<RH>1,Sample.TTF,0,40,40,<FF33>16<FF21>16<FF34>16<FF2F>16
<Q>2
<Z>
```

[Notes]

- 1.When a character code other than UTF-16 is specified, the character code will be converted into UTF-16. If there are character codes that cannot be converted, all character strings specified as a parameter error will be printed.
- 2.If the font corresponding to specified character code doesn't exist, an invalid image defined in the font set will be printed.
- 3.Supports only the TTF that supports Unicode(UTF-16BE).If TTF doesn't support Unicode (UTF-16BE), the specified character code is printed as GID (Glyph Index).
- 4.Recommended fonts If you specify a “.”

<CE>		<RH>	
Parameter a	Official name	Parameter b	Font name
858	DOS 858	SATOCGSleek.ttf	SATO CG Sleek
88591	ISO 8859/1	SATOCGStream.ttf	SATO CG Stream
88592	ISO 8859/2		
88599	ISO 8859/9		
850	DOS 850		
852	DOS 852		
855	DOS 855		
857	DOS 857		
737	DOS 737		
866	DOS 866		
1250	Win 1250		
1251	Win 1251		
1252	Win 1252		
1253	Win 1253		
1254	Win 1254		
1257	Win 1257		
869	IBM 869		
UTF-8	UTF-8		
201	X0201	-	-

5.Size that can be specified in the "character set" is up to 32byte. Also, You can specify character will be only the following characters.

(1) Alphabet (2) Number (3) Hyphen [-] (4) Underscore [_] (5) Period [.]

[Valid Command]

Print position	<V>	<H>						
Modification	<P>	<%>	<F>	<PS>	<PR>			

Scalable font sample

Fontname	Sample
SATOCGSleek.ttf	ABCXYZabcxyz123
SATOCGStream.ttf	ABCXYZabcxyz123
SATOOCRA.ttf	ABCXYZabcxyz123
SATOO.ttf	ABCXYZabcxyz123
SATOALPHABC.ttf	ABCXYZabcxyz123
SATOBETABI.ttf	ABCXYZabcxyz123
SATOFOLIOB.ttf	ABCXYZabcxyz123
SATOFUTURAMC.ttf	ABCXYZabcxyz123
SATOGAMMA.ttf	ABCXYZabcxyz123
SATOOCRIB.ttf	ABCXYZabcxyz123
SATOSANS.ttf	ABCXYZabcxyz123
SATOSERIF.ttf	ABCXYZabcxyz123
SATOSYM.ttf	f/...√∞¬HΘIηθι678
SATOVICA.ttf	ABCXYZabcxyz123
SATOWING.ttf	ଓଡ଼ିଆ

Print sample in following condition: Head density: 8 dots/mm, 30x30 point.

8.23 Font

16x16 dots Kanji in Horizontal Line

ESC+K1

Hexadecimal code	ESC	K1	Parameter
	<1B> ₁₆	<4B> ₁₆ <31> ₁₆	a~n
Initial value	Nil		

Valid range and term of command	When the power switch is OFF	The set parameter is not maintained.
	Valid range within items	The set parameter becomes invalid.
	Valid range between items	The set parameter becomes invalid.

[Function]

Specifies 16x16 (width x height) dot horizontal written Kanji character print

[Format]

<K1>a~n
<C1>a~n

• Parameter

- | | | |
|--------------------------|---|---|
| a [Kanji selection mode] | = | H: HEX character |
| | | B: Binary code |
| | | I: HEX character letters, smoothing function |
| | | C: Binary code, smoothing function |
| | | J: HEX character letters, highlight function |
| | | D: Binary code, highlight function |
| | | K: HEX character letters, smoothing and highlight function |
| | | E: Binary character letters, smoothing and highlight function |
| n [Data] | = | Refer to the code table (JIS, Shift JIS, Unicode). |

[Coding example 1] Shift JIS HEX code characters, Horizontal magnification: 3, Vertical magnification: 5

<A>
<V>100<H>200<P>2<L>0305
<K1>H81698A94816A83548367815B
<Q>2
<Z>

[Coding example 2] JIS binary code, Horizontal magnification: 2, Vertical magnification: 3

<A>
<V>100<H>200<P>2<L>0203
<K1>B ! J3T ! K%5%H ! <
<Q>2
<Z>

[Supplementary Explanation]

1. HEX characters = Kanji Code 4bytes ASCII / 1 Kanji character
2. Binary code = Kanji Code 2bytes / 1 Kanji character
3. Smoothing function validity range = Horizontal/vertical valid range: factor 3 to 12
4. Highlighting function validity range = Horizontal/vertical valid range: factor 1 to 5
5. When the language setting of the printer is Japanese or Simplified Chinese or Traditional Chinese or Korean, printing follows the language setting.

[Notes]

1. With the highlighting function the character width enlarges proportional with the expansion factor.
2. Using the highlighting function, in some cases, depending on the type of font, characters become squeezed.

[Valid Command]

Print position	<V>	<H>						
Modification	<P>	<L>	<%>	<&>	</>	<0>	<WD>	

8.24 Font

24x24 dots Kanji in Horizontal Line

ESC+K2

Hexadecimal code	ESC <1B> ₁₆	K2 <4B> ₁₆ <32> ₁₆	Parameter an~n
Initial value	Nil		

Valid range and term of command	When the power switch is OFF	The set parameter is not maintained.
	Valid range within items	The set parameter becomes invalid.
	Valid range between items	The set parameter becomes invalid.

[Function]

Specifies 24x24 (width x height) dot horizontal written Kanji character print

[Format]

<K2>an~n

- Parameter

a [Kanji selection mode]	=	H: HEX character B: Binary code I: HEX character letters, smoothing function C: Binary code, smoothing function J: HEX character letters, highlight function D: Binary code, highlight function K: HEX character letters, smoothing and highlight function E: Binary character letters, smoothing and highlight function
n [Data]	=	Refer to the code table (JIS, Shift JIS, Unicode).

[Coding example 1] Shift JIS HEX code characters, Horizontal magnification: 3, Vertical magnification: 5

```
<A>
<V>100<H>200<P>2<L>0305
<K2>H81698A94816A83548367815B
<Q>2
<Z>
```

[Coding example 2] JIS binary code, Horizontal magnification: 2, Vertical magnification: 3

```
<A>
<V>100<H>200<P>2<L>0203
<K2>B ! J3T ! K%5%H ! <
<Q>2
<Z>
```

[Supplementary Explanation]

1. HEX characters = Kanji Code 4bytes ASCII / 1 Kanji character
2. Binary code = Kanji Code 2bytes / 1 Kanji character
3. Smoothing function validity range = Horizontal/vertical valid range: factor 3 to 12
4. Highlighting function validity range = Horizontal/vertical valid range: factor 1 to 5
5. When the language setting of the printer is Japanese or Simplified Chinese or Traditional Chinese or Korean, printing follows the language setting.

[Notes]

1. With the highlighting function the character width enlarges proportional with the expansion factor.
2. Using the highlighting function, in some cases, depending on the type of font, characters become squeezed.

[Valid Command]

Print position	<V>	<H>							
Modification	<P>	<L>	<%>	<&>	</>	<0>	<WD>		

8.25 Font

22x22 dots Kanji in Horizontal Line

ESC+K3

Hexadecimal code	ESC <1B> ₁₆	K3 <4B> ₁₆ <33> ₁₆	Parameter an~n
Initial value	Nil		

Valid range and term of command	When the power switch is OFF	The set parameter is not maintained.
	Valid range within items	The set parameter becomes invalid.
	Valid range between items	The set parameter becomes invalid.

[Function]

Specifies 22x22 (width x height) dot horizontal written Kanji character print

[Format]

<K3>an~n

- Parameter

a [Kanji selection mode]	=	H: HEX character B: Binary code I: HEX character letters, smoothing function C: Binary code, smoothing function J: HEX character letters, highlight function D: Binary code, highlight function K: HEX character letters, smoothing and highlight function E: Binary character letters, smoothing and highlight function
n [Data]	=	Refer to the code table (JIS, Shift JIS, Unicode).

[Coding example 1] Shift JIS HEX code characters, Horizontal magnification: 3, Vertical magnification: 5

```
<A>
<V>100<H>200<P>2<L>0305
<K3>H81698A94816A83548367815B
<Q>2
<Z>
```

[Coding example 2] JIS binary code, Horizontal magnification: 2, Vertical magnification: 3

```
<A>
<V>100<H>200<P>2<L>0203
<K3>B ! J3T ! K%5%H ! <
<Q>2
<Z>
```

[Supplementary Explanation]

1. HEX characters	= Kanji Code 4bytes ASCII / 1 Kanji character
2. Binary code	= Kanji Code 2bytes / 1 Kanji character
3. Smoothing function validity range	= Horizontal/vertical valid range: factor 3 to 12
4. Highlighting function validity range	= Horizontal/vertical valid range: factor 1 to 5

[Notes]

1. With the highlighting function the character width enlarges proportional with the expansion factor.
2. Using the highlighting function, in some cases, depending on the type of font, characters become squeezed.
3. When the Kanji mode setting is [Japan, Compatible Kanji] or [China, Simplified Chinese (GB18030)] or [China, Traditional Chinese (BIG5)] or [Korean (KSX1001)], it will be a command error.

[Valid Command]

Print position	<V>	<H>						
Modification	<P>	<L>	<%>	<&>	</>	<0>	<WD>	

8.26 Font

32x32 dots Kanji in Horizontal Line

ESC+K4

Hexadecimal code	ESC	K4	Parameter
	<1B> ₁₆	<4B> ₁₆ <34> ₁₆	a~n
Initial value	Nil		

Valid range and term of command	When the power switch is OFF	The set parameter is not maintained.
	Valid range within items	The set parameter becomes invalid.
	Valid range between items	The set parameter becomes invalid.

[Function]

Specifies 32x32 (width x height) dot horizontal written Kanji character print

[Format]

<K4>a~n

- Parameter

a [Kanji selection mode]	=	H: HEX character
		B: Binary code
		I: HEX character letters, smoothing function
		C: Binary code, smoothing function
		J: HEX character letters, highlight function
		D: Binary code, highlight function
		K: HEX character letters, smoothing and highlight function
		E: Binary character letters, smoothing and highlight function
n [Data]	=	Refer to the code table (JIS, Shift JIS, Unicode).

[Coding example 1] Shift JIS HEX code characters, Horizontal magnification: 3, Vertical magnification: 5

```
<A>
<V>100<H>200<P>2<L>0305
<K4>H81698A94816A83548367815B
<Q>2
<Z>
```

[Coding example 2] JIS binary code, Horizontal magnification: 2, Vertical magnification: 3

```
<A>
<V>100<H>200<P>2<L>0203
<K4>B ! J3T ! K%5%H ! <
<Q>2
<Z>
```

[Supplementary Explanation]

1. HEX characters	=	Kanji Code 4bytes ASCII / 1 Kanji character
2. Binary code	=	Kanji Code 2bytes / 1 Kanji character
3. Smoothing function validity range	=	Horizontal/vertical valid range: factor 3 to 12
4. Highlighting function validity range	=	Horizontal/vertical valid range: factor 1 to 5

[Notes]

1. With the highlighting function the character width enlarges proportional with the expansion factor.
2. Using the highlighting function, in some cases, depending on the type of font, characters become squeezed.
3. When the Kanji mode setting is [Japan, Compatible Kanji] or [China, Simplified Chinese (GB18030)] or [China, Traditional Chinese (BIG5)] or [Korean (KSX1001)], it will be a command error.

[Valid Command]

Print position	<V>	<H>						
Modification	<P>	<L>	<%>	<&>	</>	<0>	<WD>	

8.27 Font

40x40 dots Kanji in Horizontal Line

ESC+K5

Hexadecimal code	ESC <1B> ₁₆	K5 <4B> ₁₆ <35> ₁₆	Parameter an~n
Initial value	Nil		

Valid range and term of command	When the power switch is OFF	The set parameter is not maintained.
	Valid range within items	The set parameter becomes invalid.
	Valid range between items	The set parameter becomes invalid.

[Function]

Specifies 40x40 (width x height) dot horizontal written Kanji character print

[Format]

<K5>an~n

- Parameter

a [Kanji selection mode]	=	H: HEX character B: Binary code I: HEX character letters, smoothing function C: Binary code, smoothing function J: HEX character letters, highlight function D: Binary code, highlight function K: HEX character letters, smoothing and highlight function E: Binary character letters, smoothing and highlight function
n [Data]	=	Refer to the code table (JIS, Shift JIS, Unicode).

[Coding example 1] Shift JIS HEX code characters, Horizontal magnification: 3, Vertical magnification: 5

```
<A>
<V>100<H>200<P>2<L>0305
<K5>H81698A94816A83548367815B
<Q>2
<Z>
```

[Coding example 2] JIS binary code, Horizontal magnification: 2, Vertical magnification: 3

```
<A>
<V>100<H>200<P>2<L>0203
<K5>B ! J3T ! K%5%H ! <
<Q>2
<Z>
```

[Supplementary Explanation]

1. HEX characters	= Kanji Code 4bytes ASCII / 1 Kanji character
2. Binary code	= Kanji Code 2bytes / 1 Kanji character
3. Smoothing function validity range	= Horizontal/vertical valid range: factor 3 to 12
4. Highlighting function validity range	= Horizontal/vertical valid range: factor 1 to 5

[Notes]

1. With the highlighting function the character width enlarges proportional with the expansion factor.
2. Using the highlighting function, in some cases, depending on the type of font, characters become squeezed.
3. When the Kanji mode setting is [Japan, Compatible Kanji] or [China, Simplified Chinese (GB18030)] or [China, Traditional Chinese (BIG5)] or [Korean (KSX1001)], it will be a command error.

[Valid Command]

Print position	<V>	<H>							
Modification	<P>	<L>	<%>	<&>	</>	<0>	<WD>		

8.28 Font

16x16 dots Kanji in Horizontal Line with 1-byte Character

ESC+K8

Hexadecimal code	ESC <1B> ₁₆	K8 <4B> ₁₆ <38> ₁₆	Parameter an~n
Initial value	Nil		

Valid range and term of command	When the power switch is OFF	The set parameter is not maintained.
	Valid range within items	The set parameter becomes invalid.
	Valid range between items	The set parameter becomes invalid.

[Function]

Specifies 16x16 (width x height) dot horizontal written Kanji character print and W8 x H16 dots half size character in horizontal line.

[Format]

<K8>an~n

- Parameter

a [Kanji selection mode]	=	H: HEX character B: Binary code I: HEX character letters, smoothing function C: Binary code, smoothing function J: HEX character letters, highlight function D: Binary code, highlight function K: HEX character letters, smoothing and highlight function E: Binary character letters, smoothing and highlight function
n [Data]	=	Refer to the code table (Shift JIS, Unicode).

[Coding example] Shift JIS HEX code characters, Data: 株式会社サト-

```
<A>
<V>100<H>200<P>2<L>0305
<K8>H8A948EA89EF8ED0BBC4B0
<Q>2
<Z>
```

[Supplementary Explanation]

1. HEX characters	= Kanji Code 4bytes ASCII / 1 Kanji character
2. Binary code	= Kanji Code 2bytes / 1 Kanji character
3. Smoothing function validity range	= Horizontal/vertical valid range: factor 3 to 12
4. Highlighting function validity range	= Horizontal/vertical valid range: factor 1 to 5

[Notes]

1. With the highlighting function the character width enlarges proportional with the expansion factor.
2. Using the highlighting function, in some cases, depending on the type of font, characters become squeezed.
3. This command is only available for Shift JIS kanji code and Unicode.
4. For the half size character (one byte character code), printing will be performed in W8 x H16 dots.
5. For the full size character (two byte character code), printing will be performed in W16 x H16 dots.

[Valid Command]

Print position	<V>	<H>						
Modification	<P>	<L>	<%>	<&>	</>	<0>	<WD>	

8.29 Font

24x24 dots Kanji in Horizontal Line with 1-byte Character

ESC+K9

Hexadecimal code	ESC <1B>16	K9 <4B>16<39>16	Parameter an~n
Initial value	Nil		

Valid range and term of command	When the power switch is OFF	The set parameter is not maintained.
	Valid range within items	The set parameter becomes invalid.
	Valid range between items	The set parameter becomes invalid.

[Function]

Specifies 24x24 (width x height) dot horizontal written kanji character print and W12 x H24 dots half size character in horizontal line.

[Format]

<K9>an~n

● Parameter

- | | | |
|----------------------------|---|---|
| a [Chinese selection mode] | = | H: HEX character |
| | | B: Binary code |
| | | I: HEX character letters, smoothing function |
| | | C: Binary code, smoothing function |
| | | J: HEX character letters, highlight function |
| | | D: Binary code, highlight function |
| | | K: HEX character letters, smoothing and highlight function |
| | | E: Binary character letters, smoothing and highlight function |
| n [Data] | = | Refer to the code table (Shift JIS, Unicode). |

[Coding example] Shift JIS HEX code characters, Data: 株式会社サト-

```

<A>
<V>100<H>200<P>2<L>0305
<K9>H8A948EA89EF8ED0BBC4B0
<Q>2
<Z>
```

[Supplementary Explanation]

- | | |
|---|---|
| 1. HEX characters | = Kanji Code 4 bytes ASCII / 1 Kanji character |
| 2. Binary code | = Kanji Code 2bytes / 1 Kanji character |
| 3. Smoothing function validity range | = Horizontal/vertical valid range: factor 3 to 12 |
| 4. Highlighting function validity range | = Horizontal/vertical valid range: factor 1 to 5 |

[Notes]

- With the highlighting function the character width enlarges proportional with the expansion factor.
- Using the highlighting function, in some cases, depending on the type of font, characters become squeezed.
- This command is only available for Shift JIS kanji code and Unicode.
- For the half size character (one byte character code), printing will be performed in W12 x H24 dots.
- For the full size character (two byte character code), printing will be performed in W24 x H24 dots.

[Valid Command]

Print position	<V>	<H>							
Modification	<P>	<L>	<%>	<&>	</>	<0>	<WD>		

8.30 Font

22x22 dots Kanji in Horizontal Line with 1-byte Character

ESC+KA

Hexadecimal code	ESC <1B> ₁₆	KA <4B> ₁₆ <41> ₁₆	Parameter an~n
Initial value	Nil		

Valid range and term of command	When the power switch is OFF	The set parameter is not maintained.
	Valid range within items	The set parameter becomes invalid.
	Valid range between items	The set parameter becomes invalid.

[Function]

Specifies 22x22 (width x height) dot horizontal written kanji character print and W11 x H22 dots half size character in horizontal line.

[Format]

<KA>an~n

- Parameter

- | | | |
|----------------------------|---|---|
| a [Chinese selection mode] | = | H: HEX character |
| | | B: Binary code |
| | | I: HEX character letters, smoothing function |
| | | C: Binary code, smoothing function |
| | | J: HEX character letters, highlight function |
| | | D: Binary code, highlight function |
| | | K: HEX character letters, smoothing and highlight function |
| | | E: Binary character letters, smoothing and highlight function |
- n [Data] =Refer to the code table (Shift JIS, Unicode).

[Coding example] Shift JIS HEX code characters, Data: 株式会社サト-

```

<A>
<V>100<H>200<P>2<L>0305
<KA>H8A948EA89EF8ED0BBC4B0
<Q>2
<Z>
```

[Supplementary Explanation]

- | | |
|---|---|
| 1. HEX characters | = Kanji Code 4bytes ASCII / 1 Kanji character |
| 2. Binary code | = Kanji Code 2bytes / 1 Kanji character |
| 3. Smoothing function validity range | = Horizontal/vertical valid range: factor 3 to 12 |
| 4. Highlighting function validity range | = Horizontal/vertical valid range: factor 1 to 5 |

[Notes]

1. With the highlighting function the character width enlarges proportional with the expansion factor.
2. Using the highlighting function, in some cases, depending on the type of font, characters become squeezed.
3. This command is only available for Shift JIS kanji code and Unicode.
4. For the half size character (one byte character code), printing will be performed in W11 x H22 dots.
5. For the full size character (two byte character code), printing will be performed in W22 x H22 dots.
6. When the Kanji mode setting is [Japan, Compatible Kanji] or [China, Simplified Chinese (GB18030)] or [China, Traditional Chinese (BIG5)] or [Korean (KSX1001)], it will be a command error.

[Valid Command]

Print position	<V>	<H>						
Modification	<P>	<L>	<%>	<&>	</>	<0>	<WD>	

8.31 Font

32x32 dots Kanji in Horizontal Line with 1-byte Character

ESC+KB

Hexadecimal code	ESC <1B>16	KB <4B>16<42>16	Parameter an~n
Initial value	Nil		

Valid range and term of command	When the power switch is OFF	The set parameter is not maintained.
	Valid range within items	The set parameter becomes invalid.
	Valid range between items	The set parameter becomes invalid.

[Function]

Specifies 32x32 (width x height) dot horizontal written kanji character print and W16 x H32 dots half size character in horizontal line.

[Format]

<KB>an~n

- Parameter

a[Chinese selection mode]	=	H: HEX character B: Binary code I: HEX character letters, smoothing function C: Binary code, smoothing function J: HEX character letters, highlight function D: Binary code, highlight function K: HEX character letters, smoothing and highlight function E: Binary character letters, smoothing and highlight function
n[Data]	=	Refer to the code table (Shift JIS, Unicode).

[Coding example] Shift JIS HEX code characters, Data: 株式会社サト-

```
<A>
<V>100<H>200<P>2<L>0305
<KB>H8A948EA89EF8ED0BBC4B0
<Q>2
<Z>
```

[Supplementary Explanation]

1. HEX characters	= Kanji Code 4bytes ASCII / 1 Kanji character
2. Binary code	= kanji Code 2bytes / 1 Kanji character
3. Smoothing function validity range	= Horizontal/vertical valid range: factor 3 to 12
4. Highlighting function validity range	= Horizontal/vertical valid range: factor 1 to 5

[Notes]

1. With the highlighting function the character width enlarges proportional with the expansion factor.
2. Using the highlighting function, in some cases, depending on the type of font, characters become squeezed.
3. For the half size character (one byte character code), printing will be performed in W16 x H32 dots.
4. For the full size character (two byte character code), printing will be performed in W32 x H32 dots.
5. This command is only available for Shift JIS kanji code and Unicode.
6. When the Kanji mode setting is [Japan, Compatible Kanji] or [China, Simplified Chinese (GB18030)] or [China, Traditional Chinese (BIG5)] or [Korean (KSX1001)], it will be a command error.

[Valid Command]

Print position	<V>	<H>						
Modification	<P>	<L>	<%>	<&>	</>	<0>	<WD>	

8.32 Font

40x40 dots Kanji in Horizontal Line with 1-byte Character

ESC+KD

Hexadecimal code	ESC <1B>16	KD <4B>16<44>16	Parameter an~n
Initial value	Nil		

Valid range and term of command	When the power switch is OFF	The set parameter is not maintained.
	Valid range within items	The set parameter becomes invalid.
	Valid range between items	The set parameter becomes invalid.

[Function]

Specifies 40x40 (width x height) dot horizontal written kanji character print and W20 x H40 dots half size character in horizontal line.

[Format]

<KD>an~n

- Parameter

a[Chinese selection mode]	=	H: HEX character B: Binary code I: HEX character letters, smoothing function C: Binary code, smoothing function J: HEX character letters, highlight function D: Binary code, highlight function K: HEX character letters, smoothing and highlight function E: Binary character letters, smoothing and highlight function
n [Data]	=	Refer to the code table (Shift JIS, Unicode).

[Coding example] Shift JIS HEX code characters, Data: 株式会社サト-

```
<A>
<V>100<H>200<P>2<L>0305
<KD>H8A948EA89EF8ED0BBC4B0
<Q>2
<Z>
```

[Supplementary Explanation]

1. HEX characters	=	Kanji Code 4bytes ASCII / 1 Kanji character
2. Binary code	=	kanji Code 2bytes / 1 Kanji character
3. Smoothing function validity range	=	Horizontal/vertical valid range: factor 3 to 12
4. Highlighting function validity range	=	Horizontal/vertical valid range: factor 1 to 5

[Notes]

1. With the highlighting function the character width enlarges proportional with the expansion factor.
2. Using the highlighting function, in some cases, depending on the type of font, characters become squeezed.
3. For the half size character (one byte character code), printing will be performed in W20 x H40 dots.
4. For the full size character (two byte character code), printing will be performed in W40 x H40 dots.
5. This command is only available for Shift JIS kanji code and Unicode.
6. When the Kanji mode setting is [Japan, Compatible Kanji] or [China, Simplified Chinese (GB18030)] or [China, Traditional Chinese (BIG5)] or [Korean (KSX1001)], it will be a command error.

[Valid Command]

Print position	<V>	<H>						
Modification	<P>	<L>	<%>	<&>	</>	<0>	<WD>	

8.33 Font

16x16 dots Kanji in Vertical Line

ESC+k1

Hexadecimal code	ESC <1B>16	k1 <6B>16<31>16	Parameter an~n
Initial value	Nil		

Valid range and term of command	When the power switch is OFF	The set parameter is not maintained.
	Valid range within items	The set parameter becomes invalid.
	Valid range between items	The set parameter becomes invalid.

[Function]

Specifies 16x16 (width x height) dot vertical written Kanji character print

[Format]

<k1>an~n

- Parameter

a[Kanji selection mode]	=	H: HEX character B: Binary code I: HEX character letters, smoothing function C: Binary code, smoothing function J: HEX character letters, highlight function D: Binary code, highlight function K: HEX character letters, smoothing and highlight function E: Binary character letters, smoothing and highlight function
n[Data]	=	Refer to the code table (JIS, Shift JIS, Unicode).

[Coding example 1]Shift JIS HEX code characters, Horizontal magnification: 3, Vertical magnification: 5

```
<A>
<V>100<H>200<P>2<L>0305
<k1>H81698A94816A83548367815B
<Q>2
<Z>
```

[Coding example 2]JIS binary code, Horizontal magnification: 2, Vertical magnification: 3

```
<A>
<V>100<H>200<P>2<L>0203
<k1>B!J3T!K%5%H!<
<Q>2
<Z>
```

[Supplementary Explanation]

1. HEX characters = Kanji Code 4bytes ASCII / 1 Kanji character
2. Binary code = Kanji Code 2bytes / 1 Kanji character
3. Smoothing function validity range = Horizontal/vertical valid range: factor 3 to 12
4. Highlighting function validity range = Horizontal/vertical valid range: factor 1 to 5
5. Print result of two bytes under bar "_" is vertical line. (Excluding when the kanji mode is [Japan, Compatible kanji])
6. When the language setting of the printer is Japanese or Simplified Chinese or Traditional Chinese or Korean, printing follows the language setting.

[Notes]

1. With the highlighting function the character width enlarges proportional with the expansion factor.
2. Using the highlighting function, in some cases, depending on the type of font, characters become squeezed.

[Valid Command]

Print position	<V>	<H>						
Modification	<P>	<L>	<%>	<&>	</>	<0>	<WD>	

8.34 Font

24x24 dots Kanji in Vertical Line

ESC+k2

Hexadecimal code	ESC	k2	Parameter
	<1B>16	<6B>16<32>16	an~n
Initial value	Nil		

Valid range and term of command	When the power switch is OFF	The set parameter is not maintained.
	Valid range within items	The set parameter becomes invalid.
	Valid range between items	The set parameter becomes invalid.

[Function]

Specifies 24x24 (width x height) dot vertical written Kanji character print

[Format]

<k2>an~n

- Parameter

- | | | |
|-------------------------|---|---|
| a[Kanji selection mode] | = | H: HEX character |
| | | B: Binary code |
| | | I: HEX character letters, smoothing function |
| | | C: Binary code, smoothing function |
| | | J: HEX character letters, highlight function |
| | | D: Binary code, highlight function |
| | | K: HEX character letters, smoothing and highlight function |
| | | E: Binary character letters, smoothing and highlight function |
| n[Data] | = | Refer to the code table (JIS, Shift JIS, Unicode). |

[Coding example 1] Shift JIS HEX code characters, Horizontal magnification: 3, Vertical magnification: 5

```
<A>
<V>100<H>200<P>2<L>0305
<k2>H81698A94816A83548367815B
<Q>2
<Z>
```

[Coding example 2] JIS binary code, Horizontal magnification: 2, Vertical magnification: 3

```
<A>
<V>100<H>200<P>2<L>0203
<k2>B ! J3T ! K%5%H ! <
<Q>2
<Z>
```

[Supplementary Explanation]

1. HEX characters = Chinese Code 4bytes ASCII / 1 Chinese character
2. Binary code = Chinese Code 2bytes / 1 Chinese character
3. Smoothing function validity range = Horizontal/vertical valid range: factor 3 to 12
4. Highlighting function validity range = Horizontal/vertical valid range: factor 1 to 5
5. Print result of two bytes under bar "—" is vertical line. (Excluding when the kanji mode is [Japan, Compatible kanji])
6. When the language setting of the printer is Japanese or Simplified Chinese or Traditional Chinese or Korean, printing follows the language setting.

[Notes]

1. With the highlighting function the character width enlarges proportional with the expansion factor.
2. Using the highlighting function, in some cases, depending on the type of font, characters become squeezed.

[Valid Command]

Print position	<V>	<H>							
Modification	<P>	<L>	<%>	<&>	</>	<0>	<WD>		

8.35 Font

22x22 dots Kanji in Vertical Line

ESC+k3

Hexadecimal code	ESC <1B>16	k3 <6B>16<33>16	Parameter an~n
Initial value	Nil		

Valid range and term of command	When the power switch is OFF	The set parameter is not maintained.
	Valid range within items	The set parameter becomes invalid.
	Valid range between items	The set parameter becomes invalid.

[Function]

Specifies 22x22 (width x height) dot vertical written Kanji character print

[Format]

<k3>an~n

- Parameter

a[Kanji selection mode]	=	H: HEX character B: Binary code I: HEX character letters, smoothing function C: Binary code, smoothing function J: HEX character letters, highlight function D: Binary code, highlight function K: HEX character letters, smoothing and highlight function E: Binary character letters, smoothing and highlight function
n[Data]	=	Refer to the code table (JIS, Shift JIS, Unicode).

[Coding example 1] Shift JIS HEX code characters, Horizontal magnification: 3, Vertical magnification: 5

```
<A>
<V>100<H>200<P>2<L>0305
<k3>H81698A94816A83548367815B
<Q>2
<Z>
```

[Coding example 2] JIS binary code, Horizontal magnification: 2, Vertical magnification: 3

```
<A>
<V>100<H>200<P>2<L>0203
<k3>B ! J3T ! K%5%H ! <
<Q>2
<Z>
```

[Supplementary Explanation]

1. HEX characters = Chinese Code 4bytes ASCII / 1 Chinese character
2. Binary code = Chinese Code 2bytes / 1 Chinese character
3. Smoothing function validity range = Horizontal/vertical valid range: factor 3 to 12
4. Highlighting function validity range = Horizontal/vertical valid range: factor 1 to 5
5. Print result of two bytes under bar " _ " is vertical line.

[Notes]

1. With the highlighting function the character width enlarges proportional with the expansion factor.
2. Using the highlighting function, in some cases, depending on the type of font, characters become squeezed.
3. When the Kanji mode setting is [Japan, Compatible Kanji] or [China, Simplified Chinese (GB18030)] or [China, Traditional Chinese (BIG5)] or [Korean (KSX1001)], it will be a command error.

[Valid Command]

Print position	<V>	<H>						
Modification	<P>	<L>	<%>	<&>	</>	<0>	<WD>	

8.36 Font

32x32 dots Kanji in Vertical Line

ESC+k4

Hexadecimal code	ESC <1B>16	k4 <6B>16<34>16	Parameter an~n
Initial value	Nil		

Valid range and term of command	When the power switch is OFF	The set parameter is not maintained.
	Valid range within items	The set parameter becomes invalid.
	Valid range between items	The set parameter becomes invalid.

[Function]

Specifies 32x32 (width x height) dot vertical written Kanji character print

[Format]

<k4>an~n

- Parameter

a[Kanji selection mode]	=	H: HEX character B: Binary code I: HEX character letters, smoothing function C: Binary code, smoothing function J: HEX character letters, highlight function D: Binary code, highlight function K: HEX character letters, smoothing and highlight function E: Binary character letters, smoothing and highlight function
n[Data]	=	Refer to the code table (JIS, Shift JIS, Unicode).

[Coding example 1] Shift JIS HEX code characters, Horizontal magnification: 3, Vertical magnification: 5

```
<A>
<V>100<H>200<P>2<L>0305
<k4>H81698A94816A83548367815B
<Q>2
<Z>
```

[Coding example 2] JIS binary code, Horizontal magnification: 2, Vertical magnification: 3

```
<A>
<V>100<H>200<P>2<L>0203
<k4>B ! J3T ! K%5%H ! <
<Q>2
<Z>
```

[Supplementary Explanation]

1. HEX characters = Chinese Code 4bytes ASCII / 1 Chinese character
2. Binary code = Chinese Code 2bytes / 1 Chinese character
3. Smoothing function validity range = Horizontal/vertical valid range: factor 3 to 12
4. Highlighting function validity range = Horizontal/vertical valid range: factor 1 to 5
5. Print result of two bytes under bar " _ " is vertical line.

[Notes]

1. With the highlighting function the character width enlarges proportional with the expansion factor.
2. Using the highlighting function, in some cases, depending on the type of font, characters become squeezed.
3. When the Kanji mode setting is [Japan, Compatible Kanji] or [China, Simplified Chinese (GB18030)] or [China, Traditional Chinese (BIG5)] or [Korean (KSX1001)], it will be a command error.

[Valid Command]

Print position	<V>	<H>						
Modification	<P>	<L>	<%>	<&>	</>	<0>	<WD>	

8.37 Font

40x40 dots Kanji in Vertical Line

ESC+k5

Hexadecimal code	ESC	k5	Parameter
	<1B>16	<6B>16<35>16	an~n
Initial value	Nil		

Valid range and term of command	When the power switch is OFF	The set parameter is not maintained.
	Valid range within items	The set parameter becomes invalid.
	Valid range between items	The set parameter becomes invalid.

[Function]

Specifies 40x40 (width x height) dot vertical written Kanji character print

[Format]

<k5>an~n

- Parameter

- | | | |
|-------------------------|---|---|
| a[Kanji selection mode] | = | H: HEX character |
| | | B: Binary code |
| | | I: HEX character letters, smoothing function |
| | | C: Binary code, smoothing function |
| | | J: HEX character letters, highlight function |
| | | D: Binary code, highlight function |
| | | K: HEX character letters, smoothing and highlight function |
| | | E: Binary character letters, smoothing and highlight function |
| n[Data] | = | Refer to the code table (JIS, Shift JIS, Unicode). |

[Coding example 1] Shift JIS HEX code characters, Horizontal magnification: 3, Vertical magnification: 5

```
<A>
<V>100<H>200<P>2<L>0305
<k5>H81698A94816A83548367815B
<Q>2
<Z>
```

[Coding example 2] JIS binary code, Horizontal magnification: 2, Vertical magnification: 3

```
<A>
<V>100<H>200<P>2<L>0203
<k5>B ! J3T ! K%5%H ! <
<Q>2
<Z>
```

[Supplementary Explanation]

1. HEX characters = Chinese Code 4bytes ASCII / 1 Chinese character
2. Binary code = Chinese Code 2bytes / 1 Chinese character
3. Smoothing function validity range = Horizontal/vertical valid range: factor 3 to 12
4. Highlighting function validity range = Horizontal/vertical valid range: factor 1 to 5
5. Print result of two bytes under bar " _ " is vertical line.

[Notes]

1. With the highlighting function the character width enlarges proportional with the expansion factor.
2. Using the highlighting function, in some cases, depending on the type of font, characters become squeezed.
3. When the Kanji mode setting is [Japan, Compatible Kanji] or [China, Simplified Chinese (GB18030)] or [China, Traditional Chinese (BIG5)] or [Korean (KSX1001)], it will be a command error.

[Valid Command]

Print position	<V>	<H>						
Modification	<P>	<L>	<%>	<&>	</>	<0>	<WD>	

8.38 Font

16x16 dots Kanji in Vertical Line with 1-byte Character

ESC+k8

Hexadecimal code	ESC	k8	Parameter
	<1B>16	<6B>16<38>16	an~n
Initial value	Nil		

Valid range and term of command	When the power switch is OFF	The set parameter is not maintained.
	Valid range within items	The set parameter becomes invalid.
	Valid range between items	The set parameter becomes invalid.

[Function]

Specifying to print the mixture text of W16 x H16 dots Kanji and W8 x H16 dots half size character in vertical line.

[Format]

<k8>an~n

• Parameter

a[Kanji selection mode]

- = H: HEX character
- B: Binary code
- I: HEX character letters, smoothing function
- C: Binary code, smoothing function
- J: HEX character letters, highlight function
- D: Binary code, highlight function
- K: HEX character letters, smoothing and highlight function
- E: Binary character letters, smoothing and highlight function

n [Data]

=Refer to the code table (Shift JIS, Unicode).

[Coding example] Shift JIS HEX code characters, Data: 株式会社ヰ-

```
<A>
<V>100<H>200<P>2<L>0305
<k8>H8A948EAE89EF8ED0BBC4B0
<Q>2
<Z>
```

[Supplementary Explanation]

1. HEX characters = Chinese Code 4bytes ASCII / 1 Chinese character
2. Binary code = Chinese Code 2bytes / 1 Chinese character
3. Smoothing function validity range = Horizontal/vertical valid range: factor 3 to 12
4. Highlighting function validity range = Horizontal/vertical valid range: factor 1 to 5
5. Print result of two bytes under bar " _ " is vertical line. (Excluding when the kanji mode is [Japan, Compatible kanji])

[Notes]

1. With the highlighting function, the character width enlarges proportional with the expansion factor.
2. Using the highlighting function, in some cases, depending on the type of font, characters become squeezed.
3. This command is valid for Shift JIS Kanji code or Unicode.
4. For the half size character specification (1-byte character code), printing will be performed in W8 x H16 dots.
5. For the full size character specification (2-byte character code), printing will be performed in W16 x H16 dots.

[Attention]

When half-sized character with voiced/P-sound consonant mark is specified, each part of character appears as a single character.

e.g.) When the word "八" is specified, it will be written separately such as " 八 ", " 丶 ", " - ".



[Valid Command]

Print position	<V>	<H>						
Modification	<P>	<L>	<%>	<&>	</>	<0>	<WD>	

8.39 Font

24x24 dots Kanji in Vertical Line with 1-byte Character

ESC+k9

Hexadecimal code	ESC <1B>16	k9 <6B>16<39>16	Parameter an~n
Initial value	Nil		

Valid range and term of command	When the power switch is OFF	The set parameter is not maintained.
	Valid range within items	The set parameter becomes invalid.
	Valid range between items	The set parameter becomes invalid.

[Function]

Specifying to print the mixture text of W24 x H24 dots Kanji and W12 x H24 dots half size character in vertical line.

[Format]

<k9>an~n

- Parameter

a[Kanji selection mode]	=	H: HEX character B: Binary code I: HEX character letters, smoothing function C: Binary code, smoothing function J: HEX character letters, highlight function D: Binary code, highlight function K: HEX character letters, smoothing and highlight function E: Binary character letters, smoothing and highlight function
n[Data]	=	Refer to the code table (Shift JIS, Unicode).

[Coding example] Shift JIS HEX code characters, Data: 株式会社サト-

<A>
<V>100<H>200<P>2<L>0305
<k9>H8A948EA89EF8ED0BBC4B0
<Q>2
<Z>

[Supplementary Explanation]

1. HEX characters = Chinese Code 4 bytes ASCII / 1 Chinese character
2. Binary code = Chinese Code 2 bytes / 1 Chinese character
3. Smoothing function validity range = Horizontal/vertical valid range: factor 3 to 12
4. Highlighting function validity range = Horizontal/vertical valid range: factor 1 to 5
5. Print result of two bytes under bar "—" is vertical line. (Excluding when the kanji mode is [Japan, Compatible kanji])

[Notes]

1. With the highlighting function, the character width enlarges proportional with the expansion factor.
2. Using the highlighting function, in some cases, depending on the type of font, characters become squeezed.
3. This command is valid for Shift JIS Kanji code or Unicode.
4. For the half size character specification (1-byte character code), printing will be performed in W12 x H24 dots.
5. For the full size character specification (2-byte character code), printing will be performed in W24 x H24 dots.

[Attention]

When half-sized character with voiced/P-sound consonant mark is specified, each part of character appears as a single character.

e.g.) When the word "ハ" is specified, it will be written separately such as " ハ ", " ハ ", " ハ ".



[Valid Command]

Print position	<V>	<H>							
Modification	<P>	<L>	<%>	<&>	</>	<0>	<WD>		

8.40 Font

22x22 dots Kanji in Vertical Line with 1-byte Character

ESC+kA

Hexadecimal code	ESC <1B>16	kA <6B>16<41>16	Parameter an~n
Initial value	Nil		

Valid range and term of command	When the power switch is OFF	The set parameter is not maintained.
	Valid range within items	The set parameter becomes invalid.
	Valid range between items	The set parameter becomes invalid.

[Function]

Specifying to print the mixture text of W22 x H22 dots Kanji and W11 x H22 dots half size character in vertical line.

[Format]

<kA>an~n

- Parameter

a[Kanji selection mode]	=	H: HEX character B: Binary code I: HEX character letters, smoothing function C: Binary code, smoothing function J: HEX character letters, highlight function D: Binary code, highlight function K: HEX character letters, smoothing and highlight function E: Binary character letters, smoothing and highlight function
n[Data]	=	Refer to the code table (Shift JIS, Unicode).

[Coding example] Shift JIS HEX code characters, Data: 株式会社サト-

```
<A>
<V>100<H>200<P>2<L>0305
<kA>H8A948EA89EF8ED0BBC4B0
<Q>2
<Z>
```

[Supplementary Explanation]

1. HEX characters	= Chinese Code 4 bytes ASCII / 1 Chinese character
2. Binary code	= Chinese Code 2 bytes / 1 Chinese character
3. Smoothing function validity range	= Horizontal/vertical valid range: factor 3 to 12
4. Highlighting function validity range	= Horizontal/vertical valid range: factor 1 to 5
5. Print result of two bytes under bar " _ " is vertical line.	

[Notes]

1. With the highlighting function, the character width enlarges proportional with the expansion factor.
2. Using the highlighting function, in some cases, depending on the type of font, characters become squeezed.
3. This command is valid for Shift JIS Kanji code or Unicode.
4. For the half size character specification (1-byte character code), printing will be performed in W11 x H22 dots.
5. For the full size character specification (2-byte character code), printing will be performed in W22 x H22 dots.
6. When the Kanji mode setting is [Japan, Compatible Kanji] or [China, Simplified Chinese (GB18030)] or [China, Traditional Chinese (BIG5)] or [Korean (KSX1001)], it will be a command error.

[Attention]

When half-sized character with voiced/P-sound consonant mark is specified, each part of character appears as a single character.

e.g.) When the word “んー” is specified, it will be written separately such as “ ん ”, “ ー ”, “ ー ”.



[Valid Command]

Print position	<V>	<H>						
Modification	<P>	<L>	<%>	<&>	</>	<0>	<WD>	

8.41 Font

32x32 dots Kanji in Vertical Line with 1-byte Character

ESC+kB

Hexadecimal code	ESC <1B>16	kB <6B>16<42>16	Parameter an~n
Initial value	Nil		

Valid range and term of command	When the power switch is OFF	The set parameter is not maintained.
	Valid range within items	The set parameter becomes invalid.
	Valid range between items	The set parameter becomes invalid.

[Function]

Specifying to print the mixture text of W32 x H32 dots Kanji and W16 x H32 dots half size character in vertical line.

[Format]

<kB>an~n

- Parameter

a[Kanji selection mode]	=	H: HEX character B: Binary code I: HEX character letters, smoothing function C: Binary code, smoothing function J: HEX character letters, highlight function D: Binary code, highlight function K: HEX character letters, smoothing and highlight function E: Binary character letters, smoothing and highlight function
n[Data]	=	Refer to the code table (Shift JIS, Unicode).

[Coding example] Shift JIS HEX code characters, Data: 株式会社サト-

```
<A>
<V>100<H>200<P>2<L>0305
<kB>H8A948EA89EF8ED0BBC4B0
<Q>2
<Z>
```

[Supplementary Explanation]

1. HEX characters = Chinese Code 4 bytes ASCII / 1 Chinese character
2. Binary code = Chinese Code 2 bytes / 1 Chinese character
3. Smoothing function validity range = Horizontal/vertical valid range: factor 3 to 12
4. Highlighting function validity range = Horizontal/vertical valid range: factor 1 to 5
5. Print result of two bytes under bar " _ " is vertical line.

[Notes]

1. With the highlighting function, the character width enlarges proportional with the expansion factor.
2. Using the highlighting function, in some cases, depending on the type of font, characters become squeezed.
3. This command is valid for Shift JIS Kanji code or Unicode.
4. For the half size character specification (1-byte character code), printing will be performed in W16 x H32 dots.
5. For the full size character specification (2-byte character code), printing will be performed in W32 x H32 dots.
6. When the Kanji mode setting is [Japan, Compatible Kanji] or [China, Simplified Chinese (GB18030)] or [China, Traditional Chinese (BIG5)] or [Korean (KSX1001)], it will be a command error.

[Attention]

When half-sized character with voiced/P-sound consonant mark is specified, each part of character appears as a single character.

e.g.) When the word "ハーネ" is specified, it will be written separately such as " ハ ", " イ ", " ネ ".



[Valid Command]

Print position	<V>	<H>						
Modification	<P>	<L>	<%>	<&>	</>	<0>	<WD>	

8.42 Font

40x40 dots Kanji in Vertical Line with 1-byte Character

ESC+kD

Hexadecimal code	ESC <1B>16	kD <6B>16<44>16	Parameter abbn~n
Initial value	Nil		

Valid range and term of command	When the power switch is OFF	The set parameter is not maintained.
	Valid range within items	The set parameter becomes invalid.
	Valid range between items	The set parameter becomes invalid.

[Function]

Specifying to print the mixture text of W40 x H40 dots Kanji and W20 x H40 dots half size character in vertical line.

[Format]

<kD>abbn~n

- Parameter

a[Kanji selection mode]	=	H: HEX character
		B: Binary code
		I: HEX character letters, smoothing function
		C: Binary code, smoothing function
		J: HEX character letters, highlight function
		D: Binary code, highlight function
		K: HEX character letters, smoothing and highlight function
		E: Binary character letters, smoothing and highlight function
- n[Data] = Refer to the code table (Shift JIS, Unicode).

[Coding example] Shift JIS HEX code characters, Data: 株式会社サト-

```

<A>
<V>100<H>200<P>2<L>0305
<kD>H8A948EA89EF8ED0BBC4B0
<Q>2
<Z>
```

[Supplementary Explanation]

1. HEX characters = Chinese Code 4 bytes ASCII / 1 Chinese character
2. Binary code = Chinese Code 2 bytes / 1 Chinese character
3. Smoothing function validity range = Horizontal/vertical valid range: factor 3 to 12
4. Highlighting function validity range = Horizontal/vertical valid range: factor 1 to 5
5. Print result of two bytes under bar "—" is vertical line.

[Notes]

1. With the highlighting function, the character width enlarges proportional with the expansion factor.
2. Using the highlighting function, in some cases, depending on the type of font, characters become squeezed.
3. This command is valid for Shift JIS Kanji code or Unicode.
4. For the half size character specification (1-byte character code), printing will be performed in W20 x H40 dots.
5. For the full size character specification (2-byte character code), printing will be performed in W40 x H40 dots
6. When the Kanji mode setting is [Japan, Compatible Kanji] or [China, Simplified Chinese (GB18030)] or [China, Traditional Chinese (BIG5)] or [Korean (KSX1001)], it will be a command error.

[Attention]

When half-sized character with voiced/P-sound consonant mark is specified, each part of character appears as a single character.

e.g.) When the word "ハーネ" is specified, it will be written separately such as "ハ", "ー", "ン", "エ".



[Valid Command]

Print position	<V>	<H>						
Modification	<P>	<L>	<%>	<&>	</>	<0>	<WD>	

8.43 Font

16x16 dots External Font Registration

ESC+T1

Hexadecimal code	ESC <1B>16	T1 <54>16<31>16	Parameter abnn~n
Initial value	Nil		

Valid range and term of command	When the power switch is OFF	The set parameter is not maintained.
	Valid range within items	The set parameter becomes invalid.
	Valid range between items	The set parameter becomes invalid.

[Function]

Registering 16x16 dots external fonts.

[Format]

<T1>abnn~n

• Parameter

a[Registration data selection] =

H:Registration code in HEX character

B: Registration code in binary code.

b[Registration font code address]

Using Kanji set <KS> command to set Japanese (01,2)

JIS code

H: Up to 95 registrations from "21" to "7F" is available.

B: Up to 95 registrations from 21H to 7FH is available.

Shift JIS code

H: Up to 95 registrations from "40" to "9E" is available.

B: Up to 95 registrations from 40H to 9EH is available.

Unicode

H: Up to 95 registrations from "00" to "5E" is available.

B: Up to 95 registrations from 00H to 5EH is available.

Using Kanji set <KS> command to set other than Japanese

(3 (China Simplified Chinese), 5 (China Traditional Chinese), 6 (Korean))

H: Up to 95 registrations from 21H to 7FH is available.

B: Up to 95 registrations from "21" to "7F" is available.

n [Registered external font data] = Data

[Coding Example 1] Registration data in JIS HEX character

```
<A>
<RU>0
<CC>0
<T1>H21
00FF · · · · · · · · FF00
<Z>
```

```
<A>
<CC>0
<V>100<H>200<K1>H9021
<Q>2
<Z>
```

[Coding Example 2] Registration code in Shift JIS binary code.

```
<A>
<KS>0
<CC>0
<T1>B<40>16
<00FF · · · · · · · · FF00>16
<Z>
```

```
<A>
<CC>0
<V>100<H>200<K1>B<90>16<40>16
<Q>2
<Z>
```

[Coding Example 3] Registration code in Unicode binary code.

```
<A>
<KS>0
<CC>0
<T1>B<00>16
<00FF . . . . . FF00>16
<Z>
```

```
<A>
<CC>0
<V>100<H>200<K1>B<E0>16<00>16
<Q>2
<Z>
```

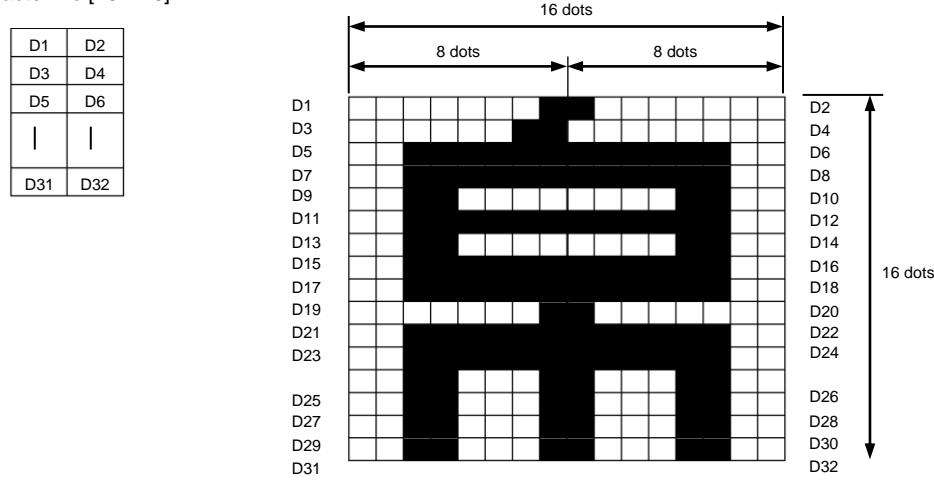
[Coding Example 4] Register in the user registration memory

```
<A>
<KS>0
<CC>1
<T1>B<40>16
<00FF . . . . . FF00>16
<Z>
```

[Supplemental explanation]

1. Registering 16x16 dots external fonts in the internal memory or user registration memory.
2. The code to specify in the registration font code address needs to match the Kanji set (<KS>) and Kanji code (<KC>).
3. Overwriting registration data is available.
4. The order of data registration is as follows.
5. The data registered in the printer memory will be deleted at the power off. In this case, you need to register the data again.

External character file [16 x 16]



When registering the external characters described above, D1 data becomes <01>16 and D2 data becomes <80>16 because D1 consists of [00000001], D2 consists of [10000000].

In the same manner, D3 is <03>₁₆, D4 is <00>₁₆, D5 is <3F>₁₆, D6 is <FC>₁₆, and the external registration data will be <018003003FFC.....>₁₆ up to D32.

[Point]

1. The data registered in the user registration memory will be maintained after the printer's power is off.
2. You cannot use the internal memory in combination with the user registration memory.
3. Specify the slot to register.
If <CC> command is not sent after the power on, the data are registered in the internal memory.

8.44 Font

24x24 dots External Font Registration

ESC+T2

Hexadecimal code	ESC	T2	Parameter
	<1B>16	<54>16<32>16	abbn~n
Initial value	Nil		

Valid range and term of command	When the power switch is OFF	The set parameter is not maintained.
	Valid range within items	The set parameter becomes invalid.
	Valid range between items	The set parameter becomes invalid.

[Function]

Invokes vertical external characters saved in the printer memory to print out

[Format]

<T2>abbn~n

• Parameter

a[Registration data selection] =

H: Registration code in HEX character

B: Registration code in binary code.

b[Registration font code address]

Using Kanji set <KS> command to set Japanese (01,2)

JIS code

H: Up to 95 registrations from "21" to "7F" is available.

B: Up to 95 registrations from 21H to 7FH is available.

Shift JIS code

H: Up to 95 registrations from "40" to "9E" is available.

B: Up to 95 registrations from 40H to 9EH is available.

Unicode

H: Up to 95 registrations from "00" to "5E" is available.

B: Up to 95 registrations from 00H to 5EH is available.

Using Kanji set <KS> command to set other than Japanese

(3 (China Simplified Chinese), 5 (China Traditional Chinese), 6 (Korean))

H: Up to 95 registrations from "21" to "7F" is available.

B: Up to 95 registrations from 21H to 7FH is available.

n [Registered external font data] = Data

[Coding Example 1] Registration data in JIS HEX character

```
<A>
<RU>0
<CC>0
<T2>H21
00FF · · · · · · · · FF00
<Z>
```

```
<A>
<CC>0
<V>100<H>200<K1>H9021
<Q>2
<Z>
```

[Coding Example 2] Registration code in Shift JIS binary code.

```
<A>
<KS>0
<CC>0
<T2>B<40>16
<00FF · · · · · · · · FF00>16
<Z>
```

```
<A>
<CC>0
<V>100<H>200<K1>B<90>16<40>16
<Q>2
<Z>
```

[Coding Example 3] Registration code in Unicode binary code.

```
<A>
<CC>0
<T2>B<00>16
<00FF . . . . . FF00>16
<Z>
```

```
<A>
<CC>0
<V>100<H>200<K1>B<E0>16<00>16
<Q>2
<Z>
```

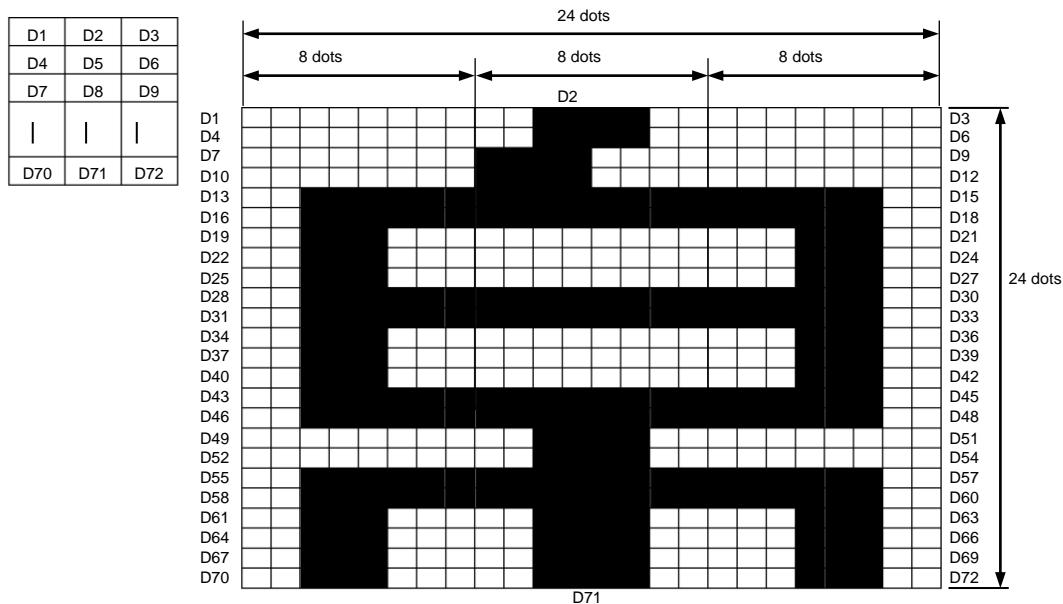
[Coding Example 4] Register in the user registration memory

```
<A>
<KS>0
<CC>1
<T2>B<40>16
<00FF . . . . . FF00>16
<Z>
```

[Supplemental explanation]

1. Registering 24 x 24 dots external fonts in the internal memory or user registration memory.
2. The code to specify in the registration font code address needs to match the Kanji set (<KS>) and Kanji code <KC>).
3. Overwriting registration data is available.
4. The order of data output is as follows.
5. The data registered in the printer memory will be deleted at the power off. In this case, you need to register the data again.

External file [24x24]



When registering the external characters described above, D1 data becomes $<00>_{16}$, D2 data becomes $<3C>_{16}$ and D3 data becomes $<00>_{16}$ because D1 consists of [00000000], D2 consists of [00111100] and D3 consists of [00000000].

In the same manner, D4 becomes $<00>_{16}$, D5 becomes $<3C>_{16}$ and D6 becomes $<00>_{16}$, and the external registration data are specified to $<003C00003C00...>_{16}$ and up to D72.

[Point]

1. The data registered in the user registration memory will be maintained after the printer's power is off.
2. You cannot use the internal memory in combination with the user registration memory.
3. Specify the slot to register.
If <CC> command is not sent after the power on, the data are registered in the internal memory.

8.45 Font

Recall Horizontal Writing External Character

ESC+K1(K2)

Hexadecimal code	ESC <1B>16	K1(K2) <4B>16<31>16(<4B>16<32>16)	Parameter ab~b
Initial value	Nil		

Valid range and term of command	When the power switch is OFF	The set parameter is not maintained.
	Valid range within items	The set parameter becomes invalid.
	Valid range between items	The set parameter becomes invalid.

[Function]

Invoking horizontal external characters saved in the printer memory to print out.

[Format]

<K1>ab~b
<k2>ab~b

- Parameter

a[Kanji selection mode]	=	H: HEX character
		B: Binary code
		I: HEX character letters, smoothing function
		C: Binary code, smoothing function
		J: HEX character letters, highlight function
		D: Binary code, highlight function
		K: HEX character letters, smoothing and highlight function
		E: Binary character letters, smoothing and highlight function

b[Registration code]

Using Kanji set <KS> command to set Japanese (01,2)

JIS code

H, I, J, K: "9021" to "907F"
B, C, D, E: 9021H to 907FH

Shift JIS code

H, I, J, K: "F040" to "F09E"
B, C, D, E: F040H to F09EH

Unicode

H, I, J, K: "E000" to "E05E"
B, C, D, E: E000H to E05EH

Using Kanji set <KS> command to set other than Japanese

(3 (China Simplified Chinese), 5 (China Traditional Chinese), 6 (Korean))

H, I, J, K: "8021" to "807F"
B, C, D, E: 8021H to 807FH

[Coding example 1] Invokes 16x16 dots external character, Registration data in JIS HEX character

```

<A>
<KS>0
<T1>H21
00FF · · · · · · · · FF00
<Z>

<A>
<V>100<H>200<K1>H9021
<Q>2
<Z>

```

[Coding example 2] Invokes 24 x 24 dots external character, Registration data in Shift JIS binary code

```
<A>
<KS>0
<T2>B<40>16
<00FF · · · · · · · · FF00>16
<Z>

<A>
<V>100<H>200<K2>B<F0>16<40>16
<Q>2
<Z>
```

[Coding example 3] Invokes 16x16 dots external character, Registration data in Unicode character

```
<A>
<KS>0
<T1>H01
00FF · · · · · · · · FF00
<Z>

<A>
<V>100<H>200<K1>HE001
<Q>2
<Z>
```

[Supplemental explanation]

1. If the print out is not executed properly, register the data again.
2. You cannot call the external characters registered as JIS/Shift JIS character as Unicode, and vice versa.
3. Valid data of registration code vary according to the Kanji set command <KS>.

8.46 Font

Recall Vertical Writing External Character

ESC+k1(k2)

Hexadecimal code	ESC <1B>16	K1(k2) <6B>16<31>16(<6B>16<32>16)	Parameter ab~b
Initial value	Nil		

Valid range and term of command	When the power switch is OFF	The set parameter is not maintained.
	Valid range within items	The set parameter becomes invalid.
	Valid range between items	The set parameter becomes invalid.

[Function]

Invoking horizontal external characters registered in the printer memory to print out.

[Format]

<k1>ab~b
<k2>ab~b

- Parameter

a[Kanji selection mode]	=	H: HEX character
		B: Binary code
		I: HEX character letters, smoothing function
		C: Binary code, smoothing function
		J: HEX character letters, highlight function
		D: Binary code, highlight function
		K: HEX character letters, smoothing and highlight function
		E: Binary character letters, smoothing and highlight function

b[Registration code]

Using Kanji set <KS> command to set Japanese (0,1,2)

JIS code

H, I, J, K: "9021" to "907F"
B, C, D, E: 9021H to 907FH

Shift JIS code

H, I, J, K: "F040" to "F09E"
B, C, D, E: F040H to F09EH

Unicode

H, I, J, K: "E000" to "E05E"
B, C, D, E: E000H to E05EH

Using Kanji set <KS> command to set other than Japanese

(3 (China Simplified Chinese), 5 (China Traditional Chinese), 6 (Korean))

H, I, J, K: "8021" to "807F"
B, C, D, E: 8021H to 807FH

[Coding example 1] Invokes 16x16 dots external character, Registration data in JIS HEX character

```

<A>
<RU>0
<T1>H21
00FF · · · · · · · · FF00
<Z>

<A>
<V>100<H>200<k1>H9021
<Q>2
<Z>

```

[Coding example 2] Invokes 24x24 dots external character, Registration data in Shift JIS binary code

```
<A>
<KS>0
<T2>B<40>16
<00FF · · · · · · · · FF00>16
<Z>

<A>
<V>100<H>200<k2>B<F0>16<40>16
<Q>2
<Z>
```

[Coding example 3] Invokes 16x16 dots external character, Registration data in Unicode character

```
<A>
<KS>0
<T1>H01
00FF · · · · · · · · FF00
<Z>

<A>
<V>100<H>200<k1>HE001
<Q>2
<Z>
```

[Supplemental explanation]

1. If the print out is not executed properly, register the data again.
2. You cannot call the external characters registered as JIS/Shift JIS character as Unicode, and vice versa.
3. Valid data of registration code vary according to the Kanji set command<KS>.

9 Barcode Command

In barcode specification, print of various barcodes, change of bar width ratio, and print of guard bar or human-readable information can be performed by the specification (B, D, BD) after ESC.

The contents may vary depending on the specification. This and next page should be read closely and followed.

Refer to the table below for the specification of B, D, and BD.

[Specification of Bar width ratio]

Barcode specification parameter	Barcode specification		<D>	<BD>
0	CODABAR (NW-7)	1:3	1:2	2:5
1	CODE39	1:3	1:2	2:5
2	ITF	1:3	1:2	2:5
5	Industrial 2 of 5	1:3	1:2	2:5
6	Matrix 2 of 5	1:3	1:2	2:5

(1) Bar width ratio

Barcode is composed of Narrow Bar, Wide Bar, Narrow Space and Wide Space. Bar width ratio is the proportion of Narrow Bar and Wide Bar.

Bar width ratio (Ratio 1 : 3)

This barcode is composed of Narrow Bar [1] and Wide Bar [3].

Bar width ratio (Ratio 1 : 2) <D>

This barcode is composed of Narrow Bar [1] and Wide Bar [2].

Bar width ratio (Ratio 2 : 5) <BD>

This barcode is composed of Narrow Bar [2] and Wide Bar [5].

If specifying bar width ratio for your own convenience, register the ratio with Bar Width Ratio <BT> and print labels with Print of Specified Bar Width Ratio <BW>.

(2) Width of narrow bar and height of barcode

Narrow bar indicates the narrow bar width, and bar height indicates the height of barcode.

For instance, printing narrow bar for 1 dot in head density of 8 dots/mm (203dpi), the narrow bar width will be 0.125mm and barcode scanner may have a reading problem. To avoid this problem, set the narrow bar to 2 dots so that the narrow bar width will be 0.25mm and this will improve the scanner reading condition.

There is a necessity to set the narrow bar width based on the printer head density or performance of barcode scanner. In bar width ratio, [Narrow bar width] specification sets the width of bar.

e.g.) When bar width ratio = 1 : 3 and narrow bar width is 3 dots, bar width ratio becomes 3 : 9.

Bar height is to specify the height of barcode, and proper height based on the scanner type can be set.

(3) Intercharacter gap

Intercharacter gap is the space between two adjacent barcode characters in a discrete barcode.

To specify and enable intercharacter gap, insert Character Pitch <P> right before barcode specification such as , <D> and <BD> or Print of Barcode with Registered Ratio <BW>. If not, initial value (2 dots) will be set.

Intercharacter gap is designable for the following barcodes.

- 1) CODABAR(NW-7)
- 2) CODE 39
- 3) Industrial 2 of 5
- 4) Matrix 2 of 5

Intercharacter gap is the multiplier of values specified with Character Pitch <P> and narrow bar width.

e.g.) When Character Pitch <P> is 3 and narrow bar width is 2 dots:

Intercharacter gap = $3 \times 2 = 6$ (dots)

(4) Designation of human readable information (HRI) and guard bar

For UPC-A and JAN/EAN 8 and13 digits barcode, availability of human-readable information (hereinafter HRI) and guard bar can be specified.

Barcode specification parameter	Barcode specification		<D>	<BD>
3	JAN/EAN 13	HRI : Nil Guard bar : Nil	HRI : Nil Guard bar : Available	HRI : Available Guard bar : Available
4	JAN/EAN 8	HRI : Nil Guard bar : Nil	HRI : Nil Guard bar : Available	HRI : Available Guard bar : Available
H	UPC-A	HRI : Nil Guard bar : Nil	HRI : Nil Guard bar : Available	HRI : Available Guard bar : Available

Barcode specification parameter	Barcode specification	<BM>	<BL>
H	JAN/EAN 13	HRI : Available Guard bar : Available	HRI : Nil Guard bar : Available

1) Specification of (No HRI, No guard bar)

If specifying , following barcode will be printed.



2) Specification of <D> (No HRI, Guard bar available)

If specifying <D>, following barcode will be printed.



[Note] HRI is printable specifying <Character Type> data subsequently to <D>.

For more information, refer to Barcode Specification (Selection of HRI) <D>~<d>.

3) Specification of <BD> (HRI and guard bar available)

If specifying <BD>, following barcode will be printed.



[Barcode Specification Only]

Barcode specification parameter	Barcode specification	
C	CODE 93	Barcode only
E	UPC-E	Barcode only
G	CODE 128	Barcode only
I	UCC/EAN 128 for standard carton ID	Barcode only

[Important]

1. In this case, barcode will not have specification such as Bar Width Ratio and HRI.
2. HRI will not be printed when barcode is error for barcode with HRI.

(5) Composition of check digit

Refer to the table below for check digit in each barcode.

[Composition of C/D]

Barcode specification parameter	Barcode specification	Input digit No.	Print digit number and contents
3	JAN/EAN 13	12-digit	13-digit (Input data of barcode + C/D) C/D is calculated by modulus10.
		13-digit	13-digit (Input data of barcode) C/D is not checked.
4	JAN/EAN 8	7-digit	8-digit (Input data of barcode + C/D) C/D is calculated by modulus10.
		8-digit	8-digit (Input data of barcode) C/D is not checked.
C	CODE 93	Max. 99- digit	C/D is calculated by modulus47.
E	UPC-E	6-digit only	C/D is calculated by modulus10.
G	CODE 128	-	C/D is calculated by modulus103.
H	UPC-A	11-digit only *1	12-digit (Input data of barcode + C/D) C/D is calculated by modulus10.
I	UCC/EAN128 for standard carton ID	17-digit only	C/D is calculated by modulus103.

[Note]

C/D stands for "Check Digit".

(6)Barcode Rotation Print

Print direction of barcode can be rotated. Note that when specifying Serial 1 and Serial 2 for barcode rotation, it may cause blurring due to barcode enlargement ratio.

Avoid printing of 1-dot narrow bar since 1 dot becomes 0.125 / 0.083 / 0.042 mm when head density is 8dot/mm (203dpi) or 12dot/mm (305dpi) or 24dot/mm (609dpi).

Parallel 1 : Forward feed print
Parallel 2 : Backfeed print at 180-degree rotation

[Note] Forward feed:
Prints horizontally to label feed direction

Serial 1 : Forward feed print at 90-degree rotation
Serial 2 : Forward feed print at 270-degree rotation

- 1) To print with Parallel1 and Parallel2, specify enlargement ratio of bar width so that narrow bar gets at least 2 dots. ("L" indicates the enlargement ratio to the bar width ratio.)

	Head density		
	8dots/mm(203dpi)	12dots/mm(305dpi)	24dots/mm(609dpi)
Bar width ratio 1:2	2L or more	2L or more	4L or more
Bar width ratio 1:3	2L or more	2L or more	4L or more
Bar width ratio 2:5	1L or more	1L or more	2L or more
UPC-A/EAN/JAN	2L or more	2L or more	4L or more

- 2) If printing in serial 1 or serial 2 mode, specify the bar width expansion factor so that when using a 8 dots/mm or 12 dots/mm head the width of the narrow bar is at least 3 dots.

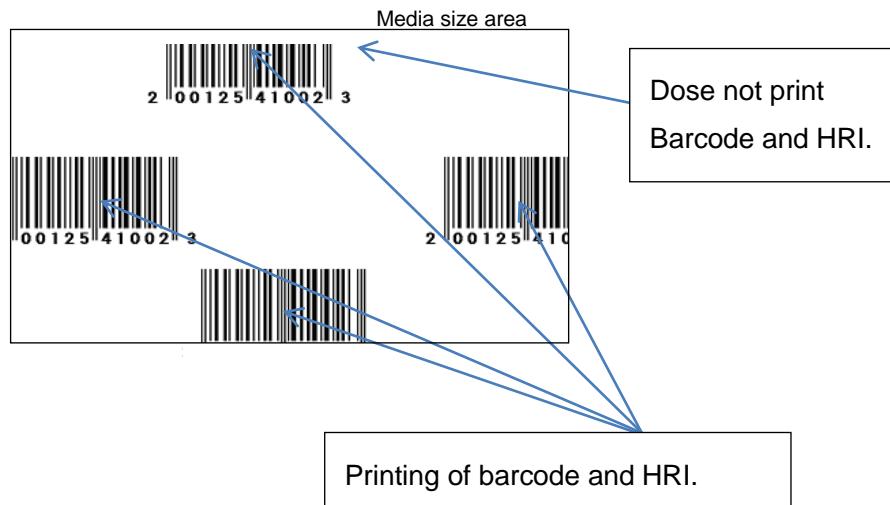
	Head density		
	8dots/mm(203dpi)	12dots/mm(305dpi)	24dots/mm(609dpi)
Bar ratio1:2	3L or more	3L or more	6L or more
Bar ratio1:3	3L or more	3L or more	6L or more
Bar ratio2:5	2L or more	2L or more	4L or more
UPC-A/JAN/EAN	3L or more	3L or more	6L or more

- 3) If printing in serial 1 or serial 2, reduce the print speed

(7) Printing barcode exceeding the area of media size (<A1>).

When printing barcode or HRI exceeding the area of media size (<A1>), the barcode and HRI inside the media will be printed.

Example of printing UPC-A (with HRI) exceeding the area of media size.



9.1 Barcode

Barcode (Ratio 1:3)

ESC+B

Hexadecimal code	ESC <1B> ₁₆	B <42> ₁₆	Parameter abbccc~n
Initial value	Nil		

Valid range and term of command	When the power switch is OFF	The set parameter is not maintained.
	Valid range within items	The set parameter becomes invalid.
	Valid range between items	The set parameter becomes invalid.

[Function]

Specifies a barcode with a ratio of 1:3 between narrow bar and wide bar.

[Format]

abbccc~n

- Parameter

a [Barcode type]	= Refer to table below
b [Narrow bar width]	= Valid range: 01 to 36 dots
c [Barcode height]	= Valid range :001 to 999 dots
n [Print data]	= Data

Barcode symbology (Ratio of module composition may not be available depending on the barcode symbology.)

A	Barcode symbol	Description	Ratio
0	CODABAR (NW-7)	Set print data including Start/Stop character. Start/Stop characters are [A,B,C,D,E,N,T,a,b,c,d,e,n,t]. Note that scan result of the characters [E,N,T,a,b,c,d,e,n,t] is [D, B, A, A, B, C, D, D, B, A]. e.g.) When barcode print data is [123], specify [A123A]. Barcode character pitch becomes enabled. For print data, refer to the CODABAR (NW-7) code table.	1:3
1	CODE39	Set print data including Start/Stop character. Start/Stop Character is [*]. e.g.) When barcode print data is [12345], specify [*12345*]. Barcode character pitch becomes enabled. For print data, refer to the CODE39 code table.	1:3
2	ITF	Specify print data in even-numbered digit. If specifying in odd-numbered digit, add "0" to the head of print data. For print data, refer to the ITF code table.	1:3
3	JAN/EAN13	This barcode has no guard bars and no human-readable characters For print data specifications, refer to table of JAN/EAN13 code	Fixed (11,12,13 digit)
4	JAN/EAN8	This barcode has no guard bars and no human-readable characters For print data specifications, refer to table of JAN/EAN8 code	Fixed (7,8 digit)
5	Industrial 2of5	Barcode character pitch is enabled. For print data specifications, refer to table of Industrial 2of5 code	1:3
6	Matrix 2of5	Barcode character pitch is enabled. For print data specifications, refer to table of Matrix 2of5 code	1:3
A	MSI	Specify 13-digit number for print data. For print data specifications, refer to table of MSI code.	Fixed
C	CODE93	Refer to CODE93 <BC>.	Fixed
E	UPC-E	Specify 6-digit number for print data. For print data specifications, refer to table of UPC-E code.	Fixed
F	UPC add-on code Book land	Refer to UPC add-on code/Book land <BF>.	Fixed
G	CODE128	Refer to CODE128 <BG>.	Fixed
H	UPC-A	This barcode has no guard bars and no human-readable characters For print data specifications, refer to table of UPC-A code.	Fixed
I	GS1-128 (UCC/EAN128)	Refer to GS1-128(UCC/EAN128)<BI>.	Fixed
P	Postnet	Refer to Postnet <BP>.	Fixed
S	USPS code	Refer to USPS code <BS>.	Fixed

[Coding Example 1] Barcode symbology: CODE39 Narrow bar width: 03 Height of barcode: 120

<A>
<V>100<H>100103120*1234AB*
<Q>2
<Z>



[Coding Example 2] Barcode symbology: JAN-8 Narrow bar width: 02 Height of barcode: 080

<A>
<V>100<H>1004020804912345
<Q>2
<Z>



[Supplementary Explanation]

1. The inter-character pitch of the barcode is valid at CODABAR (NW-7), CODE39, Industrial 2of5 and Matrix 2of5. The barcode inter-character pitch is set by specifying the character pitch <P> immediately before. If not set, the inter-character pitch will be of the same size as a narrow space and will become multiples of a narrow bar.

Command	Ratio	Narrow space width	<P> specification	Character pitch	
				Narrow bar width is [1]	Narrow bar width is [2]
	1:3	1	None	1	2
			<P>0	1	2
			<P>1	1	2
			<P>2	2	4
			<P>3	3	6
			<P>4	4	8

2. For print data of each barcode type, refer to the code tables of barcode.

[Notes]

1. If the value other than valid range is set, command error will occur and barcode will not be printed.
2. Barcode will be printed even if the data exceed the printable area.
3. Increasing narrow bar width may exceed the print area.
4. Scanner may not read the barcode with valid character pitch when Character Pitch <P> is increased. Also, increasing the narrow bar width may cause the same type of problem. For more information, refer to the documentation of your scanner.
5. For specifying the narrow bar width, consider the reading compatibility of scanner and head density beforehand.
203dpi: 2dots or more
305dpi: 2dots or more
609dpi: 4dots or more
6. Adjust Print Speed <CS> or Print Darkness <#F> in case of scanner reading problem.
7. Matrix 2of5 will be expressed as Coop2of5/NEC2of5.
8. If Start/Stop character is not included in print data at the time of CODABAR (NW-7) or CODE39 specified, barcode will be printed; however, scanner cannot read it.
9. If sending the print data including check digit at the time of JAN/EAN-13 or JAN/EAN-8 specified, set the correct calculated value. Barcode will be printed even when the data includes improper check digit; however, scanner cannot read it.

9.2 Barcode

Barcode (Ratio 1:2)

ESC+D

Hexadecimal code	ESC <1B> ₁₆	D <44> ₁₆	Parameter abbcccn~n
Initial value	Nil		

Valid range and term of command	When the power switch is OFF	The set parameter is not maintained.
	Valid range within items	The set parameter becomes invalid.
	Valid range between items	The set parameter becomes invalid.

[Function]

Specifies a barcode with a ratio of 1:2 between narrow bar and wide bar.

[Format]

<D>abbcccn~n

•Parameter

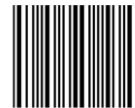
a [Barcode type]	= Refer to table below
b [Narrow bar width]	= Valid range:01 to 36 dots
c [Barcode height]	= Valid range:001 to 999 dots
n [Print data]	= Data

Barcode symbology (Ratio of module composition may not be available depending on the barcode symbology.)

A	Barcode symbol	Description	Ratio
0	CODABAR (NW-7)	Set print data including Start/Stop character. Start/Stop characters are [A,B,C,D,E,N,T,a,b,c,d,e,n,t]. Note that scan result of the characters [E,N,T,a,b,c,d,e,n,t] is [D, B, A, A, B, C, D, D, B, A]. e.g.) When barcode print data is [123], specify [A123A]. Barcode character pitch becomes enabled. For print data, refer to the CODABAR (NW-7) code table.	1:2
1	CODE39	Set print data including Start/Stop character. Start/Stop Character is [*]. e.g.) When barcode print data is [12345], specify [*12345*]. Barcode character pitch becomes enabled. For print data, refer to the CODE39 code table.	1:2
2	ITF	Specify print data in even-numbered digit. If specifying in odd-numbered digit, add "0" to the head of print data. For print data, refer to the ITF code table.	1:2
3	JAN/EAN13	This barcode has no guard bars and no human-readable characters For print data specifications, refer to table of JAN/EAN13 code	Fixed
4	JAN/EAN8	This barcode has no guard bars and no human-readable characters For print data specifications, refer to table of JAN/EAN8 code	Fixed
5	Industrial 2of5	Barcode character pitch is enabled. For print data specifications, refer to table of Industrial 2of5 code	1:2
6	Matrix 2of5	Barcode character pitch is enabled. For print data specifications, refer to table of Matrix 2of5 code	1:2
H	UPC-A	This barcode has no human-readable characters but guard bar. For print data specifications, refer to table of UPC-A code	Fixed

[Coding Example 1] Barcode symbology: CODABAR (NW-7), Narrow bar width: 03, Height of barcode: 120,
Print data: A1234A

<A>
<V>100<H>100<D>003120A1234A
<Q>2
<Z>



[Coding Example 2] Barcode symbology: ITF, Narrow bar width: 02, Height of barcode: 080
Print data: 98002345678163

<A>
<V>100<H>100<D>20208098002345678163
<Q>2
<Z>



[Coding Example 3] Barcode symbology: UPC-A, Narrow bar width: 03, Height of barcode: 120
Print data: 20123948573

<A>
<V>240<H>100<D>H0312020123948573
<Q>2
<Z>



[Supplementary Explanation]

1. The inter-character pitch of the barcode is valid at CODABAR (NW-7), CODE39, Industrial 2of5 and Matrix 2of5.
If not set, the inter-character pitch will be of the same size as a narrow space and will become multiples of a narrow bar.

e.g.)

Command	Ratio	Narrow space width	<P> specification	Gap between characters	
				Narrow bar width is [1]	Narrow bar width is [2]
<D>	1:2	1	None	1	2
			<P>0	1	2
			<P>1	1	2
			<P>2	2	4
			<P>3	3	6
			<P>4	4	8

2. For print data of each barcode type, refer to the code tables of barcode.

[Notes]

1. If the value other than valid range is set, command error will occur and barcode will not be printed.
2. Barcode will be printed even if the data exceed the printable area.
3. Increasing narrow bar width may exceed the print area.
4. Scanner may not read the barcode with valid character pitch when Character Pitch <P> is increased.
Also, increasing the narrow bar width may cause the same type of problem. For more information, refer to the documentation of your scanner.
5. For specifying the narrow bar width, consider the reading compatibility of scanner and head density beforehand.
203dpi: 2dots or more
305dpi: 2dots or more
609dpi: 4dots or more
6. Adjust Print Speed <CS> or Print Darkness <#F> in case of scanner reading problem.
7. Matrix 2of5 will be expressed as Coop2of5/NEC2of5.
8. If Start/Stop character is not included in print data at the time of CODABAR (NW-7) or CODE39 specified, barcode will be printed; however, scanner cannot read it.
9. If sending the print data including check digit at the time of JAN/EAN-13 or JAN/EAN-8 specified, set the correct calculated value. Barcode will be printed even when the data includes improper check digit; however, scanner cannot read it.

9.3 Barcode

Barcode (with HRI)

ESC+D
~ESC+d

Hexadecimal code	ESC <1B> ₁₆	D ~ d <44> ₁₆ ~ Character type	Parameter abbcccn~n~<d>n~n
Initial value	Nil		

Valid range and term of command	When the power switch is OFF	The set parameter is not maintained.
	Valid range within items	The set parameter becomes invalid.
	Valid range between items	The set parameter becomes invalid.

[Function]

Specifies character type of human readable interpretation (HRI) for barcode.

[Format]

<D>abbccn~n~<d>n~n

• Parameter

a [Barcode symbology] = 3: JAN/EAN13

4: JAN/EAN8

H: UPC-A

b [Narrow bar width] = Valid range: 01 to 36 dots

c [Height of barcode] = Valid range: 001 to 999 dots

n [Print data] = Barcode data

d [Character type] = OA,

OB,

XU,

XS,

XM,

XB,

XL,

U

S

M

WB

WL

X20,

X21,

X22,

X23,

X24

n [Print data] = HRI data

[Coding Example] Barcode type: JAN/EAN13, Narrow bar width: 03, Barcode height: 120
Barcode data: 4902471000793, Character type: XU
HRI data: 4902471000793

<A>
<V>100<H>200<D>3031204902471000793
<XU>4902471000793
<Q>2
<Z>



[Supplementary Explanation]

1. Adds HRI characters to specified font.
2. When the data other than specified value is set, printing will not be performed. When barcode enlargement ratio is small and character type is large, HRI text may be overlapped with each other.
3. Printer will lay out HRI properly.
4. HRI for JAN/EAN8, JAN/EAN13, UPC-A will be printed properly in the conditions below.

In case of 8 dots/mm (203dpi)	:	Appropriate Narrow bar width is [02], [03]
In case of 12 dots/mm (305dpi)	:	Appropriate Narrow bar width is [03], [04]
In case of 24 dots/mm (609dpi)	:	Appropriate Narrow bar width is [06], [07],[08]
5. HRI will not be printed when barcode is error for barcode with HRI.
6. When specifying <P> and <L>, (<P>02<d>n~n,<L><d>n~n) and HRI are not printed.

9.4 Barcode

Barcode (Ratio 2:5)

ESC+BD

Hexadecimal code	ESC <1B> ₁₆	BD <42> ₁₆ <44> ₁₆	Parameter abbcccn~n
Initial value	Nil		

Valid range and term of command	When the power switch is OFF	The set parameter is not maintained.
	Valid range within items	The set parameter becomes invalid.
	Valid range between items	The set parameter becomes invalid.

[Function]

Specifies a barcode with a ratio of 2:5 between narrow bar and wide bar.

[Format]

<BD>abbcccn~n

• Parameter

- a [Barcode symbology] = Refer to the table below
- b [Narrow bar width] = Valid Range : 01 to 36 dots
- c [Height of barcode] = Valid Range : 001 to 999 dots
- n [Print data] = data

Barcode symbology (Ratio of module composition may not be available depending on the barcode symbology)

A	Barcode symbology	Descriptions	Ratio
0	CODABAR (NW-7)	Set print data including Start/Stop character. Start/Stop characters are [A,B,C,D,E,N,T,a,b,c,d,e,n,t]. Note that scan result of the characters [E,N,T,a,b,c,d,e,n,t] is [D, B, A, A, B, C, D, D, B, A]. e.g.) When barcode print data is [123], specify [A123A]. Barcode character pitch becomes enabled. For print data, refer to the CODABAR (NW-7) code table.	2:5
1	CODE39	Set print data including Start/Stop character. Start/Stop Character is [*]. e.g.) When barcode print data is [12345], specify [*12345*]. Barcode character pitch becomes enabled. For print data, refer to the CODE39 code table.	2:5
2	ITF	Specify print data in even-numbered digit. If specifying in odd-numbered digit, add "0" to the head of print data. For print data, refer to the ITF code table.	2:5
3	JAN/EAN13	This barcode has guard bars and human-readable characters For print data specifications, refer to table of JAN/EAN13 code	Fixed
4	JAN/EAN8	This barcode has guard bars and human-readable characters For print data specifications, refer to table of JAN/EAN8 code	Fixed
5	Industrial 2of5	Barcode character pitch is enabled. For print data specifications, refer to table of Industrial 2of5 code	2:5
6	Matrix 2of5	Barcode character pitch is enabled. For print data specifications, refer to table of Matrix 2of5 code	2:5
H	UPC-A	This barcode has human-readable characters but guard bar. For print data specifications, refer to table of UPC-A code	Fixed

[Coding Example 1] Barcode symbology: CODABAR (NW-7), Narrow bar width: 03, Height of barcode: 120,
Print data: A1234A

<A>
<V>100<H>100<BD>003120A1234A
<Q>2
<Z>



[Coding Example 2] Barcode symbology: ITF, Narrow bar width: 03, Height of barcode: 120,
Print data: 98002345678163

<A>
<V>100<H>100<BD>20212098002345678163
<Q>2
<Z>



[Coding Example 3] Barcode symbology: UPC-A, Narrow bar width: 03, Height of barcode: 120
Print data: 20123948573

<A>
<V>240<H>100<BD>H0312020123948573
<Q>2
<Z>



[Supplementary Explanation]

1. The inter-character pitch of the barcode is valid at CODABAR (NW-7), CODE39, Industrial 2of5 and Matrix 2of5.
The barcode inter-character pitch is set by specifying the character pitch <P> immediately before.
If not set, the inter-character pitch will be of the same size as a space command.

Command	Ratio	Narrow space width	<P>	Inter-character gap	
				Narrow bar width is [1]	Narrow bar width is [2]
<BD>	2:5	2	Nil	2	4
			<P>0	2	4
			<P>1	1	2
			<P>2	2	4
			<P>3	3	6
			<P>4	4	8

2. For print data of each barcode type, refer to the code tables of barcode.
3. The barcode translation of following codes will be restricted to conditions below: JAN/EAN8, JAN/EAN13, UPC-A
In case of 8 dots/mm (203dpi) : Narrow bar width must be [02], [03]
In case of 12 dots/mm (305dpi) : Narrow bar width must be [03], [04]
In case of 24 dots/mm (609dpi) : Narrow bar width must be [06], [07], [08]
HRI will not be printed if the value other than the listed above is specified.

[Notes]

1. If the value other than valid range is set, command error will occur and barcode will not be printed.
2. Barcode will be printed even if the data exceed the printable area.
3. Increasing narrow bar width may exceed the print area.
4. Scanner may not read the barcode with valid character pitch when Character Pitch <P> is increased.
Also, increasing the narrow bar width may cause the same type of problem. For more information, refer to the documentation of your scanner.
5. For specifying the narrow bar width, consider the reading compatibility of scanner and head density beforehand.
6. Adjust Print Speed <CS> or Print Darkness <#F> in case of scanner reading problem.
7. Matrix 2of5 will be expressed as Coop2of5/NEC2of5.
8. If Start/Stop character is not included in print data at the time of CODABAR (NW-7) or CODE39 specified, barcode will be printed; however, scanner cannot read it.
9. If sending the print data including check digit at the time of JAN/EAN-13 or JAN/EAN-8 specified, set the correct calculated value. Barcode will be printed even when the data includes improper check digit; however, scanner cannot read it.

9.5 Barcode

Barcode Ratio Registration

ESC+BT

Hexadecimal code	ESC <1B> ₁₆	BT <42> ₁₆ <54> ₁₆	Parameter abbcccddee
Initial value	Nil		

Valid range and term of command	When the power switch is OFF	The set parameter is not maintained.
	Valid range within items	The set parameter becomes invalid.
	Valid range between items	The set parameter becomes invalid.

[Function]

Specifies the ratio of the narrow bar in regard to the wide bar

[Format]

<BT>abbcccddee

• Parameter

a [Barcode type]	=	0 : CODABAR (NW-7)
		1 : CODE39
		2 : ITF
		5 : Industrial 2of5
		6 : Matrix 2of5
b [Narrow space]	=	Valid range : 01 to 99 dots
c [Wide space]	=	Valid range : 01 to 99 dots
d [Narrow bar]	=	Valid range : 01 to 99 dots
e [Wide bar]	=	Valid range : 01 to 99 dots

[Coding Example] Barcode type: CODE39, Narrow space: 03, Wide space: 05,
Narrow bar: 03, Wide bar: 05

```
<A>
<BT>103050305
<V>100<H>200<BW>01233*ABCD*
<Q>2
<Z>
```



[Supplementary Explanation]

1. To print barcode with specified ratio, insert "Barcode print by specified ratio" command <BW> after this command.
2. When <BW> and the Print Quantity <Q> command are not specified, only the registration of bar width ratio of narrow and wide bars will be performed.
3. Only one ratio can be registered.
4. If the data other than specified is set, this will not be registered due to command error.
5. Matrix 2of5 is expressed as Coop2of5/NEC2of5.

9.6 Barcode

Barcode Print by Specified Ratio

ESC+BW

Hexadecimal code	ESC <1B> ₁₆	BW <42> ₁₆ <57> ₁₆	Parameter aabbbn-n
Initial value	Nil		

Valid range and term of command	When the power switch is OFF	The set parameter is not maintained.
	Valid range within items	The set parameter becomes invalid.
	Valid range between items	The set parameter becomes invalid.

[Function]

Specifies barcode ratio, saved by <BT>

[Format]

<BW>aabbbn - n

•Parameter

a [Narrow bar]	=	Valid Range	:	01 – 36 dots
b [Height of Barcode]	=	Valid Range	:	001 – 999 dots
n [Print data]	=	Barcode data		

[Coding Example] Narrow bar: 02, Height of Barcode:120

```

<A>
<BT>103060306
<V>100<H>200<BW>02120*ABCD*
<Q>2
<Z>

```



[Supplementary Explanation]

1. Barcode character pitch is available for CODABAR(NW-7), CODE39, Industrial 2of5, Matrix 2of5. To specify barcode character pitch, insert Character Pitch <P> right before Barcode symbology. When <P> is omitted, character pitch will be as same as narrow space width set by Barcode ratio.

Command	Ratio	Narrow space width	<P> specification	Gap between characters	
				Narrow bar width is [1]	Narrow bar width is [2]
<BT>	3:5	3	None	3	6
			<P>0	3	6
			<P>1	1	2
			<P>2	2	4
			<P>3	3	6
			<P>4	4	8

2. If there is no Registration of Bar Width Ratio <BT>, barcode based on pre-registered bar width ratio of narrow and wide bars will be printed. Note that specification of <BT> is required beforehand to print.
3. For print data for Barcode type, refer to Code table for each Barcode.

[Notes]

1. If the value other than valid range is set, command error will occur and barcode will not be printed.
2. Barcode will be printed even if the data exceed the printable area.
3. Increasing narrow bar width may exceed the print area and not be printed.
4. Scanner may not read the barcode with valid character pitch when Character Pitch <P> is increased. Also, increasing the narrow bar width may cause the same type of problem. For more information, refer to the documentation of your scanner.
5. For specifying the narrow bar width, consider the reading compatibility of scanner beforehand.
6. Adjust Print Speed <CS> or Print Darkness <#F> in case of scanner reading problem.
7. Matrix 2of5 is expressed as Coop2of5/NEC2of5.
8. When CODABAR(NW-7) and CODE39 is specified and Start/Stop character is not included in it, Barcode is printed but Scanner cannot read it.

CODABAR(NW-7) Code table

	S I								S O										
B8	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1			
B7	0	0	0	0	1	1	1	1	0	0	0	0	1	1	1	1			
B6	0	0	1	1	0	0	1	1	0	0	1	1	0	0	1	1			
B5	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1			
B4	B3	B2	B1	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0	0	0	0	0	0			0											
0	0	0	1	1				1	A		a								
0	0	1	0	2				2	B		b								
0	0	1	1	3				3	C		c								
0	1	0	0	4			\$	4	D	T	d	t							
0	1	0	1	5				5	E		e								
0	1	1	0	6				6											
0	1	1	1	7				7											
1	0	0	0	8				8											
1	0	0	1	9				9											
1	0	1	0	A		*	:												
1	0	1	1	B		+													
1	1	0	0	C															
1	1	0	1	D		-													
1	1	1	0	E		.		N		n									
1	1	1	1	F		/													

* Under the standards, 0x20(SP) cannot be used. If used, this code will be printed as a blank rather than returning a printer error.

CODE39 Code table

	S I						S O								
B8	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1
B7	0	0	0	0	1	1	1	1	0	0	0	0	1	1	1
B6	0	0	1	1	0	0	1	1	0	0	1	1	0	0	1
B5	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0
B4	B3	B2	B1	0	1	2	3	4	5	6	7	8	9	A	B
0	0	0	0	0	0	SP	0	P							
0	0	0	1	1			1	A	Q						
0	0	1	0	2			2	B	R						
0	0	1	1	3			3	C	S						
0	1	0	0	4			\$	4	D	T					
0	1	0	1	5			%	5	E	U					
0	1	1	0	6			6	F	V						
0	1	1	1	7			7	G	W						
1	0	0	0	8			8	H	X						
1	0	0	1	9			9	I	Y						
1	0	1	0	A		*		J	Z						
1	0	1	1	B		+		K							
1	1	0	0	C				L							
1	1	0	1	D		-		M							
1	1	1	0	E		.		N							
1	1	1	1	F		/		O							

9.7 Barcode

CODE 93 Barcode

ESC+BC

Hexadecimal code	ESC <1B> ₁₆	BC <42> ₁₆ <43> ₁₆	Parameter aabbbccn~n
Initial value	Nil		

Valid range and term of command	When the power switch is OFF	The set parameter is not maintained.
	Valid range within items	The set parameter becomes invalid.
	Valid range between items	The set parameter becomes invalid.

[Function]
Specifying CODE93 barcode.

[Format]
<BC>aabbccn~n

• Parameter

a [Narrow bar]	=	Valid Range	:	01 ~ 36 dots
b [Height of Barcode]	=	Valid Range	:	001 ~ 999 dots
c [Digit No. of data]	=	Valid Range	:	01 ~ 99
n [Print data]	=	Barcode data(Refer to the CODE93 - Code Table.)		

[Coding Example] Narrow bar width: 02, Barcode height: 120, Number of digit: 12, Print data: ABCD123456xy
 <A>
 <V>100<H>200<BC>0212012ABCD123456xy
 <Q>2
 <Z>



[Supplementary Explanation]

1. C/D is an auto-generation.
2. Start code and stop code will be automatically added.
3. Maximum entry digit number of data is 99.
4. [Digit No. of data] and No. of input data have to be equal.
5. Command error will occur when No. of input data and [Digit No. of data] are not matched.

CODE93Code table

	S I								S O							
B8	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1
B7	0	0	0	0	1	1	1	1	0	0	0	0	1	1	1	1
B6	0	0	1	1	0	0	1	1	0	0	1	1	0	0	1	1
B5	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1
B4	B3	B2	B1	0	1	2	3	4	5	6	7	8	9	A	B	C
0	0	0	0	0	0	SP	0	@	P	`	p					
0	0	0	1	1		!	1	A	Q	a	q					
0	0	1	0	2		"	2	B	R	b	r					
0	0	1	1	3		#	3	C	S	c	s					
0	1	0	0	4		\$	4	D	T	d	t					
0	1	0	1	5		%	5	E	U	e	u					
0	1	1	0	6		&	6	F	V	f	v					
0	1	1	1	7		'	7	G	W	g	w					
1	0	0	0	8		(8	H	X	h	x					
1	0	0	1	9)	9	I	Y	i	y					
1	0	1	0	A		*	:	J	Z	j	z					
1	0	1	1	B		+	;	K	[k	{					
1	1	0	0	C		,	<	L	\							
1	1	0	1	D		-	=	M]	m	}					
1	1	1	0	E		.	>	N	^	n	-					
1	1	1	1	F		/	?	O	—	o	DE	L				

You can specify from 00H to 7FH for Code93.

9.8 Barcode

UPC Add-on (Bookland)

ESC+BF

Hexadecimal code	ESC <1B> ₁₆	BF <42> ₁₆ <46> ₁₆	Parameter aabbbn~n
Initial value	Nil		

Valid range and term of command	When the power switch is OFF	The set parameter is not maintained.
	Valid range within items	The set parameter becomes invalid.
	Valid range between items	The set parameter becomes invalid.

[Function]

Specifying UPC Add-on code (Bookland).

[Format]

<BF>aabbn~n

● Parameter

a [Narrow bar width]	= Valid range: 01 to 36 dots
b [Height of barcode]	= Valid range: 001 to 999 dots
n [Print data]	= Numeric (0 to 9) 2, 5 digits

[Coding Example] Narrow bar width: 03, Barcode height: 120

```

<A>
<H>325<V>725<BD>H0315009827721123
<H>640<V>760<BF>0312021826
<H>655<V>730<OB>21826
<Q>1
<Z>

```



[Supplementary Explanation]

1. If specifying the value other than 2 and 5 digits, barcode will be not printed.
2. Only numeric can be specified as print data. (Refer to code table)
3. No HRI
4. When printed only UPC add-on <BF>, it cannot be scanned.

Scan is available only when it is printed with UPS code.

UPC Add-on Barcode Code table

	S I						S O							
B8	0	0	0	0	0	0	0	0	1	1	1	1	1	1
B7	0	0	0	0	1	1	1	1	0	0	0	0	1	1
B6	0	0	1	1	0	0	1	1	0	0	1	1	0	0
B5	0	1	0	1	0	1	0	1	0	1	0	1	0	1
B4	B3	B2	B1	0	1	2	3	4	5	6	7	8	9	A
0	0	0	0	0										
0	0	0	1	1										
0	0	1	0	2										
0	0	1	1	3										
0	1	0	0	4										
0	1	0	1	5										
0	1	1	0	6										
0	1	1	1	7										
1	0	0	0	8										
1	0	0	1	9										
1	0	1	0	A										
1	0	1	1	B										
1	1	0	0	C										
1	1	0	1	D										
1	1	1	0	E										
1	1	1	1	F										

9.9 Barcode

Code 128 Barcode

ESC+BG

Hexadecimal code	ESC <1B> ₁₆	BG <42> ₁₆ <47> ₁₆	Parameter aabbbn~n
Initial value	Nil		

Valid range and term of command	When the power switch is OFF	The set parameter is not maintained.
	Valid range within items	The set parameter becomes invalid.
	Valid range between items	The set parameter becomes invalid.

[Function]

Specifying CODE128 barcode.

[Format]

<BG>aabbbn~n

• Parameter

- | | | |
|-----------------------|---|--|
| a [Narrow bar] | = | Valid Range : 01 ~ 36 dots |
| b [Height of Barcode] | = | Valid Range : 001 ~ 999 dots |
| n [Print data] | = | Barcode data (Refer to the CODE128 - Code Table) |

[Coding Example] Narrow bar width: 02, Barcode height: 120, Print data: ABCD123456 (Start character A)

<A>
<V>100<H>200<BG>02120>GABCD123456
<Q>2
<Z>



[Supplementary Explanation]

- Specify [START CODE] at the head of print data.
 - (1) START CODE A = [>G]
 - (2) START CODE B = [>H]
 - (3) START CODE C = [>I]
- C/D is an auto-generation.
- (1) When using "START CODE C", specify print data in even-numbered digit.
(2) When "START CODE C" is set to print data in odd-number digit, specify "START CODE A" or "B" to change the first one character of print data. And then specify the rest of data with "Code Set Character C" to change it to even-numbered digit.

e.g.1) 15 digits [123456789012345]	1<C>23456789012345
e.g.2) 9 digits / Alphanumeric 6 digits [123456789ABC123]	<C>123456789ABC123.
- If using "START CODE C" to specify odd-numbered digit, command error occurs and barcode is not printed.
- When start character is omitted, data will be printed with "START CODE B".

CODE128 - Code Table

VALUE	CodeA	CodeB	CodeC
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	16
17	0	1	17
18	1	2	18
19	2	3	19
20	3	4	20
21	4	5	21
22	5	6	22
23	6	7	23
24	7	8	24
25	8	9	25
26	9	:	26
27	:	;	27
28	;	<	28
29	<	=	29
30	=	>(Note 4.)	30
31	>(Note 4.)	?	31
32	?	@	32
33	@	A	33
34	A	B	34
35	B	C	35
36	C	D	36
37	D	E	37
38	E	F	38
39	F	G	39
40	G	H	40
41	H	I	41
42	I	J	42
43	J	K	43
44	K	L	44
45	L	M	45
46	M	N	46
47	N	O	47
48	O	P	48

VALUE	CodeA	CodeB	CodeC
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	—	' — >SP	64
65	NUL >SP	a > !	65
66	SOH > !	b >"	66
67	STX >"	c >#	67
68	ETX >#	d >\$	68
69	EOT >\$	e >%	69
70	ENQ >%	f >&	70
71	ACK >&	g >'	71
72	BEL >'	h >(72
73	BS >(i >)	73
74	HT >)	j >*	74
75	LF >*	k >+	75
76	VT >+	l >,	76
77	FF >,	m >-	77
78	CR >-	n >.	78
79	SO>.	o >/	79
80	SI >/	p >0	80
81	DLE >0	q >1	81
82	DC1 >1	r >2	82
83	DC2 >2	s >3	83
84	DC3 >3	t >4	84
85	DC4 >4	u >5	85
86	NAK >5	v >6	86
87	SYN >6	w >7	87
88	ETB >7	x >8	88
89	CAN >8	y >9	89
90	EM >9	z >:	90
91	SUB >:	{ > ;	91
92	ESC > ;	><	92
93	FS ><	} >=	93
94	GS >=	~ >>	94
95	RS >>	DEL >?	95
96	US >?	FNC3>@	96
97	FNC3>@	FNC2>A	97

VALUE	CodeA	CodeB	CodeC
98	SHIFT >B	SHIFT >B	98
99	Code-C >C	Code-C >C	99
100	Code-B >D	FNC4 >D	Code-B >D
101	FNC4 >E	Code-A >E	Code-A >E
102	FNC1 >F	FNC1 >F	FNC1 >F
103	STARTCODE A>G		
104	B>H		
105	C>I		

[Notes]

1. START code must be sent.
2. STOP code is added in the printer automatically.
3. Code after VALUE64 in Code A and Code B should be specified as 2 character code with ">" attached.
4. Specification code for ">" is ">J".

9.10 Barcode

GS1-128 (UCC/EAN128) (Standard Carton ID Only)

ESC+BI

Hexadecimal code	ESC	BI	Parameter
	<1B> ₁₆	<42> ₁₆ <49> ₁₆	aabbccn~n
Initial value	Nil		

Valid range and term of command	When the power switch is OFF	The set parameter is not maintained.
	Valid range within items	The set parameter becomes invalid.
	Valid range between items	The set parameter becomes invalid.

[Function]

Specifying GS1-128(UCC/EAN128) barcode for Standard Carton ID.

[Format]

<BI>aabbccn~n

• Parameter

a [Narrow bar]	=	Valid Range	:	01 to 36 dots
b [Height of Barcode]	=	Valid Range	:	001 to 999 dots
c [Barcode expository font specification]	=	0	:	No HRI
		1	:	HRI is available (Upper part of barcode)
		2	:	HRI is available (Under part of barcode)
n [Print data]	=	Barcode data (Fixed 17 digits)		

For barcode data, refer to the GS1-128 (UCC/EAN128) code table.

EAN128 (Barcode for Standard Carton ID)

- Identifier of a continuous code for freight packaging
- Type of packaging
- Country/manufacturer code
- Serial No. for shipping container
- Check digit

Note that check digit is automatically added; therefore, specify data in 17 digits excluding check digit.

[Coding Example] Narrow bar width:05, Height of barcode:080, HRI: Available (Under part of barcode)

Print data:12345678901234567

```
<A>
<V>100<H>200<BI>05080212345678901234567
<Q>2
<Z>
```



(00) 1 2345678 901234567 5

[Supplementary Explanation]

1. UCC128 code is exclusive to Standard Carton ID. When printing in EAN128, designed for the markets in the medical, fresh food, or flowers and plants, use CODE128 Barcode <BG> to specify print data with application identification or separator that matches each specification.
2. Start character code, function character, end character code, and identification code (corresponds to [00] only) are added automatically.
3. Modulus 10 check character and modulus 103 check character are automatically generated.
4. Sequential number of barcode data is available.
5. Line pitch between barcode and expository font is fixed at 10 dots.
6. If the width of expository font is wider than that of barcode, it starts printing from the print start position of barcode.
7. If the width of expository font is narrower than that of barcode, expository font will be aligned to the center of barcode for printing.
8. Prints expository font in OCR-B.
9. If expository font is outside of print area, it will not be printed. When selecting [HRI is available], specify Vertical Print Position <V> and Horizontal Print Position <H> in consideration of print of expository font.
10. When other than 0, 1, or 2 is specified as the barcode HRI font, it will be the same as the barcode HRI font specification "0".

ITF

Matrix 2of5

Industrial2of5

UPC-A,JAN/EAN8

JAN/EAN13,UPC-E

GS1-128 (UCC/EAN128)

MSI Code table

				S I						S O					
B8	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1
B7	0	0	0	0	1	1	1	1	0	0	0	0	1	1	1
B6	0	0	1	1	0	0	1	1	0	0	1	1	0	0	1
B5	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0
B4	B3	B2	B1	0	1	2	3	4	5	6	7	8	9	A	B
0	0	0	0	0				0							
0	0	0	1	1				1							
0	0	1	0	2				2							
0	0	1	1	3				3							
0	1	0	0	4				4							
0	1	0	1	5				5							
0	1	1	0	6				6							
0	1	1	1	7				7							
1	0	0	0	8				8							
1	0	0	1	9				9							
1	0	1	0	A											
1	0	1	1	B											
1	1	0	0	C											
1	1	0	1	D											
1	1	1	0	E											
1	1	1	1	F											

9.11 Barcode

Postnet

ESC+BP

Hexadecimal code	ESC <1B> ₁₆	BP <42> ₁₆ <50> ₁₆	Parameter n~n
Initial value	Nil		

Valid range and term of command	When the power switch is OFF	The set parameter is not maintained.
	Valid range within items	The set parameter becomes invalid.
	Valid range between items	The set parameter becomes invalid.

[Function]

Specifying customer barcode.

[Format]

<BP>n~n

•Parameter

- | | | |
|--|---|--|
| n | = | Print data (Refer to the POSTNET Code Table) |
| Note that the digits other than specified below are not allowed. | | |
| - 5 digits (POSTNET-32 format) | | |
| - 6 digits (POSTNET -37 format) | | |
| - 9 digits (POSTNET -52 format) | | |
| - 11 digits (POSTNET -62 Delivery Point format) | | |

[Coding Example] Postal code: 11 digits: 01234567890

```

<A>
<V>100<H>200<BP>01234567890
<Q>2
<Z>
```

[Supplementary Explanation]

1. If specifying the value other than 5, 6, 9, and 11 digits for print data, it will be ignored.
2. Only numeric can be specified as print data.

POSTNET Code table

	S I						S O							
b8	0	0	0	0	0	0	0	0	1	1	1	1	1	1
b7	0	0	0	0	1	1	1	1	0	0	0	0	1	1
b6	0	0	1	1	0	0	1	1	0	0	1	1	0	0
b5	0	1	0	1	0	1	0	1	0	1	0	1	0	1
b4 b3 b2 b1		0	1	2	3	4	5	6	7	8	9	A	B	C
0 0 0 0	0				0									
0 0 0 1	1				1									
0 0 1 0	2				2									
0 0 1 1	3				3									
0 1 0 0	4				4									
0 1 0 1	5				5									
0 1 1 0	6				6									
0 1 1 1	7				7									
1 0 0 0	8				8									
1 0 0 1	9				9									
1 0 1 0	A													
1 0 1 1	B													
1 1 0 0	C													
1 1 0 1	D													
1 1 1 0	E													
1 1 1 1	F													

9.12 Barcode

USPS Barcode

ESC+BS

Hexadecimal code	ESC <1B> ₁₆	BS <42> ₁₆ <53> ₁₆	Parameter aabbbccccccddddd(e~e)
Initial value	Nil		

Valid range and term of command	When the power switch is OFF	The set parameter is not maintained.
	Valid range within items	The set parameter becomes invalid.
	Valid range between items	The set parameter becomes invalid.

[Function]
Print USPS code.

[Format]
<BS>aabbcccccddddd(e~e)

- Parameter

a[Barcode ID]	=	Fixed 2 digits
		note: 0~4 should be specified for the 2nd digit.
b[Service Type ID]	=	Fixed 3 digits
c[Mailer ID]	=	Fixed 6 digits
d[Serial Number]	=	Fixed 9 digits
e[Routing Code]	=	Fixed 5 digits or fixed 9 digits or fixed 11 digits(can be omitted)

[Coding Example] Barcode ID: 53, Service Type ID: 379, Customer Identifier: 777234

 Serial Number: 994544928, Routing Code: 51135759461

```
<A>
<V>100<H>200<BS>5337977723499454492851135759461
<Q>1
<Z>
```

[Supplementary note]
For available parameter, refer to USPS code table in next page.

USPS Code table

	S I								S O							
b8	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1
b7	0	0	0	0	1	1	1	1	0	0	0	0	1	1	1	1
b6	0	0	1	1	0	0	1	1	0	0	1	1	0	0	1	1
b5	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1
b4	b3	b2	b1	0	1	2	3	4	5	6	7	8	9	A	B	C
0	0	0	0	0												
0	0	0	1	1				1								
0	0	1	0	2				2								
0	0	1	1	3				3								
0	1	0	0	4				4								
0	1	0	1	5				5								
0	1	1	0	6				6								
0	1	1	1	7				7								
1	0	0	0	8				8								
1	0	0	1	9				9								
1	0	1	0	A												
1	0	1	1	B												
1	1	0	0	C												
1	1	0	1	D												
1	1	1	0	E												
1	1	1	1	F												

9.13 Barcode

Composite Symbol

ESC+EU

Hexadecimal code	ESC <1B> ₁₆	EU <45> ₁₆ <55> ₁₆	Parameter aaabbn~n
Initial value	Nil		

Valid range and term of command	When the power switch is OFF	The set parameter is not maintained.
	Valid range within items	The set parameter becomes invalid.
	Valid range between items	The set parameter becomes invalid.

[Function]

Specifying the composite symbol of EAN/UCC.

[Format 1]

<EU>aabbccn~n

• Parameter

a [Type of composite symbol]	=	01 :GS1 DataBar Composite (CC-A/CC-B) 02 :GS1 DataBar Truncated Composite (CC-A/CC-B) 03 :GS1 DataBar Stacked Composite (CC-A/CC-B) 04 :GS1 DataBar Stacked Omni-Directional (CC-A/CC-B) 05 :GS1 DataBar Limited Composite (CC-A/CC-B) 06 :GS1 DataBar Expanded Composite(CC-A/CC/B) / GS1 DataBar Expanded Stacked (CC-A/CC-B) 07 :UPC-A Composite (CC-A/CC-B) 08 :UPC-E Composite (CC-A/CC-B) 09 :EAN13 Composite (CC-A/CC-B) 10 :EAN8 Composite (CC-A/CC-B)
b [Narrow bar]	=	01 ~ 12 dots
c [Segment width]	=	02 ~ 22 (Even number only) * Only GS1 DataBar Expanded Composite (CC-A/CC-B) are supported
n [Print data]	=	Data

Maximum number of digit for 1D barcode data

GS1 DataBar Composite (CC-A/CC-B)	13 digits
GS1 DataBar Truncated Composite (CC-A/CC-B)	13 digits
GS1 DataBar Stacked Composite (CC-A/CC-B)	13 digits
GS1 DataBar Stacked Omni-Directional (CC-A/CC-B)	13 digits
GS1 DataBar Limited Composite (CC-A/CC-B)	13 digits
GS1 DataBar Expanded Composite (CC-A/CC-B) / GS1 DataBar Expanded Stacked (CC-A/CC-B)	74 digits
UPC-A Composite (CC-A/CC-B)	11 digits
UPC-E Composite (CC-A/CC-B)	Fixed 10 digits
Specify with "XX00000XXX" (X: variable) format.	
EAN13 Composite (CC-A/CC-B)	12 digits
EAN8 Composite (CC-A/CC-B)	7 digits

- Check digit is automatically calculated and added.

- To specify the print of composite symbol, delimit one-dimensional data and two-dimensional data with '|'(7Ch).

Data = One-dimensional data | Two-dimensional data

-Data of GS1 DataBar Composite (CC-A/CC-B) are needed to be specified between the 1st and 16th digit of GS1 DataBar Expanded Composite (CC-A/CC-B) data.

-GS1 DataBar Expanded Composite (CC-A/CC-B) can contain GS1 DataBar Composite (CC-A/CC-B) data and 74 digit of numeric character and 41 digits of alphabet.

(When numeric characters and alphabets are mixed, GS1 DataBar Composite (CC-A/CC-B) data and 41 digit characters can be specified.

-When specified data don't reach the maximum digits, blank is filled by zero.

-2D data can contain up to 338 digits, but it varies by the type of Barcode.

-Barcode may stick out of the label depending on data and the number of digit, and scanner cannot read it. Adjust print data beforehand so that the barcode can fit to the label.

[Format 2]
<EU>aabbcccn~n

•Parameter

a [Type of composite symbol] = 11 : GS1-128 Composite (CC-A/CC-B)

12 : GS1-128 Composite (CC-C)

b [Narrow bar width] = 01 ~ 12 dots

c [Barcode height] = 001 ~ 500 dots

*Specify barcode height when narrow bar width is "01".

*When specifying narrow bar width "03", Barcode height "100", Barcode height become 300 dots.

n [Print data] = Data (Up to 120 digits including 1D and 2D code)

Maximum number of digit for the 2D code *There is a limit for the barcode.

GS1-128(UCC/EAN128) with CC-A/B	338 digits
GS1-128(UCC/EAN128) with CC-C	2324 digits

Maximum number of digit for the barcode

GS1-128(UCC/EAN128) with CC-A/B	48 digits
GS1-128(UCC/EAN128) with CC-C	48 digits

-To specify the print of composite symbol, delimit one-dimensional data and two-dimensional data with'|'(7Ch).

Data = One-dimensional data | Two-dimensional data

- Use '#'(23h) to specify CC-A/B (Micro RDF), FNC1 (GS) of CC-C (for PDF417) as data.

- 2D data for GS1-128(UCC/EAN128) With CC-A/B can contain up to 338 digits.

- When 2D data of GS1-128(UCC/EAN128) with CC-A/B are less than 56 digits, it is identified as CC-A, and identified as CC-B when data size is between 57 digits and 338 digits automatically.

* The number of digits varies depending on the width of the barcode in GS1-128(UCC/EAN128) With CC-C, and the maximum number of digits of combination of the 1D and 2D is 2372 digits.

[Coding Example1] GS1 DataBar Composite (CC-A/CC-B)

<A>
<V>100<H>100
<EU>01040361234567890|11990102
<Q>1
<Z>



[Coding Example2] GS1 DataBar Truncated Composite (CC-A/CC-B)

<A>
<V>100<H>100
<EU>02040361234567890|11990102
<Q>1
<Z>



[Coding Example3] GS1 DataBar Stacked Composite (CC-A/CC-B)

<A>
<V>100<H>100
<EU>03040341234567890|17010200
<Q>1
<Z>



[Coding Example4] GS1 DataBar Stacked Omni-Directional (CC-A/CC-B)

<A>
<V>100<H>100
<EU>04040341234567890|17010200
<Q>1
<Z>



[Coding Example5] GS1 DataBar Limited Composite (CC-A/CC-B)

<A>
<V>100<H>100
<EU>05040351234567890|21ABCDEFGHIJKLMNPQRSTUVWXYZ
<Q>1
<Z>



[Coding Example6] GS1 DataBar Expanded Composite(CC-A/CC-B)

```
<A>
<V>100<H>100
<EU>060522104912345678904
<Q>1
<Z>
```



[Coding Example7] GS1 DataBar Expanded Stacked(CC-A/CC-B)

```
<A>
<V>100<H>100
<EU>060502104912345678904
<Q>1
<Z>
```



[Coding Example8] UPC-A Composite (CC-A/CC-B)

```
<A>
<V>100<H>100
<EU>0704331234567890|991234-abcd
<Q>1
<Z>
```



[Coding Example9] UPC-E Composite (CC-A/CC-B)

```
<A>
<V>100<H>100
<EU>08041200000123|15021231
<Q>1
<Z>
```



[Coding Example10] EAN13 Composite (CC-A/CC-B)

```
<A>
<V>100<H>100
<EU>0904331234567890|991234-abcd
<Q>1
<Z>
```



[Coding Example11] EAN8 Composite (CC-A/CC-B)

```
<A>
<V>100<H>100
<EU>10041234567|21A12345678
<Q>1
<Z>
```



[Coding Example12] GS1-128 Composite (CC-A/CC-B)

```
<A>
<V>100<H>100
<EU>11040260103212345678906|21A1B2C3D4E5F6G7H8
<Q>1
<Z>
```



[Coding Example13] GS1-128 Composite (CC-C)

```
<A>
<V>100<H>100
<EU>120402600030123456789012340|02130123456789
093724#101234567ABCDEFG
<Q>1
<Z>
```



[Supplementary Explanation]

1. Parameter varies depending on one-dimensional barcode type.
Segment width can be specified only for DataBar Expanded Composite(CC-A/CC-B) (EU06). Barcode height can be specified only for GS1-128(UCC/EAN-128) (EU11, EU12).
2. If the value is not set to the data portion, composite symbol will not be printed.
3. Parameter for print data is available up to 2361digits including 1D barcode data and 2D code data as a specification for this command. Available number for 2D code data varies depending on the type of 1D barcode and/or mixture of alphabets and numerics. When specified data exceed the maximum digits, barcode may not be printed properly.
4. Entire size of composite symbol changes depending on the specification of narrow bar width.
5. If composite symbol exceeds the printable area, only the portion located within the area will be printed, and a scanner might read the value of such composite symbol occasionally.
6. Height and width of 2D code of the composite symbol is adjusted by 1D barcode data size. When the width of 1D barcode is narrow, it cannot be printed even the size of data is less than the maximum number of digit.
7. Print of HRI cannot be designated with this command.
8. Rotation <%> is available, and Enlargement <L> is invalid.
9. When specifying 11(production date), 12(term of payment), 13 (packing date), 15(sales period), 17(warranty period) for application identifier, set correct data YYMMDD. When the incorrect date is set, print result is not guaranteed.
10. When specifying GS1 Databar as a barcode type, specify 2D code data with the format based on application identifier.
- 11.GS1 DataBar Expanded Composite (CC-A/CC-B) is stacked automatically by segment width and data size and printed as GS1 DataBar Expanded Stacked (CC-A/CC-B).
- 12.Created module was modified to improve the quality. The module may be different from the previous one, but the read result is the same.

Code table for Composite Symbol 2D code

				S				I				S				O			
b8	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1	1	
b7	0	0	0	0	1	1	1	1	0	0	0	0	1	1	1	1	1	1	
b6	0	0	1	1	0	0	1	1	0	0	1	1	0	0	1	1	1	1	
b5	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	
b4 b3 b2 b1	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F			
0 0 0 0	0			SP	0	P	p												
0 0 0 1	1			!	1	A	Q	a	q										
0 0 1 0	2			"	2	B	R	b	r										
0 0 1 1	3			3	C	S	c	s											
0 1 0 0	4			4	D	T	d	t											
0 1 0 1	5			%	5	E	U	e	u										
0 1 1 0	6			&	6	F	V	f	v										
0 1 1 1	7			,	7	G	W	g	w										
1 0 0 0	8			(8	H	X	h	x										
1 0 0 1	9)	9	I	Y	i	y										
1 0 1 0	A			*	:	J	Z	j	z										
1 0 1 1	B			+	;	K	k												
1 1 0 0	C			,	<	L	l												
1 1 0 1	D			-	=	M	m												
1 1 1 0	E			.	>	N	n												
1 1 1 1	F			/	?	O	_o												

* Use '#'(23H) for specifying FNC1.

9.14 Barcode

UPC-A Barcode (Without HRI)

ESC+BL

Hexadecimal code	ESC <1B>16	BL <42>16<4C>16	Parameter aabbcnn~n
Initial value	Nil		

Valid range and term of command	When the power switch is OFF	The set parameter is not maintained.
	Valid range within items	The set parameter becomes invalid.
	Valid range between items	The set parameter becomes invalid.

[Function]

Set the height of character barcode of the first digit and the last digit to the same height of the guard bar.

[Format]

<BL>aabbccn~n

•Parameter

a[Barcode type]	=	H	:	UPC-A(Fixed 'H')
b[Narrow bar]	=	Valid Range	:	01~36 dots
c[Height of Barcode]	=	Valid Range	:	001~999 dots
n[Print data]	=	Data	:	11 fixed digits

[Coding Example] Font type: UPC-A, Narrow bar width : 03, Barcode height : 120, Print data : 01234567890

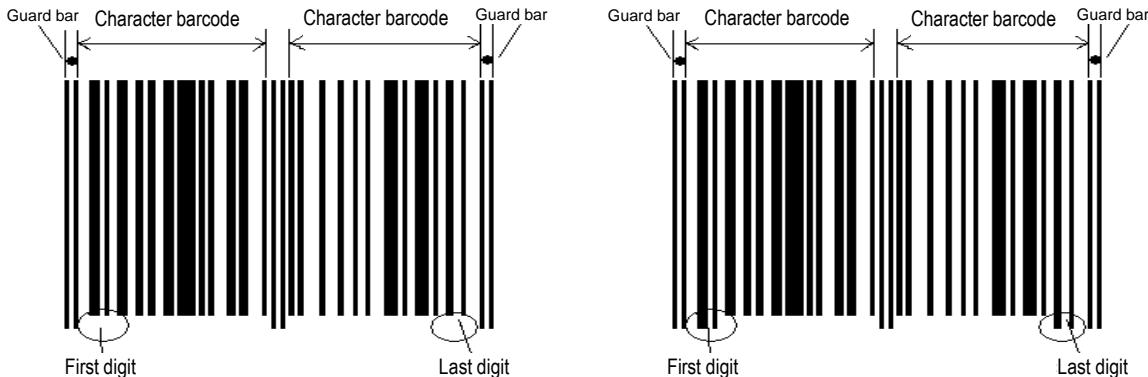
<A>
<H>100<V>100<BL>H0312001234567890
<Q>2
<Z>

[Supplementary Explanation]

1. This command supports UPC-A only. When barcode type is specified other than "H", command error occurs.
2. Setting of Guard bar, HRI and ratio is described as follows.

Guard bar	HRI	Ratio
Available	Nil	Fix

3. When the parameter value exceeds the range, operation is not supported.
4. When printing UPC-A with <D>, all character barcodes have the same height. When <BL> is used, the height of the character barcode of the start digit and the last digit have the same height of the guard bar.



UPC-A specifying <D>UPC-A specifying <BL>

9.15 Barcode

UPC-A Barcode (Without HRI)

ESC+BL
~ **ESC+d**

Hexadecimal code	ESC	BL-d	Parameter
	<1B> ₁₆	<42> ₁₆ <4C> ₁₆ ~character type	abbcccn~n~<d>n~n
Initial value	Nil		

Valid range and term of command	When the power switch is OFF	The set parameter is not maintained.
	Valid range within items	The set parameter becomes invalid.
	Valid range between items	The set parameter becomes invalid.

[Function]

Set the height of character barcode of the first digit and the last digit to the same height of the guard bar.

[Format]

<BL>abbcccn~n~<d>n~n

● Parameter

a [Barcode type]	=	H	:	UPC-A (Fixed 'H')
b [Narrow bar]	=	Valid Range	:	01~36 dots
c [Height of barcode]	=	Valid range	:	001 ~ 999 dots
n [Print data]	=	Data	:	Fixed 11 digit
d [Font type]	=	OA OB XU XS XM XB XL U S M WB WB	:	
n [Print data]	=	HRI data	:	fixed 12 digits

[Coding Example] Font type: UPC-A, Narrow bar width: 02. Barcode height: 120, Print data: 01234567890
 Font type: XS, HRI data: 01234567890

<A>
<H>100<V>100<BL>H0212001234567890
<XS>,01234567890
<Q>2
<Z>

[Supplementary Explanation]

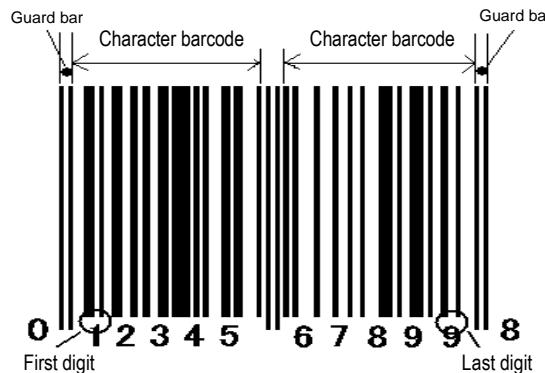
1. This command supports UPC-A only. When barcode type is specified other than "H", command error occurs.
2. Recommended to specify [02] or [03] for the narrow bar width.
3. Check digit (12th digit) for HRI data should be set the calculation result of modulus 10.
4. Setting of Guard bar, HRI and Ratio is following.

Guard bar	HRI	Ratio
Available	Available	Fix

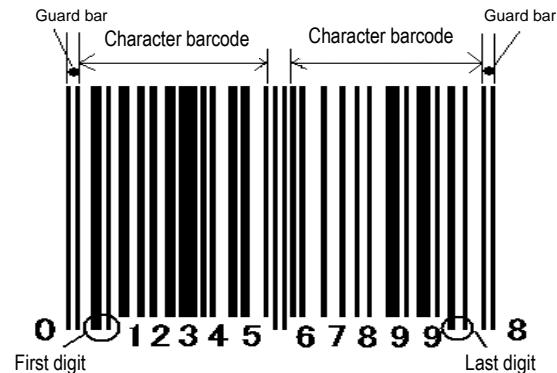
5. When the parameter value exceeds the range, operation is not supported.
6. HRI will not be printed when barcode is error for barcode with HRI.

7. All character barcode have the same height when printing UPC-A specifying <D> and then . The first and the last character barcode have the same height to the guard bar when printing UPC-A specifying <BL> and then .

When printing UPC-A specifying <D> and , HRI can be printed under the first digit and the last digit because the height of the first digit and the last digit of the barcode is low. When printing UPC-A specifying <BL> and , the height of the first digit and the last digit of the barcode is high, and the font interval is narrower than previous case.



UPC-A specifying <D> +



UPC-A specifying <BL> +

9.16 Barcode

UPC-A Barcode (With HRI)

ESC+BM

Hexadecimal code	ESC <1B> ₁₆	BM <42> ₁₆ <4D> ₁₆	Parameter abbcccn~n
Initial value	Nil		

Valid range and term of command	When the power switch is OFF	The set parameter is not maintained.
	Valid range within items	The set parameter becomes invalid.
	Valid range between items	The set parameter becomes invalid.

[Function]

Set the character barcode height of the first and the last digit to the same height of the guard bar.

[Format 1]

<BM>abbcccn~n

• Parameter

a [Barcode type]	= H	: UPC-A(fixed 'H')
b [Narrow bar]	= Valid Range	: 01~36 dots
c [Height of Barcode]	= Valid Range	: 001~999 dots
n [Print data]	= Data	: fixed 11 digits

[Coding Example] Barcode type:UPC-A, Narrow bar width:02, Barcode height :120, Print data: 20123948573

```
<A>
<H>100<V>100<BM>H0212020123948573
<Q>2
<Z>
```

[Supplementary Explanation]

1. This command supports UPC-A only. When barcode type is specified other than "H", command error occurs.

2. HRI needs following conditions;

- 8dots /mm(203dpi) : Set Narrow bar width to [02] or [03]
- 12dots/mm(305dpi) : Set Narrow bar width to [03] or [04]
- 24dots/mm(609dpi) : Set Narrow bar width to [06] or [07]or [08]

When the value other than above is specified, HRI is not printed.

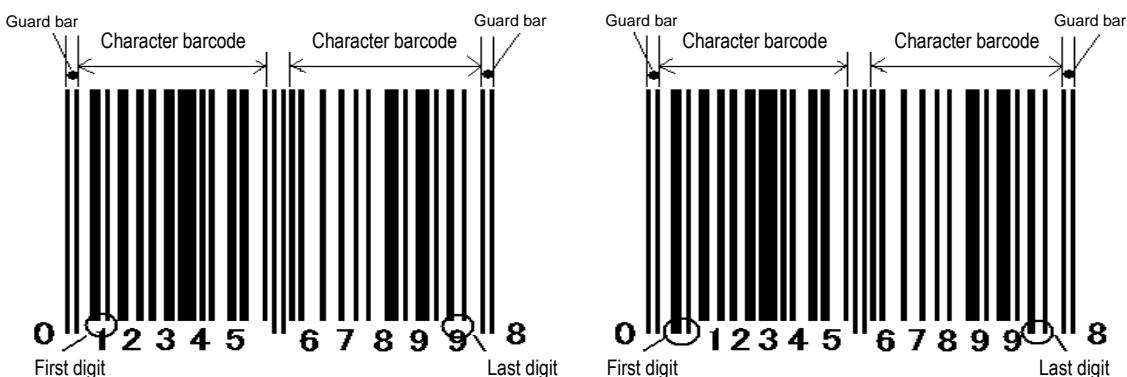
3. Setting of Guard bar, HRI and Ratio is following.

Guard bar	HRI	Ratio
Available	Available	Fix

4. When the parameter value exceeds the range, operation is not supported.

5. All character barcode have the same height when printing UPC-A specifying <D> and then . The first and the last character barcode have the same height to the guard bar when printing UPC-A specifying <BL> and then .

When printing UPC-A specifying <D> and , HRI can be printed under the first digit and the last digit because the height of the first digit and the last digit of the barcode is low. When printing UPC-A specifying <BL> and , the height of the first digit and the last digit of the barcode is high, and the font interval is narrower than previous case.



UPC-A specifying <BD>

UPC-A specifying <BM>

9.17 Barcode

Customer Barcode

ESC+BZ

Hexadecimal code	ESC <1B> ₁₆	BZ <42> ₁₆ <5A> ₁₆	Parameter aaaaaaaaan~n
Initial value	Nil		

Valid range and term of command	When the power switch is OFF	The set parameter is not maintained.
	Valid range within items	The set parameter becomes invalid.
	Valid range between items	The set parameter becomes invalid.

[Function]

Printing a customer barcode.

[Format]

<BZ>aaaaaaaa,n~n

• Parameter

a [Postal code] = Numeral :0000000 to 9999999 [7 digits, fixed]
 n[Print data] = Data (Block number) [Maximum 13 digits]
 (Refer to the customer barcode code table for details.)

[Coding example] Postal code: 3310043, Print data: 1-207

<A>
 <V>100<H>200**<BZ>3310043,1-207**
 <Q>2
 <Z>



[Supplemental explanation]

1. Only Alphanumeric and a hyphen can be specified as print data. (See the code table.)
2. When alphabet is specified for print data, data is recognized as 2 digits (Control code and Alphabet font code), and be sure the print data not to exceed 13 digits.
3. When alphabet is specified for the print data, one alphabet is handled as 2 digits data (Control code + Numeric code). When ten alphabet characters [ABCDEFGHIJ] are specified as print data, first 6 characters of [ABCDEF] become 12 digits data (control code + numeric code: 2 digits x 6 characters). For the seventh character [G], the control code of "control code + numeric code" stays in 13 digits and is valid, but numeric code is the 14th digits and invalid. The 8th character and later [HIJ] exceed 13 digits and become invalid.
 e.g. [ABCDEFGHIJ]
 - (1) [ABCDEF]: Six characters x 2 digits (Control code + numeric code), total 12 digits
 All six data are valid.
 - (2) [G]: One character x 2 digits (Control code + numeric code), total 2 digits
 The control code is valid because it is within 13 digits, and the numeric code is invalid because it is the 14th digits.
 - (3) [HIJ]: Three characters x 2 digits (Control code + numeric code), total 6 digits
 All invalid because of exceeding 14 digits.
4. Start/Stop character and C/D will be added automatically.
5. When the number of print data is less than 13 digits, the control code (CC4) will be added automatically. When the number of print data exceeds 13 digits, the data from the 14th digits become invalid.
6. When specifying parameter other than above or the number of print data is not matched, the barcode may not be printed properly or the scanner cannot read it.

Code table for Customer Barcode

	S I								S O							
b8	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1
b7	0	0	0	0	1	1	1	1	0	0	0	0	1	1	1	1
b6	0	0	1	1	0	0	1	1	0	0	1	1	0	0	1	1
b5	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1
b4	b3	b2	b1	0	1	2	3	4	5	6	7	8	9	A	B	C
0	0	0	0	0				0		P						
0	0	0	1	1				1	A	Q						
0	0	1	0	2				2	B	R						
0	0	1	1	3				3	C	S						
0	1	0	0	4				4	D	T						
0	1	0	1	5				5	E	U						
0	1	1	0	6				6	F	V						
0	1	1	1	7				7	G	W						
1	0	0	0	8				8	H	X						
1	0	0	1	9				9	I	Y						
1	0	1	0	A				J	Z							
1	0	1	1	B				K								
1	1	0	0	C				L								
1	1	0	1	D			-	M								
1	1	1	0	E				N								
1	1	1	1	F				O								

10 2D code

10.1 2D code			
PDF417			ESC+2D10
Hexadecimal code	ESC	2D10	Parameter
	<1B> ₁₆	<32> ₁₆ <44> ₁₆ <31> ₁₆ <30> ₁₆	,aa,bb,c,dd,ee(,f)
Initial value	Nil		

Valid range and term of command	When the power switch is OFF	The set parameter is maintained.
	Valid range within items	The set parameter becomes invalid.
	Valid range between items	The set parameter becomes invalid.

[Function]

Specifying PDF417

[Format](Setting part)

<2D10>,aa,bb,c,dd,ee(,f)

•Parameter

a [Minimum module width]	=	Valid Range :01 to 27 dots
b [Minimum module height]	=	Valid Range :01 to 72 dots
c [Security level]	=	Valid Range :0 to 8
d [Number of data code words per one line]	=	Valid Range :01 to 30 00 :Automatic(Width varies depending on number of data)
e [Number of line per symbol]	=	Valid Range :03 to 90 00 :Automatic(Height varies depending on number of data)
f [Code type]	=	0 :Normal, When omitted 0(can be omitted) 1 :Truncated

[Format](Data part)

<DN>mmmm,n~n

•Parameter

m [Number of data]	=	Valid Range :1 to 2681 bytes
n [Print data]	=	Data

[Coding Example1] Minimum module width: 03 dots, Minimum module height: 09 dots

Security level: 3, Number of data code words per line: 03, Number of line per symbol: 18

<A>
<V>100<H>200<2D10>,03,09,3,03,18
<DN>0010,0123456789
<Q>2
<Z>



[Coding Example2] Minimum module width: 03 dots, Minimum module height: 09 dots

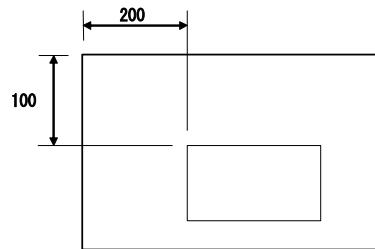
Security level: 3, Number of data code words per line: 03, Number of line per symbol: 18
Code type: Truncated

<A>
<V>100<H>200<2D10>,03,09,3,03,18,1
<DN>0010,0123456789
<Q>2
<Z>



[Supplementary Explanation]

1. Base print position of PDF417 is specified by vertical print position<V> and horizontal print position<H>
<V>100<H>200<2D10>*** **



2. When d=e=00, aspect ratio will be at 1:2 based on the number of print data.
3. When parameter d and e doesn't match number of data, print may not be performed properly.
4. When specifying security level height, parameter d or e should have large number.
5. Recommended to specify more than 2 dots for 8 dots/mm and 12 dots/mm printhead, and 4 dots for 24 dots/mm printhead because the minimum module width and minimum module height of QR code may not be read by the scanner.
6. Created module was modified to improve the quality. The module may be different from the previous one, but the read result is the same.

[Point]

1. Sequential number is not available.
2. Specifying print position by automatic line feed is not available.
3. Print 00HtoFFH is available.
4. Format registration is available.
5. Enlarging minimum module size improves print quality.
6. Increasing security level improves read rate.
7. Print height varies depending on the character such as numeric only, alphabet only or mixture of numeric and alphabets.

PDF417Code table

	S I						S O									
B8	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1
B7	0	0	0	0	1	1	1	1	0	0	0	0	1	1	1	1
B6	0	0	1	1	0	0	1	1	0	0	1	1	0	0	1	1
B5	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1
B4 B3 B2 B1	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0 0 0 0 0			SP	0	@	P	`	p								
0 0 0 1 1			!	1	A	Q	a	q								
0 0 1 0 2			"	2	B	R	b	r								
0 0 1 1 3			#	3	C	S	c	s								
0 1 0 0 4			\$	4	D	T	d	t								
0 1 0 1 5			%	5	E	U	e	u								
0 1 1 0 6			&	6	F	V	f	v								
0 1 1 1 7			'	7	G	W	g	w								
1 0 0 0 8			(8	H	X	h	x								
1 0 0 1 9)	9	I	Y	i	y								
1 0 1 0 A			*	:	J	Z	j	z								
1 0 1 1 B			+	;	K	[k	{								
1 1 0 0 C			,	<	L	\	l									
1 1 0 1 D			-	=	M]	m	}								
1 1 1 0 E			.	>	N	^	n	~								
1 1 1 1 F			/	?	O	-	o	DE								
							L									

[00HtoFFH] can be available for PDF417.

10.2 2D code

Micro PDF417

ESC+2D12

Hexadecimal code	ESC <1B> ₁₆	2D12 <32> ₁₆ <44> ₁₆ <31> ₁₆ <32> ₁₆	Parameter ,aa,bb,c,dd(,e)
Initial value	Nil		

Valid range and term of command	When the power switch is OFF	The set parameter is not maintained
	Valid range within items	The set parameter becomes invalid.
	Valid range between items	The set parameter becomes invalid.

[Function]

Specifying Micro PDF417.

[Format](Setting part)

<2D12>,aa,bb,c,dd(,e)

• Parameter

a [Minimum module width]	= Valid Range: 01 to 27 dots
b [Minimum module height]	= Valid Range: 01 to 72 dots
c [Number of data code words per rows] (Cols)	= Valid Range: 1 to 4
d [Number of rows per symbol]	= Valid Range: 2 rows
e [Binary mode]	= 0: Normal, When omitted 0 (Can be omitted) 1: Binary mode

[Format](Data part)

<DN>mmmm,n ~ n : Binary mode is Binary mode
<DS>n ~ n : Binary mode is Normal

• Parameter

m [Number of data]	= Valid Range: 0001 to 0366 bytes
n [Print data]	= Data

[Coding Example] Module width: 02 dots, Minimum module height: 04 dots

Data code word per rows: 1, Rows per symbol: 14

<A>
<V>100<H>200<2D12>,02,04,1,14
<DN>0010,0123456789
<Q>2
<Z>



[Supplementary Explanation]

- Number of row per symbol is decided by number of data code words per row.
For details, refer to "Symbol size and number of data for Micro PDF417" in next page.
- Recommended to specify more than 2 dots for 8 dots/mm and 12 dots/mm printhead, and 4 dots for 24 dots/mm printhead because the minimum module width and minimum module height of QR code may not be read by the scanner.
- Created module was modified to improve the quality. The module may be different from the previous one, but the read result is the same.

[Note]

Symbol size of Micro PDF417 has 34 types and shown in the table below.

Micro PDF417 - symbol size and number of data

Symbol size		Maximum number of data		
Cols(c)	Rows(d)	Alphabet(A-Z)	Numeric	Binary mode
1	11	6	8	3
	14	12	17	7
	17	18	26	10
	20	22	32	13
	24	30	44	18
	28	38	55	22
2	8	14	20	8
	11	24	35	14
	14	36	52	21
	17	46	67	27
	20	56	82	33
	23	64	93	38
	26	72	105	43
3	6	10	14	6
	8	18	26	10
	10	26	38	15
	12	34	49	20
	15	46	67	27
	20	66	96	39
	26	90	132	54
	32	114	167	68
	38	138	202	82
	44	162	237	97
4	4	14	20	8
	6	22	32	13
	8	34	49	20
	10	46	67	27
	12	58	85	34
	15	76	111	45
	20	106	155	63
	26	142	208	85
	32	178	261	106
	38	214	313	128
	44	250	366	150

* Way of mixing alphabets (Capital, lower case), numeric characters and control codes differs by combination of number of characters.

Micro PDF417 Code table

	S I						S O												
B8	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1			
B7	0	0	0	0	1	1	1	1	0	0	0	0	1	1	1	1			
B6	0	0	1	1	0	0	1	1	0	0	1	1	0	0	1	1			
B5	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1			
B4	B3	B2	B1	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0	0	0	0	0			SP	0	@	P	`	p							
0	0	0	1	1			!	1	A	Q	a	q							
0	0	1	0	2			"	2	B	R	b	r							
0	0	1	1	3			#	3	C	S	c	s							
0	1	0	0	4			\$	4	D	T	d	t							
0	1	0	1	5			%	5	E	U	e	u							
0	1	1	0	6			&	6	F	V	f	v							
0	1	1	1	7			'	7	G	W	g	w							
1	0	0	0	8			(8	H	X	h	x							
1	0	0	1	9)	9	I	Y	i	y							
1	0	1	0	A			*	:	J	Z	j	z							
1	0	1	1	B			+	;	K	[k	{							
1	1	0	0	C			,	<	L	\	l								
1	1	0	1	D			-	=	M]	m	}							
1	1	1	0	E			.	>	N	^	n	~							
1	1	1	1	F			/	?	O	_	o	DEL							

Micro PDF417 can specify 00HtoFFH.

10.3 2D code

MAXI Code

ESC+2D20

Hexadecimal code	ESC	2D20	Parameter
	<1B> ₁₆	<32> ₁₆ <44> ₁₆ <32> ₁₆ <30> ₁₆	,a(,bbb,ccc,d~d)
Initial value	Nil		

Valid range and term of command	When the power switch is OFF	The set parameter is not maintained.
	Valid range within items	The set parameter becomes invalid.
	Valid range between items	The set parameter becomes invalid.

[Function]

Specifying MaxiCode.

[Format](Setting part)

<2D20>,a(,bbb,ccc,d ~ d)

• Parameter

a [Mode]	=	2 : Transportation (Numeric)
	=	3 : Transportation (Alphanumeric)
	=	4 : Standard symbol
	=	6 : Reader programing

* Following parameter must be specified when specifying mode 2 or mode 3.

When specifying mode 4 or mode 6, the parameter should be omitted.

b [Service class] = Valid Range : 001 to 999 (Numeric)

c [Country code] = Valid Range : 001 to 999 (Numeric)

d [Postal code] = Valid Range : 0 to 999999999 (Mode 2)

000000 to 999999 (Mode 3)

* Mode 2: Max 9 digits (Numeric only)

Mode 3: Fixed 6 digits (Capital alphabet)

[Format](Data part)

<DN>mmmm,n~n

• Parameter

m [Number of Data] = Valid Range : 1 to 138

n [Print data] = Data

*'00H cannot be specified.

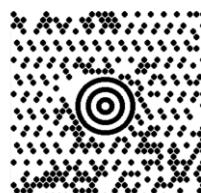
Mode	Service class	Country code	Postal code	Maximum print data		
				Numeric only	Alphanumeric	
2	Fixed 3 digits (Numeric only)	Fixed 3 digits (Numeric only)	Max. 9 digits	123	84	
3			Fixed 6 digits (Alphanumeric)			
4	Omission		138	93		
6						

[Coding Example] Mode: Transportation (Numeric only), Service class: 003, Country code: 081

Postal code: 123456789

<A>
<V>100<H>200<2D20>,2,003,081,123456789
<DN>0010,0123456789

<Q>2
<Z>



[Supplementary Explanation]

- Size of MaxiCode are not changed by number of data for printing.
- If parameter that is not described above is used, or print data doesn't match, symbol is not printed.
- When specifying mode 4 and mode 6, number of print data must be specified over 12. When number of print data is specified less than 11, scanner cannot read printed MaxiCode.
- The maximum number of print data varies depending on the print data combination when using the print data other than alphanumeric code.
- Created module was modified to improve the quality. The module may be different from the previous one, but the read result is the same.

MaxiCode Code table

				S I								S O							
B8	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1	1		
B7	0	0	0	0	1	1	1	1	0	0	0	0	1	1	1	1	1		
B6	0	0	1	1	0	0	1	1	0	0	1	1	0	0	1	1	1		
B5	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0		
B4	B3	B2	B1	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0	0	0	0	0	SP	0	@	P	`	p									
0	0	0	1	1		!	1	A	Q	a	q								
0	0	1	0	2		"	2	B	R	b	r								
0	0	1	1	3		#	3	C	S	c	s								
0	1	0	0	4		\$	4	D	T	d	t								
0	1	0	1	5		%	5	E	U	e	u								
0	1	1	0	6		&	6	F	V	f	v								
0	1	1	1	7		'	7	G	W	g	w								
1	0	0	0	8		(8	H	X	h	x								
1	0	0	1	9)	9	I	Y	i	y								
1	0	1	0	A		*	:	J	Z	j	z								
1	0	1	1	B		+	;	K	[k	{								
1	1	0	0	C		,	<	L	¥										
1	1	0	1	D		-	=	M]	m	}								
1	1	1	0	E		.	>	N	^	n	~								
1	1	1	1	F		/	?	O	_	o	DEL								

MaxiCode can specify from 1H to FFH.

10.4 2D code

QR Code (Model 2)

ESC+2D30

Hexadecimal code	ESC <1B> ₁₆	2D30 <32> ₁₆ <44> ₁₆ <33> ₁₆ <30> ₁₆	Parameter ,a,bb,c,d(,ee,ff,gg)
Initial value	Nil		

Valid range and term of command	When the power switch is OFF	The set parameter is not maintained.
	Valid range within items	The set parameter becomes invalid.
	Valid range between items	The set parameter becomes invalid.

[Function]

Specifying QR Code (Model 2)

[Format] (Setup part)

<2D30>,a, bb, c, d(,ee, ff, gg)

• Parameter

a [Error Correction Level]

= L : 7%
M : 15%
Q : 25%
H : 30%

b [Size of one side of cell]

= Valid Range : 01 to 99 dots

* Specify more than 02 dots when head density is 12dot/mm, otherwise scanner may have reading problem

c [Data setup mode]

= 0 : Manual setup
1 : Automatic setup

* Note: You need to change the method of specifying print data with this setting.

d [Concatenation mode]

= 0 : Normal mode
1 : Concatenation mode

Following parameter must be specified when specifying 1 (Concatenation mode) in Concatenation mode.

Omit following parameter in normal mode.

e [Number of partitions of concatenation mode] = Valid Range : 01 to 16

* Number of partitions: Specifying how many QR code are to be concatenated devided by Concatenation mode.

f [Sequential number partitioned by concatenation mode] = Valid Range : 01 to 16

* Sequential number: Specifying what number is it of devided QR code.

g [Concatenation mode parity data] = Valid Range : 00 to FF

* Parity data: Specifying exclusive OR of all the print data in devided QR code with HEX characters.

[Format] (Data part)

Manual setup (Data setup mod)

<DS>k,n~n * Use when input mode specification is Numeric mode, Alphanumeric mode and Kanji mode.

<DN>mmmm, n~n* Use when specifying by binary.

Automatic setup(Data setup mode)

<DN>mmmm, n~n* Change input mode automatically according to input data.

[Format] (Version)

<QV>pp * Use when specifying the version.

• Parameter

k [Input mode] = 1 : Numeric mode
2 : Alphanumeric mode
3 : Kanji mode (Shift JIS Kanji)

* Specify only when specifying Manual setup in Data setting mode.

* There is binary specification other than above, but data specification command is different.

m [Number of data] = Valid Range : 1 to 2953

* Specify when specifying Automatic setup in Data setting mode or specifying binary specification in Manual setup.

n [Print data] = Data

pp [Version] = 00 to 40 (MODEL2)

* Use when fix the size of QR symbol by specifying the version. When not specified, it will be specified automatically.

It will be Auto when specifying 00. The parameter error doesn't arise in the range from 00 to 40.

* Refer to [QR code version command] for details.

[Supplementary Explanation1]

1. When specifying Kanji in <DN>, specify size that is 2 X number of Kanji characters.

2. For <DN> in Automatic setup, when 80H to 9FH and E0H to FFH are specified as data, it is handed as Kanji mode, and cannot specify them as binary.

[Coding Example1] Error correction level: 7%, Size of one side of cell: 05
Data setup mode: Manual setup, Concatenation mode: Normal

```
<A>
<V>100<H>200<2D30>,L,05,0,0
<DS>1,012345
<Q>2
<Z>
```



[Supplementary Explanation2]

1. If the parameter other than the description is specified or number of print data is not match, print is not executed.
2. Data specification command in data part varies according to parameter setup or specified data.

[Coding Example2] Error correction level: 7%, Size of one side of cell: 04

Mixed specification of Manual setup (Data setup mode)
In Manual setup, you can proceed specifying data in specified input mode (Numeric, Alphanumeric, Kanji, Binary).

```
<A>
<V>100<H>200
<2D30>,L,04,0,0
<DS>3,サトー
<DN>0010,0123456789
<DS>1,123
<Q>1
<Z>
```

[Supplementary Explanation3]

1. Parameter part to be followed by Data part. Data part and data part should be specified in a row. When don't specify in a row, print result may not be secured.
2. Total number of data (n) need to be less than 7000 bytes. Maximum number of blocks in data part specified in a row is 200.

[Coding Example 3] Error correction level: 7%, Size of one side of cell: 05, Data setup mode: Manual setup,
Concatenation mode: Normal, Version 5

```
<A>
<V>100<H>200<2D30>,L,05,0,0
<QV>5
<DS>1,012345
<DN>0004,6789
<Q>1
<Z>
```

[Notes]

1. Specify <QV> command between <2Dxx> and <DN>/<DS>.
2. When resulted in a parameter error, it will be handled in the same manner of no specification.
3. It doesn't become a parameter error from 00 to 40. (Set the value within the range corresponding to each model)
For MODEL2, the setting range is from 00 to 40.
4. Sending the data exceeding the data size of specified version will result in error and QR code is not printed.

QR Code data size list (Model 2)

Version	Error Correction	Numeric	Alpha-numeric	Kanji	Binary	Version	Error Correction	Numeric	Alpha-numeric	Kanji	Binary
1 21X21	L	41	25	10	17	11 61X61	L	772	468	198	321
	M	34	20	8	14		M	604	366	155	251
	Q	27	16	7	11		Q	427	259	109	177
	H	17	10	4	7		H	331	200	85	137
2 25X25	L	77	47	20	32	12 65X65	L	883	535	226	367
	M	63	38	16	26		M	691	419	177	287
	Q	48	29	12	20		Q	489	296	125	203
	H	34	20	8	14		H	374	227	96	155
3 29X29	L	127	77	32	53	13 69X69	L	1022	619	262	425
	M	101	61	26	42		M	796	483	204	331
	Q	77	47	20	32		Q	580	352	149	241
	H	58	35	15	24		H	427	259	109	177
4 33X33	L	187	114	48	78	14 73X73	L	1101	667	282	458
	M	149	90	38	62		M	871	528	223	362
	Q	111	67	28	46		Q	621	376	159	258
	H	82	50	21	34		H	468	283	120	194
5 37X37	L	255	154	65	106	15 77X77	L	1250	758	320	520
	M	202	122	52	84		M	991	600	254	412
	Q	144	87	37	60		Q	703	426	180	292
	H	106	64	27	44		H	530	321	136	220
6 41X41	L	322	195	82	134	16 81X81	L	1408	854	361	586
	M	255	154	65	106		M	1082	656	277	450
	Q	178	108	45	74		Q	775	470	198	322
	H	139	84	36	58		H	602	365	154	250
7 45X45	L	370	224	95	154	17 85X85	L	1548	938	397	664
	M	293	178	75	122		M	1212	734	310	504
	Q	207	125	53	86		Q	876	531	224	364
	H	154	93	39	64		H	674	408	173	280
8 49X49	L	461	279	118	192	18 89X89	L	1725	1046	442	718
	M	365	221	93	152		M	1346	816	345	560
	Q	259	157	66	108		Q	948	574	243	394
	H	202	122	52	84		H	746	452	191	310
9 53X53	L	552	335	141	230	19 93X93	L	1903	1153	488	792
	M	432	262	111	180		M	1500	909	384	624
	Q	312	189	80	130		Q	1063	644	272	442
	H	235	143	60	98		H	813	493	208	338
10 57X57	L	652	395	167	271	20 97X97	L	2061	1249	528	858
	M	513	311	131	213		M	1600	970	410	666
	Q	364	221	93	151		Q	1159	702	297	482
	H	288	174	74	119		H	919	557	235	382

Version	Error Correction	Numeric	Alpha-numeric	Kanji	Binary	Version	Error Correction	Numeric	Alpha-numeric	Kanji	Binary
21 101X101	L	2232	1352	572	929	31 141X141	L	4417	2677	1132	1840
	M	1708	1035	438	711		M	3486	2113	894	1452
	Q	1224	742	314	509		Q	2473	1499	634	1030
	H	969	587	248	403		H	1897	1150	486	790
22 105X105	L	2409	1460	618	1003	32 145X145	L	4686	2840	1201	1952
	M	1872	1134	480	779		M	3693	2238	947	1538
	Q	1358	823	348	565		Q	2670	1618	684	1112
	H	1056	640	270	439		H	2022	1226	518	842
23 109X109	L	2620	1158	672	1091	33 149X149	L	4965	3009	1273	2068
	M	2059	1248	528	857		M	3909	2369	1002	1628
	Q	1468	890	376	611		Q	2805	1700	719	1168
	H	1108	672	284	461		H	2157	1307	553	898
24 113X113	L	2812	1704	721	1171	34 153X153	L	5253	3183	1347	2188
	M	2188	1326	561	911		M	4134	2506	1060	1722
	Q	1588	963	407	661		Q	2949	1787	756	1228
	H	1228	744	315	511		H	2301	1394	590	958
25 117X117	L	3057	1853	784	1273	35 157X157	L	5529	3351	1417	2303
	M	2395	1451	614	997		M	4343	2632	1113	1809
	Q	1718	1041	440	715		Q	3081	1867	790	1283
	H	1286	779	330	535		H	2361	1431	605	983
26 121X121	L	3283	1990	842	1367	36 161X161	L	5836	3537	1496	2431
	M	2544	1542	652	1059		M	4588	2780	1176	1911
	Q	1804	1094	462	751		Q	3244	1966	832	1351
	H	1425	864	365	593		H	2524	1530	647	1051
27 125X125	L	3517	2132	902	1465	37 165X165	L	6153	3729	1577	2563
	M	2701	1637	692	1125		M	4775	2894	1224	1989
	Q	1933	1172	496	805		Q	3417	2071	876	1423
	H	1501	910	385	625		H	2625	1591	673	1093
28 129X129	L	3669	2223	940	1528	38 169X169	L	6479	3927	1661	2699
	M	2857	1732	732	1190		M	5039	3054	1292	2099
	Q	2085	1263	534	868		Q	3599	2181	923	1499
	H	1581	958	405	658		H	2735	1658	701	1139
29 133X133	L	3909	2369	1002	1628	39 173X173	L	6743	4087	1729	2809
	M	3035	1839	778	1264		M	5313	3220	1362	2213
	Q	2181	1322	559	908		Q	3791	2298	972	1579
	H	1677	1016	430	698		H	2927	1774	750	1219
30 137X137	L	4158	2520	1066	1732	40 177X177	L	7089	4296	1817	2953
	M	3289	1994	843	1370		M	5596	3391	1435	2331
	Q	2358	1429	604	982		Q	3993	2420	1024	1663
	H	1782	1080	457	742		H	3057	1852	784	1273

10.5 2D code

QR Code (Model 1)

ESC+2D31

Hexadecimal code	ESC	2D31	Parameter <1B> ₁₆ <32> ₁₆ <44> ₁₆ <33> ₁₆ <31> ₁₆ ,a,bb,c,d,(ee,ff,gg)
Initial value	Nil		

Valid range and term of command	When the power switch is OFF	The set parameter is not maintained.
	Valid range within item	The set parameter becomes invalid.
	Valid range between items	The set parameter becomes invalid.

[Function]

Specifying QR Code (Model 1)

[Format] (Setup part)

<2D31>,a, bb, c, d,(ee, ff, gg)

•Parameter

a [Error Correction Level]	=	L : 7%
		M : 15%
		Q : 25%
		H : 30%

b [Size of one side of cell]	=	Valid Range : 01 to 99 dots
------------------------------	---	-----------------------------

*Specify more than 02 dots when head density is 12dot/mm, otherwise scanner may have reading problem

c [Data setup mode]	=	0 : Manual setup
		1 : Automatic setup

* Note: You need to change the method of specifying print data with this setting.

d [Concatenation mode]	=	0 : Normal mode
		1 : Concatenation mode

Following parameter must be specified when specifying 1 (Concatenation mode) in Concatenation mode.

Omit following parameter in normal mode.

e [Number of partitions of concatenation mode]	=	Valid Range : 01 to 16
--	---	------------------------

* Number of partitions: Specifying how many QR code are to be concatenated divided by Concatenation mode.

f [Sequential number partitioned by concatenation mode]	=	Valid Range : 01 to 16
---	---	------------------------

* Sequential number: Specifying what number is it of divided QR code.

g [Concatenation mode parity data]	=	Valid Range : 00 to FF
------------------------------------	---	------------------------

* Parity data: Specifying exclusive OR of all the print data in divided QR code with HEX characters.

[Format] (Data part)

Manual setup (Data setup mod)

<DS>k,n~n * Use when input mode specification is Numeric mode, Alphanumeric mode and Kanji mode.

<DN>mmmm, n~n * Use when specifying by binary.

Automatic setup (Data setup mode)

<DN>mmmm, n~n * Change input mode automatically according to input data.

•Parameter

k [Input mode]	=	1 : Numeric mode
		2 : Alphanumeric mode
		3 : Kanji mode (Shift JIS Kanji)

* Specify only when specifying Manual setup in Data setting mode.

* There is binary specification other than above, but data specification command is different.

m [Number of data]	=	Valid Range : 1 to 486
--------------------	---	------------------------

* Specify when specifying Automatic setup in Data setting mode or specifying binary specification in Manual setup.

n [Print data]	=	Data
----------------	---	------

[Format] (version)

<QV>pp * Specify when specifying the version.

•Parameter

pp [Version]	=	00 to 14 (MODEL1)
--------------	---	-------------------

*This setting is used when fixing the size of QR symbol with the version command. When not specified, it becomes Auto. Specifying 00 also becomes Auto. It doesn't become a parameter error from 00 to 40.

*See [QR code version command] for details.

[Supplementary Explanation1]

1. When specifying Kanji in <DN>, specify size that is 2 X number of Kanji characters.
2. For <DN> in Automatic setup, when 80H to 9FH and E0H to FFH is specified as data, it is handled as Kanji mode, and cannot specify them as binary

[Coding Example1] Error correction level: 7%, Size of one side of cell: 05

Data setup mode: Manual setup, Concatenation mode: Normal

```
<A>
<V>100<H>200<2D31>,L,05.0,0
<DS>1,012345
<Q>2
<Z>
```



[Supplementary Explanation2]

1. If the parameter other than the description is specified or number of print data is not match, print is not executed.
2. Data specification command in data part varies according to parameter setup or specified data.

[Coding Example2] Error correction level: 7%, Size of one side of cell: 04

Mixed specification of Manual setup (Data setup mode)

In Manual setup, you can proceed specifying data in specified input mode (Numeric, Alphanumeric, Kanji, Binary).

```
<A>
<V>100<H>200
<2D31>,L,04.0,0
<DS>3,サト一
<DN>0010,0123456789
<DS>1,123
<Q>1
<Z>
```

[Supplementary Explanation3]

1. Parameter part to be followed by Data part. Data part and data part should be specified in a row. When don't specify in arrow, print result may not be secured.

[Coding Example 3] Error correction level: 7%, Size of one side of cell: 05, Data setup mode: Manual setup, Concatenation mode: Normal, Version 5 data setting mode: manual setting, combine mode: normal, printed in version 5

```
<A>
<V>100<H>200<2D31>,L,05.0,0
<RU>5
<DS>1,012345
<DN>0004,6789
<Q>1
<Z>
```

[Notes]

1. Specify <QV> command between <2Dxx> and <DN>/<DS>.
2. When resulted in a parameter error, it will be handled in the same manner of no specification.
3. It doesn't become a parameter error from 00 to 40. (Set the value within the range corresponding to each model)
Setting range(MODEL1): 00 to 14
4. Sending the data exceeding the data size of specified version will result in error and QR code is not printed.

QR Code data size list (Model 1)

Version	Error Correction	Numeric	Alpha-numeric	Kanji	Binary	Version	Error Correction	Numeric	Alpha-numeric	Kanji	Binary
1 21X21	L	40	24	10	17	11 61X61	L	800	485	205	333
	M	33	20	8	14		M	608	368	156	253
	Q	25	15	6	11		Q	493	299	126	205
	H	16	10	4	7		H	342	207	87	142
2 25X25	L	81	49	20	34	12 65X65	L	915	555	234	381
	M	66	40	17	28		M	694	421	178	289
	Q	52	31	13	22		Q	579	351	148	241
	H	33	20	8	14		H	390	236	100	162
3 29X29	L	131	79	33	55	13 69X69	L	1030	624	264	429
	M	100	60	25	42		M	790	479	202	329
	Q	81	49	20	34		Q	656	398	168	273
	H	52	31	13	22		H	454	275	116	189
4 33X33	L	186	113	48	78	14 73X73	L	1167	707	299	486
	M	138	84	35	58		M	877	531	225	365
	Q	114	69	29	48		Q	738	447	189	307
	H	76	46	19	32		H	498	302	127	207
5 37X37	L	253	154	65	106						
	M	191	116	49	80						
	Q	157	95	40	66						
	H	105	63	27	44						
6 41X41	L	321	194	82	134						
	M	249	151	64	104						
	Q	201	122	51	84						
	H	133	81	34	56						
7 45X45	L	402	244	103	168						
	M	311	188	80	130						
	Q	253	154	65	106						
	H	167	101	43	70						
8 49X49	L	493	299	126	206						
	M	378	229	97	158						
	Q	301	183	77	126						
	H	203	123	52	85						
9 53X53	L	585	354	150	244						
	M	441	267	113	184						
	Q	369	223	94	154						
	H	239	145	61	100						
10 57X57	L	690	418	177	287						
	M	526	319	135	219						
	Q	433	262	111	180						
	H	291	176	74	121						

10.6 2D code

Micro QR Code

ESC+2D32

Hexadecimal code	ESC	2D32	Parameter
	<1B> ₁₆	<32> ₁₆ <44> ₁₆ <33> ₁₆ <32> ₁₆	,a,bb,c
Initial value	Nil		

Valid range and term of command	When the power switch is OFF	The set parameter is not maintained.
	Valid range within items	The set parameter becomes invalid.
	Valid range between items	The set parameter becomes invalid.

[Function]
Specifying QR Code (Micro QR Code)

[Format] (Setup part)
<2D32>,a,bb,c

• Parameter

a [Error Correction Level]	=	L : 7%
		M : 15%
		Q : 25%
b [Size of one side of cell]	=	Valid Range : 01 to 99 dots
*Specify more than 02 dots when head density is 12dot/mm, otherwise scanner may have reading problem		
c [Data setup mode]	=	0 : Manual setup 1 : Automatic setup

[Format] (Dat part)

Manual setup (Data setup mode)

<DS>k,n~n * Use when input mode specification is Numeric mode, Alphanumeric mode and Kanji mode.
<DN>mmmm, n~n * Use when specifying by binary.

Automatic setup (Data setup mode)

<DN>mmmm, n~n * Change input mode automatically according to input data.

• Parameter

k [Input mode]	=	1 : Numeric mode 2 : Alphanumeric mode 3 : Kanji mode (Shift JIS Kanji)
----------------	---	---

* There is binary specification other than above, but data specification command is different.

m[Number of data] = Valid Range:1 to 15

* Specify when specifying Automatic setup in Data setting mode.

n [Print data] = Data

pp [Version] = 00 to 04(MicroQR M1 to M4)

[Format] (version)

<QV>pp * Specify when specifying the version.

• Parameter

pp [Version] = 00 to 04 (MicroQR M1 to M4)

*This setting is used when fixing the size of QR symbol with the version command. When not specified, it becomes Auto.

Specifying 00 also becomes Auto. It doesn't become a parameter error from 00 to 40.

*See [QR code version command] for details.

[Supplementary Explanation1]

1. When specifying Kanji in <DN>, specify size that is 2 X number of Kanji characters.
2. For <DN> in Automatic setup, when 80H to 9FH and E0H to FFH are specified as data, it is handled as Kanji mode, and cannot specify them as binary.

[Coding Example1] Error correction level :7%, Size of one side of cell:04

```
<A>
<V>100<H>200<2D32>,L,04
<DS>1,012345
<Q>2
<Z>
```



[Supplementary Explanation2]

1. If the parameter other than the description is specified or number of print data is not match, print is not executed.
2. Data specification command in data part varies according to parameter setup or specified data.

[Coding Example2] Error correction level: 7%, Size of one side of cell: 04

Mixed specification of Manual setup (Data setup mode)

In Manual setup, you can proceed specifying data in specified input mode (Numeric, Alphanumeric, Kanji, Binary) in a row.

<A>

<V>100<H>200

<2D32>,L,04.0

<DS>3,サト一

<DN>0010,0123456789

<DS>1.123

<Q>1

<Z>

[Supplementary Explanation3]

1. Parameter part to be followed by Data part. Data part and data part should be specified in a row. When don't specify in arow, print result may not be secured.

Micro QR Code Data size list

Version	Error correction	Numeric	Alphanumeric	Kanji	Binary
M1 (11x11)	L (Error detection only)	5	-	-	-
M2 (13x13)	L M	10 8	6 5	-	-
M3 (15x15)	L M	23 18	14 11	6 4	9 7
M4 (17x17)	L M Q	35 30 21	21 18 13	9 8 5	15 13 9

[Coding Example 3] Error correction level: 7%, Size of one side of cell: 05, Data setup mode: Manual setup,

Concatenation mode: Normal, Version M4, Data setting mode: manual setting,

Combine mode: normal, Printed in version M4

<A>

<V>100<H>200<2D32>,L,05,0,0

<QV>4

<DS>1,012345

<DN>0004,6789

<Q>1

<Z>

[Notes]

1. Specify <QV> command between <2Dxx> and <DN>/<DS>.
2. When resulted in a parameter error, it will be handled in the same manner of no specification.
3. It doesn't become a parameter error from 3.00 to 40. (Set the value within the range corresponding to each model)
For MicroQR, the setting range is from 00 to 04.
4. Sending the data exceeding the data size of specified version will result in error and QR code is not printed.

QR Code (Numeric mode) Code table

	SI										SO									
B8	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1	1	1	1	1
B7	0	0	0	0	1	1	1	1	0	0	0	0	1	1	1	1	1	1	1	1
B6	0	0	1	1	0	0	1	1	0	0	1	1	0	0	1	1	0	0	1	1
B5	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1
B4	B3	B2	B1		0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0	0	0	0	0					0											
0	0	0	1	1					1											
0	0	1	0	2					2											
0	0	1	1	3					3											
0	1	0	0	4					4											
0	1	0	1	5					5											
0	1	1	0	6					6											
0	1	1	1	7					7											
1	0	0	0	8					8											
1	0	0	1	9					9											
1	0	1	0	A																
1	0	1	1	B																
1	1	0	0	C																
1	1	0	1	D																
1	1	1	0	E																
1	1	1	1	F																

QR Code (Alphanumeric mode) Code table

	S I								S O							
B8	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1
B7	0	0	0	0	1	1	1	1	0	0	0	0	1	1	1	1
B6	0	0	1	1	0	0	1	1	0	0	1	1	0	0	1	1
B5	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1
B4	B3	B2	B1	0	1	2	3	4	5	6	7	8	9	A	B	C
0	0	0	0	0		SP	0		P							
0	0	0	1	1				1	A	Q						
0	0	1	0	2				2	B	R						
0	0	1	1	3				3	C	S						
0	1	0	0	4			\$	4	D	T						
0	1	0	1	5			%	5	E	U						
0	1	1	0	6				6	F	V						
0	1	1	1	7				7	G	W						
1	0	0	0	8				8	H	X						
1	0	0	1	9				9	I	Y						
1	0	1	0	A		*	:	J	Z							
1	0	1	1	B		+		K								
1	1	0	0	C				L								
1	1	0	1	D		-		M								
1	1	1	0	E		.		N								
1	1	1	1	F		/		O								

QR Code (Binary mode) Code table

	S I								S O							
B8	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1
B7	0	0	0	0	1	1	1	1	0	0	0	0	1	1	1	1
B6	0	0	1	1	0	0	1	1	0	0	1	1	0	0	1	1
B5	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1
B4 B3 B2 B1	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0 0 0 0 0			SP	0	@	P	`	p								
0 0 0 1 1			!	1	A	Q	a	q								
0 0 1 0 2			"	2	B	R	b	r								
0 0 1 1 3			#	3	C	S	c	s								
0 1 0 0 4			\$	4	D	T	d	t								
0 1 0 1 5			%	5	E	U	e	u								
0 1 1 0 6			&	6	F	V	f	v								
0 1 1 1 7			'	7	G	W	g	w								
1 0 0 0 8			(8	H	X	h	x								
1 0 0 1 9)	9	I	Y	i	y								
1 0 1 0 A			*	:	J	Z	j	z								
1 0 1 1 B			+	;	K	[k	{								
1 1 0 0 C			,	<	L	\	l									
1 1 0 1 D			-	=	M]	m	}								
1 1 1 0 E			.	>	N	^	n	-								
1 1 1 1 F			/	?	O	_	o	DEL								

QR Code can specify from 00H to 7FH, and from A0H to DFH.

QR Code (Kanji mode) Code table

	Shift JIS	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
記号	813F	SP	,	。	,	.	・	:	;	?	!	゛	゜	—	—	—	〃
	814F	^	—	ヽ	ゞ	ゞ	〃	〃	全	々	〆	○	—	—	-	/	
	815F	\	~	//		…	..	‘	“	”	()	[]	[]	
	816F	{ }	<	>	《》	「」	『』	【】	+ —	—	士	×	+	—	—	—	
	8180	÷	=	≠	<	>	≤	≥	∞	..	♂	♀	◦	◦	◦	◦	
	8190	\$	¢	฿	%	#	&	*	@	§	☆	★	○	●	◎	◇	
	819E	◆	□	■	△	▲	▽	▼	※	〒	→	←	↑	↓	=	=	
英・数字	824F	0	1	2	3	4	5	6	7	8	9			L	M	N	0
	825F	A	B	C	D	E	F	G	H	I	J	K					
	826F	P	Q	R	S	T	U	V	W	X	Y	Z					
	8280	a	b	c	d	e	f	g	h	i	j	k	l	m	n	o	
	8290	p	q	r	s	t	u	v	w	x	y	z					
ひらがな	829E	あ	あ	い	い	う	う	え	え	お	お	か	が	き	ぎ	く	
	82AE	ぐ	け	げ	こ	ご	さ	ざ	じ	す	ず	せ	ぜ	そ	ぞ	た	
	82BE	だ	ち	ぢ	っ	つ	づ	づ	と	ど	ど	な	ぬ	ね	の	の	
	82CE	ば	ぱ	ひ	び	ぴ	ふ	ぶ	へ	べ	べ	ペ	ぼ	ぼ	ぼ	ま	
	82DE	む	め	も	や	や	ゆ	ゆ	よ	ら	ら	り	れ	ろ	ろ	わ	
	82EE	ゐ	ゑ	ゑ	ん												わ
カタカナ	833F	ア	ア	イ	イ	ウ	ウ	エ	エ	オ	オ	カ	ガ	キ	ギ	ク	
	834F	グ	ケ	ゲ	コ	ゴ	サ	ザ	ジ	ス	ズ	セ	ゼ	ソ	ゾ	タ	
	835F	ダ	チ	ヂ	ツ	ツ	ヅ	テ	ト	ド	ナ	ニ	ヌ	ネ	ノ	ハ	
	836F	バ	パ	ヒ	ビ	ピ	フ	ブ	ヘ	ベ	ペ	ホ	ボ	ボ	マ	ミ	
	8380	ム	メ	モ	ヤ	ヤ	ユ	ユ	ヨ	ラ	リ	ル	レ	ロ	ワ	ワ	
	8390	ヰ	ヱ	ヲ	ン	ヴ	カ	ケ									
ギリシア文字	839E	Α	Β	Γ	Δ	Ε	Ζ	Η	Θ	Ι	Κ	Λ	Μ	Ν	Ξ	Ο	
	83AE	Π	Ρ	Σ	Τ	Υ	Φ	Χ	Ω								
	83BE	α	β	γ	δ	ε	ξ	η	θ	ι	κ	λ	μ	ν	ξ	ο	
	83CE	π	ρ	σ	τ	υ	φ	χ	ω								
ロシア文字	843F	А	Б	В	Г	Д	Е	Ё	Ж	З	И	Й	К	Л	М	Н	
	844F	О	П	Р	С	Т	У	Ф	Ц	Ч	Ш	Щ	҃	ы	ь	э	
	845F	Ю	Я														
	846F	а	б	в	г	д	е	ё	ж	з	и	й	к	л	м	н	
	8480	о	п	р	с	т	у	ф	ц	ч	ш	щ	҃	ы	ь	э	
	8490	ю	я														

	Shift JIS	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
ア	889E	亞	哩	娃		阿	哀	愛	挨	始	逢	葵	茜	穉	惡	握	渥
	88AE	旭	葦	芦	鯵	梓	圧	幹	拔	宛	姐	虻	飴	絢	綾	鮎	或
	88BE	粟	裕	安	庵	按	暗	案	闇	鞍	杏						
イ	88BE											以	伊	位	依	偉	圍
	88CE	夷	委	威	尉	惟	意	慰	易	椅	為	異	維	移	緯	胃	胃
	88DE	萎	衣	謂	違	遺	医	井	亥	域	育	磯	壹	一	曆	溢	逸
	88EE	稻	茨	芋	鰐	允	印	咽	員	因	姻	引	胤	淫	胤	蔭	
	893F	院	陰	隱		韻	吺										
ウ	893F									右	宇	烏	羽	迂	雨	卯	鶴
	894F	碓	臼	渦	噓	唄	鬱	蔚	麌	姥	厩	厩	浦	瓜	鶴	噂	窺
	895F	雲														云	丑
エ	895F									左	宇	鳥	羽	迂	雨	卯	鶴
	896F	桂	餌	叡		宮	嬰	影	映	曳	榮	永	泳	洩	瑛	盈	穎
	8980	穎	英	衛	詠	銳	液	疫	益	駅	悅	謁	越	閑	榎	厭	円
	8990	園	堰	奄	宴	延	怨	掩	援	沿	演	炎	焰	煙	燕	猿	緣
オ	8990									於	污	甥	凹	央	奥	往	応
	899E	押	旺	横	桶	欧	殴	王	翁	裸	鸶	鷗	鷗	黄	岡	沖	荻
	89AE	屋	憶	臆		牡	乙	俺	卸	恩	溫	穩	音				億
カ	89AE																
	89BE	伽	価	佳	加	可	嘉	夏	嫁	家	茄	寡	暇	下	果	仮	何
	89CE	火	珂	禍	禾	稼	箇	花	苛	荷	画	華	菓	架	歌	貨	河
	89DE	迦	過	霞	蚊	俄	峨	我	牙	臥	芽	芽	蛾	課	嘩	駕	駕
	89EE	介	會	解	回	塊	壞	廻	快	悔	怪	恢	懷	雅	餓	駕	効
	8A3F	魁	魁	晦	害	海	灰	界	皆	芥	繪	蟹	懷	拐	貝	蛙	蛙
	8A4F	外	咳	害	崖	慨	概	涯	碍	街	蓋	該	開	貝	涅	穎	穎
	8A5F	垣	柿	害	鉤	嚇	嚇	各	廊	撈	括	核	穎	階段	穎	穎	穎
	8A6F	覺	角	赫	鰐	郭	嚙	隔	革	岳	學	額	穎	穎	穎	穎	穎
	8A80	檻	桿	赫	鰐	割	閣	恰	括	岳	活	葛	穎	穎	穎	穎	穎
	8A90	叶	柂	赫	鰐	株	喝	竚	蒲	岳	釜	寒	穎	穎	穎	穎	穎
	8A9E	完	粥	刈	渴	瓦	乾	侃	冠	渴	鑑	穎	穎	穎	穎	穎	穎
	8AAE	汗	漢	寬	澗	幹	甘	感	監	鑑	穎	穎	穎	穎	穎	穎	穎
	8ABE	莞	觀	諫	灌	環	還	間	閒	穎	穎	穎	穎	穎	穎	穎	穎
	8ACE	巖	玩	癌	眼	岩	覩	賡	雁								
	8ADE																

	Shift JIS	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
キ	8ADE											企	危	喜	起	疑	器
	8AEE	基	奇	嬉	寄	岐	希	幾	忌	揮	机	旗	既	棋	棄	杵	
	8B3F	機	機	帰	毅	毅	汽	畿	祈	季	稀	紀	徽	記	貴	犧	
	8B4F	軌	輝	飢	騎	驕	龟	偽	儀	伎	技	戲	技术	砧	犧	犧	
	8B5F	祇	義	蟻	誼	菊	偽	菊	鞠	吉	宜	喫	咲	詰	急	犧	
	8B6F	黍	却	客	泣	丘	掬	久	窮	仇	吃	休	及	弓	去	京	
	8B80	朽	求	汲	涙	究	逆	窮	距	笈	級	漁	糾	牛	享	峠	
	8B90	巨	拒	拋	挾	渠	虛	許	凶	狂	業	匡	禦	卿	境	興	
	8B9E	彊	供	俠	恐	競	競	共	況	狂	業	狹	局	嬌	桐	菌	
	8BAE	鏡	響	饗	驚	教	教	橋	曉	業	禁	局	矯	曲	玉	秆	
	8BBE	勤	均	凝	驚	凝	凝	堯	琴	禁	禁	禽	筋	筋	軒	襟	
	8BCE	謹	近	巾	錦	欣	欣	欽									
	8BDE	銀															
ク	8BDE					九	俱	句		区	狗	玖	矩	苦	躯	駆	
	8BEE	駒	具	愚	虞	空	偶	寓	遇	遇	隅	串	櫛	釧	屑	屈	
	8C3F	掘	窟	沓	沓	轡	窪	熊	隈	隈	条	栗	綠	桑	熏	熏	
	8C4F	訓	群	軍	郡												
ケ	8C4F					卦	袈	祁		係	傾	刑	兄	啓	圭	珪	型
	8C5F	契	形	徑	惠	慧	憩	揭	祁	携	敬	景	桂	溪	眭	系	鯨
	8C6F	經	繼	繫	罝	荊	螢	計	揭	詣	警	輕	頸	迎	芸	迎	件
	8C80	劇	載	擊	激	衍	傑	欠	計	決	潔	穴	結	月	訣	拳	月
	8C90	僕	倦	健	兼	券	喧	圈	欠	堅	嫌	建	憲	捲	賢	現	捲
	8C9E	鍵	檢	權	牽	犬	劍	硯	圈	絹	縉	肩	見	軒	謙	軒	舷
	8CAE	言	諺	顯	驗	鹹	獻	嚴	硯	幻	弦	減	源	玄	現	舷	舷
	8CBE	限															
コ	8CBE					個	古	呼	固	姑	孤	己	庫	弧	戶	枯	
	8CCE	湖	狐	糊	乎	股	胡	菰	虎	誇	跨	鈷	雇	顧	鼓	互	
	8CDE	伍	午	吳	袴	娛	後	御	悟	梧	嶮	瑚	基	語	誤	護	
	8DEE	乞	鯉	交	吾	侯	候	偉	光	公	功	効	勾	口	口	向	
	8D3F	弘	后	喉	伎	垢	好	孔	孝	宏	工	巧	巷	庚	構	洪	
	8D4F	浩	恒	慌	抗	拘	控	糠	昂	晃	更	杭	校	江	構	肱	
	8D5F	腔	港	溝	甲	皇	硬	穠	糠	紅	紜	絞	綱	肯	考	鋼	
	8D6F	項	膏	航	荒	行	衡	貢	酵	購	郊	醇	鉢	閣	麌	閻	
	8D80		香	高	鴻	剛	劫	合	豪	壞	拷	豪	克				

	Shift JIS	0 1 2 3	4 5 6 7	8 9 A B	C D E F
口	8D90	告 国 穀 酷	鵠 黑 獄 漚	腰 𩫔 忽 懶	骨 狲 迸 痘
	8D9E	此 頃 今	困 坤 墾	恨 憂 昏	根 根 混 痘
	8DAE	紺 良 魂			
才	8DAE		些	左 差 沙	鑰 鎖
	8DBE	裟 坐 座	佐 叉 唆	查 宰 妻	栽 在 削
	8DCE	歲 済 災	債 催 咳	際 妻	晒 賛
	8DDE	材 罪 財	碎 冴 周	鸞 冊 鮫	
	8DEE	昨 摧 挖	坂 壴 壴	冊 鮫 蟻	
	8E3F	察 撥 摺	索 撥 撥	鮫 蟻 算	
	8E4F	參 撇 撇	薩 撥 撥		
	8E5F	餐 撇 殘	棧 撥 殘		
	903F	暫 撇 殘			
シ	8E5F		仕 仔 刺	司 史	始 止
	8E6F	姉 姿 子	師 志 思	孜 斯	誌 誌
	8E80	死 姿 獅	糸 紙	詩 時	鹿 漆
	8E90	諭 資 次	齒 治	持 汹	赦 爵
	8E9E		靈 宰	悉 射	種 種
	8EAE		七 芝	杓 纓	
	8EBE		遮 遮	收 灼	
	8ECE		主 洲	臭 珠	
	8EDE		壽 酒	十 周	
	8EEE		酌 酒	肅 舟	
	8F3F	衆 紹	弱 謝	循 周	
	8F4F	柔 若	受 謝	宿 駿	
	8F5F	出 紗	愁 謝	駿 初	
	8F6F	準 首	過 謝	徐 楹	
	8F80	署 州	重 順	捷 娴	
	8F90		春 順	症 捷	
	8F9E		助 商	訟 捷	
	8FAE		商 抄	冗 剩	
	8FBF	尚 庄	燒 烤	讓 食	
	8FCE	樟 樟	蕉 𩫔		
	8FDE	笑 粧	丈 罩		
	8FEE	鉦 擦	𡇠 織		
	903F	情 擦	燭 織		侵

	Shift JIS	0 1 2 3	4 5 6 7	8 9 A B	C D E F
シ	904F	唇 娠 寢 審	心 慎 振 新	晋 森 榛 浸	深 中 疗 真
	905F	神 秦 紳 臣	芯 薪 親 診	身 辛 進 针	震 人 仁 刃
	906F	塵 王 尋 甚	尽 腎 訊 迅	陣 鞠	
ス	906F	逗 吹 垂 帥	推 水 炊 睡	筍 謐 遂	須 醉 錐 囵
	9080	瑞 體 崇 嵩	数 枢 趕 雛	翠 衰 楠 菅	醉 錐 雀 锤
	9090	澄 摺 寶 寸			頗 隨 爪
	909E				
セ	909E	整 星 晴 楼	世 濱 敵 是	凄 制 勢 姓	征 性 成 政
	90AE	誓 請 逝 醒	栖 正 清 牲	生 盛 精 壽	声 製 虐 誠
	90BE	石 積 稽 繢	青 静 斥 稅	脆 隻 席 切	戚 斥 摄 評
	90CE	窃 節 說 雪	脊 責 赤 跡	蹟 碩 碩 占	接 捶 尖 戰
	90DE	扇 摆 桧 梅	絕 舌 蝉 横	先 千 煎 煙	專 穿 箭 線
	90EE	前 織 羨 腺	泉 外 船 薦	潛 潛 賤 践	錢 選 銃 閃
	913F		全 禪 繪 譬	賤 輕 賤 譬	
	914F				鮮
ソ	914F	狙 疏 疎 础	祖 租 粗 素	增 塑 岐 曾	措 遷 猬 曾
	915F	双 叢 倉 墓	壯 奏 爽 宋	蘇 訴 阻 鼠	搜 糟 插 僧
	916F	操 早 巢 葬	檜 槽 瘦 燥	匝 阻 想 遲	糟 總 捅 懵
	9180	草 莊 葬 蒼	藻 裝 走 送	匝 想 窓 聰	
	9190		造 促 側 則	息 捉 騷 俗	
	919E	屬 臟 藏 贈	卒 袖 其 撃	孫 捉 束 損	
	91AE				
タ	91AE				他
	91BE	太 汗 訏 唾	墮 妥 情 打	舵 替 檻 陀	多 堆 貸
	91CE	対 耐 岱 帶	怠 代 態 戴	泰 替 滯 胎	体 袋 卓 只
	91DE	退 逮 隊 黨	鯛 代 台	醍 替 醒 題	袋 卓 只
	91EE	宅 托 抨 拓	沢 灌 琢	濁 替 鳴 蘭	貸 只 樽 縱
	923F	丹 叩 单 嘆	辰 奪 脱 畏	鐸 竖 濁 罷	灘 端 犬 端
	924F	胆 蛋 誕 錛	担 探 坦 敦	迥 淡 濁 炭	談 犬 筆
	925F		団 壇 但 斷	檀 暖 短 男	
チ	925F	弛 恥 智 池	痴 稚 置 致	蜘 遷 馳 築	值 知 地
	926F	逐 秩 窒 茶	嫡 着 中 仲	宙 忠 抽 築	畜 竹 蓄 裡
	9280	註 酣 鑄 駐	樗 蒼 猪 芈	著 貯 丁 昆	
	9290				兆

	Shift JIS	0 1 2 3	4 5 6 7	8 9 A B	C D E F
チ	929E	帖 帳 庁	弔 張 彫 徵	懲 挑 暢 朝	潮 牒 町 眺
	92AE	聴 脹 腸 蝶	調 謔 超 跳	銚 長 頂 鳥	勅 摶 直 朕
	92BE	沈 珍 賈 鎮	陳		
ツ	92BE		津 墜 椎	槌 追 鎖 痛	通 塚 梅 捱
	92CE	槐 佃 漬 枯	辻 菦 緞 銬	椿 漬 坪 壺	嬬 紬 爪 吊
	92DE	釣 鶴			
テ	92DE	亭 低	停 偵 刹 貞	呈 堤 定 帝	底 庭 廷 弟
	92EE	梯 抵 挺 提	梯 汀 碇 祚	程 締 艇 訂	蹄 鑄 溺 詣
	933F	邸 鄭 釘	鼎 泥 摘 擧	敵 滴 的 笛	適 鑄 潑 詣
	934F	徹 撤 輻 送	鐵 典 填 天	展 店 添 纓	甜 貼 転 顛
	935F	点 伝 殿 澱	田 電		
ト	935F		兔 吐	堵 塗 妒 屠	斗 杜 渡
	936F	登 菁 賭 途	都 鍍 砥 砥	努 度 土 奴	倒 党 冬
	9380	凍 刀 唐 塔	塘 套 穴 島	嶼 悼 等 答	桃 積 棟
	9390	盜 淘 湯 潤	燈 燈 痘 痘	禱 逃 透 鐙	統 頭 謂
	939E	董 蕩 藩 藤	討 謄 洞 豆	踏 童 脭 道	騰 峰 鍔
	93AE	動 同 堂 導	憧 撞 洞 瞳	童 聰 桃 橡	突 楪 罷
	93BE	得 德 流 特	督 禿 篤 毒	獨 読 样 横	吞 楪 罷
	93CE	薦 苦 寅 西	靜 嶠 屯 惇	敦 沁 豚 遣	曇 頃 鈍
ナ	93DE	奈 那 内 乍	廻 蘭 謎 灘	捺 鍋 楷 馴	繩 瞞 南
	93EE	軟 難 汝			楠
ニ	93EE	二	尼 式 迹 匂	賑 肉 虹 甘	日 乳 入
	943F	如 尿 蕁	任 妊 忍 認		
ヌ	943F			濡	
ネ	943F			襦 衤 寧	葱 猫 熱 年
ノ	944F	念 想 攝 燃	粘	乃 酒 惱 濃	納 能 脳 膿
	945F	農 視 蚊			
ハ	945F		巴	波 派 琶 破	婆 驚 芭 馬
	946F	俳 廢 拝 排	把 播 霸 柏	背 肺 輩 配	倍 培 媒 梅
	9480	模 煤 狽 買	敗 杯 盃 牌	蠅 秤 紗 紮	伯 剥 博 拍
	9490	柏 泊 白 箔	壳 賠 陪 這	曝 漠 爆 紮	莫 駁 麦 發
	949E	函 畏 箱 硎	粕 舶 薄 迫	幡 肌 煙 隅	八 鉢 淚 反
	94AE	醜 髮 伐 罰	箸 肇 簾 閥	嘶 壽 壞 鳩	伴 判 半

	Shift JIS	0 1 2 3	4 5 6 7	8 9 A B	C D E F		
八	94BE 94CE	叛 帆 搬 斑 采 煩 頒 飯	板 汗 汎 版 挽 晚 番 盤	犯 班 畔 繁 磐 蕃 蚩	般 蘩 販 範		
ヒ	94CE 94DE 94EE 953F 954F 955F 956F	彼 悲 扉 批 誹 費 避 非 鼻 桧 格 稗 桧 姫 暖 紐 廟 描 痘 秒 賓 頻 敏 瓶	披 斐 比 泌 飛 楊 簾 備 匹 止 髮 彦 百 謬 俵 彪 苗 錨 鋸 蒜 蟲 標 水 魚	疲 尾 微 枇 尾 膝 菱 肘 膝 膝 漂 品 標 標 氷 魚 水 魚 蛭 品 魚 蛭 標 品	匪 秘 碑 昆 秘 眉 弶 猶 碑 眉 畢 簾 昆 弶 簾 瓢 碑 猶 瓢 彬 猶 瓢 彬 檳	卑 否 妃 庇 緋 罷 肥 被 琵 眉 美 逼 必 畢 筆 豹 票 表 評 貧 斌 濱 濱 濱	
フ	956F 9580 9590 959E 95AE	斧 普 浮 父 武 舞 菊 蕪 福 腹 複 複 憤 扮 焚 舊 付 腹 粉 糞	不 符 部 覆 付 腹 粉 糞 腐 封 淵 糞 膚 封 淵 糞 父 弗 紛 雲	埠 膚 風 佛 膚 封 淵 佛 膚 腹 弗 佛 膚 腹 弗 佛 父 紛 雲 文	富 富 賦 伏 物 富 賦 落 伏 物 賦 落 佛 𩙑 物 賦 𩙑 𩙑 𩙑 物 布 𩙑 𩙑 𩙑 物	府 阜 復 分 阜 附 幅 吻 復 幅 吻 噴 分 吻 噴 墳	怖 扶 敷 撫 附 侮 撫 墳
ヘ	95AE 95BE 95CE	弊 柄 並 蔽 偏 變 片 篇	閉 編 陸 迴 壁 编 陸 迴 僻 便 𩙑 遍	丙 壁 痢 婉 併 碧 婉 卍	兵 墙 幣 幣 別 警 蔑 幣 鞭 鞭 幣 幣	平 幣 幣 幣	
木	95CE 95DE 95EE 963F 964F 965F 966F	圃 捕 步 甫 俸 包 呆 報 法 泡 烹 烹 飽 凤 鵬 乏 棒 冒 紡 肪 撲 朴 牧 瞞	補 農 宝 穩 奉 穩 穩 胞 砲 泡 芳 坊 亡 泡 芳 坊 膨 紡 坊 貿 穆 瞞 勃 貿	穗 峯 峯 峯 募 峯 芳 坊 蓬 芳 坊 師 妨 師 師 忘 帽 師 貿 呀 鉢 師 勃 呀	暮 戊 抱 褒 暮 崩 庖 褒 蓬 崩 蓬 褒 妨 師 蜂 忙 帽 師 帽 忙 鉢 師 師 𩙑	保 母 放 訪 房 舗 方 豊 豊 北 做 朋 邦 暴 僕 做 鋒 鋒 𩙑 𩙑 鋒 某 望 𩙑 𩙑 某 僕 𩙑 𩙑 𩙑 墨 𩙑 𩙑 𩙑 𩙑	鋪 做 鋒 𩙑 做 𩙑 𩙑 𩙑 𩙑 鋒 𩙑 𩙑 𩙑 𩙑 某 𩙑 𩙑 𩙑 𩙑 墨 𩙑 𩙑 𩙑 𩙑 𩙑 𩙑 𩙑 𩙑 𩙑
マ	9680 9690 969E	摩 磨 魔 麻 鱈 样 亦 俣 漫 曼 蔓 俣	埋 妹 昧 枚 又 抹 末 泡	每 哩 模 幕 迄 𠂇 繭 疏	膜 万 枕 满	杼 满 满 满	
ミ	969E 96AE	味 粮 民 眠	未 魅 巳 箕	岬 密 蜜 湊	蓑 稔 脍 妙		
ム	96AE	務	夢 無 牟 矛	霧 鶴 棕 婕	娘		
メ	96AE 96BE	明 盟 迷 銘	鳴 姪 牝 滅	免 棉 綿 緬	冥 名 命	面 麵	
モ	96BE 96CE	茂 妄 孟 毛	猛 盲 網 耗	蒙 儲 木 默	摸 模	目 杁 勿 餅	

	Shift JIS	0 1 2 3	4 5 6 7	8 9 A B	C D E F
モ	96DE	尤 戻 粉 貴	間 悶 紋 門	匂	
ヤ	96DE 96EE	矢 厄 役 約	薬 訳 躍 靖	也 治 夜 柳 蔽 鐧	爺 耶 野 弥
ユ	96EE 973F 974F	諭 輸 唯 涌 猶 獣 由	佑 優 勇 友 祐 裕 誘 遊	宥 幽 悠 憂 邑 郵 雄 融	愉 油 癒 揖 有 柚 湧 夕
ヨ	974F 975F 976F 9780	誉 輿 預 傭 熔 用 窯 羊 沃 浴 翼 翼	幼 妖 容 庸 耀 葉 蓉 要 淀	揚 摆 擁 曜 謡 踊 遙 陽	予 余 与 楊 樣 洋 欲 養 慾 抑
ラ	9780 9790	乱 卵 嵐 櫛	羅 螺 裸 濫 藍 蘭 覧	来 莱 賴 雷	洛 絡 落 酪
リ	9790 979E 97AE 97BE 97CE	痢 裏 裡 琉 留 硫 粒 寮 料 梁 涼 綠 倫 厘 林	里 離 陸 律 隆 竜 龍 侶 猶 療 瞭 棱 淋 燐 琳 臨	利 吏 履 李 率 立 蓬 掠 慮 旅 虜 了 糧 良 諒 遼 輪 隣 鱗 鱗	梨 理 璃 溜 略 劉 流 両 亮 僚 両 凌 量 陵 領 力
ル	97CE 97DE	類			瑠 墨 淚 累
レ	97DE 97EE 983F	令 伶 例 齡 曆 歷 列 蓮 連 鍊	冷 励 嶺 怜 劣 烈 裂 廉 恋 憐 淚 煉	玲 礼 苛 鈴 恋 憐 淚 煉	隸 零 靈 麗 簾 練 聯
ロ	983F 984F 985F	樓 椰 浪 漏 論	呂 魯 櫓 爐 牢 狼 筆 老	賂 路 露 労 聾 蜈 還 六	婁 廊 弄 朗 麓 祿 肋 錄
ワ	985F 986F	倭 和 話 椀 湾 碗 腕	歪 賄 脇 惑	杵 驚 瓦 亘	鰐 詫 蕉 蕨

	Shift JIS	0 1 2 3	4 5 6 7	8 9 A B	C D E F
一	989E	式 丐 爪			
丨	989E		个 卌		
丶	989E			丶 丂	
丶	989E			丶 丂	
丶	989E			丶 丂	
乙	989E				亂
丶	989E 98AE	舒			丶 豫 事
二	98AE	式 于 亞	亟		
士	98AE		士 亢 京	毫 壴	
人	98AE 98BE 98CE 98DE 98EE 993F 994F	仞 仞 𠙴 价 佩 𠙴 𠙴 佯 俾 倚 𠙴 𠙴 偃 假 會 𠙴 僉 僥 𠙴 傳 僕 僕 𠙴 僕 僕 僕 𠙴 僕	𠙴 佚 估 佛 來 𠙴 𠙴 僦 倪 𠙴 𠙴 𠙴 修 𠙴 𠙴 𠙴 僕 𠙴 𠙴 𠙴 僕 𠙴 𠙴 𠙴	从 仍 尙 𠙴 𠙴 𠙴 ^𠙴 俟 俎 𠙴 𠙴 ^𠙴 𠙴 𠙴 𠙴 𠙴 ^𠙴 𠙴 𠙴 𠙴 𠙴 ^𠙴 𠙴 𠙴 𠙴 𠙴 ^𠙴 𠙴 𠙴 𠙴 𠙴 ^𠙴	仄 仆 𠙴 仗 侈 侏 𠙴 𠙴 ^𠙴 𠙴 𠙴 𠙴 𠙴 ^𠙴
儿	994F			儿 兮 兒	兌 免 競
入	995F	兩 犭			
八	995F	兮 巍			
冂	995F		冂 回 册 冂	冏 胄 莽 冂	
冂	995F 996F	寫 幕			冂 冂 冠 冂
丷	996F	丷 决	互 冲 冰 况	冽 涸 凉 凜	
几	996F 9980				几 處 𠂔 凭
匚	9980	匚 函			
刀	9980 9990 999E	刂 剗 剔 剪 剗 辨	刂 刨 剔 剪 剗 剩 剗 剪 剗 剗 劍 剗 剪 剗 剗	刂 刮 剗 剗 剗 劍 剗 剪 剗 剗	刂 刮 剗 剗 剗 剗 劍 剗 剗 剗
力	999E 99AE	効 劻 劻 勸	効 券 効 劻 勸	勗 勞 勤 勤	飭 勤 勤 勤
匚	99AE	匚 匚 匚	匚 匚 匚		
匕	99AE			匕	
匱	99AE			匱 匱 匱	匱 匱

	Shift JIS	0 1 2 3	4 5 6 7	8 9 A B	C D E F
匚	99AE				匚 區
十	99BE	十 丂 丂 丂	卍 準		
ト	99BE		丄		
口	99BE		口	卮 郑 却 卷	
厂	99BE 99CE	廥 厥 厮			厂 扉 廁 厦
厶	99CE	厶	參 篆		
又	99CE		雙 叴	曼 變	
口	99CE 99DE 99EE 9A3F 9A4F 9A5F 9A6F 9A80 9A90	呀 听 吭 吼 咒 呻 咀 啰 𠵼 咤 晒 呗 喨 哇 嘬 呔 喟 苞 啟 喘 嗤 嘴 嘸 噴 噫 嘘 嘔 噪 嚙 嘩 嘛 噘	吮 呐 吻 吻 咄 咐 呶 呶 𠵼 呀 呀 呀 售 噠 呹 呋 唧 單 咩 喻 噴 噴 噴 噴 噪 噕 噏 噏 嚙 噕 噏 噏	叮 叻 叻 叻 呴 呴 呴 呴 𠵼 咂 咂 咂 咬 咂 咂 咂 唔 咂 咂 咂 喨 咂 咂 咂 喨 咂 咂 咂 喨 咂 咂 咂	叭 叻 叻 叻 𠵼 咂 咂 咂 吁 呴 呴 呴 咨 咂 咂 咂 𠵼 咂 咂 咂 喨 咂 咂 咂 哺 咂 咂 咂 嘒 咂 咂 咂
口	9A90 9A9E	圈 國 圉	圓 團 圖	口 圜 圜 圜	囿 圜 圜
土	9A9E 9AAE 9ABE 9ACE 9ADE	坵 垂 垈 坡 埒 聖 塹 坝 墅 壽 墣 墟 壘 壤 墟 墟 壤 壤 壤 壤	坵 坡 垈 垈 埒 埤 塹 塹 墅 塉 壈 壈 壘 壈 壈 壈 壤 壈 壈 壈	坏 坏 坏 坏 塈 塈 塈 塈 塈 塈 塈 塈 塈 塈 塈 塈 塈 塈 塈 塈	坎 坎 坎 坎 埢 埮 埮 埮 塈 塈 塈 塈 塈 塈 塈 塈 塈 塈 塈 塈
士	9ADE	壯	壺 壴 墉 壺	壽	
夕	9ADE			夕	
夊	9ADE			夊 夬	
夕	9ADE				夊 夢 夥
大	9ADE 9AEE	天 本 夸 夾	奇 奕 契 奎	奚 奒 奢 奠	奥 奒 奒
女	9B3F 9B4F 9B5F 9B6F	奸 姣 妆 婆 娜 婢 娲 媽 嫣 婪 婕 嬢 嫣 婪 婪	佞 嬷 妲 姐 嫗 媪 婪 婪 嫗 媪 婪 婪 嬢 媪 婪 婪	姆 媳 姜 媢 娶 婢 婮 媚 嬌 嬬 婪 嫵 嬢 嬬 婪 婪	姪 姚 婕 娟 嫗 媚 嫮 嫮 嫗 媚 嫮 嫮 嬢 媚 嫮 婪

	Shift JIS	0 1 2 3	4 5 6 7	8 9 A B	C D E F
子	9B6F	子	孕 孛 孛 孢	孩 孩 孨 學	孝 孝 孝 孝
宀	9B6F 9B80 9B90	它 宀 辰 宛 寶	寇 雀 寔 眠	寤 實 寢 寞	寥 寫 寔 寶
寸	9B90	尅 將 專	對		
小	9B90		尔 紗		
尤	9B90		尤	尨	
尸	9B90 9B9E	屍 屏 扉	屬	尸 尸 屁	届 届 屁
山	9B9E 9BAE 9BBE 9BCE	峯 岷 峙 岘 峯 嶺 嶠 崔 嶮 嶠 嶠 嶠	峝 峒 峪 峽 峢 峥 峯 峪 嶮 嶠 嶠 嶠	屹 岌 峣 岮 嶺 嶠 嶠 嶠 嶮 嶠 嶠 嶠	峩 峭 峒 峧 峩 嶠 嶠 嶠 峩 嶠 嶠 嶠
巛	9BCE				巛
工	9BDE	巫			
巳	9BDE	巳 卦			
巾	9BDE 9BEE	帀 帑 帐 帔 幘 幢 幢 幢	帀 帑 帐 帔	帶 帷 帐 帐	幘 幕 幕 幕
干	9BEE		升 并		
乚	9BEE		么 麽		
广	9BEE 9C3F	廖 廣 廝	厨 廬 廐 廐	广 库 廁 廂	廈 廐 廐
疋	9C3F				疋 迪
升	9C4F	升 弃 弋 羣	羣		
弋	9C4F		弋 弑		
弓	9C4F		弣	弩 弩 弩 弩	彈 弩 弩 弩
乚	9C5F	乚 象 彙 彙			
彑	9C5F		彑 彭		
彳	9C5F 9C6F	彳 徒 徒 徒	彳 徵	彳 徵 徵 徵	彳 徵 徵 徵
心	9C6F 9C80 9C90	忄 怖 怖 忖 恊 恒 恒 忖	忄 忖 忖 忖 恊 恒 恒 忖	忄 忖 忖 忖 恊 恒 恒 忖	忄 忖 忖 忖 恊 恒 恒 忖

	Shift JIS	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
心	9C9E	悄	悛	悖	惄	惄	惄	惄	惄	惄	惄	惄	惄	惄	惄	惄	惄
	9CAE	悵	惄	惄	惄	惄	惄	惄	惄	惄	惄	惄	惄	惄	惄	惄	惄
	9CBE	懲	惄	惄	惄	惄	惄	惄	惄	惄	惄	惄	惄	惄	惄	惄	惄
	9CCE	慚	惄	惄	惄	惄	惄	惄	惄	惄	惄	惄	惄	惄	惄	惄	惄
	9CDE	憮	惄	惄	惄	惄	惄	惄	惄	惄	惄	惄	惄	惄	惄	惄	惄
	9CEE	憇	惄	惄	惄	惄	惄	惄	惄	惄	惄	惄	惄	惄	惄	惄	惄
戈	9CEE	戛 戲 截				戩 戰 戲 截				戈 戊 戌				戌 羌 夏			
戸	9D3F									扁							
手	9D3F									扎 扯 扣 扒				扛 拏 拗 拏			
	9D4F	扠	抉	找	抒	抓	抖	拔	扒	扠	拗	𢃥	𢃥	拿	挈	拆	𢃥
	9D5F	拈	拜	拌	拊	拂	拇	抛	拉	格	拮	拱	𢃥	挂	挈	拯	𢃥
	9D6F	捐	挾	捍	搜	捏	掖	掎	掀	𢃥	捶	掣	𢃥	掉	捉	掻	𢃥
	9D80	捩	掾	揩	揀	揆	揣	揉	插	揶	揄	搖	𢃥	構	搓	搦	𢃥
	9D90	攝	搗	搘	搏	摧	擎	搏	𢃥	揶	撕	撓	𢃥	撩	撈	撓	𢃥
	9D9E	攬	據	擒	擅	擇	撻	擘	𢃥	擗	舉	撥	𢃥	擡	撈	擡	𢃥
	9DAE	攬	攜	擴	擲	擺	攀	操	𢃥	攜	攢	攤	𢃥	攬	攬	攬	𢃥
支	9DAE													支 文 放			
	9DBE	收	攸	畋	效	敖	敕	敍	敍	敞	敝	敲	數	斂	斃	斃	變
斗	9DBE																
	9DCE	斟 斷															
斤	9DCE	旆 旆 旆 旆				旆 旆 旆 旆											
方	9DCE																
无	9DCE									无				无			
日	9DCE													旱 果 春			
	9DDE	昃	旻	杳	昵	昶	昴	易	晏	暎	晉	晁	晞	晝	晤	皓	晨
	9DEE	熯	哲	晰	霏	暭	暎	暉	暄	暘	暝	暨	暹	曉	瞰	睞	
	9E3F	暭	暭	暭	暭	暭	暭	暭	暭	暭	暭	暭	暭	暭	暭	暭	暭
曰	9E3F									曰 曜 曠 曜				曰 曜 曠 曜			
月	9E3F													朏 腴 莠 蒙			
	9E4F	朧 霸															
木	9E4F					朶	朶	朶	朶	朶	朶	朶	朶	朶	朶	朶	朶
	9E5F					朶	朶	朶	朶	朶	朶	朶	朶	朶	朶	朶	朶
	9E6F					朶	朶	朶	朶	朶	朶	朶	朶	朶	朶	朶	朶

	Shift JIS	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
木	9E80	梳	栴	梓	檉	档	桷	桺	梟	楨	梪	條	櫛	梃	櫓	柵	桴
	9E90	梵	枏	榦	禁	檼	槐	榦	槩	楻	棘	樞	櫈	樞	柶	棍	柶
	9E9E		椿	榷	檷	棕	櫻	椒	棗	楳	枷	梔	櫈	檸	柶	柶	柶
	9EAЕ	楥	櫟	榷	榆	檼	楷	楨	櫟	榦	楳	榦	櫈	檸	柶	柶	柶
	9EBE	榆	榷	榷	棟	榩	榷	榷	榩	榩	榩	榩	榩	榩	榩	榩	榩
	9ECE	楊	榷	槃	榷	榷	榷	榷	榩	榩	榩	榩	榩	榩	榩	榩	榩
	9EDE	槲	榷	榷	榷	榷	榷	榷	榷	榷	榩	榩	榩	榩	榩	榩	榩
	9EEE	楨	榷	榷	榷	榷	榷	榷	榷	榷	榩	榩	榩	榩	榩	榩	榩
	9F3F	欒	榷	榷	榷	榷	榷	榷	榷	榷	榩	榩	榩	榩	榩	榩	榩
	9F4F	櫟	榷	榷	榷	榷	榷	榷	榷	榷	榩	榩	榩	榩	榩	榩	榩
欠	9F4F	歛 歲 歊 歟				歎 歲 歊 飲				歔 歆 歊 歐							
止	9F5F					歡 歸											
歹	9F5F	殮 殇 殯 獄				歹 殴 殂 殭				殃 殂 殂 殂				殮 殂 殂 殂			
殳	9F6F					殳 殷 肅				殳							
母	9F6F									母 穡							
毛	9F6F									耄				耄 毫 穂 毯			
氏	9F80	氓															
气	9F80	气 氚 氕 氕															
水	9F80	汾	汨	沵	沒	沫	泄	浹	泓	汞	汙	汙	汪	沂	沴	沚	沁
	9F90	汨	汨	汨	汨	泙	汨	汨	衍	汙	汙	汙	汙	沂	沮	沾	沛
	9F9E	涙	涙	涙	涙	涙	涙	涙	涙	涙	涙	涙	涙	涙	涙	涙	涙
	9FAE	涙	涙	涙	涙	涙	涙	涙	涙	涙	涙	涙	涙	涙	涙	涙	涙
	9FBE	涙	涙	涙	涙	涙	涙	涙	涙	涙	涙	涙	涙	涙	涙	涙	涙
	9FCE	涙	涙	涙	涙	涙	涙	涙	涙	涙	涙	涙	涙	涙	涙	涙	涙
	9FDE	涙	涙	涙	涙	涙	涙	涙	涙	涙	涙	涙	涙	涙	涙	涙	涙
	9FEE	涙	涙	涙	涙	涙	涙	涙	涙	涙	涙	涙	涙	涙	涙	涙	涙
	E03F	涙	涙	涙	涙	涙	涙	涙	涙	涙	涙	涙	涙	涙	涙	涙	涙
	E04F	涙	涙	涙	涙	涙	涙	涙	涙	涙	涙	涙	涙	涙	涙	涙	涙
火	E05F	涙	涙	涙	涙	涙	涙	涙	涙	涙	涙	涙	涙	涙	涙	涙	涙
	E06F	涙	涙	涙	涙	涙	涙	涙	涙	涙	涙	涙	涙	涙	涙	涙	涙
		炙 炒 炄				烟 灶 炸 炝				炮 烟 体 烟							

	Shift JIS	0 1 2 3	4 5 6 7	8 9 A B	C D E F
火	E080 E090 E09E	熾 焉 烽 煙 熆 煙 熬 煙 熑 烹 燿 煙	焙 煥 熙 煦 熹 煥 烧 煦 爛 爛 煙 煥	煦 暝 煙 煥 燔 燥 煙 煥	煖 熏 煙 煥 燧 燹 煙 煥
爪	E09E			爭	爬 爰 爲
爻	E09E				爻 爪
爿	E09E EOAE	牋 瘣			爿 牀 牆
牛	EOAE	牴 牯	犂 犁 犢 犂	犖 瘢 犕 犭	
犬	EOAE EOBE EOCE	狎 犒 犐 犠 狃 犑 犐 犐	狡 狹 犑 犔 默 獵 犑 獨	猗 犮 猜 犐 磼 獸 獵 獻	狃 犺 犮 犐 猝 猴 猥 猩
王	EOCE EODE EOEE	玻 珀 玳 瑶 瑣 瑰 瑩 瑰	珞 瑰 琅 瑯 瑣 瑪 瑶 瑾	琥 玩 珐 琥 璋 璞 璧 璍	珈 玳 珠 瑙 瑕 璇 瑟 瑙
瓜	E13F	瓠 瓣			
瓦	E13F E14F	甃	甂 甁 甈 甈	甂 甁 甁 甈	甂 甁 甈 甈
甘	E14F	嘗			
生	E14F		甦		
用	E14F		甬		
田	E14F E15F	畧 畫 畵 畸	畊 畵 畵 畵	畷 畵 畵 畵	畷 畵 畵 畵
疒	E15F E16F E180 E190 E19E	瘡 瘡 痘 瘡 瘡 瘡 痘 瘡 瘡 瘡 痘 瘡	疽 瘡 痘 瘡 瘻 瘡 瘡 瘡 瘻 瘡 瘡 瘡	疔 瘡 瘡 瘡 瘻 瘡 瘡 瘡 瘻 瘡 瘡 瘡	疚 瘡 瘡 瘡 瘻 瘡 瘡 瘡 瘻 瘡 瘡 瘡
火	E19E	火 癸	發		
白	E19E		皀 兒 皀	皀 皀 皀	皀 皀
皮	E19E E1AE	皺 輝 皺			皺 皺
皿	E1AE	孟	盍 盖 盒 盞	盍 盞 盧 盪	盍
目	E1AE E1BE	眴 眩 眇 真	眴 眴 眇 眇	眴 眴 眇 眇	眴 眴 眇 眇

	Shift JIS	0 1 2 3	4 5 6 7	8 9 A B	C D E F
目	E1CE E1DE	睂 睹 瞔 瞢 瞞 瞴	瞑 瞔 瞞 瞢	瞃 瞗 瞔 瞓	瞇 瞈 瞔 瞔
矛	E1DE	矜			
矢	E1DE	矣	矮		
石	E1DE E1EE E23F	磈 磠 碉 碉 磧 磡 碉 碉 磧 磡 碉 碉	矼 砌 砩 礮 磦 磕 磕 礮 磺 磯 磯	礪 硏 磯 磻 礮 磰 磯 磻 礮 磰 磻 磻	碎 砥 磷 硼 磅 磤 磤 磤
示	E23F E24F	祕 祛 祺 祿 禊 禩 禧 疱	禊 禩 禧 疱	禪 禮 禩	祠 祇 崇 祚
禹	E24F				禹 禹
禾	E24F E25F E26F	秬 秩 穀 稂 穉 稧 穀 穂	稍 稒 植 稲 穊 穀 稧 穂	稟 稟 稱 稻	秉 批 秧 稟 稷 稷 穂
穴	E26F E280	竈 窃 竄 窿 邃 寶 窜 竊	穹 穹 穹 穹	窈 窓 穆 窕	審 窩 竈 窔
立	E280 E290	竦 竭 竦 竦	𠂇	𠂇 竇 竇 竇	竚 站 竇 竇
竹	E290 E29E E2AE E2BE E2CE E2DE	筭 篾 篦 篦 箒 篦 篦 篦	筭 篦 篦 篦 筭 篦 篦 篦	筭 篦 篦 篦 筭 篦 篦 篦	笨 笑 篦 箬 箇 篦 篦 箬�
米	E2DE E2EE	粧 粧 粧 粧 粃 粧 粧 粧	粁 粁 粁 粁 粃 粁 粁 粁	粄 粄 粄 粄 粃 粄 粄 粄	粲 粱 粱 粱 糴 粱 粱 粱
糸	E2EE E33F E34F E35F E36F E380 E390	紵 純 純 純 緘 累 緘 緘 緘 總 緺 緺 緘 總 緺 緺 緘 總 緺 緺 縷 縷 縷 縷 緘 縷 縷 緺	紵 純 純 純 緘 累 緘 緘 緘 總 緺 緺 緘 總 緺 緺 緘 總 緺 緺 縷 縷 縷 縷 緘 縷 縷 緺	緘 紹 紹 紹 緘 紹 紹 紹	糸 紋 紋 紋 緘 紋 紋 紋
缶	E390 E39E	罅 罂 罂 罂 罧 罂 罂 罂	罧 罂 罂 罂		缸 缺

	Shift JIS	0 1 2 3	4 5 6 7	8 9 A B	C D E F
网	E39E		网 空	罔 罢 署 罂	罨 罩 罂 罚
	E3AE	羈 犍 罡 羁	羈		
羊	E3AE		羌 羔 羞	羝 羚 羣 羶	羲 羲 羲 羶
	E3BE	羸 羘			
羽	E3BE	翅 翠	翊 翩 翔 翡	翦 翩 翫 翱	翫
	E3BE				
老	E3BE				耆 毳 鬚
	E3CE	耒 耘 耙 耘	耈		
耳	E3CE		耿 耻	聊 聆 聒 聘	聚 聰 聋 聯
	E3DE	聳 聲 聰 聰	聰 聴		
聿	E3DE		聿 壅	肆 肅	
	E3DE				
肉	E3EE	胛 胥 脍 脨	胄 胚 胖 脉	膀 胮 脓 脱	肚 脱 胃 脱
	E43F	隋 脾 脾 脾	腓 脼 脼 腱	腮 腭 腦 脑	脰 脰 脰 脰
	E44F	膂 膜 脣 膚	腔 腔 腸 脂	膾 腕 膾 膾	膈 膳 膳 膳
	E45F	臉 脍 脍 脍	臚 脍 脍 脍	鬚	臂 臂 臂 臂
	E45F				
臣	E45F			臧	
至	E45F			臺 璎	
臼	E45F				𠂇 昇 春 眇
	E46F	與 舊			
舌	E46F	舍 舐	舖		
舟	E46F		船 舶 舷 舸	舳 舻 舱 舸	艚 舷 舫 舢
	E480	艤 艤 艤 艤	艤		
艮	E480		艱		
色	E480		艷		
艸	E480				
	E490	苣 苒 苒 苒	苺 莓 莓 莺	艾 苟 芒 菏	芻 茉 芮 芮
	E49E	茵 苒 苒 苒	茲 茉 莹 莺	苻 莵 苑 芒	芨 茄 莦 莒
	E4AE	莪 苔 苔 苔	莫 莎 莎 莎	荅 莳 莳 莳	莠 莪 莪 莪
	E4BE	葍 董 葫 葵	萃 茄 茄 葵	荅 莮 莮 莮	萍 萍 萍 萍
	E4CE	蕘 蓼 蓼 蕓	莉 莼 莼 蕓	葍 菴 菴 菴	葩 蕴 蕴 蕴
	E4DE	葍 施 蕩 蕃	蓋 蕙 蕙 蕃	蓀 菴 菴 菴	蓀 蕤 蕤 蕤
	E4EE	蒡 蔡 蕃 蕃	蔗 蕴 蕴 蕃	蓀 莴 莴 蕃	蕘 蕤 蕤 蕤
	E53F	薜 蘋 蕃 蕃	蕷 蕃 蕃 蕃	薹 莲 莲 蕃	薜 蕤 蕤 蕤
	E54F	薜 蘋 蕃 蕃	藉 蕃 蕃 蕃	藪 莲 莲 蕃	蘂 蕤 蕤 蕤

	Shift JIS	0 1 2 3	4 5 6 7	8 9 A B	C D E F
艸	E55F	蘋 藜 蘭 蘆	龍 蘚 蘿 蘿		
虍	E55F			虍 虏 虐 號	虧
虫	E55F E56F E580 E590 E59E E5AE E5BE	蚩 蛭 蚊 蛭 蛟 蛛 蛉 蛭 蛇 蜴 蛇 蛭 螭 蜢 蛍 蛭 蠅 蠕 蛔 蛭 螳 蟻 螳 蛭 蠶 蟻 蟻 蛭	蚶 蚵 蛏 蛏 蜋 蝦 蜈 蜈 蜑 蜈 蜈 蜈 蜑 蝶 蜈 蜈 蜑 蝶 蜈 蜈 蜑 蝶 蜈 蜈 蜑 蝶 蜈 蜈	蚰 蛭 蛭 蛭 𧈧 蛭 蛭 蛭	𧈧 蛭 蛭 蛭 𧈧 蛭 蛭 蛭
血	E5BE			衄	
行	E5BE			衙 衙	衛 衛
衣	E5BE E5CE E5DE E5EE E63F	衾 衰 衮 衮 衤 衽 衮 衮 衤 衽 衮 衮 衤 衽 衮 衮 衤 衽 衮 衮	衽 衤 衫 衫 袴 裳 裳 裳 袴 裳 裳 裳 袴 裳 裳 裳 袴 裳 裳 裳	袒 衫 衫 衫 裯 穫 穫 穫 裯 穫 穫 穫 裯 穫 穫 穫 裯 穫 穫 穫	袁 衫 衫 衫 袞 袞 袞 袞 袞 袞 袞 袞 袞 袞 袖 袖 袞 袖 袖 袖
丂	E63F			丂	
見	E63F E64F		覩 覓 觀 觀	覩	覩 觀 觀
角	E64F			觨 觚 觚 觚	觨 觚 觚 觚
言	E64F E65F E66F E680 E690 E69E	訐 訂 訏 訂 誣 誅 誨 誅 誎 說 誦 說 諺 誥 誥 誥 謔 謔 謔 謔 謔 謔 謔 謔	訥 訌 詰 詰 誣 詰 詰 詰 誎 詮 詮 詮 諺 詮 詮 詮 謔 詮 詮 詮 謔 詮 詮 詮	詒 訂 詷 詷 詭 該 詷 詷 詎 詮 詷 詷 謔 詮 詷 詷 謔 詮 詷 詷 謔 詮 詷 詷	訐 訂 訂 訂 詭 該 該 該 詎 詮 詮 詮 謔 詮 詮 詮 謔 詮 詮 詮 謔 詮 詮 詮
谷	E69E E6AE	谿			哿 谷
豆	E6AE	豈 豌 豐	豊		
豕	E6AE		豕 眷 豬		
豸	E6AE E6BE	貔 貔 貔		豸 豺 貔 貔	貅 貔 貔 貔
貝	E6BE E6CE	賤 賈 賈 賚 賈 賈	貲 貪 貄 贊 賈 賈	貳 貳 貳 贍 賦 賦	貢 賤 賽 貯 賦 賦

	Shift JIS	0 1 2 3	4 5 6 7	8 9 A B	C D E F
赤	E6CE E6DE	赭			赧
走	E6DE	走 趟 趋	趙		
足	E6DE E6EE E73F E74F	蹠 跛 跗 跤 蹠 跛 跛 跤 蹠 踏 蹤 蹤 蹠 蹔 蹤 蹤	跂 趾 跖 跎 蹠 跛 跢 跎 蹠 踏 蹤 蹤 蹠 蹕 蹤 蹤	蹠 跛 跖 跎 蹠 跢 跢 蹮 蹠 踏 蹤 蹮 蹠 蹖 蹳 蹮	跛 跛 跛 蹮 踰 跢 跢 蹮 蹠 蹲 蹲 蹮 蹠 蹪 蹲 蹮
身	E74F E75F	軀 軫			躬
車	E75F E76F E780	轆 輒 輂 轆 輒 輂 轆 輒 輂	轔 較 軑 軑 轔 較 軑 軑 轔 較 輂 輂	轔 較 輓 輓 轔 較 輓 輓 轔 較 輂 輂	輶 輅 輇 輂 轔 較 輇 輂 轔 較 輂 輂
辛	E780	辜	辟 辣 辭 辭		
辤	E780 E790 E79E E7AE	迺 迹 酒 逮 迺 過 遐 遑 迺 遊 遙 逾 迺 遽 邁 邶	逕 遘 逍 逞 迺 適 逍 透 迺 適 遙 遲 邊 邁 邶 邶	汎 迸 囂 迢 迺 逋 逍 透 迺 適 遙 遲 邊 邁 邶 邶	迪 逃 邇 囂 達 達 逆 邇 遯 遷 隨 邇 遯 遷 隨 邇
邑	E7AE E7BE	鄒 鄙 鄱 鄴		邨	邯 邱 邵 鄢
酉	E7BE E7CE	醫 醴 酬 酿	酌 酉 酸 酉 醴 醴 酿 醉	酥 酥 酢 醒	醋 醉 酣 醐
采	E7CE			軹 釋	
里	E7CE			釐	
金	E7CE E7DE E7EE E83F E84F E85F E86F	釵 鈍 鈞 鈫 鉋 鈎 銜 鈤 鉔 鈜 銜 鈤 鎔 錠 鐘 鐘 鎔 錠 鐘 鐘 鑄 鐘 鐘 鐘 鑄 鐘 鐘 鐘	鈔 鈔 鈦 鈦 銓 銓 鈦 鈦 鎔 鎔 鈦 鈦 鑄 鑄 鈦 鈦 鑄 鑄 鈦 鈦 鑄 鑄 鈦 鈦 鑄 鑄 鈦 鈦	釤 鈦 鈦 鈦 鉤 鈦 鈦 鈦 鎔 鈦 鈦 鈦 鑄 鈦 鈦 鈦 鑄 鈦 鈦 鈦 鑄 鈦 鈦 鈦 鑄 鈦 鈦 鈦	釤 鈦 鈦 鈦 鉤 鈦 鈦 鈦 鎔 鈦 鈦 鈦 鑄 鈦 鈦 鈦 鑄 鈦 鈦 鈦 鑄 鈦 鈦 鈦 鑄 鈦 鈦 鈦
門	E86F E880 E890	閨 闔 關 闔 關 闔 闔 闔	閥 闔 闔 闔	閂 閂 閂 閂	閔 闊 闔 闊 闔 闊 闔 闔
阜	E890		阡 阖 阮 阤	陂 陌 隋 陋	陗 陝 陞

	Shift JIS	0 1 2 3	4 5 6 7	8 9 A B	C D E F
阜	E89E	陁 陟 𠂇	陲 𠂆 隍 𩙃	隕 𩙃 險 𩙃	隱 𩙃 𩙃 𩙃
隶	E8AE	隶			
隹	E8AE	隹 眎	雥 雉 雍 褵	雑 霍 雕	
雨	E8AE E8BE	霽 露 霖 霖	霧 雷 霆 霆	雹 霽 霦 霦	霄 霆 霢 霢 懿 靈 霊 霊
青	E8CE	靜			
非	E8CE	靠			
面	E8CE	靐 靗	靔		
革	E8CE E8DE	靑 鞘 鞄 鞍	勒 鞅 鞄 鞣 鞘 鞏 鞍	鞶 鞄 鞍 鞍	鞚 鞄 鞋 鞠
韋	E8DE			韋 韮	
韭	E8DE				韭 蒿 薺
音	E8DE E8EE	韶 韵			竟
貞	E8EE E93F	頑 頌 顱 頤 頸	頸 頤 頓 頤	頰 𩙃 𩙃 𩙃	顛 𩙃 𩙃 𩙃
風	E93F		嵐 鳳 颱 鳳	飄 飆 飄	
食	E93F E94F E95F	餉 餘 餡 餡 饑 饫 饪 饪	餻 飲 餅 館	餉 饫 餡 餡	餕 餃 餉 饋 饉 饅 饩 饋
首	E95F		馗		
香	E95F		馥		
馬	E95F E96F E980	駭 駱 駒 駝 驃 駕 駒 駝	駿 駢 駒 駒 駿 駢 駒 駒	馭 駒 駒 駒 駢 駢 駒 駒	駝 駘 驚 駭 驅 駢 驚 駧
骨	E980 E990	骹 骸 骸 骸			骹 骸 骸 骸
高	E990		謾		
影	E990 E99E	鬱 鬚 鬚	鬱 鬚 鬚 鬚	髦 鬚 鬚 鬚	髦 鬚 鬚
鬥	E99E			鬥 鬥 鬥 鬥	鬪 鬥
鬯	E99E				鬯
鬲	E99E				鬲
鬼	E9AE	魄 魔 魏 魑	魖 魔 魏 魑		

	Shift JIS	0 1 2 3	4 5 6 7	8 9 A B	C D E F
魚	E9AE E9BE E9CE E9DE	鰈 鯡 鯊 鯫 鰆 鯔 鯷 鯮 鯵 鯪 鯷 鯮 鰉 鯩 鯵 鯮	鮎 鰐 鰕 鰏	鮀 鮒 鮀 鮀	鮓 鮻 鮀 鮀
鳥	E9DE E9EE EA3F EA4F EA5F	鳶 鸠 鴟 鴛 鵝 鴛 鴦 鴨 鶴 鶴 鶴 鶴 鸚 鳞 鳞 鳞	鳩 鴟 鴗 鴕	鳬 鴿 鴕 鴕	鳩 鴞 鴖 鴖
齒	EA5F	齒	鹹	鹽	
鹿	EA5F		麅	塵	麋
麥	EA5F EA6F	麌 麴 麘			麌
麻	EA6F	靡			
黃	EA6F		穧		
黍	EA6F		黎	黏 粕	
黑	EA6F EA80	黴 黩 黢		黔 黜 點 黥	黠 黛 黚
黹	EA80	黹	黻	黼	
鼈	EA80		鼈	鼈	
敲	EA80			敲	
鼠	EA80			尗	鼈
鼻	EA80				鼾
齊	EA80				齊
齒	EA80 EA90	齧 齙 齇 齋	齡 齑 齒 齇	齦 齑 齒 齇	齒
龍	EA90				龕
龜	EA90				龜
龠	EA90				龠

10.7 2D code

DataMatrix (ECC200)

ESC+2D50

Hexadecimal code	ESC <1B> ₁₆	2D50 <32> ₁₆ <44> ₁₆ <35> ₁₆ <30> ₁₆	Parameter ,aa,bb,ccc,ddd
Initial value	Nil		

Valid range and term of command	When the power switch is OFF	The set parameter is not maintained.
	Valid range within items	The set parameter becomes invalid.
	Valid range between items	The set parameter becomes invalid.

[Function]

Specifying DataMatrix Code (ECC200).

[Format] (Setup part)

<2D50>,aa,bb,ccc,ddd

● Parameter

a [Horizontal cell size]	= Valid Range	:	01 to 99 dots
b [Vertical cell size]	= Valid Range	:	01 to 99 dots
c [Number of cell in one line]	= Valid Range	:	010 to 144 000 : (Auto-setting)
d [Number of cell lines]	= Valid Range	:	008 to 144 000 : (Auto-setting)

[Format] (Data part)

<DN>mmmm,n~n

● Parameter

m [Number of data]	= Valid Range	:	1 to 3116
n [Print data]	= Data	:	

*When print 7EH, specify "7EH, 7EH"

*If Parameter other than above is specified or print data don't match, print is not secured.

[Coding Example] Horizontal cell size: 3 dots, Vertical cell size: 3 dots

```
<A>
<V>100<H>200<2D50>03,03,000,000
<DN>0010, 0123456789
<Z>
```

[Supplementary Explanation]

- If Parameter other than above is specified or print data don't match, print is not executed
- When specifying print format, secure more than 2mm blank space in for sides of the DataMatrix for read margin for the scanner.
- When print data is 7EH, specify "7EH, 7EH" Number of data will be "0002".
- When Auto setup (000) is applied for [Number of cell in one row] and [Number of cell lines], square DataMatrix is printed

Data format	Data format	Number of data
	Numeric	3116
	Alphanumeric	2335
	Binary (00H to FFH)	1556

*Symbol size of DataMatrix (ECC200) is following 30 types.

Symbol size and number of data of DataMatrix (ECC200)

Number of cell in one line(c)	Symbol size		Maximum data digits		
	Number of cell line(d)	Number of block	Numeric	Alphanumeric	Briary
10	10	1	6	3	1
12	12	1	10	6	3
14	14	1	16	10	6
16	16	1	24	16	10
18	18	1	36	25	16
20	20	1	44	31	20
22	22	1	60	43	28
24	24	1	72	52	34
26	26	1	88	64	42
32	32	4	124	91	60
36	36	4	172	127	84
40	40	4	228	169	112
44	44	4	288	214	142
48	48	4	348	259	172
52	52	4	408	304	202
64	64	16	560	418	278
72	72	16	736	550	366
80	80	16	912	682	454
88	88	16	1152	862	574
96	96	16	1392	1042	694
104	104	16	1632	1222	814
120	120	36	2100	1573	1048
132	132	36	2608	1954	1302
144	144	36	3116	2335	1556
18	8	1	10	6	3
32	8	2	20	13	8
26	12	1	32	22	14
36	12	2	44	31	20
36	16	2	64	46	30
48	16	2	98	72	47

*Mixture of Numeric, Alphanumeric and Control code varies according to number of characters.

DataMatrix Code table

	S I								S O										
B8	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1			
B7	0	0	0	0	1	1	1	1	0	0	0	0	1	1	1	1			
B6	0	0	1	1	0	0	1	1	0	0	1	1	0	0	1	1			
B5	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1			
B4	B3	B2	B1	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0	0	0	0	0	0	SP	0	@	P	`	p								
0	0	0	1	1		!	1	A	Q	a	q								
0	0	1	0	2		"	2	B	R	b	r								
0	0	1	1	3		#	3	C	S	c	s								
0	1	0	0	4		\$	4	D	T	d	t								
0	1	0	1	5		%	5	E	U	e	u								
0	1	1	0	6		&	6	F	V	f	v								
0	1	1	1	7		,	7	G	W	g	w								
1	0	0	0	8		(8	H	X	h	x								
1	0	0	1	9)	9	I	Y	i	y								
1	0	1	0	A		*	:	J	Z	j	z								
1	0	1	1	B		+	;	K	[k	{								
1	1	0	0	C		,	<	L	¥	I									
1	1	0	1	D		-	=	M]	m	}								
1	1	1	0	E		.	>	N	^	n	~								
1	1	1	1	F		/	?	O	—	o	DEL								

*DataMatrix can specify from 00H to ~FFH.

When print 7EH, specify"7EH, 7EH".

10.8 2D code

GS1 DataMatrix

ESC+2D51

Hexadecimal code	ESC <1B> ₁₆	2D51 <32> ₁₆ <44> ₁₆ <35> ₁₆ <31> ₁₆	Parameter ,aa,bb,ccc,ddd
Initial value	Nil		

Valid range and term of command	When the power switch is OFF	The set parameter is not maintained.
	Valid range within items	The set parameter becomes invalid.
	Valid range between items	The set parameter becomes invalid.

[Function]

Specifying GS1 DataMatrix Code.

[Format] (Setup part)

<2D51>,aa,bb,ccc,ddd

● Parameter

a [Horizontal cell size]	=	Valid Range	:	01 to 99 dots
b [Vertical cell size]	=	Valid Range	:	01 to 99 dots
c [Number of cell in one line]	=	Valid Range	:	010 to 144 000 : (Auto-setting)
d [Number of cell lines]	=	Valid Range	:	008 to 144 000 : (Auto-setting)

[Format] (Data part)

<DN>mmmm,n~n

● Parameter

m [Number of data]	=	Valid Range	:	1 to 3116
n [Print data]	=	Data		

*When print 7EH, specify [7EH, 7EH]

*When print 1BH, specify [1BH, 1BH].

*When print FNC1, specify ["1BH, 31H].

*If Parameter other than above is specified or print data don't match, print is not secured.

[Coding Example] Horizontal cell size: 3 dots, Vertical cell size: 3 dots

<A>
<V>100<H>200<2D51>,03,03,000,000
<DN>0014, <1B>₁₆1100123456789
<Z>

*<1B>₁₆ specify character code "1BH".

[Supplementary Explanation]

- If Parameter other than above is specified or print data don't match, print is not executed.
- When specifying print format, secure more than 2 mm blank space in for sides of the DataMatrix for read margin for the scanner.
- When print data is 7EH, specify [7EH, 7EH]. Number of data will be "0002".
- When [7EH] is specified solely, the command error occurs and the code will not be printed.
- When print data is 1BH, specify [1BH, 1BH]. Number of data will be "0002".
- When print data is FNC1, specify [1BH, 31H]. Number of data will be "0002".
- When [7EH] is specified solely, the command error occurs and the code will not be printed.
- When Auto setup (000) is applied for [Number of cell in one row] and [Number of cell lines], square DataMatrix is printed
- When the same value other than 000 is specified (manual setting) in the "number of cell per 1 line" and "cell lines", square DataMatrix will be printed.
- When different value other than 000 is specified (manual setting) in the "number of cell per 1 line" and "cell lines", rectangle DataMatrix will be printed.

11. The number of data can be specified in the data part depends on the data format. Available data number is as follows.
(Number of cell is auto setting or the maximum cell number is specified):

	Data format	Number of data
Data format	Numeric	3116
	Alphanumeric	2335
	Binary (00H to FFH)	1556

12. The symbol may not be read by a scanner when the cell size is smaller. In the above case, specify enough cell size for the scanner.
13. The symbol size available in the GS1 DataMatrix is limited to the 30 types in the below table. Also, the maximum number of data is limited depending on the symbol size. Refer to the "The maximum digit of the number of data" table.
14. Make sure to specify 1BH and 31H at the beginning of the data.

Symbol size and number of data of GS1 DataMatrix.

Number of cell in one line(c)	Symbol size		Maximum data digits		
	Number of cell line(d)	Number of block	Numeric	Alphanumeric	Briary
10	10	1	6	3	1
12	12	1	10	6	3
14	14	1	16	10	6
16	16	1	24	16	10
18	18	1	36	25	16
20	20	1	44	31	20
22	22	1	60	43	28
24	24	1	72	52	34
26	26	1	88	64	42
32	32	4	124	91	60
36	36	4	172	127	84
40	40	4	228	169	112
44	44	4	288	214	142
48	48	4	348	259	172
52	52	4	408	304	202
64	64	16	560	418	278
72	72	16	736	550	366
80	80	16	912	682	454
88	88	16	1152	862	574
96	96	16	1392	1042	694
104	104	16	1632	1222	814
120	120	36	2100	1573	1048
132	132	36	2608	1954	1302
144	144	36	3116	2335	1556
18	8	1	10	6	3
32	8	2	20	13	8
26	12	1	32	22	14
36	12	2	44	31	20
36	16	2	64	46	30
48	16	2	98	72	47

*Mixture of Numeric, Alphanumeric and Control code varies according to number of characters.

GS1 DataMatrix Code table

	S I								S O										
B8	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1			
B7	0	0	0	0	1	1	1	1	0	0	0	0	1	1	1	1			
B6	0	0	1	1	0	0	1	1	0	0	1	1	0	0	1	1			
B5	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1			
B4	B3	B2	B1	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0	0	0	0	0				SP	0	@	P	`	p						
0	0	0	1	1				!	1	A	Q	a	q						
0	0	1	0	2				"	2	B	R	b	r						
0	0	1	1	3				#	3	C	S	c	s						
0	1	0	0	4				\$	4	D	T	d	t						
0	1	0	1	5				%	5	E	U	e	u						
0	1	1	0	6				&	6	F	V	f	v						
0	1	1	1	7				,	7	G	W	g	w						
1	0	0	0	8				(8	H	X	h	x						
1	0	0	1	9)	9	I	Y	i	y						
1	0	1	0	A				*	:	J	Z	j	z						
1	0	1	1	B				+	;	K	[k	{						
1	1	0	0	C				,	<	L	¥	l							
1	1	0	1	D				-	=	M]	m	}						
1	1	1	0	E				.	>	N	^	n	~						
1	1	1	1	F				/	?	O	—	o	DEL						

	Data n	Data n+1
FNC1	1BH	31H

GS1 DataMatrix can specify from 00H to FFH.

When print data is 7EH, specify [7EH, 7EH].

When print data is 1BH, specify [1BH, 1BH].

When specifying FNC1, specify [1BH, 31H].

10.9 2D code

Aztec 2D code

ESC+2D70

Hexadecimal code	ESC	2D70	Parameter <1B>16 <32>16<44>16<37>16<30>16 ,a,bb,cc,dd,e,f~f
Initial value	Nil		

Valid range and term of command	When the power switch is OFF	The set parameter is not maintained.
	Valid range within items	The set parameter becomes invalid.
	Valid range between items	The set parameter becomes invalid.

[Function]

Specifies Aztec Code.

[Format] (Setting Portion)

<2D70>,a,bb,cc,dd,e,f~f

•Parameter

a [Symbol Type]	=	0 : Full Range Symbol 1 : Compact Symbol
b [ECC Percentage]	=	0 : Default error correction level 01 to 99 : Error correction percentage
c [Symbol Size]	=	0 : Automatic minimization 1 to 4 : 1 to 4 – layer (Compact Symbol) *1 4 to 32 : 4 to 32 – layer (Full Range Symbol) *1 *1 : Following symbol size table reference.
d [Number of symbols for structured append]	=	0 : Encodes without append 1 : Automatic Setting 2~26 : Append structured blocks
e [Message ID]	=	Y : Specify Message ID for structured bound symbol N : No Message ID
f [Message ID for structured bound symbol]	=	Printable ASCII string (0x21~0x7E) with maximum 24 bytes.

[Format] (Data part)

<DS>n~n // for ASCII data
<DN>mmmm, n~n // for Binary data

•Parameter

m [Number of Data]	=	0001 to 1914
- Set this parameter when Print data are in Binary.		

n [Print data]	=	Data
- When selecting [1BH], make sure to specify [1BH,1BH].		
- When selecting [FNC1], make sure to specify [1BH,30H]		
- When selecting [ECI], make sure to specify [1BH,*]. (* refers from 31H to 36H.)		

•Generated Label



[Notes]

- When parameters other than the description are specified, symbol may not print.
- When the size of the Aztec code is small, the symbol might not be able to read according to the performance of the scanner. In that case, please magnify the size of the symbol to make it large enough by using <ESC>L command maintaining the same ratio of magnification for both length and width.
- The smallest symbol size is 15x15 modules and largest is 151x151 modules. Available Aztec code formats and its maximum capacity are as follows:

Symbol size table

Parameter c	Format	Digit	Text	Binary data
1	15x15 Compact	13	12	6
2	19x19 Compact	40	33	19
3	23X23 Compact	70	57	33
4	27X27 Compact	110	89	53
4	31X31	128	104	62
5	37X37	178	144	87
6	41X41	232	187	114
7	45X45	294	236	145
8	49X49	362	291	179
9	53X53	433	348	214
10	57X57	516	414	256
11	61X61	601	482	298
12	67X67	691	554	343
13	71X71	793	636	394
14	75X75	896	718	446
15	79X79	1008	808	502
16	83X83	1123	900	559
17	87X87	1246	998	621
18	91X91	1378	1104	687
19	95X95	1511	1210	753
20	101X101	1653	1324	824
21	105X105	1801	1442	898
22	109X109	1956	1566	976
23	113X113	2116	1694	1056
24	117X117	2281	1826	1138
25	121X121	2452	1963	1224
26	125X125	2632	2107	1314
27	131X131	2818	2256	1407
28	135X135	3007	2407	1501
29	139X139	3205	2565	1600
30	143X143	3409	2728	1702
31	147X147	3616	2894	1806
32	151X151	3832	3067	1914

4. Aztec code is settable within the range (00H – FFH).
For Binary data, user needs to set the data number properly by using the <ESC>DN command. If Data number and Print data doesn't match, symbol will not print properly.
5. When print data is [1BH], specify [1BH,1BH]. Data number becomes [0002].
6. Use [1BH,*] in pairs within input data when presenting ECI . '*' must be a value between 31H and 36H. The number in the following FLG(1) - FLG(6) are the number of digits of the data to be used for ECI.

<ESC>1→FLG(1) The number of digits specified for ECI data is 1 digit.
 <ESC>2→FLG(2) The number of digits specified for ECI data is 2 digits.
 <ESC>3→FLG(3) The number of digits specified for ECI data is 3 digits.
 <ESC>4→FLG(4) The number of digits specified for ECI data is 4 digits.
 <ESC>5→FLG(5) The number of digits specified for ECI data is 5 digits.
 <ESC>6→FLG(6) The number of digits specified for ECI data is 6 digits.

e.g.) A sample data with <ESC>4 : <ESC>41111ABCDE

The scanned data when <ESC>4 will be "¥001111ABCDE" (¥ may differ depending on scanner settings).

- 1) <ESC>4 means FLG(4). The succeeding "1111"(4 digits) will be treated as ECI data.
- 2) Since it is short by 2 digits, 0 is padded in the beginning to make it "¥001111".
7. The message ID is enabled only when it is separated to print after automatic setting with "Number of symbols for structured append" with specifying "Append structured blocks".

Aztec Code Table

	S I								S O							
b8	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1
b7	0	0	0	0	1	1	1	1	0	0	0	0	1	1	1	1
b6	0	0	1	1	0	0	1	1	0	0	1	1	0	0	1	1
b5	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1
B4 b3 b2 b1	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0 0 0 0	0			SP	0	@	P	`	p							
0 0 0 1	1			!	1	A	Q	a	q							
0 0 1 0	2			"	2	B	R	b	r							
0 0 1 1	3			#	3	C	S	c	s							
0 1 0 0	4			\$	4	D	T	d	t							
0 1 0 1	5			%	5	E	U	e	u							
0 1 1 0	6			&	6	F	V	f	v							
0 1 1 1	7			,	7	G	W	g	w							
1 0 0 0	8			(8	H	X	h	x							
1 0 0 1	9)	9	I	Y	i	y							
1 0 1 0	A			*	:	J	Z	j	z							
1 0 1 1	B			+	;	K	[k	{							
1 1 0 0	C			,	<	L	\	l	l							
1 1 0 1	D			-	=	M]	m	}							
1 1 1 0	E			.	>	N	^	n	~							
1 1 1 1	F			/	?	O	_	o	DEL							

	Data n	Data n+1
FNC1	1BH	30H
ECI	1BH	30H to 36H

Aztec code is settable within the range (00H – FFH).

To set 1BH, specify [1BH,1BH]

To set FNC1, specify [1BH, 30H].

To set ECI, specify [1BH, *]. (* refer from 31H to 36H.)

10.10 2D code

QR Code(Compatible Commands)

ESC+BQ

Hexadecimal code	ESC <1B> ₁₆	BQ <42> ₁₆ <51> ₁₆	Parameter Manual setupabcc,(ddeeff,)g(hhhh)n Auto setup abcc,(ddeeff,)gn
Initial value	Nil		

Valid range and term of command	When the power switch is OFF	The set parameter is not maintained.
	Valid range within items	The set parameter becomes invalid.
	Valid range between items	The set parameter becomes invalid.

[Function]

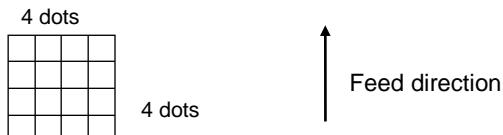
Specifying QR code.

[Format]

[Manual setup] <BQ>abcc,(ddeeff,)g(hhhh)n
[Auto setup] <BQ>abcc,(ddeeff,)0n

• Parameter

a [Error correction level]	=	1 : 7% High density level (L)
	=	2 : 15% Standard level (M)
	=	3 : 30% High reliability level (H)
	=	4 : 15% High reliability level (Q)
b [Concatenation mode]	=	0 : Normal mode
	=	1 : Concatenation mode
c [Size of one side of cell]	=	Valid Range: 01 to 99(dot) e.g.)cc=04



d [No. of partitions by concatenation mode]	=	Valid range : 01 to 16
e [Sequential number partitioned by concatenation mode]	=	Valid range : 01 to 16
f [Concatenation mode parity data]	=	Valid range : 00 to FF
g [Character mode]	=	0 : Auto setup mode 1 : Number mode 2 : Alphanumeric mode 3 : Binary mode 4 : Kanji mode
h [No. of data]	=	Valid range : 0001 to 7366 (dot)
n [Print data]	=	Data

[Coding Example] Error correction level: 30%, Concatenation mode: Normal, Size of one side of cell: 10

<A>
<V>100<H>200<BQ>3010,112345
<Q>2
<Z>

[Supplementary Explanation]

- Carry out XOR logic operation of all the partitioned print data of the QR code and then, specify this operation data in hexadecimal character. This is what we call [Parity data].
- When character mode is set to other than binary mode, it is not necessary to set data number parameter.
- This command is for existing models. Using <2D31> is recommended.

QR Code data size list (Model 1)

Version	Error Correction	Numeric	Alpha-Numeric	Kanji	Binary
1 21X21	L	40	24	10	17
	M	33	20	8	14
	Q	25	15	6	11
	H	16	10	4	7
2 25X25	L	81	49	20	34
	M	66	40	17	28
	Q	52	31	13	22
	H	33	20	8	14
3 29X29	L	131	79	33	55
	M	100	60	25	42
	Q	81	49	20	34
	H	52	31	13	22
4 33X33	L	186	113	48	78
	M	138	84	35	58
	Q	114	69	29	48
	H	76	46	19	32
5 37X37	L	253	154	65	106
	M	191	116	49	80
	Q	157	95	40	66
	H	105	63	27	44
6 41X41	L	321	194	82	134
	M	249	151	64	104
	Q	201	122	51	84
	H	133	81	34	56
7 45X45	L	402	244	103	168
	M	311	188	80	130
	Q	253	154	65	106
	H	167	101	43	70
8 49X49	L	493	299	126	206
	M	378	229	97	158
	Q	301	183	77	126
	H	203	123	52	85
9 53X53	L	585	354	150	244
	M	441	267	113	184
	Q	369	223	94	154
	H	239	145	61	100
10 57X57	L	690	418	177	287
	M	526	319	135	219
	Q	433	262	111	180
	H	291	176	74	121

Version	Error Correction	Numeric	Alpha-Numeric	Kanji	Binary
11 61X61	L	800	485	205	333
	M	608	368	156	253
	Q	493	299	126	205
	H	342	207	87	142
12 65X65	L	915	555	234	381
	M	694	421	178	289
	Q	579	351	148	241
	H	390	236	100	162
13 69X69	L	1030	624	264	429
	M	790	479	202	329
	Q	656	398	168	273
	H	454	275	116	189
14 73X73	L	1167	707	299	486
	M	877	531	225	365
	Q	738	447	189	307
	H	498	302	127	207

QR Code (Numeric mode) Code table

	SI										SO									
B8	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1	1	1	1	1
B7	0	0	0	0	1	1	1	1	0	0	0	0	1	1	1	1	1	1	1	1
B6	0	0	1	1	0	0	1	1	0	0	1	1	0	0	1	1	0	0	1	1
B5	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1
B4	B3	B2	B1		0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0	0	0	0	0					0											
0	0	0	1	1					1											
0	0	1	0	2					2											
0	0	1	1	3					3											
0	1	0	0	4					4											
0	1	0	1	5					5											
0	1	1	0	6					6											
0	1	1	1	7					7											
1	0	0	0	8					8											
1	0	0	1	9					9											
1	0	1	0	A																
1	0	1	1	B																
1	1	0	0	C																
1	1	0	1	D																
1	1	1	0	E																
1	1	1	1	F																

QR Code (Alphanumeric mode) Code table

	S I								S O							
B8	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1
B7	0	0	0	0	1	1	1	1	0	0	0	0	1	1	1	1
B6	0	0	1	1	0	0	1	1	0	0	1	1	0	0	1	1
B5	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1
B4 B3 B2 B1	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0 0 0 0 0		SP	0		P											
0 0 0 1 1				1	A	Q										
0 0 1 0 2				2	B	R										
0 0 1 1 3				3	C	S										
0 1 0 0 4			\$	4	D	T										
0 1 0 1 5			%	5	E	U										
0 1 1 0 6				6	F	V										
0 1 1 1 7				7	G	W										
1 0 0 0 8				8	H	X										
1 0 0 1 9				9	I	Y										
1 0 1 0 A			*	:	J	Z										
1 0 1 1 B			+		K											
1 1 0 0 C					L											
1 1 0 1 D			-		M											
1 1 1 0 E			.		N											
1 1 1 1 F			/	O												

QR Code (Binary mode) Code table

	S I								S O							
B8	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1
B7	0	0	0	0	1	1	1	1	0	0	0	0	1	1	1	1
B6	0	0	1	1	0	0	1	1	0	0	1	1	0	0	1	1
B5	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1
B4 B3 B2 B1	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0 0 0 0 0			SP	0	@	P	`	p								
0 0 0 1 1			!	1	A	Q	a	q								
0 0 1 0 2			"	2	B	R	b	r								
0 0 1 1 3			#	3	C	S	c	s								
0 1 0 0 4			\$	4	D	T	d	t								
0 1 0 1 5			%	5	E	U	e	u								
0 1 1 0 6			&	6	F	V	f	v								
0 1 1 1 7			'	7	G	W	g	w								
1 0 0 0 8			(8	H	X	h	x								
1 0 0 1 9)	9	I	Y	i	y								
1 0 1 0 A			*	:	J	Z	j	z								
1 0 1 1 B			+	;	K	[k	{								
1 1 0 0 C			,	<	L	\	l									
1 1 0 1 D			-	=	M]	m	}								
1 1 1 0 E			.	>	N	^	n	-								
1 1 1 1 F			/	?	O	_	o	DEL								

QR Code can specify from 00H to 7FH, and from A0H to DFH.

QR Code (Kanji mode) Code table

	Shift JIS	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
記号	813F	SP	'	.	.	,	.	.	:	;	?	!	``	.	'	`	..
	814F	^	—	—	、	、	、	、	、	全	々	〆	○	—	—	-	/
	815F	＼	～	//		…	…	‘	‘	“	”	()	[]	[]
	816F	{ }	<	>	《 》	「 」	『 』	【 】	+ —	+	—	±	×	+	—	±	×
	8180	÷	=	≠	<	>	≤	≥	∞	∴	♂	♀	°	,	”	°C	¥
	8190	\$	¢	฿	%	#	&	*	@	§	☆	★	○	●	◎	◇	
	819E	◆	□	■	△	▲	▽	▼	※	〒	→	←	↑	↓	=		
英・数字	824F	0	1	2	3	4	5	6	7	8	9						
	825F	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	
	826F	P	Q	R	S	T	U	V	W	X	Y	Z					
	8280	a	b	c	d	e	f	g	h	i	j	k	l	m	n	o	
	8290	p	q	r	s	t	u	v	w	x	y	z					
ひらがな	829E	あ	あ	い	い	う	う	え	え	お	お	か	が	き	ぎ	く	
	82AE	ぐ	け	げ	こ	ご	さ	ざ	し	じ	す	せ	ぜ	そ	ぞ	た	
	82BE	だ	ち	ぢ	っ	つ	づ	て	で	と	ど	な	ぬ	ね	の	は	
	82CE	ば	ぱ	ひ	び	ぴ	ふ	ぶ	ぶ	へ	べ	ペ	ぼ	ぼ	ぽ	ま	み
	82DE	む	め	も	や	や	ゆ	ゆ	よ	よ	ら	り	れ	ろ	わ	わ	
	82EE	ゐ	ゑ	ゑ	ん												
カタカナ	833F	ア	ア	イ	イ	ウ	ウ	エ	エ	オ	オ	カ	ガ	キ	ギ	ク	タ
	834F	グ	ケ	ゲ	コ	ゴ	サ	ザ	シ	ジ	ス	ズ	セ	ゼ	ソ	ゾ	タ
	835F	ダ	チ	ヂ	ツ	ツ	ヅ	テ	デ	ト	ド	ナ	ニ	ヌ	ネ	ノ	ハ
	836F	バ	パ	ヒ	ビ	ピ	フ	ブ	ブ	ヘ	ベ	ペ	ホ	ボ	ボ	マ	ミ
	8380	ム	メ	モ	ヤ	ヤ	ユ	ユ	ヨ	ヨ	ラ	リ	ル	ロ	ロ	ワ	ワ
	8390	ヰ	ヱ	ヲ	ン	ヴ	カ	ケ									
ギリシア字	839E	Α	Β	Γ	Δ	Ε	Ζ	Η	Θ	Ι	Κ	Λ	Μ	Ν	Ξ	Ο	
	83AE	Π	Ρ	Σ	Τ	Υ	Φ	Χ	Ω								
	83BE	α	β	γ	δ	ε	ξ	η	θ	ι	κ	λ	μ	ν	ξ	ο	
	83CE	π	ρ	σ	τ	υ	φ	χ	ω								
ロシア文字	843F	А	Б	В	Г	Д	Е	Ё	Ж	З	И	Й	К	Л	М	Н	
	844F	О	П	Р	С	Т	У	Ф	Ц	Ч	Ш	Щ	Ђ	Ы	Ь	Э	
	845F	Ю	Я														
	846F	а	б	в	г	д	е	ё	ж	з	и	й	к	л	м	н	
	8480	о	п	р	с	т	у	ф	ц	ч	ш	щ	Ђ	ы	ь	э	
	8490	ю	я														

	Shift JIS	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
ア	889E	亞	哩	娃		阿	哀	愛	挨	始	逢	葵	茜	穉	惡	握	渥
	88AE	旭	葦	芦	鯵	梓	圧	幹	拔	宛	姐	虻	飴	絢	綾	鮎	或
	88BE	粟	裕	安	庵	按	暗	案	闇	鞍	杏						
イ	88BE											以	伊	位	依	偉	圍
	88CE	夷	委	威	尉	惟	意	慰	易	椅	為	異	維	移	緯	胃	逸
	88DE	萎	衣	謂	違	遺	医	井	亥	域	育	磯	壹	一	曆	溢	蔭
	88EE	稻	茨	芋	鰐	允	印	咽	員	因	姻	引	胤	淫			
	893F	院	陰	隱		韻	吺										
ウ	893F									右	宇	烏	羽	迂	雨	卯	鶲
	894F	碓	臼	渦	噓	唄	鬱	蔚	麌	姥	厩	廸	浦	瓜	鶴	噂	云
	895F	雲								鰐	麌	姥	廸	浦	瓜	卯	運
エ	895F									右	宇	鳥	羽	迂	雨	卯	鶲
	896F	桂	餌	叡		宮	嬰	影	映	曳	榮	永	泳	洩	瑛	盈	穎
	8980	穎	英	衛	詠	銳	液	疫	益	駅	悅	謁	越	閑	檉	厭	円
	8990	園	堰	奄	宴	延	怨	掩	援	沿	演	炎	焰	煙	燕	猿	緣
オ	8990									於	污	甥	凹	央	奥	往	応
	899E	押	旺	横	桶	欧	殴	王	翁	裸	鸶	鷗	鷗	黄	岡	沖	荻
	89AE	屋	憶	臆		牡	乙	俺	卸	恩	溫	穩	音				億
カ	89AE																
	89BE	伽	価	佳	加	可	嘉	夏	嫁	家	茄	寡	暇	下	果	仮	何
	89CE	火	珂	禍	禾	稼	箇	花	苛	荷	芽	華	菓	架	歌	貨	河
	89DE	迦	過	霞	蚊	俄	峨	我	牙	臥	芽	卉	荷	課	嘩	駕	駕
	89EE	介	會	解	回	塊	壞	廻	快	悔	恢	恢	蛾	雅	餓	駕	駕
	8A3F	魁	魄	晦	害	海	概	界	皆	芥	蟹	懷	懷	拐	改	効	蛙
	8A4F	外	柿	害	崖	慨	嚇	涯	碍	街	該	開	貝	馨	凱	馨	穎
	8A5F	垣	柿	赫	鈎	劃	嚇	各	廊	撈	核	鎧	涅	階	馨	穎	穎
	8A6F	覺	桺	赫	鈎	郭	閣	隔	革	岳	額	穎	穎	殼	獲	蛙	穎
	8A80	樞	桺	赫	鈎	割	閣	恰	括	岳	核	葛	穎	核	轄	穎	穎
	8A90	叶	桺	赫	鈎	株	喝	竚	蒲	岳	樂	鴨	穎	穎	轄	穎	穎
	8A9E	完	官	粥	刈	瓦	乾	侃	冠	活	樂	鴨	穎	穎	轄	穎	穎
	8AAE	汗	漢	潤	寬	幹	甘	感	釜	釜	樂	勸	穎	穎	轄	穎	穎
	8ABE	莞	觀	諫	灌	環	還	監	寒	刊	滑	茅	穎	穎	轄	穎	穎
	8ACE	巖	玩	癌	眼	岩	覩	間	憾	竿	噏	喚	穎	穎	轄	穎	穎
	8ADE																

	Shift JIS	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
ヰ	8ADE 8AEE 8B3F 8B4F 8B5F 8B6F 8B80 8B90 8B9E 8BAE 8BBE 8BCE 8BDE	基 奇 機 軌 祇 袞 黍 朽 巨 彊 鏡 勤 謹	嬉 帰 餓 驕 義 却 求 拒 供 怯 響 饗 凝 欣	寄 毅 騎 蹠 誼 腳 泣 汲 客 恐 驚 饗 競 教 凝 欣	岐 希 汽 龟 鞠 久 窮 距 凶 況 曉 琴	幾 幾 偽 菊 丘 究 許 共 橋 恭 驚 競 教 凝 欣	忌 祈 儀 儀 鞠 久 窮 距 凶 況 曉 琴	微 稀 宜 吃 休 級 漁 匡 狹 業 禁	既 稀 吉 仇 及 糾 禦 卿 矯 業 禁	徴 技 桔 吸 給 魚 叫 胸 曲 筋	企 机 紀 戲 喫 詰 弓 牛 享 境 興 桐 菌	伎 期 規 擬 橘 宮 旧 亨 喬 喬 喬 喬 喬 芹	危 棋 記 欺 詰 弓 牛 享 境 興 桐 菌	喜 棄 貴 犧 砧 急 去 京 峽 喬 喬 喬 喬 喬 芹	器 起 疑 杵 救 居 強 鄉 僅 襟		
ㇰ	8BDE 8BEE 8C3F 8C4F	駒 具 掘 薰	愚 窟 沓 群	虞 沓 軍	九 空 轡 郡	俱 偶 窪	句 寓 熊	区 遇 隈	狗 隅 条	玖 串 栗	矩 櫛 綠	苦 釧 桑	駆 屈 勲	駢	駢	君	
ㇱ	8C4F 8C5F 8C6F 8C80 8C90 8C9E 8CAE 8CBE	契 經 劇 僕 僕 鍵 言	形 繼 載 僕 僕 檢 諺	徑 繫 擊 激 僕 僕 限	惠 罝 激 兼 僕 僕 限	荅 荅 荅 傑 喧 研 驗	祁 揭 計 欠 圈 硯 嚴	祁 揭 計 欠 圈 硯 嚴	係 携 詣 決 堅 絹 幻	傾 敬 警 潔 嫌 県 弦	刑 景 輕 穴 建 肩 減	兄 桂 頸 結 憲 見 源	啓 溪 鷄 血 懸 謙 玄	圭 眭 芸 訣 拳 賢 現	珪 稽 迎 月 捲 軒 絃	型 系 鯨 件 遺 舷	
ㇷ	8CBE 8CCE 8CDE 8DEE 8D3F 8D4F 8D5F 8D6F 8D80	湖 伍 乞 弘 浩 腔 腔 項	狐 午 鯉 恒 港 膏 膏 香	糊 吳 交 恒 溝 航 航 高	乎 呉 交 恒 溝 航 航 鴻	袴 吾 伎 抗 抗 抗 抗 剛	古 胡 後 好 拘 拘 行 剛	呼 菰 御 倖 孔 攻 稿 講	固 虎 悟 光 孝 昂 糠 貢	姑 誇 梧 公 宏 晃 紅 購	孤 跨 檜 公 宏 晃 紅 購	己 鈷 瑚 功 更 紜 絞 郊	庫 雇 碁 勾 巷 校 綱 拓	弧 顧 語 厚 幸 梗 耕 礎	戸 鼓 誤 口 広 構 考 鋼	枯 互 翻 護 向 庚 江 肯 閣 克	

	Shift JIS	0 1 2 3	4 5 6 7	8 9 A B	C D E F
口	8D90	告 国 穀 酷	鵠 黑 獄 漚	腰 𩫔 忽 懶	骨 狲 迸 痘
	8D9E	此 頃 今	困 坤 墾	恨 憂 昏	根 根 混 痘
	8DAE	紺 良 魂			
才	8DAE		些	左 差 沙	鑰 鎖
	8DBE	裟 坐 座	佐 叉 唆	查 宰 妻	栽 在 削
	8DCE	歲 済 災	債 催 咳	際 嘉 妻	晒 賛
	8DDE	材 罪 財	碎 冥 墓	鸞 喬 喻	
	8DEE	昨 摧 摧	坂 墓 墓	冊 鮫 鮫	
	8E3F	察 摧 摧	柵 墓 墓	鮫 鯖 𩫔	
	8E4F	參 撒 撒	札 殘 殘	算 燭 燭	
	8E5F	暫 殘 殘			
シ	8E5F		仕 仔 刺	史 司 刺	始 止 誌
	8E6F		師 志 支	斯 詞 施	鹿 漆
	8E80		糸 紙 脂	視 時 持	赦 爵
	8E90		齒 事 脂	寺 時 辞	種 種
	8E9E		靈 痘 柔	自 時 悅	
	8EAE		宍 七 邪	嫉 射 約	
	8EBE		𠂇 兮 邪	舍 約 狩	
	8ECE		示 震 守	勾 狩 收	
	8EDE		叱 離 樹	朱 狩 收	
	8EEE		屢 驚 樹	需 狩 收	
	8F3F		蛇 取 醉	繕 狩 收	
	8F4F		取 授 醉	終 什 狩	
	8F5F		秀 集 醉	淑 淑 狩	
	8F6F		夙 处 醉	准 所 狩	
	8F80		舜 序 醉	恕 懈 狩	
	8F90		憲 曆 醉	所 懈 狩	
	8F9E		商 懈 醉	恕 犹 狩	
	8FAE		抄 烧 醉	昇 犹 狩	
	8FBF		燒 蕉 醉	省 証 狩	
	8FCE		𦵹 丈 醉	証 剩 狩	
	8FDE		𦵹 狹 醉	釀 食 狩	
	8FEE		𦵹 狹 醉	食 蝕 狩	
	903F		𦵹 狹 醉		

	Shift JIS	0 1 2 3	4 5 6 7	8 9 A B	C D E F
シ	904F 905F 906F	唇 娠 寢 審 神 秦 紳 臣 塵 王 尋 甚	心 慎 振 新 芯 薪 親 診 尽 腎 訊 迅	晋 森 棒 浸 身 辛 進 鈿 陣 鞠	深 中 疗 真 震 人 仁 刃
ス	906F 9080 9090 909E	逗 吹 垂 帥 瑞 體 崇 嵩 澄 摆 摺 寸	推 水 炊 睡 数 枢 趕 雛	筍 翠 衰 相 据 杉 楠 菅	須 醉 錐 囬 醉 頗 雀 锤 鍔
セ	909E 90AE 90BE 90CE 90DE 90EE 913F 914F	整 星 晴 樓 誓 請 逝 醒 石 積 籍 繢 窃 節 說 雪 扇 摆 桧 梅 前 織 羨 腺 善 漸 然	世 栖 青 脊 栖 正 靜 責 清 齊 赤 蝉 稅 賦 舌 漢 躰 先 潛 泉 蹟 碩 千 洗 切 先 潛 薦 占 千 煎 蘭 宣 践 賦 賦 旋 選 賦 賦	淒 制 盛 隻 生 生 脆 隻 精 隻 切 千 席 切 占 煎 惜 拙 占 煎 拙 宣 旋 選 宣 旋 選 選 鮮 選	征 声 戚 接 声 戲 摄 專 製 斥 捲 穿 斥 捲 尖 箭 析 摄 尖 箭 設 摄 尖 箭 戰 穿 錄 錄
ソ	914F 915F 916F 9180 9190 919E 91AE	狙 疏 疎 硏 双 叢 倉 喪 操 早 曹 巢 草 莊 葬 蒼 臓 賦 藏 贈 属 賊 族 繢	祖 租 粗 素 壯 奏 爽 宋 檜 槽 瘦 爪 藻 裝 走 燥 造 促 鐘 送 卒 帽 側 則 其 撃 存 則	增 組 層 亞 蘇 亞 争 霜 訴 惱 相 霜 惣 惱 相 霜 想 騷 捉 束 窓 騷 捉 束 騷 捉 束 損	措 曾 鼠 捜 糟 遡 僧 掃 總 像 創 插 總 像 搔 聰 測 遷 聰 遷 足 遷 俗 遷
タ	91AE 91BE 91CE 91DE 91EE 923F 924F 925F	太 汗 訏 唾 対 耐 岱 帶 退 逮 隊 黨 宅 托 拙 拓 叩 单 嘆 坦 丹 胆 蛋 誕 胆 蛋 誕 鍛	墮 妥 情 打 待 怠 態 戴 鯛 代 台 大 沢 灑 琢 託 辰 奪 脱 翌 担 探 旦 歎 団 壇 強 斷	柁 舵 桥 陀 替 泰 滯 豚 第 醍 題 鷹 鐸 濁 諦 茅 堅 潶 諦 簡 淡 湛 炭 短 暖 檻 炭 男	他 駄 腿 滯 体 苔 滯 豚 袋 潞 豚 簡 卓 僧 滯 簡 只 端 猴 簡 樽 猴 簡 谈 綻 簡 谈
チ	925F 926F 9280 9290	弛 恥 智 池 逐 秩 窒 茶 註 酣 鑄 駐	痴 稚 置 致 嫡 着 中 仲 樗 蒼 猪 芊 著 著 豈 芊	蜘 遲 馳 築 宙 忠 抽 築 著 贯 丁 昆 凋 贯 丁 昆	值 畜 竹 注 地 柱 竹 注 蓄 畜 竹 注 衷 畜 竹 注

	Shift JIS	0 1 2 3	4 5 6 7	8 9 A B	C D E F
チ	929E	帖 帳 庁	弔 張 彫 徵	懲 挑 暢 朝	潮 牒 町 眺
	92AE	聴 脹 腸 蝶	調 謔 超 跳	銚 長 頂 鳥	勅 摶 直 朕
	92BE	沈 珍 賈 鎮	陳		
ツ	92BE		津 墜 椎	槌 追 鎖 痛	通 塚 梅 捱
	92CE	槐 佃 漬 枯	辻 菦 綴 銬	椿 漬 坪 壺	嬬 紬 爪 吊
	92DE	釣 鶴			
テ	92DE	亭 低	停 偵 刹 貞	呈 堤 定 帝	底 庭 廷 弟
	92EE	梯 抵 挺 提	梯 汀 碇 祯	程 締 艇 訂	蹄 適 鑄 潑
	933F	邸 鄭 釘	鼎 泥 摘 擧	敵 滴 的 笛	遙 哲 頓
	934F	徹 撤 輻 送	鐵 典 填 天	展 店 添 纓	溺 貼 甜
	935F	点 伝 殿 澱	田 電		
ト	935F		兔 吐	堵 塗 妒 屠	斗 杜 渡
	936F	登 菁 賭 途	都 鍍 砥 砥	努 度 土 奴	倒 党 冬
	9380	凍 刀 唐 塔	塘 套 穴 島	嶼 悼 等 答	桃 積 棟
	9390	盜 淘 湯 潤	燈 燈 痘 痘	禱 逃 透 鐙	統 頭 謂
	939E	董 蕩 藩 藤	討 謄 洞 睫	童 脫 陶 道	騰 峰 鍔
	93AE	動 同 堂 導	憧 撞 洞 瞳	獨 諭 样 橡	匿 層 楪
	93BE	得 德 流 特	督 烦 篤 毒	敦 沁 豚 遣	突 楪 楪
	93CE	薦 苦 寅 西	靜 嶠 屯 惇	沌 沁 豚 遣	吞 曇 鈍
ナ	93DE	奈 那 内 乍	廻 蘭 謎 灘	捺 鍋 楷 馴	繩 瞞 南
	93EE	軟 難 汝			楠
ニ	93EE	二	尼 式 迹 匂	賑 肉 虹 甘	日 乳 入
	943F	如 尿 蕁	任 妊 忍 認		
ヌ	943F			濡	
ネ	943F	念 想 撚 燃	粘	襦 衤 寧	葱 猫 熱 年
ノ	944F	農 視 蚊	乃 酒 之	埜 囊 惱 濃	納 能 脳 膿
	945F				
ハ	945F		巴	波 派 琶 破	婆 罵 芭 馬
	946F	俳 廢 拝 排	把 播 霸 柏	背 肺 輩 配	倍 培 媒 梅
	9480	模 煤 狽 買	敗 杯 盃 牌	蠅 秤 紗 紮	伯 剥 博 拍
	9490	柏 泊 白 箔	壳 賠 陪 這	曝 漠 爆 紮	莫 駁 麦 發
	949E	函 畏 箱 硕	粕 舶 薄 迫	幡 肌 烟 鳥	八 鉢 半 反
	94AE	醜 髮 伐 罰	箸 肇 簾 閥	嘶 壽 煙 蛉	伴 判 半

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八	94BE	叛 帆 搬 斑	板 汗 汎 版	犯 班 畔 繁	般 蕃 販 範
	94CE	采 煩 頒 飯	挽 晚 番 盤	磐 蕃 蛮	
ヒ	94CE				卑 否 妃 庇
	94DE	彼 悲 扉 批	披 斐 比 泌	疲 皮 碑 秘	緋 罷 眉 肥
	94EE	誹 費 避 非	飛 樋 篪 備	尾 微 枇 昆	琵 美 筆 逼
	953F	鼻 鼻 栄 稗	匹 正 犀 彦	膝 菱 肘 强	票 筆 評 豹
	954F	桧 姫 暖 紐	百 謬 依 彪	標 水 魚 漂	表 濱 品 彪
	955F	廟 廟 描 痘	苗 錨 鈎 蒜	蛭 魚 品 檳	評 濱 彬
	956F	賓 頻 敏 瓶			貳 濱 貧
フ	956F				府 怖 扶 敷
	9580	斧 普 浮 父	不 符 腐 膚	埠 夫 賦 貧	阜 附 幅 侮
	9590	武 舞 菊 蕪	部 封 楓 風	譜 落 伏 物	復 分 吻 噴
	959E	福 福 腹 複	覆 淵 弗 紛	沸 仏 鮎	
	95AE	憤 扮 焚 舞	粉 糞 紛 雲	文 聞	吻 噴 墳
ヘ	95AE				兵 墙 幣 平
	95BE	弊 柄 並 蔽	閉 陞 米 頁	丙 壁 碧 併	別 警 蔑 篦
	95CE	偏 變 片 篇	編 迴 返 遍	僻 便 勉 婉	鞭
木	95CE				保 舖 鋪
	95DE	圃 捕 步 甫	補 輔 穂 募	墓 慕 戊 暮	簿 菩 做
	95EE	俸 包 呆 報	奉 宝 峰 嶠	崩 崩 袍 捧	方 朋 鋒
	963F	法 泡 烹 烹	砲 縫 胞 峯	萌 蓬 蜂 蜂	訪 豊 邦
	964F	飽 凤 鵬 乏	亡 傍 胞 峯	妨 帽 忘 忙	房 暴 望
	965F	棒 冒 紡 肪	膨 謂 貌 貿	鋒 防 忙 類	某 僕 卜
	966F	撲 朴 牧 瞞	穆 鈕 勃 貿	殆 堀 幌 奔	墨 本 凡
マ	9680	摩 磨 魔 麻	埋 妹 昧 枚	每 哩 模 幕	膜 枕 鮑 杓
	9690	鱈 样 亦 俣	又 抹 末 泡	迄 但 繭 疏	万 慢 滿
	969E	漫 蔓			
ミ	969E	味	未 魅 巳 箕	岬 密 蜜 湊	蓑 稔 脈 妙
	96AE	耗 民 眠			
ム	96AE	務	夢 無 牟 矛	霧 鶴 棕 婕	娘
メ	96AE				冥 名 命
	96BE	明 盟 迷 銘	鳴 姪 牝 滅	免 棉 綿 緬	面 麵
モ	96BE				摸 模
	96CE	茂 妄 孟 毛	猛 盲 網 耗	蒙 儲 木 默	目 杁 勿 餅

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モ	96DE	尤 戻 粉 貴	間 悶 紋 門	匂	
ヤ	96DE 96EE	矢 厄 役 約	薬 訳 躍 靖	也 治 夜 柳 蔽 鐧	爺 耶 野 弥
ユ	96EE 973F 974F	諭 輸 唯 涌 猶 獣 由	佑 優 勇 友 祐 裕 誘 遊	宥 幽 悠 憂 邑 郵 雄 融	愉 油 癒 揖 有 柚 湧 夕
ヨ	974F 975F 976F 9780	誉 輿 預 傭 熔 用 窯 羊 沃 浴 翼 翼	幼 妖 容 庸 耀 葉 蓉 要 淀	揚 摆 擁 曜 謡 踊 遙 陽	予 余 与 楊 樣 洋 欲 養 慾 抑
ラ	9780 9790	乱 卵 嵐 櫛	羅 螺 裸 濫 藍 蘭 覧	来 莱 賴 雷	洛 絡 落 酪
リ	9790 979E 97AE 97BE 97CE	痢 裏 裡 琉 留 硫 粒 寮 料 梁 涼 綠 倫 厘 林	里 離 陸 律 隆 竜 龍 侶 猶 療 瞭 棱 淋 煙 琳 臨	利 吏 履 李 率 立 蓬 掠 慮 旅 虜 了 糧 良 諒 遼 輪 隣 鱗 麟	梨 理 璃 溜 略 劉 流 両 亮 僚 両 凌 量 陵 領 力
ル	97CE 97DE	類			瑠 墨 淚 累
レ	97DE 97EE 983F	令 伶 例 齡 曆 歷 列 蓮 連 鍊	冷 励 嶺 怜 劣 烈 裂 廉 恋 憐 淚 煉	玲 礼 苛 鈴 恋 憐 淚 煉	隸 零 靈 麗 簾 練 聯
ロ	983F 984F 985F	樓 椰 浪 漏 論	呂 魯 櫓 爐 牢 狼 筆 老	賂 路 露 労 聾 蜈 還 六	婁 廊 弄 朗 麓 祿 肋 錄
ワ	985F 986F	倭 和 話 椀 湾 碗 腕	歪 賄 脇 惑	杵 驚 瓦 亘	鰐 詫 蕉 蕨

	Shift JIS	0 1 2 3	4 5 6 7	8 9 A B	C D E F
一	989E	式 丐 爪			
丨	989E		个 卌		
丶	989E			丶 丂	
丶	989E			丶 丂	
丶	989E			丶 丂	
乙	989E				亂
丶	989E 98AE	舒			丶 豫 事
二	98AE	式 于 亞	亟		
士	98AE		士 亢 京	毫 壴	
人	98AE 98BE 98CE 98DE 98EE 993F 994F	仞 仞 𠙴 价 佩 𠙴 𠙴 佯 俾 倚 𠙴 𠙴 偃 假 會 𠙴 僉 僥 𠙴 傳 儻 儻 𠙴 儻 儻 儻 𠙴 儻	𠙴 佚 估 佛 來 𠙴 𠙴 僦 倪 𠙴 𠙴 𠙴 修 𠙴 𠙴 𠙴 僕 𠙴 𠙴 𠙴 儻 𠙴 𠙴 𠙴 儻 𠙴 𠙴 𠙴	从 仍 尙 𠙴 𠙴 𠙴 ^𠙴 俟 𠙴 𠙴 𠙴 ^𠙴 𠙴 𠙴 𠙴 𠙴 ^𠙴 𠙴 𠙴 𠙴 𠙴 ^𠙴 𠙴 𠙴 𠙴 𠙴 ^𠙴 𠙴 𠙴 𠙴 𠙴 ^𠙴	仄 仆 𠙴 仗 侈 侏 𠙴 𠙴 ^𠙴 𠙴 𠙴 𠙴 𠙴 ^𠙴
儿	994F			儿 兮 兒	兌 免 競
入	995F	兩 犭			
八	995F	兮 羹			
匚	995F		匚 回 冊 冉	冏 胃 莽 冏	
匚	995F 996F	寫 幕			匚 冊 寸 家
丶	996F	丶 决	互 冲 冰 况	冽 涼 凉 凜	
几	996F 9980				几 處 𠙴 凭
匚	9980	匚 函			
刀	9980 9990 999E	刂 剔 剪 剗 剗 剔 剪 剗 剗 剔 剪 剗	刂 刨 剔 剗 剗 剔 剪 剗 剗 剔 剪 剗	刪 刮 剗 剣 剗 剔 剪 剗 剗 剔 剪 剗	刂 刮 剗 剣 剗 剔 剪 剗 剗 剔 剪 剗
力	999E 99AE	効 劯 劊 勸	効 券 効 劊	勗 勞 勤 勤	飭 勤 勤 勤
匚	99AE	匚 匚 匚	匚 匚 匚		
匕	99AE			匕	
匚	99AE			匚 匚 匚	匱 穎

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匚	99AE				匚 區
十	99BE	十 丂 丌 丄	卍 準		
ト	99BE		丂		
口	99BE		口	卮 郑 却 卷	
厂	99BE 99CE	廥 厥 厮			厂 扉 廁 厩
厶	99CE	厶	參 篆		
又	99CE		雙 叴	曼 變	
口	99CE 99DE 99EE 9A3F 9A4F 9A5F 9A6F 9A80 9A90	呀 听 吭 吼 呪 呬 咀 呥 𠂇 咤 咜 呗 喨 咩 嘬 呆 喟 萸 啟 啅 嗤 噴 嘔 啟 噫 噘 嘘 啟 嚙 噕 嘘 啟	吮 呐 吻 呴 咄 咏 呵 呴 𠂇 咸 咾 呴 哦 哕 咾 呴 售 喻 哱 呴 唧 喻 哱 呴 噪 喻 哱 呴 嚙 喻 哱 呴	叮 叻 叻 叻 呪 咏 呵 呴 𠂇 咒 咾 呴 哦 哕 咾 呴 售 喻 哱 呴 唧 喻 哱 呴 噪 喻 哱 呴 嚙 喻 哱 呴	叭 叻 叻 叻 𠂇 咏 呵 呴 哭 咏 呵 呴 唉 咏 呵 呴 嚎 咏 呵 呴 嚎 咏 呵 呴 喨 咏 呵 呴 嚙 咏 呵 呴
口	9A90 9A9E	圈 國 圉	圓 團 圖 圓	口 圈 圈 圈	圍 圍 圍 圍
土	9A9E 9AAE 9ABE 9ACE 9ADE	坵 垂 垈 坡 埒 聖 塹 坝 墅 壽 墣 墟 壠 壤 墛 墟	坵 埤 垈 垈 埒 墭 塹 塹 墅 墭 墛 墛 壠 墭 墛 墛	坏 坏 坏 坏 塈 塈 塈 塈 塈 塈 塈 塈 墮 墮 墮 墮	坎 坎 坎 坎 埣 埮 埮 埮 塈 塈 塈 塈 塈 塈 塈 塈
士	9ADE		壯	壺 壴 墉 壺	壽
夊	9ADE				夊
夊	9ADE				夊 夬
夕	9ADE				夊 夢 夥
大	9ADE 9AEE	天 本 夸 夾	奇 奕 契 奎	奚 奒 奢 奠	奥 奒 奒
女	9B3F 9B4F 9B5F 9B6F	奸 妲 妆 婆 娜 娠 娑 媽 嫣 嫣 嫣 嬢 嫣 嫣 嫣	佞 嬷 妲 姐 嫗 媪 媳 嫣 嫗 嫣 媳 嫣 嬢 媳 媳 嫣	姆 媳 姜 嫣 娶 媳 嫣 媚 嬢 媳 嫣 嫣 嬢 媳 媳 嫣	姪 姚 娥 娟 嫗 媚 嫣 嫣 嫗 媳 嫣 嫣 嫗 媳 媳 嫣

	Shift JIS	0 1 2 3	4 5 6 7	8 9 A B	C D E F
子	9B6F	子	孕 孛 孛 孢	孩 孩 孨 學	孝 孝 孝 孝
宀	9B6F 9B80 9B90	它 宀 辰 宛 寶	寇 雀 寔 眠	寤 實 寢 寞	寥 寫 寔 寶
寸	9B90	尅 將 專	對		
小	9B90		尔 尻		
尤	9B90		尤	尨	
尸	9B90 9B9E	屍 屏 扉	屬	尸 尹 屁	届 屍 局
山	9B9E 9BAE 9BBE 9BCE	峯 岷 峙 岘 峯 嶺 嶠 崔 嶮 嶠 嶠 嶠	峝 峒 峪 峽 峢 峥 峯 峪 嶮 嶠 嶠 嶠	屹 岌 峑 岔 嶺 嶠 嶠 峪 嶮 嶠 嶠 嶠	峩 峭 峙 峠 峩 嶠 峙 峠 峩 嶠 峙 峠
巛	9BCE				巛
工	9BDE	巫			
巳	9BDE	巳 卦			
巾	9BDE 9BEE	帗 帐 帔 帛	帗 帐 帔 帛	帶 帷 帐 帼	幘 幢 幢 幕
干	9BEE		升 并		
乚	9BEE		么 麽		
广	9BEE 9C3F	廖 廣 廝	厨 廬 廐 廐	广 库 廁 廂	廈 廐 廐
疋	9C3F				疋 迪
升	9C4F	升 弃 弋 羣	羣		
弋	9C4F		弋 弑		
弓	9C4F		弣	弩 弩 弩 弩	彈 弩 弩 弩
乚	9C5F	乚 象 彙 彙			
彑	9C5F		彑 彭		
彳	9C5F 9C6F	彳 徒 徒 徒	彳 徵	彳 徵 徵 徵	彳 徵 徵 徵
心	9C6F 9C80 9C90	忄 恬 恤 怎 恊 恒 恒 恒	忄 恤 恤 恤 忄 恤 恤 恤	忄 恤 恤 恤 忄 恤 恤 恤	忄 恤 恤 恤

	Shift JIS	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
心	9C9E	悄	悛	悖	惄	惄	惄	惄	惄	惄	惄	惄	惄	惄	惄	惄	惄
	9CAE	悵	惄	惄	惄	惄	惄	惄	惄	惄	惄	惄	惄	惄	惄	惄	惄
	9CBE	懲	惄	惄	惄	惄	惄	惄	惄	惄	惄	惄	惄	惄	惄	惄	惄
	9CCE	慚	惄	惄	惄	惄	惄	惄	惄	惄	惄	惄	惄	惄	惄	惄	惄
	9CDE	憮	惄	惄	惄	惄	惄	惄	惄	惄	惄	惄	惄	惄	惄	惄	惄
	9CEE	惄	惄	惄	惄	惄	惄	惄	惄	惄	惄	惄	惄	惄	惄	惄	惄
戈	9CEE	戛 戲 截				戩 戰 戲 截				戈 戊 戌				戌 羌 夏			
戸	9D3F									扁							
手	9D3F									扎 扯 扣 扒				扛 拏 拗 拏			
	9D4F	扠	抉	找	抒	抓	抖	拔	扒	扠	拗	𢃥	𢃥	拿	挈	拆	𢃥
	9D5F	拈	拜	拌	拊	拂	拇	抛	拉	格	拮	拱	𢃥	挂	挈	拯	𢃥
	9D6F	捐	挾	捍	搜	捏	掖	掎	掀	𢃥	捶	掣	𢃥	掉	捉	掻	𢃥
	9D80	捩	掾	揩	揀	揆	揣	揉	插	揶	揄	搖	𢃥	構	搓	搦	𢃥
	9D90	攝	搗	搘	搏	摧	擎	搏	𢃥	揶	撕	撓	𢃥	撩	撈	撓	𢃥
	9D9E	攬	據	擒	擅	擇	撻	擘	𢃥	擗	舉	撥	𢃥	擡	撈	擡	𢃥
	9DAE	攬	攜	擴	擲	擺	攀	操	𢃥	攜	攢	攤	𢃥	攬	攬	攬	𢃥
支	9DAE													支 文 放			
	9DBE	收	攸	畋	效	敖	敕	敍	敍	敞	敝	敲	數	斂	斃	斃	變
斗	9DBE																
	9DCE	斟 斷															
斤	9DCE	旆 旆 旆 旆				旆 旆 旆 旆											
方	9DCE																
无	9DCE									无				无			
日	9DCE													旱 果 春			
	9DDE	昃	旻	杳	昵	昶	昴	易	晏	暎	晉	晁	晞	晝	晤	皓	晨
	9DEE	熯	哲	晰	霏	暭	暎	暉	暉	暘	暎	暉	暉	暉	暉	暉	暉
	9E3F	暭	暭	暭	暭	暭	暭	暭	暭	暭	暭	暭	暭	暭	暭	暭	暭
曰	9E3F									曰 曜 曜 曜							
月	9E3F													朏 腴 莠 蒙			
	9E4F	朧 霸															
木	9E4F					朶	朶	朶	朶	朶	朶	朶	朶	朶	朶	朶	朶
	9E5F	朶	朶	朶	朶	朶	朶	朶	朶	朶	朶	朶	朶	朶	朶	朶	朶
	9E6F	朶	朶	朶	朶	朶	朶	朶	朶	朶	朶	朶	朶	朶	朶	朶	朶

	Shift JIS	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
木	9E80	梳	栴	梓	檉	档	桷	桺	梟	楨	梲	條	櫛	梃	櫓	柵	桴
	9E90	梵	枏	榦	禁	檼	槐	榦	槩	楻	棘	樞	櫈	樞	柶	棍	柶
	9E9E		椿	榢	檷	棕	櫻	椒	棗	楳	枷	梔	櫈	檸	柶	柶	柶
	9EAЕ	楥	櫟	榢	榆	檼	楷	楨	櫟	榦	楳	榩	櫈	檸	柶	柶	柶
	9EBE	榆	榢	榢	棟	榩	榢	榢	榢	榢	榢	榢	榢	榢	榢	榢	榢
	9ECE	楊	榢	槃	榢	榢	榢	榢	榢	榢	榢	榢	榢	榢	榢	榢	榢
	9EDE	槲	榢	榢	榢	榢	榢	榢	榢	榢	榢	榢	榢	榢	榢	榢	榢
	9EEE	楨	榢	榢	榢	榢	榢	榢	榢	榢	榢	榢	榢	榢	榢	榢	榢
	9F3F	櫟	榢	榢	榢	榢	榢	榢	榢	榢	榢	榢	榢	榢	榢	榢	榢
	9F4F	櫟	榢	榢	榢	榢	榢	榢	榢	榢	榢	榢	榢	榢	榢	榢	榢
欠	9F4F	歛 歲 歊 歟				歎 歲 歊 飲				歎 歲 歊 歐							
止	9F5F					歡 歸											
歹	9F5F					歹 死 歿 此				殃 殤 殤 殤				殮 殮 殮 殮			
殳	9F6F					殳 殆 殆 殆				殳 殆 殖 殈							
母	9F6F									母 穡							
毛	9F6F									耄 豪				耄 豪 豪 豪			
氏	9F80					氓											
气	9F80					气 氚 氕 氕											
水	9F80													氁 沢 沢 沢			
	9F90	汾	汨	沵	沒	沫	泄	浹	浹	氁	汙	汙	汙	汙	汙	汙	汙
	9F9E	汨	汨	汨	汨	汨	汨	汨	汨	汨	汨	汨	汨	汨	汨	汨	汨
	9FAE	冽	澆	涓	澁	澁	涙	涙	涙	涙	涙	涙	涙	涙	涙	涙	涙
	9FBE	澆	澆	澆	澆	澆	涙	涙	涙	涙	涙	涙	涙	涙	涙	涙	涙
	9FCE	涙	涙	涙	涙	涙	涙	涙	涙	涙	涙	涙	涙	涙	涙	涙	涙
	9FDE	滿	渝	游	游	游	渥	渥	渥	渥	渥	渥	渥	渥	渥	渥	渥
	9FEE	薄	漾	漓	漓	穎	渢	渢	渢	渢	渢	渢	渢	渢	渢	渢	渢
	E03F	澎	潘	濂	濂	濂	濬	濬	濬	濬	濬	濬	濬	濬	濬	濬	濬
	E04F	濱	濱	濱	濱	濱	濱	濱	濱	濱	濱	濱	濱	濱	濱	濱	濱
	E05F	瀾	瀾	瀾	瀾	瀾	瀾	瀾	瀾	瀾	瀾	瀾	瀾	瀾	瀾	瀾	瀾
	E06F																
火	E06F					炙 炒 炄 炅				烟 炬 炸 炅				炮 烟 併 烟			

	Shift JIS	0 1 2 3	4 5 6 7	8 9 A B	C D E F
火	E080 E090 E09E	熾 焉 烽 煙 熁 煙 熬 煙 燹 燋 煥 煥	焙 煥 熙 煦 熹 煥 烧 煦 爛 煥 煥 煥	煦 暝 煙 煖 燔 燎 煙 煖 燭 煥 煥 煥	煬 熏 煙 煖 燧 燹 煢 煖
爪	E09E			爭	爬 爰 爲
爻	E09E				爻 翟
爿	E09E EOAE	牘 牽			爿 牀 牆
牛	EOAE	牴 牮	犁 犁 牛 犂	犖 牽 牮 犕	
犬	EOAE EOBE EOCE	狎 犒 犑 犠 狃 犑 犑 犐 狃 犑 獎 犐	狡 狹 犐 梼 默 獐 獐 獐	猗 犐 猜 獵 磼 獐 獵 獵	狃 犔 犔 犔 狃 犔 獵 獵
王	EOCE EODE EOEE	玻 珀 珩 瑶 瑣 瑰 瑩 瑰	珞 瑰 琅 瑯 瑣 瑪 瑶 瑹	琥 琥 珀 瑕 璋 璞 璧 璞	珈 玳 玳 瑙 瑕 璇 瑟 瑙
瓜	E13F	瓠 瓣			
瓦	E13F E14F	甌	甌 甌 甌 甌	甌 甌 甌 甌	甌 甌 甌 甌
甘	E14F	嘗			
生	E14F		甦		
用	E14F		甬		
田	E14F E15F	畧 畫 畸 畴	畧 畵 畵 畴	畷 畵 畵 畵	畷 畵 畵 畵
𤤵	E15F E16F E180 E190 E19E	瘡 痘 痒 痘 瘡 痘 痒 痘 瘡 瘡 痒 瘡	瘡 痘 痒 痘 瘡 瘡 痒 瘡	疔 瘡 瘡 瘡	疚 瘡 瘡 瘡
火	E19E	火 癸	發		
白	E19E		皀 兒 𩱁	皀 𩱁 𩱁 𩱁	皀 𩱁
皮	E19E E1AE	皺 輝 鏺			皺
皿	E1AE	孟	盍 盖 盒 盞	盍 盞 盧 盪	盍
目	E1AE E1BE	眴 眩 眇 真	眴 眼 眇 眇	眴 眴 眴 眴	眴 眴 眴 眴

	Shift JIS	0 1 2 3	4 5 6 7	8 9 A B	C D E F
目	E1CE E1DE	睂 睹 瞔 瞢 瞞 瞴	瞑 瞔 瞞 瞢	瞇 瞔 瞔 瞔	瞖 瞔 瞔 瞔
矛	E1DE	矜			
矢	E1DE	矣	矮		
石	E1DE E1EE E23F	磈 磠 碉 碉 磧 磡 碉 碉 磧 磡 碉 碉	矼 砌 砥 礮 磦 磕 磕 礮 磺 磯 磯	礪 硏 磯 磯 礮 磠 磰 磰 礪 磠 磰 磰	碎 砲 磷 磻 磅 磤 磠 磠
示	E23F E24F	祕 祛 祺 祿 禊 禩 禧 禧	禊 禩 禧 禧	禪 禮 禩	祠 禗 禃 禩
禹	E24F				禹 禹
禾	E24F E25F E26F	秬 秩 穀 稂 穉 稽 穀 穀	稍 稒 植 稠 穊 穀 稔 穀	稟 稟 稱 稻	秉 稗 稅 穀 稟 稗 稅 穀
穴	E26F E280	竈 窃 竄 窜	穹 穹 穹 穹	窈 窓 穆 穆	審 窩 竈 穐
立	E280 E290	竦 竭 竦 竦	𠂇	𠂇 竚 竚 竚	𠂇 竚 竚 竚
竹	E290 E29E E2AE E2BE E2CE E2DE	筭 篙 篙 篙 箇 篙 篙 篙	筭 篗 篑 篯 筭 篗 篑 篯 筭 篗 篑 篯 筭 篗 篑 篯 筭 篗 篯 篯 筭 篗 篯 篯	筭 篗 篯 篯 筭 篗 篯 篯	笨 笮 篃 篃 箇 篃 篃 篃
米	E2DE E2EE	粧 粧 粧 粧 粧 粧 粧 粧	粧 粧 粧 粧	粧 粧 粧 粧	粲 粧 粧 粧
糸	E2EE E33F E34F E35F E36F E380 E390	紵 純 純 純 絳 累 累 累 絳 縷 縷 縷 緺 縷 縷 縷 緺 縷 縷 縷 緺 縷 縷 縷 緺 縷 縷 縷	紵 純 純 純 絳 累 累 累 絳 縷 縷 縷 緺 縷 縷 縷 緺 縷 縷 縷 緺 縷 縷 縷 緺 縷 縷 縷	紵 純 純 純 絳 累 累 累 絳 縷 縷 縷 緺 縷 縷 縷 緺 縷 縷 縷 緺 縷 縷 縷 緺 縷 縷 縷	糾 純 純 純 絳 累 累 累 絳 縷 縷 縷 緺 縷 縷 縷 緺 縷 縷 縷 緺 縷 縷 縷 緺 縷 縷 縷
缶	E390 E39E	罅 罂 罂 罂	罅 罂 罂 罂		缸 缺

	Shift JIS	0 1 2 3	4 5 6 7	8 9 A B	C D E F
网	E39E		网 空	罔 罢 署 罂	罨 罩 罂 罚
	E3AE	羈 犍 罡 羁	羈		
羊	E3AE		羌 羔 羞	羝 羚 羣 羶	羲 羲 羲 羶
	E3BE	羸 羘			
羽	E3BE	翅 翠	翊 翩 翔 翡	翦 翩 翫 翱	翫
	E3BE				
老	E3BE				耆 毛 髯
	E3CE	耒 耘 耙 耘	耈		
耳	E3CE		耿 耻	聊 聆 聒 聘	聚 聰 聋 聯
	E3DE	聳 聲 聰 聰	聰 聴		
聿	E3DE		聿 壴	肆 肅	
	E3DE				
肉	E3EE	胛 胥 脍 脨	胄 胚 胖 脉	膀 胮 脓 脱	肚 脱 胃 脱
	E43F	隋 脾 脾 脾	腓 脼 脼 腱	腮 腭 腦 脑	脰 脰 脰 脰
	E44F	膂 膜 脣 膚	腔 腔 腸 脂	臍 脇 脍 脍	膈 脔 脔 脔
	E45F	臉 脍 脍 脍	臍 脍 脍 脍	鬚	臂 臂 臂 臂
	E45F				
臣	E45F			臧	
至	E45F			臺 璎	
臼	E45F				𠂇 昇 春 眇
	E46F	與 舊			
舌	E46F	舍 舐	舖		
舟	E46F		船 舶 舷 舸	舳 舻 舱 舸	艚 般 舫 舢
	E480	艤 艤 艤 艤	艤		
艮	E480		艱		
色	E480		艷		
艸	E480				
	E490	苣 苒 苒 苒	苺 莓 莓 莓	艾 苟 芒 菏	芻 茉 芮 芮
	E49E	茵 苒 苒 苒	茲 茉 莹 莹	苻 莵 苑 茄	苜 茄 莮 莮
	E4AE	莪 苔 苔 苔	莫 莎 莎 莎	荼 苑 莩 莩	莠 莪 莧 莧
	E4BE	葍 董 葫 葵	萃 茄 茄 葵	蒂 莮 莮 莮	萍 莲 莲 莲
	E4CE	蕡 莼 莼 莼	莉 莼 莼 莼	葍 莴 莴 莴	蒂 莴 莴 莴
	E4DE	蘂 施 蘂 蘂	蓋 兼 蕺 蕺	薹 葵 莴 莴	蓐 蕺 莴 莴
	E4EE	蒡 蔡 蕃 蕃	蕘 蕺 蕺 蕘	薹 葵 莴 莴	蕘 蕺 莴 莴
	E53F	蕡 蕃 蕃 蕃	蕘 蕃 蕘 蕘	薹 葵 莴 莴	蕘 蕺 莴 莴
	E54F	薜 蘋 蘋 蘋	藉 蕃 蕘 蕘	薹 葵 莴 莴	薜 蕺 莴 莴

	Shift JIS	0 1 2 3	4 5 6 7	8 9 A B	C D E F
艸	E55F	蘋 藜 蘭 蘆	龍 蘚 蘿 蘿		
虍	E55F			虍 虏 虐 號	虧
虫	E55F E56F E580 E590 E59E E5AE E5BE	蚩 蛭 蛴 蛭 蛟 蛛 蛇 蛭 螭 螭 蛍 蛭 螭 螭 蛍 蛭 蠅 蠕 蠕 蠕 螳 蟻 蟻 蟒 蠅 蟻 蟻 蟒	蚋 蚊 蚊 蚊 蜋 蝶 蝶 蝶 蜀 蜀 蜀 蜀 蠅 蝠 蝠 蝠 蠅 蝶 蝶 蝶 蠅 蟻 蟻 蟒 蠅 蟑 蟑 蟑	𧈧 蟎 蟎 蟎 𧈧 蟒 蟒 蟒 𧈧 蟒 蟒 蟒	𧈧 蟒 蟒 蟒 𧈧 蟒 蟒 蟒
血	E5BE			衄	
行	E5BE			衙 衙	衛 衛
衣	E5BE E5CE E5DE E5EE E63F	衾 袞 相 衮 衤 衤 衤 衤 衤 衤 衤 衤 衤 衤 衤 衤 衤 衤 衤 衤	袴 紉 衫 衫 袴 裳 裳 裳 袴 裳 裳 裳 袴 裳 裳 裳 袴 裳 裳 裳	袴 衫 衫 衫 袴 衫 衫 衫 袴 衫 衫 衫 袴 衫 衫 衫 袴 衫 衫 衫	衫 袁 衤 衤 衤 衤 衤 衤 衤 衤 衤 衤 衤 衤 衤 衤 衤 衤
丂	E63F			丂	
見	E63F E64F		覩 覓 觀 觀	覩	覩 觀 觀
角	E64F			觔 觚 觚 觚	觔 觚 觚 觚
言	E64F E65F E66F E680 E690 E69E	訐 訂 訏 訝 誣 誅 誨 誦 誇 誥 誦 誥 諤 誥 誥 誥 謔 謔 謔 謔 譖 譖 譖 譖	訥 訌 詰 詰 誣 誥 詹 詹 誥 誥 評 評 諤 誥 評 評 謔 謔 評 評 譖 譖 評 評	訖 訖 評 評 誣 評 評 評 誥 評 評 評 諤 評 評 評 謔 評 評 評 譖 評 評 評	訖 訖 評 評 誣 評 評 評 誥 評 評 評 諤 評 評 評 謔 評 評 評 譖 評 評 評
谷	E69E E6AE	谿			芻 谷
豆	E6AE	豈 豌 豐	豊		
豕	E6AE		豕 眷 豬		
豸	E6AE E6BE	貔 貔 貔		豸 豺 貂 貂	貅 貔 貔 貔
貝	E6BE E6CE	賤 賈 賈 賚 賈 賈	貲 貪 貄 贊 賈 賈	貳 貳 貶 貶 贍 賦 賦 賦	貲 賈 賈 賈 贍 賦 賦 賦

	Shift JIS	0 1 2 3	4 5 6 7	8 9 A B	C D E F
赤	E6CE E6DE	赭			赧
走	E6DE	走 趟 趋	趙		
足	E6DE E6EE E73F E74F	蹠 跛 跗 跤 蹠 跛 跛 跤 蹠 踏 蹤 蹤 蹠 蹔 蹤 蹤	跂 趾 跖 跎 蹠 跛 跢 跎 蹠 踏 蹤 蹤 蹠 蹕 蹢 蹤	蹠 跛 跖 跎 蹠 跢 蹢 蹎 蹠 踏 蹤 蹢 蹠 蹖 蹢 蹎	跛 跛 跛 蹶 踰 跢 蹢 蹮 蹠 蹲 蹢 蹮 蹠 蹖 蹢 蹮
身	E74F E75F	軀 軫			躬
車	E75F E76F E780	轆 輒 輂 轆 輒 輂 轆 輒 輂	轔 較 軑 軑 轔 較 軑 軑 轔 輒 輂 輂	轔 較 輓 較 轔 較 輓 較 轔 輒 輂 輂	輶 載 輅 輁 轔 較 輓 輁 轔 輒 輓 輁
辛	E780	辜	辟 辣 辭 辭		
辤	E780 E790 E79E E7AE	迺 迹 酒 速 迺 過 遐 遑 迺 遊 遙 遙 迺 遽 邁 邶	逕 遘 遵 逞 迺 適 遙 遙 迺 適 遙 遙 邊 邁 邶 邶	汎 迪 囂 迨 迺 逋 迨 逶 迺 邇 遞 邇 邊 邁 邶 邶	迪 逃 邇 囂 達 達 逆 邇 遯 遷 隨 邇 遯 遷 隨 邇
邑	E7AE E7BE	鄒 鄙 鄱 鄴		邨	邯 邱 邵 鄢
酉	E7BE E7CE	酉 醴 酬 酿	酈 酝 酸 酉 酈 醴 酿 酉	酈 酝 酸 酉	醑 醉 酣 醪
采	E7CE			釗	釋
里	E7CE			釐	
金	E7CE E7DE E7EE E83F E84F E85F E86F	釵 鈚 鈞 鈫 鉋 鈎 銜 鈤 鉋 鈎 銜 鈤 鎔 鐸 錠 鍔 鎔 鐸 錠 鍔 鑄 鐸 鑄 鍔 鑄 鐸 鑄 鍔	鈔 鈦 鈕 鈛 銓 鈦 鈕 鈛 銓 鈦 鈕 鈛 鑄 鐸 鑄 鍔 鑄 鐸 鑄 鍔 鑄 鐸 鑄 鍔 鑄 鐸 鑄 鍔	釦 鈚 鈎 鈜 鉋 鈎 銜 鈤 鉋 鈎 銜 鈤 鎔 鐸 錠 鍔 鎔 鐸 錠 鍔 鑄 鐸 鑄 鍔 鑄 鐸 鑄 鍔	釦 鈚 鈚 鈚 鉋 鈚 鈚 鈚 鉋 鈚 鈚 鈚 鎔 鐸 鎔 鎔 鎔 鐸 鎔 鎔 鑄 鐸 鎔 鎔 鑄 鐸 鎔 鎔
門	E86F E880 E890	閨 闔 關 闔 關 闔 闔 闔	閨 闔 闔 闔	閨 闔 闔 闔	閨 闔 闔 闔
阜	E890		阡 廪 阮 阤	陂 陌 隋 陋	陗 陝 陞

	Shift JIS	0 1 2 3	4 5 6 7	8 9 A B	C D E F
阜	E89E	陁 陟 𠙴	陲 𠂇 隍 𩶱	隕 𩶱 險 𩶱	隱 𩶱 𩶱 𩶱
隶	E8AE	隶			
隹	E8AE	隹 眚	雥 雉 雍 褵	雑 霽 雕	
雨	E8AE E8BE	霽 霧 霖 霖	霽 雷 霆 霆	雹 霽 霖 霖	霄 霆 霖 霖
靑	E8CE	靜			
非	E8CE	靠			
面	E8CE	靝 靗	靔		
革	E8CE E8DE	靮 鞘 鞍 鞍	勒 鞍 鞄 鞍	靉 鞍 鞏 鞠	鞚 鞄 鞋 鞠
韋	E8DE			韋 韋	
韭	E8DE				韭 蒜 薤
音	E8DE E8EE	韶 韵			竟
貢	E8EE E93F	頹 頌 顱 頤 頤	頸 頤 頤 頤	頰 𩶱 𩶱 𩶱	顛 𩶱 𩶱 𩶱
風	E93F		嵐 颯 颩 颩	飄 飈 飈 飈	
食	E93F E94F E95F	餉 餘 餡 餡 饑 饫 饪 饪	餻 餃 餅 餳	餉 饫 餳 餳	餕 餃 餳 饪
首	E95F		馗		
香	E95F		馥		
馬	E95F E96F E980	駭 駱 駒 駝 驃 駕 駒 駝	駿 駢 駢 駒	馭 馮 駢 駢 駢 驅 駢 駢	駝 駘 驅 駢 驅 驢 驢 駢
骨	E980 E990	骭 骨 體 體			骭 骨 體 體
高	E990		謾		
影	E990 E99E	鬚 鬚 鬚	鬚 鬚 鬚 鬚	髦 鬚 鬚 鬚	髦 鬚 鬚
鬥	E99E			鬥 鬥 鬥 鬥	鬪 鬥
鬯	E99E				鬯
鬲	E99E				鬲
鬼	E9AE	魄 魔 魏 魑	魖 魔 魖 魖		

	Shift JIS	0 1 2 3	4 5 6 7	8 9 A B	C D E F
魚	E9AE E9BE E9CE E9DE	鯥 鱸 鯊 鮣 鰈 鱵 鯪 鮑 鯷 鯫 鯪 鮐 鯯 鯩 鯻 鮓	鰆 鯉 鯔 鯪 鰆 鯇 鯔 鯪 鰆 鯇 鯔 鯪 鰆 鯇 鯔 鯪	鯧 鯏 鯈 鯨 鯧 鯏 鯈 鯨 鯧 鯏 鯈 鯨 鯧 鯏 鯈 鯨	鯻 鯢 鯔 鯨 鯻 鯢 鯔 鯨 鯻 鯢 鯔 鯨 鯻 鯢 鯔 鯨
鳥	E9DE E9EE EA3F EA4F EA5F	鴈 鳥 鴟 鶩 鵠 鶩 鴟 鶩 鵠 鶩 鴟 鶩 鵠 鶩 鴟 鶩 鸚 鶒 鶠 鶩	鶯 鴟 鴟 鶩 鶯 鴟 鴟 鶩 鶯 鴟 鴟 鶩 鶯 鴟 鴟 鶩 鶯 鴟 鴟 鶩	鳬 鳥 鴟 鴟 鴟 鳥 鴟 鴟 鴟 鳥 鴟 鴟 鴟 鳥 鴟 鴟 鴟 鳥 鴟 鴟	鳩 鴞 鴟 鴟 鴟 衛 鴖 鴟 鴟 鴖 鴖 鴟 鴟 鴖 鴖 鴟 鴟 鴖 鴖 鴟
鹹	EA5F	鹹	鹹	鹽	
鹿	EA5F		麌	塵	麋
麥	EA5F EA6F	麌 麴 麴			麌 麴
麻	EA6F	靡			
黃	EA6F		覺		
黍	EA6F		黎	黏 粕	
黑	EA6F EA80	黴 黝 黜		黔 黜 點 黴	黠 黛 黨 黯
黹	EA80	黹	黻	黼	
鼴	EA80		鼴	鼴	
鼴	EA80			鼴	
鼠	EA80			筭	鼴
鼻	EA80				鼾
齊	EA80				齊
齒	EA80 EA90	齒 齒 齒 齒	齒 齒 齒 齒	齒 齒 齒 齒	齒
龍	EA90				龕
龜	EA90				龜
龠	EA90				龠

10.11 2D code

Maxi Code(Compatible Commands)

ESC+BV

Hexadecimal code	ESC <1B> ₁₆	BV <42> ₁₆ <56> ₁₆	Parameter a,b,c,ddddddddd,eee,fff,n~n
Initial value	Nil		

Valid range and term of command	When the power switch is OFF	The set parameter is not maintained.
	Valid range within items	The set parameter becomes invalid.
	Valid range between items	The set parameter becomes invalid.

[Function]

Specifying MaxiCode.

[Format]

<BV>a,b,c,ddddddddd,eee,fff,n~n

• Parameter

a [Symbol number]	=	Valid Range	:	1 to 8
b [Number of symbol digit]	=	Valid Range	:	1 to 8
c [Mode]	=	2	:	Transportation only
		3	:	Transportation only
		4	:	Standard symbol
		6	:	Reader programing
d [Postal code]	=	Valid Range	:	0 to 999999999 (Mode 2) 000000 to 999999 (Mode 3) * Mode 2: Max 9 digits (Numeric only) * Mode 3: Fixed 6 digits (Capital alphabet)
e [Country code]	=	Valid Range	:	001 to 999
f [Service class]	=	Valid Range	:	001 to 999
n [Low priority message]	=	Alphanumeric/Symbol		

Mode	Service class	Country code	Postal code	Maximum print data		
				Numeric only	Alphanumeric	
2	Fixed 3 digits (Numeric only)	Fixed 3 digits (Numeric only)	Max. 9 digits	123	84	
3			Fixed 6 digits (Alphanumeric)			
4	Omission			138	93	
6						

[Coding Example]

```
<A>
<V>100<H>200<BV>1,1,2,123456789,001,002,SAHTHA
<Q>2
<Z>
```

[Supplementary Explanation]

- Size of MaxiCode is not changed by number of data for printing.
- If parameter that is not described above is used, or print data doesn't match, symbol is not printed.
- When specifying mode 4 and mode 6, number of print data must be specified over 12. When number of print data is specified less than 11, scanner cannot read printed MaxiCode.
- This command is for existing models. Using Maxi Code command <2D20> is recommended.

MaxiCode Code table

				S I								S O							
B8	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1	1		
B7	0	0	0	0	1	1	1	1	0	0	0	0	1	1	1	1	1		
B6	0	0	1	1	0	0	1	1	0	0	1	1	0	0	1	1	1		
B5	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0		
B4	B3	B2	B1	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0	0	0	0	0	SP	0	@	P	`	p									
0	0	0	1	1		!	1	A	Q	a	q								
0	0	1	0	2		"	2	B	R	b	r								
0	0	1	1	3		#	3	C	S	c	s								
0	1	0	0	4		\$	4	D	T	d	t								
0	1	0	1	5		%	5	E	U	e	u								
0	1	1	0	6		&	6	F	V	f	v								
0	1	1	1	7		'	7	G	W	g	w								
1	0	0	0	8		(8	H	X	h	x								
1	0	0	1	9)	9	I	Y	i	y								
1	0	1	0	A		*	:	J	Z	j	z								
1	0	1	1	B		+	;	K	[k	{								
1	1	0	0	C		,	<	L	¥										
1	1	0	1	D		-	=	M]	m	}								
1	1	1	0	E		.	>	N	^	n	~								
1	1	1	1	F		/	?	O	o	DEL									

MaxiCode can specify from 1H to FFH.

10.12 2D code

PDF417(Compatible Commands)

ESC+BK

Hexadecimal code	ESC <1B> ₁₆	BK <42> ₁₆ <4B> ₁₆	Parameter Aabbcddeeffffg~g(,h)
Initial value	Nil		

Valid range and term of command	When the power switch is OFF	The set parameter is not maintained.
	Valid range within items	The set parameter becomes invalid.
	Valid range between items	The set parameter becomes invalid.

[Function]

Specifying PDF417.

[Format]

<BK>aabbcddeeffffg~g(,h)

• Parameter

a [Minimum module width]	=	Valid range : 01 to 27 dots
b [Minimum module height]	=	Valid range : 01 to 72 dots
c [Security level]	=	Valid range : 0 to 8
d [No. of data code words per digit]	=	Valid range : 01 to 30 00 : Automatic (Width varies depending on the No. of data specified)
e [Digit No. per symbol]	=	Valid range : 03 to 90 00 : Automatic (Height varies depending on the No. of data specified)
f [Digit No. of data]	=	Valid data : 0001 to 2681
g [Print data]	=	Data
h [PDF code type]	=	When omitted : PDF 417 T : Truncated scale M : Micro PDF

[Coding Example] Minimum module width: 03 dots, Minimum module height: 09 dots

Security level: 3, Number of data codewords per line: 03, Digit Number of line per symbol: 18

```
<A>
<V>100<H>200<BK>0309303180010PDF1234567
<Q>2
<Z>
```

[Supplementary Explanation]

1. Minimum module width can be set to 01 and 02; however, this may not be read properly.
2. 01, 02, and 03 are designable for Minimum module height however; it may cause a reading problem.
3. When d=e=00, aspect ratio will be at 1:2 based on the number of print data.
4. When specifying security level height, parameter d or e should have large number.
5. Maximum number of digit of data is 2,681, but it varies depending on Minimum module size, Security level and type of print data.
6. When parameter d and e doesn't match number of data, print may not be performed properly.
7. When Micro PDF is specified by PDF type, number per symbol is specified by number of data codeword per line, and accordingly maximum number of data digit is specified. For details, refer to "Symbol size and number of data" in next page.
8. When specifying Micro PDF by PDF code type, security level is disabled.

[Point]

1. Sequential number is not available.
2. Specifying print position by automatic line feed is not available.
3. Print 00H to FFH is available.
4. Format registration is available.
5. Enlarging minimum module size improves print quality.
6. Increasing security level improves read rate.
7. Print height varies depending on the character such as numeric only, alphabet only or mixture of numeric and alphabets.

*Symbol size of Micro PDF417 is following 34 types in the table below.

[Symbol size and number of data of MicroPDF417]

Symbol size		Maximum number of data		
Cols(c)	Rows(d)	Alphabet (A to Z)	Numeric	Binary mode
1	11	6	8	3
	14	12	17	7
	17	18	26	10
	20	22	32	13
	24	30	44	18
	28	38	55	22
2	8	14	20	8
	11	24	35	14
	14	36	52	21
	17	46	67	27
	20	56	82	33
	23	64	93	38
	26	72	105	43
3	6	10	14	6
	8	18	26	10
	10	26	38	15
	12	34	49	20
	15	46	67	27
	20	66	96	39
	26	90	132	54
	32	114	167	68
	38	138	202	82
	44	162	237	97
4	4	14	20	8
	6	22	32	13
	8	34	49	20
	10	46	67	27
	12	58	85	34
	15	76	111	45
	20	106	155	63
	26	142	208	85
	32	178	261	106
	38	214	313	128
	44	250	366	150

*Mix of Alphabet (Capital letter, small letter), Numeric and Control code varies depending on number of combined characters.

PDF417Code table

	S I						S O									
B8	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1
B7	0	0	0	0	1	1	1	1	0	0	0	0	1	1	1	1
B6	0	0	1	1	0	0	1	1	0	0	1	1	0	0	1	1
B5	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1
B4 B3 B2 B1	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0 0 0 0 0			SP	0	@	P	`	p								
0 0 0 1 1			!	1	A	Q	a	q								
0 0 1 0 2			"	2	B	R	b	r								
0 0 1 1 3			#	3	C	S	c	s								
0 1 0 0 4			\$	4	D	T	d	t								
0 1 0 1 5			%	5	E	U	e	u								
0 1 1 0 6			&	6	F	V	f	v								
0 1 1 1 7			'	7	G	W	g	w								
1 0 0 0 8			(8	H	X	h	x								
1 0 0 1 9)	9	I	Y	i	y								
1 0 1 0 A			*	:	J	Z	j	z								
1 0 1 1 B			+	;	K	[k	{								
1 1 0 0 C			,	<	L	\	l									
1 1 0 1 D			-	=	M]	m	}								
1 1 1 0 E			.	>	N	^	n	~								
1 1 1 1 F			/	?	O	_	o	DEL								

PDF417 can specify from 00H to FFH.

10.13 2D code

DataMatrix (ECC200) (Compatible Commands)

ESC+BX

Hexadecimal code	ESC <1B> ₁₆	BX <42> ₁₆ <58> ₁₆	Parameter aabbcdddeeffffghh
Initial value	Nil		

Valid range and term of command	When the power switch is OFF	The set parameter is not maintained.
	Valid range within items	The set parameter becomes invalid.
	Valid range between items	The set parameter becomes invalid.

[Function]

Specifying DataMatrix (ECC200).

[Format] (Setup part)

<BX>aabbccddeeffffghh

•Parameter

a [Format ID]	= Valid Range	:	01 (Fixed)
b [Error correction level]	= Valid Range	:	20 (Fixed)
c [Cell width]	= Valid Range	:	01 to 16 (dot cell)
d [Cell pitch]	= Valid Range	:	01 to 16 (dot cell)
e [Number of cells per line]	= Valid Range	:	010 to 144 000 : (Auto setup)
f [Number of cell lines]	= Valid Range	:	008 to 414 000 : (Auto setup)
g [Mirror image]	= Valid Range	:	0 (Fixed)
h [Size of guide cell]	= Valid Range	:	01 (Fixed)

[Supplementary Explanation]

- 1.01 and 02 are designable for [Cell width] and [Cell Pitch]; however, they may not be read properly. In this case, 00 will be an error.
2. If 000 is specified for both [No. of cells per line] and [Number of cell lines], optimum matrix size is set automatically based on the Number of data.
- 3.This command is for existing models. Using DataMatrix(ECC200) command <2D50> is recommended.

10.14 2D code

DataMatrix (ECC200)

Data Specify(Compatible Commands)

ESC+DC

Hexadecimal code	ESC <1B> ₁₆	DC <44> ₁₆ <43> ₁₆	Parameter n~n
Initial value	Nil		

Valid range and term of command	When the power switch is OFF	The set parameter is not maintained.
	Valid range within items	The set parameter becomes invalid.
	Valid range between items	The set parameter becomes invalid.

[Function]

Specifying data for DataMatrix (ECC200).

[Format] (Data specification part)

<DC>n~n

• Parameter

n [Print data] = Data

[Coding Example] Cell width: 02, Cell pitch: 02, Number of cells per line: 000 (Auto setup),

Number of cell lines: 000 (Auto setup), Print data: 1234567890

```
<A>
<V>100<H>200
<BX>012002020000000001
<DC>1234567890
<Q>2
<Z>
```

[Supplementary Explanation]

DataMatrix (ECC200) can specify from 00H to FFH except for printer control code of 05H, 10H, 11H, 18H, 1BH.

When specifying control code for data, use DataMatrix<2D50>.

	Data format	Number of data
Data format	Numeric	3116
	Alphanumeric	2335
	Binary (00H to FFH)	1556

* Value in above table shows the maximum number of data that can be specified as barcode data.

[Note]

This command is for existing models. Using <2D50> is recommended.

10.15 2D code

DataMatrix (ECC200)

Sequential Number(Compatible Commands)

ESC+FX

Hexadecimal code	ESC <1B> ₁₆	FX <46> ₁₆ <58> ₁₆	Parameter aabcccddeee
Initial value	Nil		

Valid range and term of command	When the power switch is OFF	The set parameter is maintained.
	Valid range within items	The set parameter becomes invalid.
	Valid range between items	The set parameter becomes invalid.

[Function]

Specifying sequential number for DataMatrix.

[Format] (Sequential number part)

<FX>aabcccddeee

• Parameter

a [Number of duplication to print]	=	Valid Range	:	001 to 999
b [Flag of increase and decrease]	=	+ -	:	Increment Decrement
c [Number of increase and decrease]	=	Valid Range	:	001 to 999
d [Specification of digit position]	=	Valid Range	:	001 to 999
e [Number of digit]	=	Valid Range	:	001 to 999

[Coding Example] Number of duplication to print: 001, Flag of increase and decrease: +

Number of increase and decrease: 001, Digit position: 005, Number of digit: 003

```

<A>
<V>100<H>200
<FX>001+001005003
<BX>01100202000000001
<DC>00006000
<Q>2
<Z>

```

[Supplementary Explanation]

This command is for existing models. Using DataMatrix(ECC200) command <2D50> is recommended.

GS1 DataMatirx (ECC200)Code table (<DC>)

				S I								S O								
				B8	0	0	0	0	0	0	0	0	1	1	1	1	1	1		
				B7	0	0	0	0	1	1	1	1	0	0	0	0	1	1	1	1
				B6	0	0	1	1	0	0	1	1	0	0	1	1	0	0	1	1
				B5	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1
B4	B3	B2	B1		0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0	0	0	0	0		SP		0	@	P	`	p								
0	0	0	1	1		!		1	A	Q	a	q								
0	0	1	0	2		"		2	B	R	b	r								
0	0	1	1	3		#		3	C	S	c	s								
0	1	0	0	4		\$		4	D	T	d	t								
0	1	0	1	5		%		5	E	U	e	u								
0	1	1	0	6		&		6	F	V	f	v								
0	1	1	1	7		,		7	G	W	g	w								
1	0	0	0	8		(8	H	X	h	x								
1	0	0	1	9)		9	I	Y	i	y								
1	0	1	0	A		*	:	J	Z	j	z									
1	0	1	1	B		+	;	K	[k	{									
1	1	0	0	C		,	<	L	¥	I										
1	1	0	1	D		-	=	M]	m	}									
1	1	1	0	E		.	>	N	^	n	~									
1	1	1	1	F		/	?	O	_	o	DEL									

GS1 DataMatrix (ECC200) can specify from 00H to FFH except for printer control code of 05H, 10H, 11H, 18H, 1BH.
When specifying 7EH, specify [7EH, 7EH].

10.16 2D code

QR Code Version

ESC+QV

Hexadecimal code	ESC	QV	Parameter
	<1B> ₁₆	<51> ₁₆ <56> ₁₆	aa
Initial value	aa=00		

Valid range and term of command	When the power switch is OFF	The set parameter is not maintained.
	Valid range within items	The set parameter is in effect until a new specification is made.
	Valid range between items	The set parameter becomes a default value in the next item <A>.

[Function]

Specifying any QR code version can print the code with fixed cell size.
When not specified, it becomes the auto setting.

[Format]

<QV>aa

• Parameter

aa[Version number] = Valid range : 00 to 40 (Specifying this range doesn't become a parameter error.
An error may arise for some QR code types, while analyzing the image.)

Print valid MODE1 : 00 to 14 (00: Auto setting)
MODE2 : 00 to 40 (00: Auto setting)
MicroQR : 00 to 04 (M1 to M4) (00: Auto setting)

[Coding example 1] MODEL 1, Error correction: H, Cell size font: 05, Manual setting, Normal mode, Version 14

<A>
<V100><H100><2D31>,H,05,0,0
<QV>14
<DN0011>,0123456789X
<Z>

[Coding example 2] MODEL 2, Error correction: H, Cell size font: 05, Manual setting, Normal mode, Version 35

<A>
<V100><H100><2D30>,H,05,0,0
<QV>35
<DN0011>,0123456789X
<Z>

[Coding example 3] MicroQR, Error correction: L, Cell size font: 05, Manual setting, Version M3

<A>
<V100><H100><2D32>,H,05,0
<QV>3
<DN005>,01234
<Z>

[Supplemental explanation]

1. MODEL 1: up to 17, MODEL 2 up to 40, MicroQR: up to 4
The valid parameter range is from 0 to 40 and it varies depending on the QR code type.
2. For MicroQR, 1 to 4 correspond with M1 to M4.
3. Specifying <QV> 0 becomes Auto. (Default: Compatible with the existing code)
4. Sending the data exceeding the data size of specified version will result in error and QR code will not be printed.
5. Specify the <QV> command in between <2Dxx> and <DN>/<DS>.
6. It doesn't affect other than QR code.
7. When resulted in a parameter error, it will be handled in the same manner of no specification.

[About the version]

Refer to the QR code specification for details.

Version 1: 21 x 21 cell, Version 2: 25 x 25 cell, ..., Version 40: 177 x 177 cell.

For MicroQR, M1 to M4 = 11 x 11 to 17 x 17 cell, smaller than MODEL 1/2.

11 Graphic Command

11.1 Graphic			
Graphic Print			ESC+G
Hexadecimal code	ESC	G	Parameter
	<1B> ₁₆	<47> ₁₆	abbbcccn~n
Initial value	Nil		

Valid range and term of command	When the power switch is OFF	The set parameter is not maintained.
	Valid range within items	The set parameter becomes invalid.
	Valid range between items	The set parameter becomes invalid.

[Function]

Specifying the print of graphic.

[Format]

<G>abbbcccn~n

• Parameter

a [Data specification by HEX and BIN]

H: Hex data Divide 8 bits data into 4 bits and output it as hex code corresponding to ASCII.

B: Binary data Output 8 bits data as one font of data all at once.

b [Specification of crosswise graphic area per byte] = Valid range: Refer to the table below

c [Specification of lengthwise graphic area per byte] = Valid range: Refer to the table below

n [Graphic data]

[Coding Example 1] [H: HEX data] is specified for [Data specification by HEX and BIN]

[□] is printed with the below specification.

<A>
<V>50<H>50
<G>H001001<4646383138313831383138314646>16
<Q>1
<Z>

[Coding Example 2] [B: Binary data] is specified as Data specification by HEX and BIN]

[□] is printed with the below specification.

<A>
<V>50<H>50
<G>B001001<FF8181818181FF>16
<Q>1
<Z>

[Supplementary Explanation]

1. Specification of [B] has longer program description than that of specification [H]; however, transfer data length is 50 percent shorter. This could be advantage in data capacity.
2. Specification of Rotation <%> and Enlargement <L> are available.
3. <L> command should be placed just before <G> command.
4. When using rotation <%> and enlargement <L> commands at the same time, specify <%> command before <L>.
5. The crosswise maximum byte and lengthwise maximum byte are specified in the table below, however, it is possible to specify up to 999 bytes to have compatibility with the old model.

The graphic data less than 2,937,600 bytes can be printed.

6. The calculation of graphic data size is [crosswise maximum byte x lengthwise maximum byte x 8].

[Valid Range]

Model		Crosswise max. bytes	Lengthwise max. bytes
CL4NX	203 dpi	104	400
	305 dpt	156	600
	609 dpi	312	999
CL6NX	203 dpi	152 (*1) 167 (*2)	400
	305 dpt	248 (*1) 251 (*2)	600

(*1) Valid range for "Standard" in "Head Base Position" setting.

(*2) Valid range for "Left-justify" in "Head Base Position" setting.

Refer to the operator manual for further information of the setting.

11.2 Graphic

BMP File Print

ESC+GM

Hexadecimal code	ESC <1B> ₁₆	GM <47> ₁₆ <4D> ₁₆	Parameter aaaaaa,n~n
Initial value	Nil		

Valid range and term of command	When the power switch is OFF	The set parameter is not maintained.
	Valid range within items	The set parameter becomes invalid.
	Valid range between items	The set parameter becomes invalid.

[Function]

Specifying the print or BMP file created by such as Paint Brush of Windows.

[Format]

<GM>aaaaaa,n~n

● Parameter

a [Total bytes of BMP file]

n [Data]

[Coding Example]

```
<A>
<V>50<H>50<GM>04500, <424D00~00>16
<Q>2
<Z>
```

[Supplementary Explanation]

1. Data is sent in binary data (Outputs 8-bit data as 1 font data all at once) (Total byte size corresponds to file size BMP file and BMP file data corresponds to data).
2. When [Total bytes of BMP file] is not matching the transfer data, this may become the cause of malfunction.
3. Total bytes are the file size displayed at [Property] and such.
4. BMP file is available in Black/White mode only. In color mode, printing is not guaranteed. Also, this command is not valid for BMP compressed file.
Make sure that the file extension is set to [BMP] before printing.
5. Rotation <%> and Enlargement <L> are available.
6. Enlarge command <L> should be placed just before this command.
7. When using rotation <%> and enlargement <L> commands at the same time, specify <%> command before <L>.

11.3 Graphic

PCX File Print

ESC+GP

Hexadecimal code	ESC <1B> ₁₆	GP <47> ₁₆ <50> ₁₆	Parameter aaaaaa,n~n
Initial value	Nil		

Valid range and term of command	When the power switch is OFF	The set parameter is maintained.
	Valid range within items	The set parameter becomes invalid.
	Valid range between items	The set parameter becomes invalid.

[Function]

Specifying the print of PCX file created by such as Paint Brush of Windows.

[Format]

<GP>aaaaaa,n~n

• Parameter

a [Total bytes of PCX file]
n [Data]

[Coding Example]

```
<A>
<V>50<H>50<GP>04500,XXXXXXXXXXXX
<Q>2
<Z>
```

[Supplementary Explanation]

1. Data is sent in binary data (Outputs 8-bit data as 1 font data all at once) (Total byte size corresponds to file size PCX file and PCX file data corresponds to data).
2. If [Total bytes of PCX file] is not matching the transfer data, this may become the cause of malfunction.
3. Total bytes are the file size displayed at [Property] and such.
4. PCX file is available in Black/White mode only. In color mode, printing will not be performed due to command error.
Also, this command is not valid for PCX compressed file.
Make sure that the file extension is set to [PCX] before printing.
5. Rotation <%> and Enlargement <L> are available.
6. Enlarge command <L> should be placed just before this command.
7. When using rotation <%> and enlargement <L> commands at the same time, specify <%> command before <L>.

12 System Command

12.1 System									
Print Speed			ESC+CS						
Hexadecimal code	ESC	CS	Parameter						
	<1B> ₁₆	<43> ₁₆ <53> ₁₆	aa						
Initial value	Refer to the table below.								
Valid range and term of command	<table border="1"> <tr> <td>When the power switch is OFF</td> <td>The set parameter is maintained.</td> </tr> <tr> <td>Valid range within items</td> <td>The set parameter is valid until the next valid setting.</td> </tr> <tr> <td>Valid range between items</td> <td>The set parameter is valid until the next valid setting.</td> </tr> </table>			When the power switch is OFF	The set parameter is maintained.	Valid range within items	The set parameter is valid until the next valid setting.	Valid range between items	The set parameter is valid until the next valid setting.
When the power switch is OFF	The set parameter is maintained.								
Valid range within items	The set parameter is valid until the next valid setting.								
Valid range between items	The set parameter is valid until the next valid setting.								

[Function]

Specifying the speed of printing.

[Format]

<CS>aa

•Parameter

a [Print speed] = Refer to the table below

[Coding Example]

<A>
<CS>4
<Z>

[Supplementary Explanation]

Print speed value specified by the command or LCD is maintained.

[Notes]

1. If the value over valid range is specified, command error will occur and print speed will not be changed.
2. Use default set operation of the printer to set back the value to the initial one.
3. If print mode is linerless cutter, the maximum speed would be 6 inches/sec and initial value would be 4 inches/sec. Command error does not occur if 7 inches/sec~maximum for each model has been specified. In that case the value will not be set.
4. In case of models that can specify the print speed of more than 11 inches/sec, the maximum speed will be 10 inches/sec if the print mode is set to dispenser mode. No command error will return if a value from 11 inches/sec to the maximum speed for each model has been set. The value will not be set in this case.

[Parameter Initial Value and Specified Range]

Model	Initial value [aa]	Parameter Valid Range	Print speed corresponding to parameter
CL4NX	203 dpi	6	2, 3, 4, 5, 6, 7, 8, 9, 10 2: 2(inch/s) 50.8 (mm/s) 3: 3(inch/s) 76.2 (mm/s) 4: 4(inch/s) 101.6 (mm/s) 5: 5(inch/s) 127.0 (mm/s) 6: 6(inch/s) 152.4 (mm/s) 7: 7(inch/s) 177.8 (mm/s) 8: 8(inch/s) 203.2 (mm/s) 9: 9(inch/s) 228.6 (mm/s) 10: 10(inch/s) 254.0 (mm/s)
	305 dpt	6	2, 3, 4, 5, 6, 7, 8
	609 dpi	4	2, 3, 4, 5, 6
CL6NX	203 dpi	6	2, 3, 4, 5, 6, 7, 8, 9, 10
	305 dpt	6	2, 3, 4, 5, 6, 7, 8

12.2 System

Print Darkness

ESC+#F****

Hexadecimal code	ESC <1B> ₁₆	#F <23> ₁₆ <46> ₁₆	Parameter ab or aab
Initial value	Refer to the table below.		

Valid range and term of command	When the power switch is OFF	The set parameter is maintained.
	Valid range within items	The set parameter is valid until the next valid setting.
	Valid range between items	The set parameter is valid until the next valid setting.

[Function]

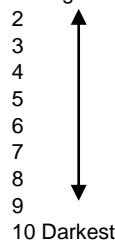
Specifies print darkness.

[Format]

<**#F**>ab
<**#F**>aab

• Parameter

a [Print darkness level specification] = 1 Lightest



b [Print darkness specification] = A to F (omissible)

This parameter is usually "A".

The parameter valid range differs depending on the model. (See the table below)

[Coding Example]

<A>
<**#F**>5A
<Z>

[Supplementary Explanation]

Print darkness value specified by the command or LCD is maintained.

[Notes]

- If the value over valid range is specified, command error will occur and print darkness will not be changed.
- Initial value is settable by default setting operation of the printer.

[Print darkness level range]

Model	Default	Parameter valid range	When setting outside of valid range
CL4NX		1, 2, 3, 4, 5, 6, 7, 8, 9, 10	Command error will occur when other values than parameter valid range in the left is specified.
CL6NX	5		

[Print darkness range]

Model	Default	Parameter valid range	When setting outside of valid range
CL4NX CL6NX	A	A	From B to F are reserved. Print darkness other than from A to F will be replaced with A. (It doesn't become a command error.)

12.3 System

Print Darkness(Compatible Command)

ESC+#E****

Hexadecimal code	ESC <1B> ₁₆	#E <23> ₁₆ <45> ₁₆	Parameter ab
Initial value	Nil		

Valid range and term of command	When the power switch is OFF	The set parameter is maintained.
	Valid range within items	The set parameter is valid until the next valid setting.
	Valid range between items	The set parameter is valid until the next valid setting.

[Function]

Specifies print darkness.

[Format]

<**#E**>ab

•Parameter

a [Print darkness level specification] = 1 Lightest
 2
 3
 4
 5 Darkest



b [Print darkness specification] = A to F (ommissible)

This parameter is usually "A".

The parameter valid range differs depending on the model. (See the table below)

[Coding Example]

<A>
<#E>3A
<Z>

[Supplementary Explanation]

Print darkness value specified by the command.

[Note]

1. This command is for the compatibility with previous one. The print darkness level obtained by DC2+PB, and the print darkness level on the display screen becomes twice the value set by this command. (Only CL4NX Series)
2. On the CL6NX, when the print darkness level is set to 1, 2 or 3, the actual respective values are 1, 5 and 10.

[Print darkness level range]

Model		Parameter valid range	When setting outside of valid range
CL4NX	203 dpi	1, 2, 3, 4, 5	Command error will occur when other values than parameter valid range in the left is specified.
	305 dpt	1, 2, 3, 4, 5	
	609 dpi	1, 2, 3, 4, 5	
CL6NX	203 dpi	1, 2, 3	Command error will occur. However, when you specify 4 or 5 at 305 dpi, the actual setting used is 2.
	305 dpt	1, 2, 3	

[Print darkness range]

Model	Default	Parameter valid range	When setting outside of valid range
CL4NX CL6NX	A	A	From B to F are reserved. Print darkness other than from A to F will be replaced with A. (It doesn't become a command error.)

12.4 System

Media Size

ESC+A1

Hexadecimal code	ESC	A1	Parameter
	<1B> ₁₆	<41> ₁₆ <31> ₁₆	aaaabbbb VaaaaaHbbbb
Initial value	Nil		

Valid range and term of command	When the power switch is OFF	The set parameter is not maintained.
	Valid range within items	The set parameter is valid until the next valid setting.
	Valid range between items	The set parameter is valid until the next valid setting.

[Function]
Specifying media size.

[Format]

<A1>aaaabbbb	(A, B fixed)	*Label size is less than 9999
<A1>VaaaaaHbbbb	(A, B variable)	

• Parameter

a [Height of label]	=	Valid range:	Refer to the table below
b [Width of label]	=	Valid range:	Refer to the table below

[Valid Range]

Model	Width of label (dots)	Height of label (dots)
CL4NX	203 dpi	1 to 832
	305 dpt	1 to 1248
	609 dpi	1 to 2496
CL6NX	203 dpi	1 to 1216 (*1) 1 to 1340 (*2)
	305 dpt	1 to 1984 (*1) 1 to 2010 (*2)

(*1) Valid range for "Standard" in "Head Base Position" setting.

(*2) Valid range for "Left-justify" in "Head Base Position" setting.

Refer to the operator manual for further information of the setting.

[Coding example 1] Label length: 800 dots, label width: 640 dots

```
<A>
<A1>08000640
<Z>
```

[Coding example 2] Label length: 800 dots, label width: 640 dots

```
<A>
<A1>V800H640
<Z>
```

[Coding example 3] Label length: 1200 dots, label width: 40 dots

```
<A>
<A1>12000040
<Z>
```

[Coding example 4] Label length: 1200 dots, label width: 40 dots

```
<A>
<A1>V1200H40
<Z>
```

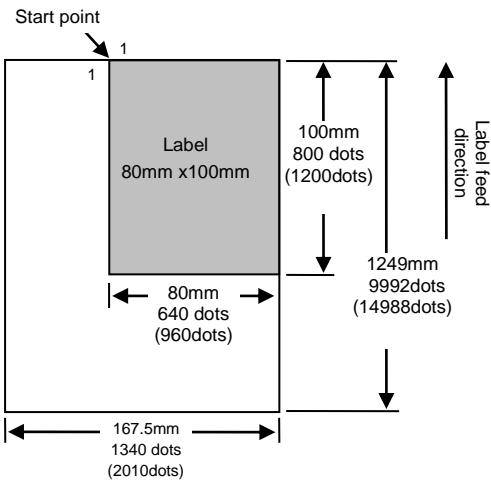
[Coding example 5] Label length: 11200 dots, label width: 240 dots

```
<A>
<A1>V11200H240
<Z>
```

[Supplementary Explanation]

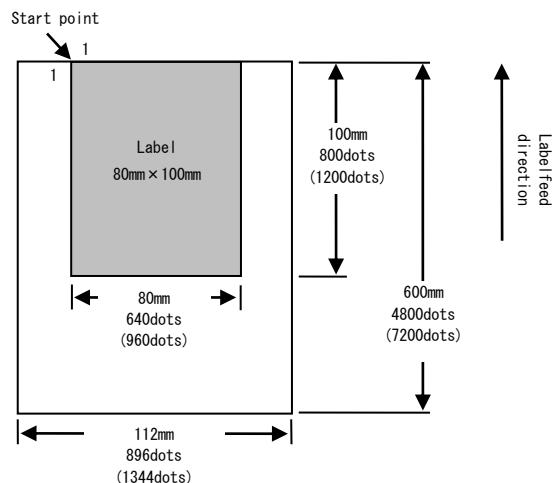
1. If using the label smaller than the head width, use this command for specifying the label size and adjust the start point position corresponding to the label size.
2. For specifying the label size, include the size of backing paper.

(Side alignment, 8dots/mm)



Value inside () is 12 dots/mm

(Center alignment, 8dot/mm)



Value inside () is 12 dots/mm

12.5 System

Base Reference Point

ESC+A3

Hexadecimal code	ESC <1B> ₁₆	A3 <41> ₁₆ <33> ₁₆	Parameter VabbbHcddd
Initial value	a=+,b=000,c=+,d=000		

Valid range and term of command	When the power switch is OFF	The set parameter is not maintained.(with the start point correction)
	Valid range within items	The set parameter is maintained. (without the start point correction)
	Valid range between items	The set parameter is valid until the next valid setting.
The set parameter is valid until the next valid setting.		

[Function]

Changing the start point coordinate in User mode of the printer (normaly).

[Format]

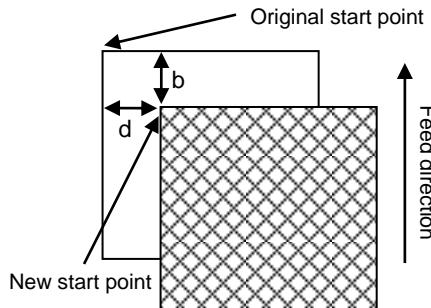
<A3>VabbbHcddd

● Parameter

a [Vertical start point correction sign]	=	+,-
b [Vertical start point correction (No. of dots)]	=	Refer to the table below
c [Horizontal start point correction sign]	=	+,-
d [Horizontal start point correction (No. of dots)]	=	Refer to the table below

[Coding Example]

<A>
<A3>V+10H+10
<Z>



[Supplementary Explanation]

1. If changing start point correction and being located outside of printable area, printing may not be performed.
2. When changing start point correction through multiple label formats, correction will affect all of the formats.

[Notes]

1. This command is effective prior to the User mode settings of printer LCD.
2. The offset value specified by the start point correction <A3> with the start point correction sign is not saved. Thus, the offset value specified by the <A3> command is maintained until the change is made by the next <A3> or the printer's power is off.
3. The offset value specified by the <A3> command is registered also in the user mode of the printer LCD. Thus, the offset value specified by the <A3> command is maintained even the printer power is off.

[Valid range]

Head density	Horizontal start point correction (dots)	Vertical start point correction (dots)
8dots/mm(203dpi)	0 to 792	0 to 792
12dots/mm(305dpi)	0 to 792	0 to 792
24dots/mm(609dpi)	0 to 792	0 to 792

12.6 System

Print End Position

ESC+EP

Hexadecimal code	ESC <1B> ₁₆	EP <45> ₁₆ <50> ₁₆	Parameter [,aaaaaa]
Initial value	Nil		

Valid range and term of command	When the power switch is OFF	The set command is not maintained.
	Valid range within items	The set command becomes invalid.
	Valid range between items	The set command becomes invalid.

[Function]

Specifying the label stop position in the sensor ignored mode.

[Format]

<EP>[,aaaaaa]

● Parameter

a 「print stop position」 = Refer to the following table

【Range of specification】

Model		Length of label(dots)
CL4NX	203dpi	0 to 20000
	305dpi	0 to 18000
	609dpi	0 to 9600
CL6NX	203dpi	0 to 20000
	305dpi	0 to 18000

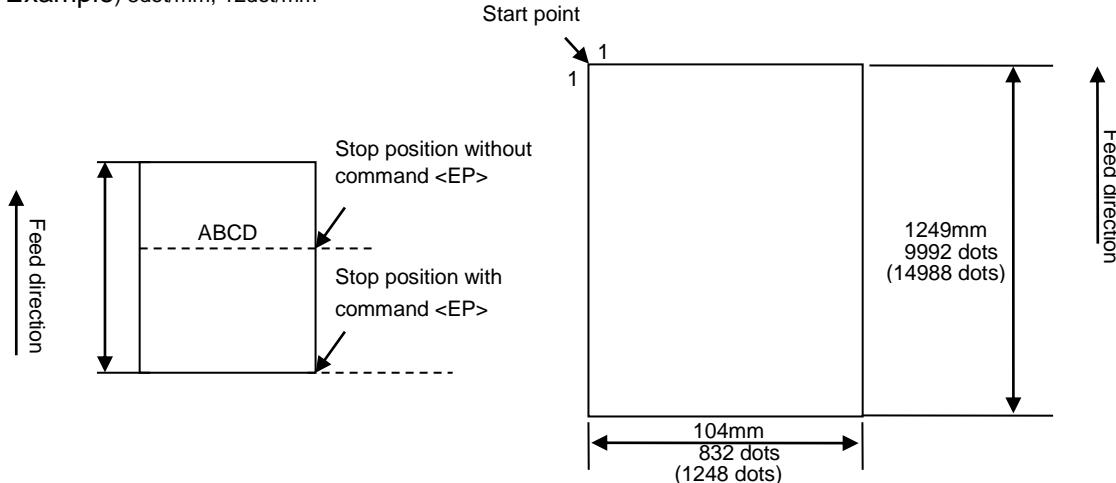
[Coding Example]

```

<A>
<A1>014240832
<Z>
<A>
<V>100<H>200<P>2<L>0202<XS>ABCD
<Q>2
<EP>
<Z>

```

Example) 8dot/mm, 12dot/mm



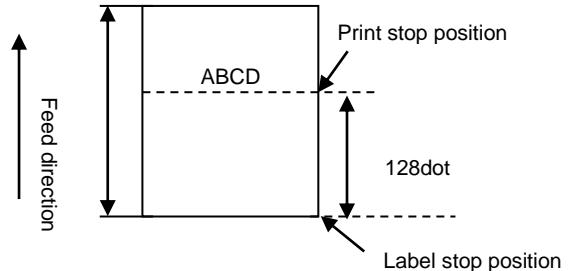
Value inside () is 12 dots/mm

[Supplementary Explanation]

1. Use this command in the sensor invalid mode.
2. Use this command in combination with Label Size <A1>.
3. After using <A1> command for <YS> and <&S> command, it needs to use <EP> command when specifying <YR> and <&R>.

【Coding Sample 2】

```
<A>
<V>100<H>200<P>2<L>0202<XS>ABCD
<Q>2
<EP>.128
<Z>
```



【Supplementary Explanation】

1. Use this command in the sensor invalid mode.
2. Use this command in combination with Label Size <A1>.
3. When you specify the parameter, the last position of printing + value specified in parameter will be the stop position of label. However if last position of printing + position specified in parameter exceeds label length, the size is truncated to label length.
4. If you specify label size <A1> in Format Registration <YS> and Form Overlay Registration <&S> make sure to specify Print End Position<EP> when you specify Format Call<YR> and Form Overlay Call<&R>.
5. The label stop position depends on the following combination. The table below shows which commands will be adopted by the combination of <A1>~LCD setting items.

<A1>	<EP>		LCD setting item	Adopted command	Remarks
	Without parameter	With parameter			
○	○	-	-	<A1>	
○	-	○	-	<EP>	
○	-	-	○	LCD(Print End Position)	If you do not specify of the <EP>.
○	○	-	○	<A1>	
○	-	○	○	<EP>	
-	○	-	-	<A1>	If after power ON, <A1> is designated once.
				LCD(Label Length)	If after power ON, <A1> is not specified even once.
-	-	○	-	<EP>	
-	-	-	○	LCD(Print End Position)	If you do not specify of the <EP>.
-	○	-	○	<A1>	If after power ON, <A1> is designated once.
				LCD(Label Length)	If after power ON, <A1> is not specified even once.
-	-	○	○	<EP>	

12.7 System

Multiple Cut

ESC+~

Hexadecimal code	ESC	~	Parameter
	<1B> ₁₆	<7E> ₁₆	aaaa
Initial value	aaaa=1		

Valid range and term of command	When the power switch is OFF	The set parameter is not maintained.
	Valid range within items	The set parameter is valid until next valid setting.
	Valid range between items	The set parameter becomes initial value at the next item <A>.

[Function]

Specifies the number of labels to print between each cut

[Format]

<~>aaaa

• Parameter

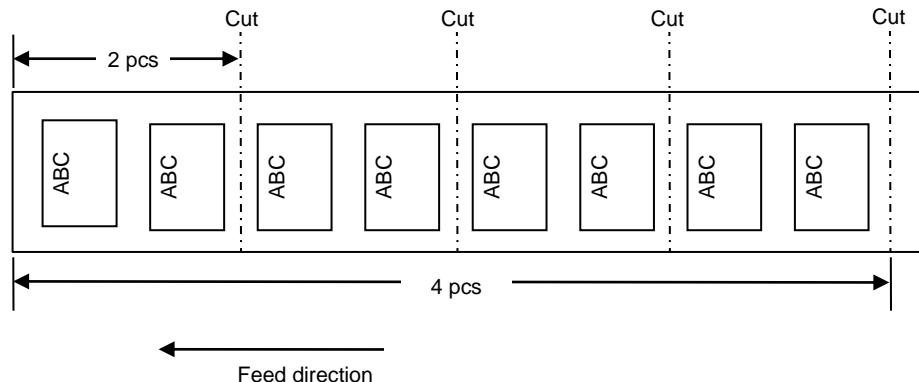
a [Number of prints before cutting] = Valid Range : 0 to 9999

[Coding Example]

```

<A>
<V>100<H>200<P>2<L>0202<XM>ABC
<Q>4
<~->2
<Z>

```



[Supplementary Explanation]

1. Valid only for Cutter models.
2. If this command is not specified in Cutter mode, each label will be cut off after printed.
3. In case the parameter "a" is set to 0, no label will be cut.
4. The product of Qty and value of "aaaa" shall not exceed the maximum number "999999".
5. This command <~> shall be put after Qty<Q>. <Q>, in this case, is to specify number of sheets to be cut.

12.8 System

Cut Number Unit

ESC+CT

Hexadecimal code	ESC	CT	Parameter
	<1B> ₁₆	<43> ₁₆ <54> ₁₆	aaaa
Initial value	aaaa=1		

Valid range and term of command	When the power switch is OFF	The set parameter is not maintained.
	Valid range within items	The set parameter is valid until the next valid setting.
	Valid range between items	The set parameter becomes initial value at the next item <A>.

[Function]

Cuts labels at a specified interval in a print job.

[Format]

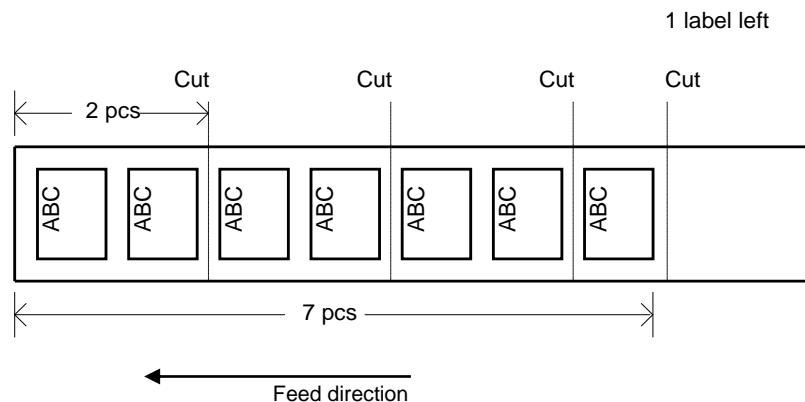
<CT>aaaa

• Parameter

a [Number of labels between each cut] = Qty range : 0 to 9999

[Coding Example]

```
<A>
<V>100<H>200<P>2<L>0202<XM>ABC
<CT>2
<Q>7
<Z>
```



[Supplementary Explanation]

1. Valid only for cutter models.
2. If the parameter is not specified by this command <CT>, each label will be cut after being printed.
3. In case the parameter "a" is set to 0, no label will be cut.
4. Set this command before <Q> command.
5. This command may not be used in combination with other cut commands <~>.

12.9 System

Eject and Cut

ESC+NC

Hexadecimal code	ESC <1B> ₁₆	NC <4E> ₁₆ <43> ₁₆	Parameter Nil
Initial value	Nil		

Valid range and term of command	When the power switch is OFF	The set command is not maintained.
	Valid range within items	The set command becomes invalid.
	Valid range between items	The set command becomes invalid.

[Function]

Specifies eject and cut operation

[Format]

<NC>

[Coding Example]

<A>

<NC>

<Z>

(1) Label stop position

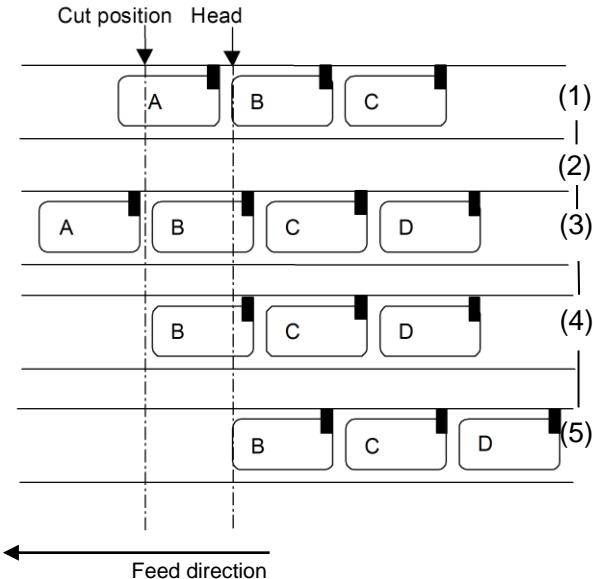
- A: Printed
- B: Not printed
- C: Not printed
- D: Not printed

(2) Command received

(3) Label is fed to the cut position.

(4) Label is cut off.

(5) Label is back fed to the print position.



[Supplementary Explanation]

1. Valid only for cutter models.
2. This command is used to cut the last label remaining in the printer.
3. This command <NC> should be used by differentiating between Start code<A> and Stop code<Z>.
4. This command <NC> may not be used in combination with other commands.
5. This command <NC> is valid when the printer still holds the label which is not cut after being printed.

[Note]

This command is used to cut remaining label in printer after the commands <CT>0 or <~>0 is executed.

12.10 System

Cut Number Unit

ESC+~A

Hexadecimal code	ESC <1B> ₁₆	~A <7E> ₁₆ <41> ₁₆	Parameter aaaa
Initial value	aaaa=1		

Valid range and term of command	When the power switch is OFF	The set parameter is maintained.
	Valid range within items	The set parameter is valid until the next valid setting.
	Valid range between items	The set parameter becomes initial value at the next item <A>.

[Function]

Cuts labels at a specified interval in a print job.

[Format]

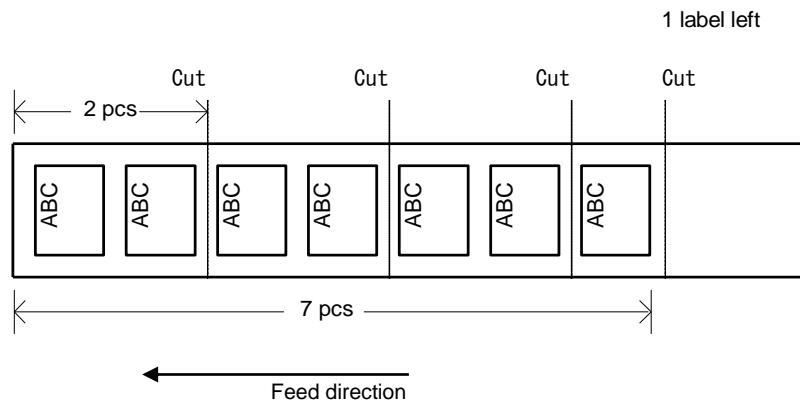
<~A>aaaa

• Parameter

a [Number of labels between each cut] = Valid range : 0 to 9999

[Coding Example]

```
<A>
<V>100<H>200<P>2<L>0202<XM>ABC
<~A>2
<Q>7
<Z>
```



[Supplementary Explanation]

1. Valid only for cutter models.
2. If the parameter is not specified by this command <~A>, each label will be cut after being printed.
3. In case the parameter "a" is set to 0, no label will be cut.
4. Set this command before <Q> command.
5. This command may not be used in combination with other cut commands <~->.

12.11 System

Eject and Cut

ESC+~B

Hexadecimal code	ESC	~B	Parameter
	<1B> ₁₆	<7E> ₁₆ <42> ₁₆	Nil

Initial value Nil

Valid range and term of command	When the power switch is OFF	The set command is not maintained.
	Valid range within items	The set command becomes invalid.
	Valid range between items	The set command becomes invalid.

[Function]

Specifies eject and cut operation

[Format]

<~B>

[Coding Example]

<A>

<~B>

<Z>

(1) Label stop position

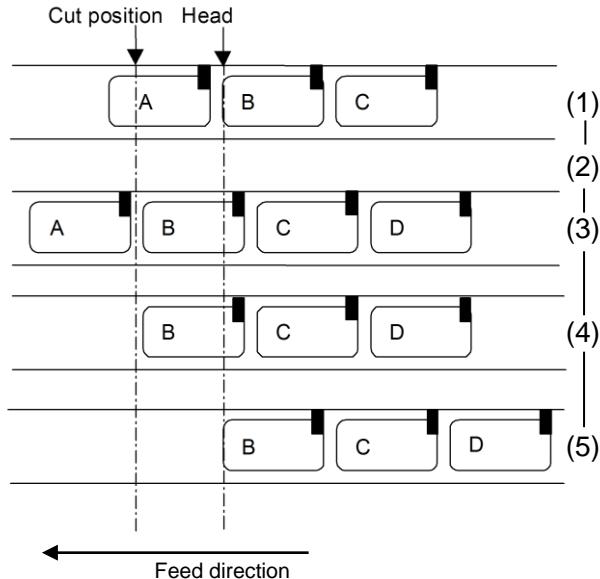
- A: Printed
- B: Not printed
- C: Not printed
- D: Not printed

(2) Command received

(3) Label is fed to the cut position.

(4) Label is cut off.

(5) Label is back fed to the print position.



[Supplementary Explanation]

1. Valid only for cutter models.
2. This command is used to cut the last label remaining in the printer.
3. This command <~B> should be used by differentiating between Start code<A> and Stop code<Z>.
4. This command <~B> may not be used in combination with other commands.
5. This command <~B> is valid when the printer still holds the label which is not cut after being printed.

[Note]

This command is used to cut remaining label in printer after the commands <~A>0 or <~>0 is executed.

12.12 System

Memory Clear

ESC+*

Hexadecimal code	ESC <1B> ₁₆	*	Parameter <2A> ₁₆
Initial value	Nil		

Valid range and term of command	When the power switch is OFF	The set parameter is not maintained.
	Valid range within items	The set parameter becomes invalid.
	Valid range between items	The set parameter becomes invalid.

[Function]

Clears print jobs and specific item in memory.

[Format]

<*>a

• Parameter

a [Item to be cleared] = Not specified: Single item buffer, Receive buffer, Edit buffer (reprint is not possible)
Multi item buffer, Receive buffer, Edit buffer (Clears job in parsing)
 T : User defined characters
 & : Form overlay
 X : All clear
 (Receive buffer, Edit buffer, User defined characters, form overlay)

Note the job, which is currently in progress, will not be cleared

[Coding Example1] Clear receive and edit buffer

<A>
<*>
<Z>

[Coding Example2] All clear

<A>
<*>X
<Z>

[Coding Example3] Clear user-defined characters <A>

<*>T
<Z>

[Supplementary Explanation]

1. Set this command between Start code<A> and Stop code<Z>.
2. This command<*>(a=X) will clear all the data sent before the command. However, the data which is completely parsed before the command will not be cleared. X will also clear user-defined characters and form overlay.

[Notes]

1. After the command <*> is executed, have an interval of more than 100ms before sending next print data.
2. The job in printing will not be terminated by the command <*>.

12.13 System

Offline

ESC+@

Hexadecimal code	ESC	@	Parameter
	<1B> ₁₆	<40> ₁₆	Nil

Initial value Nil

Valid range and term of command	When the power switch is OFF	The set command is not maintained.
	Valid range within items	The set command becomes invalid.
	Valid range between items	The set command becomes invalid.

[Function]

Set printer offline

[Format]

<@>

[Coding Example]

<A>

<@>

<Z>

[Supplementary Explanation]

1. Set this command between Start code<A> and Stop code<Z>
2. Select single-item-buffer for data transmission mode
3. When this command is used at offline state, the printer goes offline when the printer status becomes online next time.

12.14 System

Reprint

ESC+C

Hexadecimal code	ESC	C	Parameter
	<1B> ₁₆	<43> ₁₆	Nil

Initial value	Nil
---------------	-----

Valid range and term of command	When the power switch is OFF	The set command is not maintained.
	Valid range within items	The set command becomes invalid.
	Valid range between items	The set command becomes invalid.

[Function]

Specifies to reprint the last label

[Format]

<C>

[Coding Example]

<A>

<C>

<Z>

[Supplementary Explanation]

1. Since the last print data will be cleared by powering off, reprint operation will not be available after the printer booted.
2. The forced tear-off command <TK> and eject cut command <~B> doesn't execute reprinting.

[Note]

In case the print data contains sequential numbering by command <F>, the same number will be printed.

12.15 System

Auto Line Feed

ESC+E

Hexadecimal code	ESC <1B> ₁₆	E <45> ₁₆	Parameter aaa
Initial value	Nil		

Valid range and term of command	When the power switch is OFF	The set parameter is not maintained.
	Valid range within items	The set parameter becomes invalid.
	Valid range between items	The set parameter becomes invalid.

[Function]

Specifies amount of line spacing and CR (Line feed)

[Format]

<E>aaa

•Parameter

a [line spacing] = valid rang : 0 to 999 dots

[Coding Example]

```

<A>
<E>10
<V>100<H>200<P>2<L>0304<XM>ABCDE+CR
FGHIJ+CR
<Q>2
<Z>
```

[Supplementary Explanation]

1. When CR (0DH) is specified, linefeed based on line pitch will be performed.
2. Rotation command <%> can be used in combination with this command.
3. The command <E> may be used in a job and change the line spacing as necessary.
4. Specify this command before designating the consecutive print of 1-line.
5. Specifying this command executes the line feed regardless of CR/LF deletion setting.
6. Performing auto linefeed by the designation of CR(0DH), print start position of linefeed will be determined based on the pitch specified with <E> and the value specified with Horizontal Print Position <H> designated after <E>. In case that <H> is specified several times after <E>, return position by CR (0DH) will be at the end of <H>.

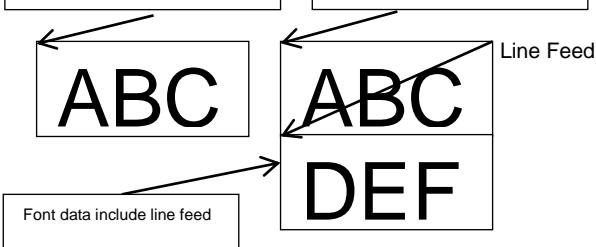
[Print sample]

```

<A><E>0
<V>100<H>100
<XM>ABC
<V>100<H>150
<XM>ABC+CR
DEF
<Z>
```

Font data to specify the base reference point
<V>100<H>100<XM>ABC

Font data to specify the base reference point
<V>100<H>150<XM>ABC+CR



12.16 System

Offset

ESC+PO

Hexadecimal code	ESC <1B> ₁₆	PO <50> ₁₆ <4F> ₁₆	Parameter abcc
Initial value	a=0, b=+, cc=00		

Valid range and term of command	When the power switch is OFF	The set parameter is not maintained.
	Valid range within items	The set parameter is valid until the next valid setting.
	Valid range between items	The set parameter is valid until the next valid setting.

[Function]

Gives offset to media's stop position on the fly.

[Format]

<PO>>abcc

• Parameter

a [Offset]	=	0 : Cutter
		1 : Dispenser
		2 : Tear-off
		3 : Continuous
b [Offset direction]	=	+ : Feed forward
		- : Backward
c [Amount of offset]	=	Valid range : 00 to 99 (dot)

[Coding Example]

<A>
<PO>3+08
<Z>

[Supplementary Explanation]

1. This command does not need to be set in normal printing.
2. Please specify an appropriate value when the printing is off, which is unique for each printer. Printer will not work properly if you don't specify appropriate value.

12.17 System

Sensor Type

ESC+IG

Hexadecimal code	ESC <1B> ₁₆	IG <49> ₁₆ <47> ₁₆	Parameter a
Initial value	a=1		

Valid range and term of command	When the power switch is OFF	The set parameter is maintained.
	Valid range within items	The set parameter is valid until the next valid setting.
	Valid range between items	The set parameter is valid until the next valid setting.

[Function]

Specifies the sensor type.

[Format]

<IG>a

• Parameter

a [Sensor type]	=	0	:	Reflective (I-mark)
		1	:	Transmissible (Gap)
		2	:	Sensor disabled

[Coding Example]

<A>

<IG>1

<Z>

[Supplementary Explanation]

1. The setting by this command is normally not needed.
2. The set parameter is maintained after turning off the printer.
3. Do not use this command while printing operation as sensor may not work properly.
4. Receiving print command after changing the sensor type executes printing after backfeed except specifying the "ignore sensor" to the sensor type.
Feed motion is not performed after turning the printer's power off and then power on.
5. Command error occurs when setting printer operation mode to [Tear-off] and [Dispenser] and specifying sensor type to 2(Ignor sensor)
6. When printer operation mode is set to [Linerless cutter], the range will be available only in 0: Reflective sensor (I-MARK)and 2: Ignore sensor. When 1: Transmissive sensor (GAP) is specified, there will be no command error. In this case, no value will be set.

12.18 System

Print Method

ESC+PH

Hexadecimal code	ESC	PH	Parameter
	<1B> ₁₆	<50> ₁₆ <48> ₁₆	a

Initial value a=0

Valid range and term of command	When the power switch is OFF	The set parameter is maintained.
	Valid range within items	The set parameter is valid until the next valid setting.
	Valid range between items	The set parameter is valid until the next valid setting.

[Function]

Specifies print method.

[Format]

<PH>a

• Parameter

a Print method	=	0	:	Thermal transfer
		1	:	Direct Thermal

[Coding Example]

<A>
<PH>0
<Z>

[Supplementary Explanation]

1. The setting by this command is normally not needed.
2. The set parameter is maintained after turning off the printer.

12.19 System

Print Mode

ESC+PM

Hexadecimal code	ESC	PM	Parameter
	<1B> ₁₆	<50> ₁₆ <4D> ₁₆	a
Initial value	a=0		

Valid range and term of command	When the power switch is OFF	The set parameter is maintained.
	Valid range within items	The set parameter is valid until the next valid setting.
	Valid range between items	The set parameter is valid until the next valid setting.

[Function]
Specifies print mode.

[Format]
<PM>a

- Parameter
- a Print mode = 0 : Continuous
1 : Tear-off
2 : Cutter (Head position)
3 : Cutter (Cutter position)
4 : Cutter (No back feed)
5 : Linerless cutter motion (Cutter position)
7 : Dispenser (Head position)
8 : Dispenser (Dispenser position)
B : Cutter (Cut position + Cut while printing)

[Coding Example]
<A>
<PM>0
<Z>

[Supplementary Explanation]

- Settable operation modes are different depending on the installed options.

Options	Operation mode
None	Continuous, Tear-off
Dispenser	Continuous, Tear-off, Dispenser(Head position), Dispenser(Dispenser position)
Cutter	Continuous, Cutter (Head position), Cutter (Cut position), Cutter (No backfeed)
Linerless cutter	Linerless cutter (Cut position)

Setting other than above operation modes doesn't go to the specified mode.

- General description of each mode :

- (0) Continuous
The printer stays still after printing.

(1) Tear-off

The media will be fed up to the tear-off edge after printed. Then the printer, after receiving next print data, will back feed the next label to the print head position.

(2) Cutter (Head position)

The printer back feed the label up to the print head position immediately after the last label is cut.

(3) Cutter (Cutter position)

The printer, after receiving the next print data, will back feed the media to the print head position.

(4) Cutter (No back feed)

No back feed.

(5) Linerless cutter operation (cutting position)

The mode performing following operation that receive print data, then backfeed to the printhead position, after that print and cut the label after completing printing.

(6) Dispenser (Head position)

Back feeds the labels to head position after dispensing.

(7) Dispenser (Dispenser position)

The media will be fed up to the head position after data receiving and the label will be fed to the dispenser position after printing.

(8) Cut (Cut position + Cut during print)

When receiving print data, the printer cuts the last label while printing a label.

12.20 System

Mincho (Kanji)

ESC+KM

Hexadecimal code	ESC	KM	Parameter
	<1B> ₁₆	<4B> ₁₆ <4D> ₁₆	Nil
Initial value	Nil		

Valid range and term of command	When the power switch is OFF	The set parameter is maintained.
	Valid range within items	The set parameter is valid until the next valid setting.
	Valid range between items	The set parameter is valid until the next valid setting.

[Function]

Sets Kanji font style to Mincho.

[Format]

<KM>

[Coding Example]

```
<A>
<KM>
<V>100<H>200<P>2<L>0304
<K1>H82508A94816A83548367815B
<KG>
<V>200<H>200<P>2<L>0304
<K1>H82508A94816A83548367815B
<Q>2
<Z>
```

[Supplementary Explanation]

This command can be used more than once in single item.

12.21 System

Gothic (Kanji)

ESC+KG

Hexadecimal code	ESC <1B> ₁₆	KG <4B> ₁₆ <47> ₁₆	Parameter Nil
Initial value	Nil		

Valid range and term of command	When the power switch is OFF	The set parameter is maintained.
	Valid range within items	The set parameter is valid until the next valid setting.
	Valid range between items	The set parameter is valid until the next valid setting.

[Function]

Sets Kanji font style to Gothic.

[Format]

<KG>

[Coding Example]

```

<A>
<KG>
<V>100<H>200<P>2<L>0304
<K1>H82508A94816A83548367815B
<KG>
<V>200<H>200<P>2<L>0304
<K1>H82508A94816A83548367815B
<Q>2
<Z>

```

[Supplementary Explanation]

This command can be used more than once in single item.

12.22 System

European Code Page

ESC+CE

Hexadecimal code	ESC <1B> ₁₆	CE <43> ₁₆ <45> ₁₆	Parameter a~a,(b)
Initial value	Nil		

Valid range and term of command	When the power switch is OFF	The set parameter is maintained.
	Valid range within items	The set parameter is valid until the next valid setting.
	Valid range between items	The set parameter is valid until the next valid setting.

[Function]

Specify the European code page to be used.

[Format]

<CE>a~a,(b)

• Parameter

a [Code page name]	=Valid range : refer to the [Code page parameter].
b [Code page setting maintain]	=Valid range: P (fixed) Specify [P] to retain selected code page. (omissible) When omitted, the selected code page is not retained.

[Coding Example1] Win 1253 setting

```
<A>
<V>100<H>200<P>2<L>0304<CE>1253<XU>ABCDE
<Q>2
<Z>
```

[Coding Example2] DOS 855 setting

```
<A>
<V>100<H>200<P>2<L>0304<CE>855<XU>ABCDE
<Q>2
<Z>
```

[Code page parameter]

Parameter a	Official name	[Supplemental explanation]
858	DOS 858	Multilingual Latin 1 + Euro character Default Code page proprietary to SATO.
88591	ISO 8859/1	ISO 8859-1 Latin 1
88592	ISO 8859/2	ISO 8859-2 Latin 2
88599	ISO 8859/9	ISO 8859-9 Latin 5
850	DOS 850	Latin 1 Multilingual
852	DOS 852	Latin 2
855	DOS 855	Cyrillic
857	DOS 857	Turkish
737	DOS 737	Greek
866	DOS 866	Cyrillic II
1250	Win 1250	Central Europe
1251	Win 1251	Cyrillic
1252	Win 1252	Western Latin 1
1253	Win 1253	Greek
1254	Win 1254	Turkish
1257	Win 1257	Baltic
869	IBM 869	IBM 869 Greek
201	X0201	Japanese X0201 *1
UTF-8	UTF-8	Unicode encoding in UTF-8

*1: Specifying X0201 to perform following operation.

Bitmap font (for U font, S font, M font, WB font and WL font): Print with X0201 character set. XU font, XS font, XM font, XB font and XL font: Print with default -858 (DOS 858) character set.

CG font: Print with 88591 (ISO 8859-1 Latin 1) character set.

[Code page support font]

Following bitmap fonts are extended for supporting European code page.

Font name	Size	Font type
U	5x9	Helvetica
S	8x15	Universal Condensed
M	13x20	Universal Condensed
WB	18x30	Universal
WL	28x52	Sans Serif Bold
XU	5x9	Helvetica
XS	17x17	Universal Condensed Bold
XM	24x24	Universal Condensed Bold
XB	48x48	Universal Condensed Bold
XL	48x48	Universal

Refer to the European code page specification for the print character set.

Forced Tear-Off**ESC+TK**

Hexadecimal code	ESC	TK	Parameter
	<1B> ₁₆	<54> ₁₆ <4B> ₁₆	Nil
Initial value	Nil		

Valid range and term of command	When the power switch is OFF	The set parameter is not maintained.
	Valid range within items	The set parameter becomes invalid.
	Valid range between items	The set parameter becomes invalid.

[Function]

Executes Tear-off compulsory.

[Format]

<TK>

[Coding Example]

<A>

<TK>

<Z>

[Supplementary Explanation]

1. This command can be specified only in Tear-off mode.
2. With this command, the printer executes Tear-off motion without waiting the time set by command <TW>. If the next data is received before Tear-off motion, Tear-off is executed compulsory.
3. This command cannot be used in combination with other commands.

[Note]

This command can be used to save the time set by command <TW>, if it is sure that there is no following item.

12.24 System

Option Waiting Time

ESC+TW

Hexadecimal code	ESC	TW	Parameter
	<1B> ₁₆	<54> ₁₆ <57> ₁₆	aaa
Initial value	aaa = 000		

Valid range and term of command	When the power switch is OFF	The set parameter is maintained.
	Valid range within items	The set parameter becomes invalid.
	Valid range between items	The set parameter becomes invalid.

[Function]

Specifies waiting time for optional device

[Format]

<TW>aaa

•Parameter

aaa [Waiting time] = Valid range: 000, 005 to 200 (unit: 100ms)

[Coding Example] (waiting time = 1.5 seconds)

<A>
<TW>015
<Z>

[Supplementary Explanation]

1. This command specifies, in Tear-off mode, the waiting time between print completion and Tear-off motion.
2. The set parameter becomes valid soon after receiving the command and will be retained after power off.

12.25 System

Delete CR/LF

ESC+CL

Hexadecimal code	ESC <1B> ₁₆	CL <50> ₁₆ <4D> ₁₆	Parameter a
Initial value	Nil		

Valid range and term of command	When the power switch is OFF	The set parameter is maintained.
	Valid range within items	The set parameter is valid until the next valid setting.
	Valid range between items	The set parameter is valid until the next valid setting.

[Function]

Deletes CR/LF included in print commands.

[Format]

<CL>a

• Parameter

a [Delete CR/LF]	=	0	:	Do not delete CR/LF
		1	:	Deletes CR/LF

[Coding Example]

<A>
<CL>1
<Z>

[Supplementary Explanation]

1. Delimit Start of Data Transmission <A> and End of Data Transmission <Z> with this command for use.
2. This command cannot be used in combination with other commands.

13 Calendar Command

13.1 Calendar			
Calendar Setup			ESC+WT
Hexadecimal code	ESC	WT	Parameter
	<1B> ₁₆	<57> ₁₆ <54> ₁₆	aabbccddeee
Initial value	Nil		

Valid range and term of command	When the power switch is OFF	The set parameter is not maintained.
	Valid range within items	The set parameter is valid until the next valid setting.
	Valid range between items	The set parameter is valid until the next valid setting.

[Function]

Specifying the calendar.

[Format]

<WT>aabbccddeee

• Parameter

a [Year]	=	Valid Range	:	00 to 35
b [Month]	=	Valid Range	:	01 to 12
c [Day]	=	Valid Range	:	01 to 31
d [Hour]	=	Valid Range	:	00 to 23
e [Minutes]	=	Valid Range	:	00 to 59

[Coding Example] 2020.1.1 13:13

<A>
<WT>2001011313
<Z>

[Supplementary Explanation]

1. This command requires optional calendar IC and it is not usable without IC.
2. Valid calendar setting value is from year:2000, month: 1, day: 1, hour: 00, minutes: 00 to year: 2035, month: 12, day: 31, hour: 23, minutes: 59.

13.2 Calendar

Calendar Arithmetic (Add)

ESC+WP

Hexadecimal code	ESC <1B> ₁₆	WP <57> ₁₆ <50> ₁₆	Parameter abbb
Initial value	Nil		

Valid range and term of command	When the power switch is OFF	The set parameter is maintained.
	Valid range within items	The set parameter is valid until the next valid setting.
	Valid range between items	The set parameter becomes invalid.

[Function]

Specifying addition of calendar date.

[Format]

<WP>abbb

• Parameter

a [Specification of Year-Month-Day]

= Y : Year

M : Month

D : Day

h : Time

W : Week

b [Specification of additional value for Y-M-D-h]

= Valid Range of Y : 0 to 9

Valid Range of M : 00 to 99

Valid Range of D : 000 to 999

Valid Range of h : 000 to 999

Valid Range of W : 00 to 99

[Coding Example] Specifying and printing out the date that is three months from today.

```
<A>
<WP>M03
<V>100<H>200
<OB><WA>DD/MM/YY
<Q>2
<Z>
```

[Supplementary Explanation]

1. This command requires optional calendar IC and it is not usable without IC.
2. This command adds specified value to specified data (Year, Month, Day, Hour and Week). It can specify the date three months from current date.
3. When there are more than one <WP> in one item, the last one is available.

13.3 Calendar

Calendar Print

ESC+WA

Hexadecimal code	ESC	WA	Parameter
	<1B> ₁₆	<57> ₁₆ <41> ₁₆	a
Initial value	Nil		

Valid range and term of command	When the power switch is OFF	The set parameter is maintained.
	Valid range within items	The set parameter becomes invalid.
	Valid range between items	The set parameter becomes invalid.

[Function]

Specifying the print of calendar.

[Format]

<WA>Parameter

• Parameter

a [Specification of print contents] =	YYYY(Year)	Valid Range :	2000 to 2035
	YY(Year)	Valid Range :	00 to 35
	MM(Month)	Valid Range :	01 to 12
	DD(Day)	Valid Range :	01 to 31
	HH(Hour)	Valid Range :	00 to 11
	hh(Hour)	Valid Range :	00 to 23
	mm(Minutes)	Valid Range :	00 to 59
	ss(Second)	Valid Range :	00 to 59
	TT(AM/PM)	Valid Range :	AM/PM
	JJJ(Julian date)	Valid Range :	001 to 366
	WW(Week)	Valid Range :	00 to 53
	ww(Week)	Valid Range :	01 to 54

[Coding Example] Specifying and printing out the date that is three months from today.

```
<A>
<WP>M03
<V>100<H>200
<OB><WA>DD/MM/YYhh:mm
<Q>2
<Z>
```

[Supplementary Explanation]

1. This command requires optional calendar IC and it is not usable without IC.
2. When specifying QTY>2, real-time printing will be performed per label.
3. This command specification is available up to 6 locations within one form.
4. Up to 16 characters are available for calendar print data.
5. In the [Parameter] above, count the initiation of WW (Week) as [0], and ww (Week) as 1.
6. Specify the font type for calendar printing by font command(refer to the available command below) before this command.

WW/ww command example

Ex.1) January in 2008, The year of Jan 1 begins with Mon, Tue, Wed, and Thu.

M	T	W	T	F	S	S
31	1	2	3	4	5	6
7	8	9	10	11	12	13
14	15	16	17	18	19	20
21	22	23	24	25	26	27
28	29	30	31	1	2	3

WW	ww
wk0	wk1
wk1	wk2
wk2	wk3
wk3	wk4
wk4	wk5

- 2007/12/31: WW(week) prints week 0. (ww(week) prints week 1.)
- 2008/01/25: WW(week) prints week 3.(ww(week) prints week 4.)
- 2008/01/28: WW(week) prints week 4. (ww(week) prints week 5.)
- 2008/02/03: WW(week) prints week 4. (ww(week) prints week 5.)

Ex.2) January in 2010, the year of Jan 1 begins with Fri, Sat, and Sun.

M	T	W	T	F	S	S
28	29	30	31	1	2	3
4	5	6	7	8	9	10
11	12	13	14	15	16	17
18	19	20	21	22	23	24
25	26	27	28	29	30	31

WW	ww
wk52	wk53
wk 0	wk 1
wk 1	wk 2
wk 2	wk 3
wk 3	wk 4

- 2010/1/1: WW(week) prints week 52. (ww(week) prints week 53.)
- 2010/1/4: WW (week) prints week 0. (ww(week) prints week1.)

Note: The yeas Jan 1 begins with Fri, Sat and Sun, the second week of January is set as week 0 (ww(week): week1).

7. Correct calendar is not printed in following condition.

The time data will be edited firstly when the host cannot send whole print data of one item to the printer (e.g. printer's buffer is full) and also received data included the calendar print command. The printer will print the calendar when receiving one item data after taking a long time and completing editing all data, and the printed calendar is not the time of printing but the time of editing time data.

[Valid command]

Print position	<V>	<H>							
Modification	<P>	<L>	<%>	<R>					
font	<XU>	<XS>	<XM>	<XB>	<XL>	<OA>	<OB>		
	<U>	<S>	<M>	<WB>	<WL>				
	<X20>	<X21>	<X22>	<X23>	<X24>				

14 Memory Card Command

14.1 Memory Card

Card Slot for Use

ESC+CC

Hexadecimal code	ESC	CC	Parameter
	<1B> ₁₆	<43> ₁₆ <43> ₁₆	a
Initial value	a=1		

Valid range and term of command	When the power switch is OFF	The set parameter is not maintained.
	Valid range within items	The set parameter is valid until the next valid setting.
	Valid range between items	The set parameter is valid until the next valid setting.

[Function]

Specifying the slot number for use.

[Format]

<CC>a

•Parameter

a [Slot number]	=	0	:	Slot 0 (Default: Printer memory)
		1	:	Slot 1 (Default: FROM)

[Coding Example]

<A>
<CC>1
<GI>H003003001FF000000~000000FF
<Z>

[Supplementary Explanation]

1. The allocation of the slot number can be changed from the above default in the memory card mode.
2. It is necessary to specify when accessing to "Printer's memory" and "FROM".
3. Specifying the unused slot becomes command error.
4. When specifying slot number 0 (printer's memory), registration other than using the external character registration command is not available.

[Note]

Do not turn off the printer when accessing to the memory. When the printer power is off while memory accessing, the data in the accessed media may be corrupted.

14.2 Memory Card

Memory Card Initialization

ESC+FM

Hexadecimal code	ESC <1B> ₁₆	FM <46> ₁₆ <4D> ₁₆	Parameter aaaaaaaa
Initial value	Nil		

Valid range and term of command	When the power switch is OFF	The set parameter is maintained.
	Valid range within items	The set parameter becomes invalid.
	Valid range between items	The set parameter becomes invalid.

[Function]

Specifying the format (initialization) of memory card.

[Format]

<FM>aaaaaaaa

• Parameter

a [User ID] = Specifying up to 8 bytes in alphanumeric and symbols

[Coding Example]

<A>
<CC>1
<FM>satocard
<Z>

[Supplementary Explanation]

1. Specify slot number registered with Card Slot for Use <CC> prior to this command <BFJ> by all means.
2. This command <FM> is for formatting a memory card; therefore, it cannot be used in combination with other commands.
3. Initialization takes sometime. Do not send any command until the initialization finishes.
4. The error occurs when specifying the slot allocated to the printer's memory.

[Note]

Do not turn off the printer when accessing to the memory. When the printer power is off while memory accessing, the data in the accessed media may be corrupted.

14.3 Memory Card

Memory Card Initialization

ESC+BJF

Hexadecimal code	ESC <1B> ₁₆	BJF <42> ₁₆ <4A> ₁₆ <46> ₁₆	Parameter aaaaaaaa
Initial value	Nil		

Valid range and term of command	When the power switch is OFF	The set parameter is not maintained.
	Valid range within items	The set parameter becomes invalid.
	Valid range between items	The set parameter becomes invalid.

[Function]

Specifying the format (initialization) of memory card.

[Format]

<BJF>aaaaaaaa

•Parameter

a [User ID] = Specify up to 8 bytes in alphanumeric and symbols

[Coding Example]

<A>
<CC>1
<BJF>satocard
<Z>

[Supplementary Explanation]

1. Specify slot number registered with Card Slot for Use <CC> prior to this command <BFJ> by all means.
2. This command <BFJ> is for formatting a memory card; therefore, it cannot be used in combination with other commands.
3. Initialization takes sometime. Do not send any command until the initialization finishes.
4. The error occurs when specifying the slot allocated to the printer's memory.

[Note]

Do not turn off the printer when accessing to the memory. When the printer power is off while memory accessing, the data in the accessed media may be corrupted.

14.4 Memory Card

Memory Card Status Print

ESC+FP

Hexadecimal code	ESC	FP	Parameter
	<1B> ₁₆	<46> ₁₆ <50> ₁₆	Nil
Initial value	Nil		

Valid range and term of command	When the power switch is OFF	The set parameter is not maintained.
	Valid range within items	The set parameter becomes invalid.
	Valid range between items	The set parameter becomes invalid.

[Function]

Printing status of memory card.

[Format]

<FP>

[Coding Example]

<A>
<CC>1
<FP>
<Z>

[Supplementary Explanation]

1. Be sure to specify the slot number used for the Card Slot for Use <CC> before <FP>.
2. This command is for printing status of memory card; therefore, it cannot be used in combination with other commands.
3. Status can be checked with the label of 68mm width and 90mm length.

[Note]

Do not turn off the printer while accessing the memory. When the printer power is off while memory accessing, the data in the accessed media may be corrupted.

14.5 Memory Card

Memory Card Status Print

ESC+BJS

Hexadecimal code	ESC	BJS	Parameter
	<1B> ₁₆	<42> ₁₆ <4A> ₁₆ <53> ₁₆	Nil
Initial value	Nil		

Valid range and term of command	When the power switch is OFF	The set parameter is not maintained.
	Valid range within items	The set parameter becomes invalid.
	Valid range between items	The set parameter becomes invalid.

[Function]

Printing status of memory card.

[Format]

<BJS>

[Coding Example]

<A>
<CC>1
<BJS>
<Z>

[Supplementary Explanation]

1. This command is for printing status of memory card; therefore, it cannot be used in combination with other commands.
2. Status can be checked with the label of 68mm width and 90mm length.

[Note]

Do not turn off the printer while accessing the memory. When the printer power is off while memory accessing, the data in the accessed media may be corrupted.

14.6 Memory Card

Form Overlay Registration

ESC+&S

Hexadecimal code	ESC <1B> ₁₆	&S <26> ₁₆ <53> ₁₆	Parameter ,aa(,bbbb,cccc)
Initial value	Nil		

Valid range and term of command	When the power switch is OFF	The registered data becomes valid.
	Valid range within items	The registered data is valid until the next specification is made.
	Valid range between items	The registered data is valid until the next specification is made.

[Function]

Specifying the registration of fixed print contents to a memory card.

[Format]

<&S>,aa(,bbbb,cccc)

• Parameter

a [Registration No.]	=	Valid range: 1 to 99
b [Size specification of window width]	=	Valid range: Refer to the table below (Omissible)
c [Size specification of window height]	=	Valid range: Refer to the table below (Omissible)

[Coding Example]

```

<A>
<V>100<H>100<X21>,MODEL
<CC>1
<&S>.1
<Z>
```

[Supplementary Explanation]

- Specify slot No. with Card Slot for Use <CC> prior to this command.
- Delimit Start of Data Transmission <A> and End of Data Transmission <Z> with the format to be registered.
- Registration of identical registration No. is invalid.
- Both Print of Graphic <G> and Print of BMP File <GM> can be registered.
- This command<&S> allows up to 99 registries. Note that the capacity of registry may vary depending on the memory card to be used.
- Data registered with this command<&S> can be cleared with Clear <*>R.
- The error occurs when specifying unused or specifying the slot which the printer is allocated.

[Note]

Do not turn off the printer while accessing the memory. There is no guarantee of data in media if the power is turned off while accessing the memory.

[Valid Range]

Model	Valid Range (dot)	
	Horizontal size of the window	Vertical size of the window
CL4NX	203 dpi	50 to 832
	305 dpi	50 to 1248
	609 dpi	50 to 2498
CL6NX	203 dpi	50 to 1216 (*1) 50 to 1340 (*2)
	305 dpi	50 to 1984 (*1) 50 to 2010 (*2)

(*1) Valid range for "Standard" in "Head Base Position" setting.

(*2) Valid range for "Left-justify" in "Head Base Position" setting.

Refer to the operator manual for further information of the setting.

[Valid Command]

Print position	<V>	<H>							
Font	<XU>	<XS>	<XM>	<XB>	<XL>	<OA>	<OB>	<RD>	<\$=>
	<K2>	<K3>	<K4>	<K5>	<K8>	<K9>	<KA>	<KB>	<KD>
	<k2>	<k3>	<k4>	<k5>	<k8>	<k9>	<kA>	<kB>	<kD>
	<S>	<M>	<WB>	<WL>	<X20>	<X21>	<X22>	<X23>	<X24>
Barcode		<BC>	<BG>	<BI>	<D>	<D><d>	<BD>	<BT>	<BW>
	<BP>	<BF>	<BS>	<BL>	<BL><d>	<BM>			
2D Code	<2D10>	<BK>	<2D12>	<2D20>	<BV>	<2D30>	<2D31>	<2D32>	<BQ>
	<2D50>	<BX>	<2D51>	<2D70>					
Composite symbol	<EU>								
Modification	<WD>	<FW>	<(>	<RF>	<FC>	<FT>	<RM>		
Graphic	<G>	<GM>	<GP>						

In general, this command is used for [Registration number] only. Specification of window height and width will control the movement with Vertical Print Position <V> and Horizontal Print Position <H> at the time of calling. For the movement at the time of calling, if registered area is exceeding print area, the portion outside of print area will not be printed.

The following are the brief operation.

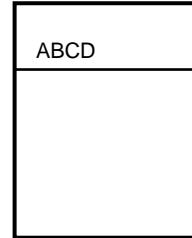
(1) Normal(To register)

```

<A>
<V>100<H>100<P>2<L>0202
<X23>,0ABCD
<V>60<H>60
<FW>0808V800H400
<V>320<H>60
<FW>04H400
<CC>1
<&S>,1
<Z>

```

Registered image



(2) When print is specified after the command <&S>

```

<A>
<V>100<H>100<P>2<L>0202
<X23>,0ABCD
<V>60<H>60
<FW>0808V800H400
<V>320<H>60
<FW>04H400
<CC>1
<&S>,1
<V>200<H>100<OB>12345
<Z>

```

} Anything specified prior to the command <&S> will be registered as form overlay.

← Printing out this part

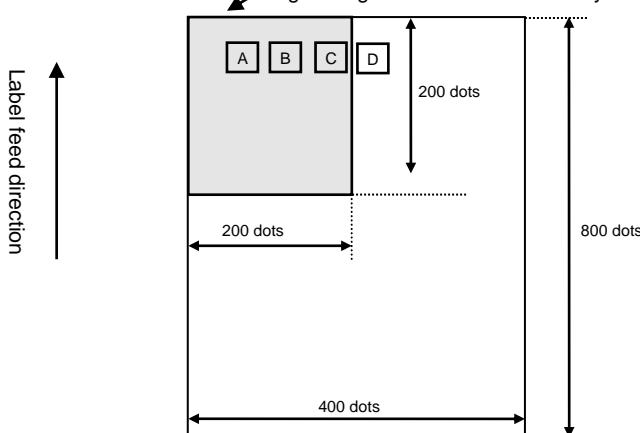
(3) When window size is specified

Label Size <A1>08000400, Window width [200], Window height[200]

```

<A>
<A1>08000400
<V>100<H>00<P>2<L>0202
<X23>,0ABCD
<CC>1
<&S>,1,200,200
<Z>

```



14.7 Memory Card

Form Overlay Call

ESC+&R

Hexadecimal code	ESC <1B> ₁₆	&R <26> ₁₆ <52> ₁₆	Parameter ,aa
Initial value	Nil		

Valid range and term of command	When the power switch is OFF	The set parameter is not maintained.
	Valid range within items	The set parameter becomes invalid.
	Valid range between items	The set parameter becomes invalid.

[Function]

Invoking the contents in memory card with Registration of Form Overlay <&S>.

[Format]

<&R>,aa

• Parameter

a[Registration Number] = Valid Range : 1 to 99

[Coding Example]

<A>
<CC>1
<&R>.1
<Z>

[Supplementary Explanation]

- Specify slot number of Card Slot for Use <CC> prior to this command when using.
- This command can be combined with different registration No. and printed.
- When registration No. is not specified, this command will be ignored.
- If specifying unregistered No., Read/Write error will occur.
- When registering without specifying window, Vertical Print Position <V> and Horizontal Print Position <H> will be ignored and V1 and H1 (Start position of drawing area) will be determined.
- When specifying and registering window, movement with <V> and <H> will be enabled.
Note that when exceeding print area, the portion outside of print area will not be printed.
- The error occurs when specifying unused or specifying the slot which the printer is allocated.

[Note]

Don't power off while accessing the memory. There is no guarantee of data in media if the power is turned off while accessing the memory.

[Valid Command]

Print position	<V>	<H>						
----------------	-----	-----	--	--	--	--	--	--

14.8 Memory Card

Format Registration

ESC+YS

Hexadecimal code	ESC <1B> ₁₆	YS <59> ₁₆ <53> ₁₆	Parameter ,aaa
Initial value	Nil		

Valid range and term of command	When the power switch is OFF	The set parameter is not maintained.
	Valid range within items	The set parameter is valid until the next valid setting.
	Valid range between items	The set parameter is valid until the next valid setting.

[Function]

Registering print format.

[Format]

<YS>,aaa

• Parameter

a [Format registration number] = Valid Range : 1 to 999

[Coding Example]

```
<A>
<CC>1
<YS>1
</N>,3,3
<%>0<V>100<H>200<P>2<L>0101<XM>ABC
<Z>
```

[Supplementary Explanation]

1. When registering multiple formats, Delimit Start of Data Transmission <A> and End of Data Transmission <Z> with one format.
2. Specify Card Slot for Use <CC> prior to this command when using.
3. Use this command and Registration of Field </N> as a pair.
4. Attempts to re-register with registered No., error will occur, and the targeted content will be printed.
5. The error occurs when specifying unused or specifying the slot which the printer is allocated.

[Notes]

1. Do not turn off the printer while accessing the memory. When the printer power is off while memory accessing, the data in the accessed media may be corrupted.
2. The maximum registration with </N> is 99 fields. (Refer to the customizable print command of the field registration(ESC+N) for the commands can be registered.)
3. The maximum registration with other than </N> is 50 fields. Refer to the customizable print command for the commands can be registered.)

[Point]

Details of Format Registration

A group of commands can be registered to a memory card (option). Once registered, it saves time to specify the identical command group. The registration also allows a change of print data when invoking the format. Such function is called "Format Registration".

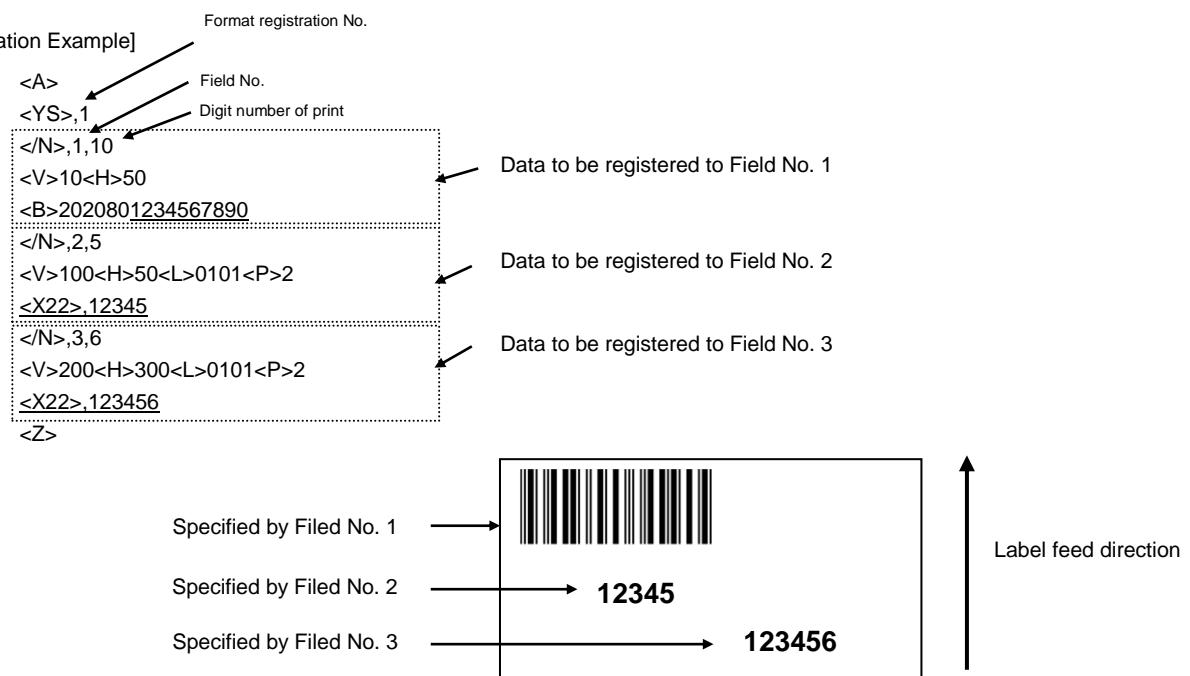
One item consists of different command groups necessary for printing, and such groups are called "Field". Note that multiple fields make format.

Commands for format registration:

One format consists of a pair of commands from Start of Data Transmission <A> to End of Data Transmission <Z>, and specify Registration of Format <YS> right after <A>. For <YS>, specify [Format registration No.] between 1 and 999. And then, insert Registration of Field </N> after <YS> to specify [Field No.] and [Digit No. of print quantity].

After [Field No.] and [Digit No. of print quantity] are entered, specify print position, character type, barcode, and so on.

[Registration Example]



Invoking the registered print contents

Specify saved [Format registration No.] between 1 and 999 with Format Call <YR>.

To change print data, use Print of Field <D> to specify [Field No.] to be changed, and continuously specify the changed print data.

Note that the underlined parts in the [Registration Example] are changeable.

Calling Example

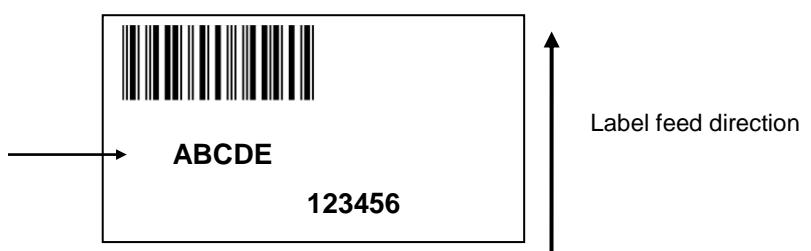
```
<A>
<YR>,1
<D>,2,ABCDE
<Q>2
<Z>
```

Format registration No. to invoke

Field No. of print data to be changed

Data to be changed

Changed data



Available registration command is as follows.

[Available registration command]

Print position	<V>	<H>								
Font	<XU>	<XS>	<XM>	<XB>	<XL>	<OA>	<OB>	<RD>	<\$=>	<K1>
	<K2>	<K3>	<K4>	<K5>	<K8>	<K9>	<KA>	<KB>	<KD>	<k1>
	<k2>	<k3>	<k4>	<k5>	<k8>	<k9>	<kA>	<kB>	<kD>	
	<U>	<S>	<M>	<WB>	<WL>	<X20>	<X21>	<X22>	<X24>	
Barcode		<BC>	<BG>	<Bi>		<D>	<D><d>	<BD>	<BT>	<BW>
Modification	<P>	<L>	<PS>	<PR>	<%>	<FW>	<(>	<WD>		
system	<A1>	<A3>	<AX>	<AR>						
Memory card	<&R>	</N>	<GR>	<GC>						

(Caution) The operation when registering a command other than available command is not guaranteed.

14.9 Memory Card

Registration of Field

ESC+N

Hexadecimal code	ESC <1B> ₁₆	/N <2F> ₁₆ <4E> ¹⁶	Parameter ,aa,bb
Initial value	Nil		

Valid range and term of command	When the power switch is OFF	The set parameter is not maintained.
	Valid range within item	The set parameter is valid until the next valid setting.
	Valid range between items	The set parameter is valid until the next valid setting.

[Function]

Registering items within the field of Registration of Format <YS>.

[Format]

</N>,aa,bb

• Parameter

a [Field number]	=	Valid Range	:	1 to 99
b [Digit number of print]	=	Valid Range	:	1 to 99

[Coding Example]

```

<A>
<CC>1
<YS>, 1
</N>,1,3
<%>0<V>100<H>200<P>2<L>0101<XM>ABC
</N>,2,5
<%>0<V>200<H>200<P>2<L>0101<OA>12345
</N>,3,8
<%>0<V>300<H>40<B>40208049123456
<Z>

```

[Supplementary Explanation]

- Specify the value of [Field number] in ascending order.
- Specify Vertical Print Position <V> and Horizontal Print Position <H> for each field. If not, default value will be set.
- Specification of digit number when printing external character.
External code H, one external character has 4 digits; thus, three external characters make 12 digits for printing.
External code B, one external character has 2 digits; thus, three external characters make 6 digits for printing.
- Use this command and Registration of Format <YS> as a pair.
- Due to the memory capacity limit, it may not save up to 99 registries.
- The error occurs when specifying unused or specifying the slot which the printer is allocated.

[Note]

Don't power off while accessing the memory. There is no guarantee of data in media if the power is turned off while accessing the memory.

[Designable Commands for the Change of Print]

Font	<XU>	<XS>	<XM>	<XB>	<XL>	<OA>	<OB>	<RD>	<\$=>	<K1>
	<K2>	<K3>	<K4>	<K5>	<K8>	<K9>	<KA>	<KB>	<KD>	<k1>
	<k2>	<k3>	<k4>	<k5>	<k8>	<k9>	<kA>	<kB>	<kD>	
	<X20>	<X21>	<X22>	<X23>	<X24>					
Modification	<P>	<L>	<PS>	<PR>	<%>					
Barcode		<BC>	<BG>	<BI>	<D>	<D><d>	<BD>	<BT>	<BW>	
	<BL>									

14.10 Memory Card

Format Call

ESC+YR

Hexadecimal code	ESC <1B> ₁₆	YR <59> ₁₆ <52> ₁₆	Parameter ,aaa
Initial value	Nil		

Valid range and term of command	When the power switch is OFF	The set parameter is not maintained.
	Valid range within items	The set parameter is valid until the next valid setting.
	Valid range between items	The set parameter is valid until the next valid setting.

[Function]

Invoking and printing out the format registered with Registration of Format <YS>.

[Format]

<YR>,aaa

• Parameter

a [Format registration Number] = Valid Range : 1 to 999

[Coding Example]

```

<A>
<CC>1
<YR>1
</D>,1,DEF
</D>,2,78901
</D>,3,49000238
<Q>2
<Z>

```

[Supplementary Explanation]

1. This command cannot invoke multiple formats between Start of Data Transmission <A> and End of Data Transmission <Z>.
2. Use this command and Print of Field <D> as a pair.
3. The error occurs when specifying unused or specifying the slot which the printer is allocated.

[Note]

Don't power off while accessing the memory. There is no guarantee of data in media if the power is turned off while accessing the memory.

14.11 Memory Card

Print of Field

ESC+/D

Hexadecimal code	ESC <1B> ₁₆	/D <2F> ₁₆ <44> ₁₆	Parameter ,aa,n~n
Initial value	Nil		

Valid range and term of command	When the power switch is OFF	The set parameter is not maintained.
	Valid range within items	The set parameter is valid until the next valid setting.
	Valid range between items	The set parameter is valid until the next valid setting.

[Function]

Invoking the items registered with Registration of Field and specifying data.

[Format]

</D>,aa,n~n

• Parameter

a [Field number]	=	Valid Range : 1 to 99
n [Data]	=	Data to be changed

[Coding Example]

```

<A>
<CC>1
<YR>,1
</D>,1,DEF
</D>,2,78901
</D>,3,49000238
<Q>2
<Z>
```

[Supplementary Explanation]

1. Digit number of print is valid within the range specified with Registration of Field </N>.
2. When digit number of this command is larger than the one specified with Registration of Field </N>, only the defined digit No. will be available for printing.
3. Use this command and Format Call <YR> as a pair.
4. The error occurs when specifying unused or specifying the slot which the printer is allocated.

[Note]

Don't power off while accessing the memory. There is no guarantee of data in media if the power is turned off while accessing the memory.

14.12 Memory Card

Registration of Graphic

ESC+GI

Hexadecimal code	ESC <1B> ₁₆	GI <47> ₁₆ <49> ₁₆	Parameter abbbccdddn~n
Initial value	Nil		

Valid range and term of command	When the power switch is OFF	The set parameter is not maintained.
	Valid range within items	The set parameter becomes invalid.
	Valid range between items	The set parameter becomes invalid.

[Function]

Specifying the registration of graphic pattern data.

[Format]

<GI>abbccdddn~n

• Parameter

a [Selection of data transfer in HEX or BIN] = H : Hex data
B : Binary data

Hex data (Divide 8 bits data into 4 bits and outputs it as hex code corresponding to ASCII)
Binary data (Output 8 bits data as one character data all at once)

b [Specification of crosswise graphic area per byte] = Refer to the table below
c [Specification of lengthwise graphic area per byte] = Refer to the table below
d [Registration number] (Identification number when invoking) = Valid range: 1to 999
n [Data] = Graphic data

[Coding Example 1] [H: HEX data] is specified for [Data specification by HEX and BIN]

[□] is registered to the 999th of the slot 1 by the below.

<A>
<CC>1
<GI>H001001999<4646383138313831383138314646>₁₆
<Z>

[Coding Example 2] [B: Binary data] is specified as Data specification by HEX and BIN]

[□] is registered to the 999th of the slot 1 by the below.

<A>
<CC>1
<GI>B001001999<FF8181818181FF>₁₆
<Z>

[Supplementary Explanation]

- Specify the card slot number used for Card Slot <CC> prior to this command.
- Specify registered data only.
- To change the registered content, clear it with Clear <*> to re-register.
- Graphic Call <GR> is for printing out the data registered with Registration of Graphic <GI>.
- When data is not registered properly, print error may occur. For details of data format, refer to Print of Graphic <G>.
- The error occurs when specifying unused or specifying the slot which the printer is allocated.

[Note]

Don't power off while accessing the memory. There is no guarantee of data in media if the power is turned off while accessing the memory.

[Specified Range]

Model		Maximum byte in horizontal direction	Maximum byte in vertical direction
CL4NX	203 dpi	104	400
	305 dpi	156	600
	609dpi	312	999
CL6NX	203 dpi	152 (*1) 167 (*2)	400
	305 dpi	248 (*1) 251 (*2)	600

(*1) Valid range for "Standard" in "Head Base Position" setting.

(*2) Valid range for "Left-justify" in "Head Base Position" setting.

Refer to the operator manual for further information of the setting.

14.13 Memory Card

Graphic Call

ESC+GR

Hexadecimal code	ESC <1B> ₁₆	GR <47> ₁₆ <52> ₁₆	Parameter aaa
Initial value	Nil		

Valid range and term of command	When the power switch is OFF	The set parameter is not maintained.
	Valid range within items	The set parameter becomes invalid.
	Valid range between items	The set parameter becomes invalid.

[Function]

Invoking and printing out the data registered with Registration of Graphic <GI>.

[Format]

<GR>aaa

• Parameter

a[Registration number] = Valid Range : 1 to 999

[Coding Example]

```

<A>
<V>100<H>100
<CC>1
<GR>1
<Q>1
<Z>
```

[Supplementary Explanation]

1. Specify Card Slot for Use <CC> prior to this command when using.
2. Ignoring Start Point Correction <A3> and making no correction.
3. Rotation <%> and Enlargement <L> are available for the invoked graphic.
4. The error occurs when unused or the slot which the printer is allocated is specified.

[Note]

Do not turn off the printer while accessing the memory. When the printer power is off while memory accessing, the data in the accessed media may be corrupted.

14.14 Memory Card

BMP File Registration

ESC+GT

Hexadecimal code	ESC $<1B>_{16}$	GT $<47>_{16}<54>_{16}$	Parameter aaa,bbbb,n~n
Initial value	Nil		

Valid range and term of command	When the power switch is OFF	The set parameter is not maintained.
	Valid range within item	The set parameter becomes invalid.
	Valid range between items	The set parameter becomes invalid.

[Function]

Specifying the registration of BMP file created by such as Paint Brush of Windows.

[Format]

$<GT>aaa,bbbb,n~n$

• Parameter

- | | | |
|-----------------------------|---|---|
| a [Registration number] | = | Valid Range : 1 to 999 |
| b [Total bytes of BMP file] | = | Valid Range : 1 to 99999
Specify the file size of BMP file for total bytes. |
| n [Data] | = | BMP file data
Data is sent as binary data (Outputs 8 bits as one character data all at once) |

[Coding Example]

```
<A>
<CC>1
<GT>1,12345,<424D00~00>_{16}
<Z>
```

[Supplementary Explanation]

1. Data is sent as binary data (Outputs 8 bits as one character data all at once). In this case, file size of BMP file becomes the total bytes, and BMP file data becomes data.
2. When [Total bytes of BMP file] is not matching the transfer data, this may cause malfunction.
3. Total bytes are the file size displayed at [Property] and such.
4. BMP file is available in Black/White mode only. In color mode, printing will not be performed due to command error. Also, this command is not valid for BMP compressed file. Make sure that the file extension is set to [BMP] before printing.
5. Specify Card Slot for use <CC> prior to <GT> command.
6. The error occurs when unused or the slot which the printer is allocated is specified.

[Note]

Don't power off while accessing the memory. There is no guarantee of data in media if the power is turned off while accessing the memory.

14.15 Memory Card

BMP File Call

ESC+GC

Hexadecimal code	ESC	GC	Parameter
	<1B> ₁₆	<47> ₁₆ <43> ₁₆	aaa
Initial value	Nil		

Valid range and term of command	When the power switch is OFF	The set parameter is not maintained.
	Valid range within items	The set parameter becomes invalid.
	Valid range between items	The set parameter becomes invalid.

[Function]

Invoking and printing out the data registered with Registration of BMP File<GT>.

[Format]

<GC>aaa

• Parameter

a [Registration number] = Valid Range : 1 to 999

[Coding Example]

```

<A>
<V>100<H>100
<CC>1
<GC>1
<Q>2
<Z>
```

[Supplementary Explanation]

1. Rotation <%> and Enlargement <L> are available for the invoked data.
2. Specify Card Slot for Use <CC> prior to this command when using.
3. The error occurs when specifying unused or specifying the slot which the printer is allocated.

[Note]

Don't power off while accessing the memory. There is no guarantee of data in media if the power is turned off while accessing the memory.

14.16 Memory Card

PCX File Registration

ESC+PI

Hexadecimal code	ESC	PI	Parameter
	<1B> ₁₆	<50> ₁₆ <49> ₁₆	aaa,bbbb,n~n
Initial value	Nil		

Valid range and term of command	When the power switch is OFF	The set parameter is not maintained.
	Valid range within items	The set parameter becomes invalid.
	Valid range between items	The set parameter becomes invalid.

[Function]

Specifying the registration of PCX file created by such as Paint Brush of Windows.

[Format]

<PI>aaa,bbbb,n~n

•Parameter

a [Registration number] = Valid Range : 1 to 999
 b [Total bytes of PCX file] = Valid Range : 1 to 99999

*Specify the file size of PCX file for total bytes.

n [Data] = PCX file data

* Data is sent as binary data (Outputs 8 bits as one character data all at once)

[Coding Example]

```
<A>
<CC>1
<PI>001,12345,n~n
<Z>
```

[Supplementary Explanation]

1. Data is sent as binary data (Outputs 8 bits as one font data all at once) (Total bytes are PCX file size and Data are PCX file data)
2. In PCX file, 128 bytes of data is for the header part and the rest of data is for the image data.
3. When [Total bytes of PCX file] is not matching the transfer data, this may become the cause of malfunction.
4. Total bytes are the file size displayed at [Property] and such.
5. PCX file is available in Black/White mode only. In color mode, printing will not be performed due to command error. Also, this command is not valid for PCX compressed file. Make sure that the file extension is set to [PCX] before printing.
6. Specify Card Slot for Use <CC> prior to this command<PI> when using.
7. The error occurs when specifying unused or specifying the slot which the printer is allocated.

[Note]

Don't power off while accessing the memory. There is no guarantee of data in media if the power is turned off while accessing the memory.

14.17 Memory Card

PCX File Call

ESC+PY

Hexadecimal code	ESC <1B> ₁₆	PY <50> ₁₆ <59> ₁₆	Parameter aaa
Initial value	Nil		

Valid range and term of command	When the power switch is OFF	The set parameter is not maintained.
	Valid range within items	The set parameter becomes invalid.
	Valid range between items	The set command becomes invalid.

[Function]

Invoking and printing out the data registered with Registration of PCX File <Pl>.

[Format]

<PY>aaa

•Parameter

a[Registration number] = Valid Range : 1 to 999

[Coding Example]

```
<A>
<V>100<H>100
<CC>1
<PY>001
<Q>2
<Z>
```

[Supplementary Explanation]

- Specify Card Slot for Use <CC> prior to this command <PY> when using.
- Rotation <%> and Enlargement <L> are available for the invoked data.
- The error occurs when specifying unused or specifying the slot which the printer is allocated.

[Note]

Don't power off while accessing the memory. There is no guarantee of data in media if the power is turned off while accessing the memory.

14.18 Memory Card

Memory Card Clear

ESC+*

Hexadecimal code	ESC	*	Parameter
	<1B> ₁₆	<2A> ₁₆	a(,bbb)
Initial value	Nil		

Valid range and term of command	When the power switch is OFF	The set parameter is not maintained.
	Valid range within item	The set parameter becomes invalid.
	Valid range between items	The set parameter becomes invalid.

[Function]

Clearing the entire contents in memory card (option).

[Format]

<*>a(,bbb)

•Parameter

- | | | |
|------------------------|---|--|
| a [Item to be cleared] | = | G: SATO Graphic
(Clearing graphic registered with Registration of Graphic <GI>) |
| | | P: PCX file
(Clearing PCX file registered with Registration of PCX File <PI>) |
| | | M: BMP file
(Clearing BMP file registered with Registration of BMP File <GT>) |
| | | F: Format
(Clearing format registered with Registration of Format <YS>) |
| | | O: True Type font
(Clearing True Type font registered with Registration of True Type Font <BJ>) |
| | | R: Form Overlay
(Clearing form overlay registered with Registration of Form Overlay <&S>) |
| b [Registration No.] | = | Valid range: 000 to 999 (Omissible) True Type font
001 to 999 (Omissible) Except True Type font
(When omitting Registration No., all the registered data will be cleared.) |

[Coding Example1] Clearing 001 of SATO graphic

```
<A>
<CC1>
<*>G,001
<Z>
```

[Coding Example2] Clearing 002 of PCX file

```
<A>
<CC1>
<*>P,002
<Z>
```

[Coding Example3] Clearing Form Overlay entirely

```
<A>
<CC1>
<*>R
<Z>
```

[Supplementary Explanation]

1. Delimit Start of Data Transmission <A> and End of Data Transmission <Z> with this command <*> for use.
2. Specify slot number of Card Slot for Use <CC> prior to this command-<*> when using.

[Point]

To clear all data of memory card, use Format <BJF>.

[Note]

Don't power off while accessing the memory. There is no guarantee of data in media if the power is turned off while accessing the memory.

14.19 Memory Card

Memory Card 16x16 dots External Font Registration

ESC+T1

Hexadecimal code	ESC <1B> ₁₆	T1 <54> ₁₆ <31> ₁₆	Parameter abbn~n
Initial value	Nil		

Valid range and term of command	When the power switch is OFF	The set parameter is maintained.
	Valid range within items	The set parameter becomes invalid.
	Valid range between items	The set parameter becomes invalid.

[Function]

Registering 16x16 dots external fonts in the memory card.

[Format]

<T1>abbn~n

• Parameter

a [Registration data selection] = H:HEX character
B:Binary code

b [Registration font code address]

Using Kanji set <KS> command to set Japanese (01,2)
JIS code

H: Up to 95 registrations from 21H to 7FH is available.
B: Up to 95 registrations from "21" to "7F" is available.

Shift JIS code

H: Up to 95 registrations from 40H to 9EH is available.
B: Up to 95 registrations from "40" to "9E" is available.

Unicode

H: Up to 95 registrations from 00H to 5EH is available.
B: Up to 95 registrations from "00" to "5E" is available.

Using Kanji set <KS> command to set other than Japanese
(3 (China Simplified Chinese), 5 (China Traditional Chinese), 6 (Korean))

H: Up to 95 registrations from 21H to 7FH is available.
B: Up to 95 registrations from "21" to "7F" is available.

n [Registered external font data]

[Coding Example]

```
<A>
<CC>1
<T1>H2100FF00FF~3C0000FF
<Z>
```

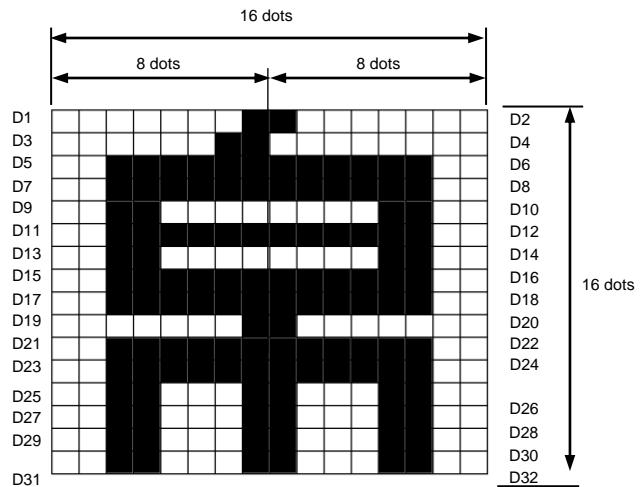
[Supplementary Explanation]

- Overwriting registration data is available.
- Specify slot registered with Card Slot for Use <CC> prior to this command<T1> by all means.
- The code to specify in the registration font code address needs to match the Kanji set (<KS>) and Kanji code (<KC>).
- When use <T1> with another registration command, it may occur error because of capacity shortage of the memory card.
In this case, register another command in another memory card, or use a memory card having bigger capacity.

5. Data output is as follows.

External file [16x16]

D1	D2
D3	D4
D5	D6
D31	D32



When registering the external characters described above, D1 data becomes $<01>_{16}$ and D2 data becomes $<80>_{16}$ because D1 consists of [00000001], D2 consists of [10000000].

In the same manner, D3 is $<03>_{16}$, D4 is $<00>_{16}$, D5 is $<3F>_{16}$, D6 is $<FC>_{16}$, and the external registration data will be $<018003003FFC.....>_{16}$ up to D32.

[Note]

Don't power off while accessing the memory. There is no guarantee of data in media if the power is turned off while accessing the memory.

14.20 Memory Card

Memory Card 24x24 dots External Font Registration

ESC+T2

Hexadecimal code	ESC	T2	Parameter
	<1B> ₁₆	<54> ₁₆ <32> ₁₆	abbn~n
Initial value	Nil		

Valid range and term of command	When the power switch is OFF	The set parameter is maintained.
	Valid range within item	The set parameter becomes invalid.
	Valid range between items	The set parameter becomes invalid.

[Function]

Registering 24x24 dots external fonts in the memory card.

[Format]

<T2>abbn~n

• Parameter

a [Registration data selection] = H:HEX character
B:Binary code

b [Registration font code address]

Using Kanji set <KS> command to set Japanese (0,1,2)
JIS code

H:Up to 95 registrations from 21H to 7FH is available.
B: Up to 95 registrations from "21" to "7F" is available.

Shift JIS code

H: Up to 95 registrations from 40H to 9EH is available.
B: Up to 95 registrations from "40" to "9E" is available.

Unicode

H: Up to 95 registrations from 00H to 5EH is available.
B: Up to 95 registrations from "00" to "5E" is available.

Using Kanji set <KS> command to set other than Japanese

(3 (China Simplified Chinese), 5 (China Traditional Chinese), 6 (Korean))

H:Up to 95 registrations from 21H to 7FH is available.

B: Up to 95 registrations from "21" to "7F" is available.

n [Registered external font data]

[Coding Example]

```
<A>
<CC>1
<T2>H2100FF00FF~3C0000FF
<Q>2
<Z>
```

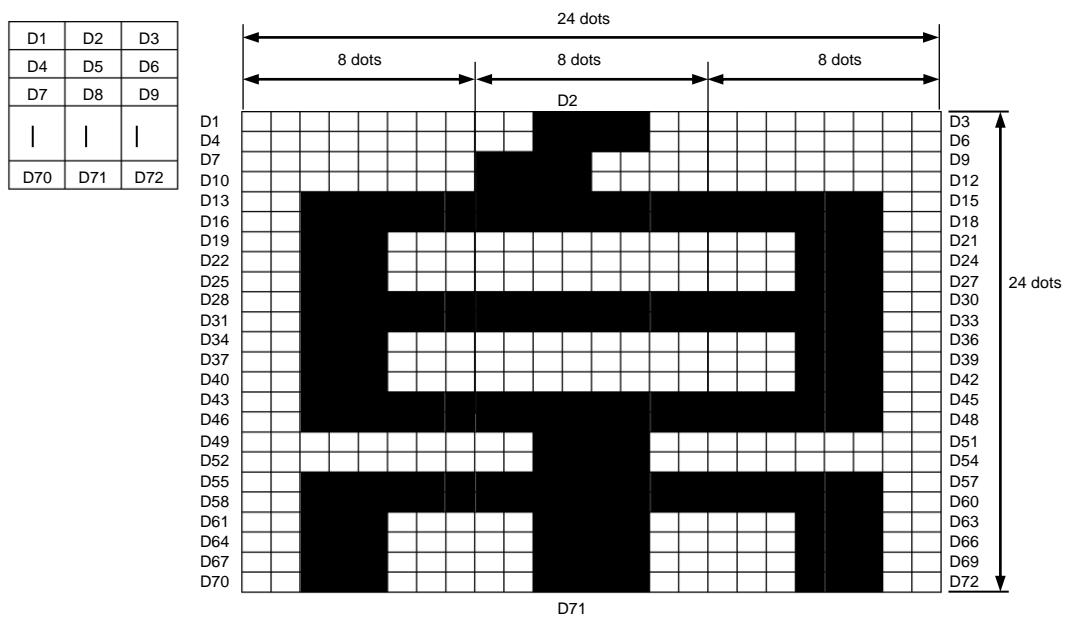
[Supplementary Explanation]

- Overwriting registration data is available.
- Specify slot registered with Card Slot for Use <CC> prior to this command<T2> by all means.
- The code to specify in the registration font code address needs to match the Kanji set (<KS>) and Kanji code (<KC>).
- When use <T2> with other registration command, error may occur because of capacity shortage of the memory card.

In this case, register another command in another memory card, or use a memory card having bigger capacity.

5. Data output is as follows.

External file [24x24]



When registering the external characters described above, D1 data becomes <00>₁₆, D2 data becomes <3C>₁₆ and D3 data becomes <00>₁₆ because D1 consists of [00000000], D2 consists of [00111100] and D3 consists of [00000000].

In the same manner, D4 becomes <00>₁₆, D5 becomes <3C>₁₆ and D6 becomes <00>₁₆, and the external registration data are specified to <003C00003C00...> and up to D72.

[Note]

Don't power off while accessing the memory. There is no guarantee of data in media if the power is turned off while accessing the memory.

14.21 Memory Card

Horizontal Writing External Font Call

ESC+K1(K2)

Hexadecimal code	ESC <1B> ₁₆	K1(K2) <4B> ₁₆ <31> ₁₆ <4B> ₁₆ <32> ₁₆)	Parameter abbn~n
Initial value	Nil		

Valid range and term of command	When the power switch is OFF	The set parameter is not maintained.
	Valid range within items	The set parameter becomes invalid.
	Valid range between items	The set parameter becomes invalid.

[Function]

Specifying call of external fonts registered in memory card.

[Format]

<K1>an~n
<K2>an~n

• Parameter

a [External font registration] = H : HEX character
 B : Binary code
 I : HEX character with smoothing
 C : Binary code with smoothing
 J : HEX character with highlighting
 D : Binary code with highlighting
 K : HEX character with smoothing and highlighting
 E : Binary code with smoothing and highlighting
 n~n [Registration code] = Specifying Kanji (0,1,2) with Kanji set command <KS>(0,1,2)
 JIS code
 H, I, J, K: "9021" to "907F"
 B, C, D, E: 9021H to 907FH

Shift JIS code
 H, I, J, K: "F040" to "F09E"
 B, C, D, E: F040H to F09EH
 Unicode
 H, I, J, K: "E000" to "E05E"
 B, C, D, E: E000H to E05EH

Using Kanji set <KS> command to set other than Japanese
 (3 (China Simplified Chinese), 5 (China Traditional Chinese), 6 (Korean))

H, I, J, K: "8021" to "807F"
 B, C, D, E: 8021H to 807FH

[Coding Example]

<A>
<KS>0
<CC>1
<V>100<H>100
<K1>H9021
<Q>2
<Z>

[Supplementary Explanation]

- Specify slot No. registered with Card Slot for Use <CC> prior to this command <K1> by all means.
- Valid range of registration code varies according to the Kanji set command <KS>.

[Note]

Don't power off while accessing the memory. There is no guarantee of data in media if the power is turned off while accessing the memory.

14.22 Memory Card

Vertical Writing External Font Call

ESC+k1(k2)

Hexadecimal code	ESC <1B> ₁₆	k1(k2) <6B> ₁₆ <31> ₁₆ (<6B> ₁₆ <32> ₁₆)	Parameter abbn~n
Initial value	Nil		

Valid range and term of command	When the power switch is OFF	The set parameter is not maintained.
	Valid range within items	The set parameter becomes invalid.
	Valid range between items	The set parameter becomes invalid.

[Function]

Specifying call of external fonts registered in memory card.

[Format]

<k1>an~n
<k2>an~n

• Parameter

a [External font registration] = H : HEX character
 B : Binary code
 I : HEX character with smoothing
 C : Binary code with smoothing
 J : HEX character with highlighting
 D : Binary code with highlighting
 K : HEX character with smoothing and highlighting
 E : Binary code with smoothing and highlighting
 n~n[Registration code] = Using Kanji set <KS> command to set Japanese (01,2)
 JIS code
 H, I, J, K: "9021" to "907F"
 B, C, D, E: 9021H to 907FH

Shift JIS code
 H, I, J, K: "F040" to "F09E"
 B, C, D, E: F040H to F09EH
 Unicode
 H, I, J, K: "E000" to "E05E"
 B, C, D, E: E000H to E05EH

Using Kanji set <KS> command to set other than Japanese
 (3 (China Simplified Chinese), 5 (China Traditional Chinese), 6 (Korean))
 H, I, J, K: "8021" to "807F"
 B, C, D, E: 8021H to 807FH

[Coding Example]

```
<A>
<V>100<H>100
<RU>1
<k1>H9021
<Q>2
<Z>
```

[Supplementary Explanation]

- Specify slot No. registered with Card Slot for Use <CC> prior to this command <k1> by all means.
- Valid range of registration code varies according to the Kanji set command <KS>.

[Note]

Don't power off while accessing the memory. There is no guarantee of data in media if the power is turned off while accessing the memory.

14.23 Memory Card

True Type Font Registration (Compatible Commands)

ESC+BJ ESC+BJD

Hexadecimal code	ESC	BJ BJD	Parameter
	<1B> ₁₆	<42> ₁₆ <4A> ₁₆ <42> ₁₆ <4A> ₁₆ <44> ₁₆ <42> ₁₆ <4A> ₁₆	(a · · · ab · · b c · · · cddde · · e)
Initial value	Nil		

Valid range and term of command	When the power switch is OFF	The set parameter is not maintained.
	Valid range within items	The set parameter becomes invalid.
	Valid range between items	The set parameter becomes invalid.

[Function]

Specifying registration of True Type Font.

[Format]

```
<BJ>(a · · · ab · · · b
<BJD>c · · · cddde · · e
<BJ>)
```

● Parameter

a [Font description]	40 byte font
b [Date]	10 bytes date data
c [Memory offset]	5 bytes memory offset (HEX)
d [Number of data bytes]	Valid Range = 0001 to 9999
e [Font data to download]	

[Coding Example] Font= 'abcdefghijklabcdefghijklabcdefghijkl' , Date data=29-08-2010,
Memory offset=0000000220₁₆, Number of data bytes=3001, Font data= 'A00490020....00000000'

```
<A>
<RU>1
<BJ>(abcdefghijklabcdefghijklabcdefghijkl29-08-2010
<BJD>00000002203001A00490020 · · · · · · · · 0000000
<BJ>)
<Z>
```

[Supplementary Explanation]

Specify slot number of Card Slot for Use <CC> prior to this command when using.

[Note]

1. Do not turn off the printer while accessing the memory. When the printer power is off while memory accessing, the data in the accessed media may be corrupted.
2. This command is for existing models. Using [DC2]DE and <RH> is recommended.

14.24 Memory Card

True Type Font Call (Compatible Commands)

ESC+BJT

Hexadecimal code	ESC	BJT	Parameter
	<1B> ₁₆	<42> ₁₆ <4A> ₁₆ <54> ₁₆	,aa,bb,cc,dd,ee,ffff,n~n
Initial value	Nil		

Valid range and term of command	When the power switch is OFF	The set parameter is not maintained.
	Valid range within items	The set parameter becomes invalid.
	Valid range between items	The set parameter becomes invalid.

[Function]

Specifying True Type Font call.

[Format]

<BJT>,aa,bb,cc,dd,ee,ffff,n~n

•Parameter

a [Font ID]	Valid Range	:	00 to 99
b [Horizontal scale factor]	Valid Range	:	01 to 12
c [Vertical scale factor]	Valid Range	:	01 to 12
d [Word Pitch]	Valid Range	:	00 to 99
e [Reserve]	Valid Range	:	00 (Fixed)
f [Reserve]	Valid Range	:	0000 (Fixed)
n [Data]			

[Coding Example]

```

<A>
<V>100<H>200<CC>1
<BJT>,01,02,02,01,00,0004SATO
<Q>
<Z>
```

[Supplementary Explanation]

Specify slot number of Card Slot for Use <CC> prior to this command when using.

[Note]

1. Don't power off while accessing the memory. There is no guarantee of data in media if the power is turned off while accessing the memory.
2. This command is for existing models. Using [DC2]DE and <RH> is recommended.

15 Intelligent Command

15.1 Intelligent Command

Label Feed Control

ESC+IK

Hexadecimal code	ESC	IK	Parameter
	<1B> ₁₆	<49> ₁₆ <4B> ₁₆	a,(bbbb)
Initial value	Nil		

Valid range and term of command	When the power switch is OFF	The set parameter is not maintained.
	Valid range within items	The set parameter becomes invalid.
	Valid range between items	The set parameter becomes invalid.

[Function]

Feeding forward or backward for the specified number of labels.

[Format]

<IK>a,(bbbb)

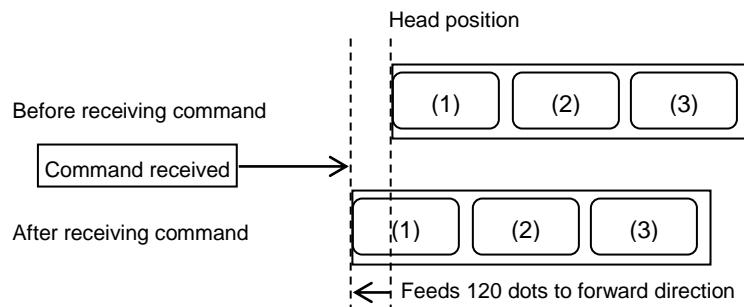
• Parameter

a [Feed direction] = 0 : Forward feed
1 : Backfeed

b [Number of label feed] = Valid Range : Refer to the table in the next page (Omissible only for forward feed)
Forwards one label when omitting this parameter.

[Coding Example1]

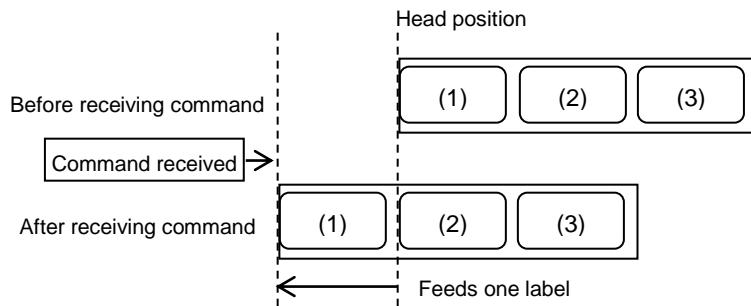
<A>
<IK>0,120
<Z>



When print data is received without returning to the original position with <IK>1,120, printing will start from the current stop position.

[Coding Example2] When feeding one label

<A>
<IK>0
<Z>



[Supplementary Explanation]

1. Delimit Start of Data Transmission <A> and End of Data Transmission <Z> with this command.
When specifying this command with the same item as print data, the command will be ignored.
2. When setting [Label feed direction] to [1: Backfeed], length of label feed needs to be checked. If this length is very long, it may cause overlapped prints or label may fall off the platen and result in detection error as paper-end.
3. When setting [Thermal transfer] to [Print method], length of label backfeed needs to be under 30mm. Failure to do so may result in detection error as ribbon end. And also, avoid consecutive specification of label feed command for backfeed.
4. In cutter and dispenser mode, do not attempt to backfeed right after cutting and dispensing label.
5. When omitting [No. of label feed] in forward feed, printer motion will be similar to label feed motion when pressing the FEED button in offline state.
6. Label feed motion with this command will be activated at the time of online.
7. Control of feed motion by external signal is not available.
8. When omitting [No. of label feed] in backfeed, label feed will not be performed due to command error.
9. When the sensor is disabled in continuous mode, <IK>0 (omission of [No. of label feed]) will not feed labels.
10. When the print start position is outside of printable area, printing will not be performed due to command error.
11. The valid feeding range in the backward direction is from 6 mm to 60 mm. The command error occurs when the feeding length is out of range and the media is not fed.
12. Actual feed distance may be different from the set value according to the individual difference of each printer, supplies and operating environment. Recommend to adjust the feed value before operation.

[Valid Range]

Head density		Media feed direction = Forward direction feed length (dot)	Media feed direction = Backward direction feed length (dot)
CL4NX	203 dpi	48 to 1600	48 to 480
	305 dpi	72 to 2400	72 to 720
	609dpi	144 to 4800	144 to 1440
CL6NX	203 dpi	48 to 1600	48 to 480
	305 dpi	72 to 2400	72 to 720

16 RFID Command

RFID commands can be used only in printers equipped with the RFID option. A command error occurs if the RFID option is not provided.

The continuous mode, cutter mode, dispenser mode and tear-off mode are available when the printer is operated in the RFID mode.

Reading and return of data cannot be performed with other than <RU> and [DC2]PK when backfeed is selected before printing in the cutter mode and dispenser mode, when the tear-off mode is specified, and when the tag offset is set to other than default. Refer to the table below for the relationship between the print mode and the RFID read/write command.

Corresponding table between the print mode and the RFID read/write command

		Printer Type					
RFID Command		Continuous mode	Tear-off mode	Cutter mode Backfeed after printing (Motion 1)	Cutter mode Backfeed before printing (Motion 2)	Dispenser mode Backfeed after printing (Motion 1)	Dispenser mode Backfeed before printing (Motion 2)
Write	<IP0>	○	○	○	○	○	○
	<RK>	○	○	○	○	○	○
Read / Return Data	[DC2]PJ	○	✗	○	✗	○	✗
	<TU>	○	✗	○	✗	○	✗
	<RU> [DC2]PK	○	○	○	○	○	○

○: Available ✗: Not available

Note 1: RFID read/write command and return command other than <RU>-[DC2]PK are not available when the tag offset is adjusted other than default, even if it is "o" marked commands in the operation mode.

Note 2: RFID commands cannot be used when "Ignore sensor" setting is made.

Note 3: RFID is not available in the linerless mode and the cutter with no backfeed mode.

Note 4: In addition to the commands described in the table above, external signal modes 1, 2, 3, 4 are available.

Both single item reception and multiple item reception are available in the receive mode. Make sure to receive the data returned from the printer after sending [DC2]PJ command, and then send the next item data when using multiple receptions.

Print restraint function at the time of command error

You can select whether or not to print by the command error restraint (COMMAND_ERROR_BEHAVIOR) in [RFID] section in RFID mode [DC2]PA command when command error occurred in the item containing RFID print command (<IP0>, <TU>).

The default setting after downloading the program and after default clear is "Do not print".

When "Do not print" is selected and a command error occurs in the item containing the RFID print command, the printer discards the item, halts printing, and then goes OFFLINE, displays the error, and stops.

If the printer shows this screen and stops after sending the item containing the RFID print command, there is a section where the command error occurs in the item.

RFID command classification

RFID print command		RFID setting command		RFID auxiliary command
Write	Read Data	Setting	Return Setting	Read/Return Data
<IP0> <RK>	<TU>	<IP5> [DC2]PA <RU>	[DC2]PB	[DC2]PJ [DC2]PK

RFID print items which do not have print objects

Only perform writing to tag and not feed labels if the items include RFID print command(writing) <IP0> and <RK> but not print objects.

In this case, short buzzer sound twice when writing to tag is succeeded, and short buzzer sound 6 times when writing to tag is failed.

When 1 is specified to fsx : parameter, <IP0> and <RK> commands feed items even if they do not include print objects.

EPC Code write(UHF)

ESC+IPO

Command	ESC	IP0	Parameter
HEX code	$<1B>_{16}$	$<49>_{16}<50>_{16}<30>_{16}$	See under "Parameters".
Default Value	Nil		

Valid range and term of command	When turning off the power switch	The set command is not maintained.
	Valid range within item	The set parameter becomes invalid.
	Valid range between items	The set parameter becomes invalid.

[Function]

This command writes the EPC code and other data to the EPC corresponding RFID tag. The standard format (three-character parameter identifier) is used when using the memory area extended for each IC chip manufacturer. Available in M6e module installed printers.

[Format]

[Standard format]

<IP0>e:h(.pcw:xxx)(,epc:xxxx...xxxx)(,usr:xxxx...xxxx)|(|,usa:dddd,aaaaa...aaaa)(,lck:bbbbbb);

[Conventional format]

<IP0>e:a,c:d,s:d,d:ddddddddd,dd,(o:xxx),(m:bbbbbb),(k:xxxxxxxx),(a:xxxxxxxx),(p:xxxxxxxx);

[SSCC96 code conversion]

(xx)(m·hhhhh)(k·xxxxxxxx)(a

<|>e.c,(r,a,c,t,d,aaaaaaaaaaaaaaaaaaaa,rr,aaaaaaaaaaaa,(o,xxx),(nn,bbbb),(k,rr,rrrr),(a,aaaa))
[SCT1995 encoding]

(,p.xxxxxxxx),

[SGT1N96 encoding]

<|P0>e:z,(d:xxxxxxxxxxxxxxxxxxxx)(,u:xxxxxxxxxxxx)(,k:xxxxxxx)(,a:xxxxxxxx)

(,p:xxxxxxxx)(,o:xxx)(,m:bbbbbb)(,k:xxxxxxxx)(,a:xxxxxxxx)(,p:xxxxxxxx);

[Free mapping]

Note: Typical parameters are shown in the format examples above. Refer to the next item for details on the parameters.

[Conventional format] is solely for maintaining compatibility with models before CL4NX. If you are going to use a new command from CL4NX and beyond, please create with [Standard format].

- Parameter

EPC encode type parameter			
e:	EPC encode Type Specify the parameter right after <IP0>. The parameter cannot be omitted.	h	[Standard format] Use the three-character parameter identifier after the declaration. The memory area extended for each IC chip manufacturer can be extended for other than the standard Gen 2 tag.
		a	[Conventional format] SSCC96 code conversion Use the "one-character parameter identifier". When the Company prefix/Serial reference/Filter value is received, and then converted to an SSCC96 compliant code, and written to the tag.
		c	[Conventional format] SGTIN96 code conversion Use the "one-character parameter identifier". When the Company prefix/Serial reference/Filter value is received, and then converted to an GTIN96 compliant code, and written to the tag.
		z	[Conventional format] Free mapping Use the "one-character parameter identifier". When data is written as is without performing code conversion.

Standard format

This is the extended format for the tag from IC chip manufacturer having over 96 bits EPC area.

<IP0>e: Write these parameters after specifying h.

<IP0>e: The order of the parameters after specifying h doesn't matter.

Three-character parameter identifier

Gen 2 basic operation parameters (can be omitted)		
pcw:	PC rewrite	The PC area contains length information for controlling the number of digits of data to be recorded to the EPC. You can change the number of digits of the EPC data by specifying multiples of four from 4 to 124 in decimal code to this parameter. Specifying this parameter is not necessary in most cases because the length information is written to the PC automatically by judging from the data length specified by epc:, if this parameter is not specified. (Maximum value of the length information of PC is 124 digits.)
afi:	AFI write data	Specify the number from 000 to 1FF in HEX code. Synthesize data together with current PC length information and write.
epc:	EPC write data	Specify 4 to 124 digit number in HEX code corresponding to the traditionally written data in the EPC area. Digits can be varied in multiples of four. When the character string is longer than the digits specified by pcw:, a parameter error occurs, and when the character string is shorter, the blanks are filled with zeros. You may also use the space, tab, line feed in data separator, but these codes will be skipped.
usr:	USER memory write	Specify numbers to write to USER area in hexadecimals. It must be specified in digits that are multiples of 4. The numbers should be within 4-128 digits, but the maximum number of digits depends on the tag in use. You may also use the space, tab, line feed in data separator, but these codes will be skipped.
usa:	USER memory ASCII write	Specify numbers to write to USER area in ASCII. Data that includes Control code (00H-1FH) can be written as well. Note that size information of the data area separated with comma is required in front of the data. Example: If the data size is 64, specify usa:64,abcde... The digits should be a multiple of 2. The numbers should be specified within 2- 64 digits, but the maximum number of digits depends on the tag in use.

Operation parameters in standard format (can be omitted)		
lck:	Lock	Specify the area to be locked by five bits in binary code such as lck:10101. The display order is USER, TID, ACCESS, KILL, EPC, from the top. If the access password is specified, it results in a password lock, and if the access password is not specified, it results in a permanent lock.
apw:	Access password	To perform locking or read protecting with a password, specify an eight-character HEX code.
psw:	Unlocking password	To access an area on which a password lock or password read lock is applied, specify the same number sequence as that used when locking. Specify unlocking area with lck:.
kpw:	Kill code	Specify the kill code with eight-character HEX code. You cannot execute the kill by writing the code only.

NXP G2XL dedicated secure parameters (can be omitted) (Cannot be used in a Gen2 chip other than NXP G2XL..)		
rlk: G2X,	Read protection	Specify 0 or 1 to indicate whether read protection is to be set or canceled. 1 for set and 0 for reset. When read protection is set, the reading of all areas becomes restricted. You must concurrently use an access password other than "00000000", and for reset, specify the same number sequence as the access password used during setting, in the cancellation password.(dedicated for NXP G2XL)
eas: G2X,	EAS bit data	Specify 0 or 1 as the value of the EAS bit. 1 for set and 0 for reset. You must concurrently use an access password other than "00000000", and for reset, specify the same number sequence as the access password used during setting, in the cancellation password.(dedicated for NXP G2XL)

NXP G2iM/G2iL dedicated secure parameters (can be omitted) (Cannot be used in a Gen2 chip other than NXP G2iM/G2iL..)		
rlk: G2i,	Read protection	Specify 0 or 1 to indicate whether read protection is to be set or canceled. 1 for set and 0 for reset. When read protection is set, the reading of all areas becomes restricted. You must concurrently use an access password other than "00000000", and for reset, specify the same number sequence as the access password used during setting, in the cancellation password.(dedicated for NXP G2im/G2iL)
eas: G2i,	EAS bit data	Specify 0 or 1 as the value of the EAS bit. 1 for set and 0 for reset. You must concurrently use an access password other than "00000000", and for reset, specify the same number sequence as the access password used during setting, in the cancellation password.(dedicated for NXP G2im/G2iL)

Feed control parameters (can be omitted)		
fsw:	Feed without printing	Usually, for RFID write item without print data, only writing of RFID data is performed, and the label is not fed. (Except for cases where the tag offset is set to other than default.) When "1" is specified in this parameter, the label is fed even if the item does not contain print data. When "0" is specified for this parameter, the label is not fed for the item without print data, and the operation is the same as when fsw: is not specified. If don't feed, Short buzzer will sound 2 times when write is successful. Short buzzer will the sound 6 times when it fails to write. In addition, if 2 is specified for the item including print data, a write test can be performed without consuming a label as only write is executed without feed/print. Valid range : 0-2

SSCC96/SGTIN96 standard code conversion parameters		
enc:	Declaration of code standard conversion	Declare when executing conversion according to the code standard. SSCC96 and SGTIN96 can be specified. If you specify 'a', it indicates SSCC96, and if you specify 'c', it indicates SGTIN96. The converted data is written in the EPC area. Therefore, you can no longer use the epc: parameter identifier Valid range: a, c
flt:	Filter value	Specify the filter value with the number from 0 to 7. Refer to the filter value standard table described later.
com:	Company prefix	Specify the company prefix with a 6 to 12-digit decimal number.
srl:	Serial reference	In the case of SSCC96, specify the serial reference with a 5 to 11-digit decimal number together with the number sequence specified in com:, so that the value is 17 digits or less. Even if the value does not reach 17 digits, leave it as is since the upper digits are filled with a zero inside the printer. In the case of SGTIN96, specify the serial number with 12-digit fixed decimal number. Specify 274877906943 or a smaller number. It becomes a parameter error in the case of less than 12 digits.
itm:	Item reference (Only for SGTIN96)	Specify the item reference with a 1 to 7-digit decimal number together with the number sequence specified in com:, so that the value is 13 digits or less. Even if the value does not reach 13 digits, leave it as is since the upper digits are filled with a zero inside the printer.

Coding examples of the standard format (three-character parameter identifier)

[Coding example 1]

When data is written in an arbitrary length in the EPC region in the IC chip manufacturer extension specifications tag

<A>
<V>50<H>50<XM>SECURE RFID EPC DATA WRITE
<IP0>e:h,epc:01234567890123456789012345678901; (in digits that are multiples of 4)
<Q>1
<Z>

[Coding example 2]

When EPC and user memory are written in a batch in the IC chip manufacturer extension specifications tag, and permanent locking is performed

<A>
<V>50<H>50<XM>SECURE RFID EPC & USER DATA WRITE
<IP0>e:h,epc:0123456789012345678901,usr:012345678.....5676789012345678901,lck:10001;
<Q>1
<Z>

[Coding example 3]

When data is written in EPC by specifying the SSCC96 standard code conversion in the Gen2 tag, and permanent locking is performed

<A>
<V>50<H>50<XM>SECURE RFID SSCC96 DATA WRITE
<IP0>e:h,enc:a,flt:0,com:12345678,srl:012345678,lck:00001;
<Q>1
<Z>

[Coding example 4]

When data is written in EPC by specifying the SGTIN96 standard code conversion in the Gen2 tag

<A>
<V>50<H>50<XM>SECURE RFID SGTIN96 DATA WRITE
<IP0>e:h,enc:c,flt:0,com:123456,itm:0123456,srl:012345678901;
<Q>1
<Z>

Conventional format

The format for Gen2(Class1Generation2) tag only.

Use the standard format for the tag from the IC chip manufacturer having an EPC area of more than 96 bits.

<IP0>e: Write these parameters after specifying “ * ”.

Conventional format: One-character parameter identifier (SSCC96 code conversion / SGTIN96 code conversion / free mapping)

EPC data parameter		
d:	EPC data	Specify the EPC data. The restrictions on the number of digits based on each EPC encoding type are as follows:
		When SCC96 code conversion is specified <IP0>e:a,..
		When SGTIN96 code conversion is specified <IP0>e:c,..
		When free mapping is specified <IP0>e:z,..

SSCC96/SGTIN96 conversion parameter		
f:	filter value	Refer to the filter value and the filter value standard table described later.
c:	company prefix	Number of digits of the company prefix A number from 6 to 12. Number of digits of the company prefix in the first half of the data specified in the d parameter.
s:	serial reference	Number of digits of Serial reference (only when selecting SCC96) Number of digits of the serial reference in the latter half of the data specified in the d parameter. Specify a number from 5 to 11, so that when combined with c, the resultant value is 17.
t:	item reference	Number of digits of Item reference (only when selecting SGTIN96) Specify a number from 1 to 7, so that when combined with c, the resultant value is 13.
n:	serial number	Serial number 12 digits (fixed) (only when selecting SGTIN96) Specify 274877906943 or a smaller number.

Feed control parameters (can be omitted)		
g:	Feed without printing	Usually, for RFID write item without print data, only writing of RFID data is performed, and the label is not fed. (Except for cases where the tag offset is set to other than default)

Gen 2 memory bank operation parameters (can be omitted)														
u:	User Memory HEX	<p>Specify numeric string to write to USER area in hexadecimals. Specified digits must be multiples of 4.</p> <p>This can be specified in the range of 4 to 128 digits, but the maximum number of digits depends on the used tag.</p> <p>You may also use the space, tab, line feed in data separator, but these codes will be skipped.</p>												
v:	User Memory Ascii	<p>Specify numeric string to write to USER area in ASCII data. It is necessary to have data area and data size information separated with a comma before the data. For example in specifying a data size as 16, specify as follows:</p> <p>V:16,abcd...</p> <p>Specified digits must be multiples of 2.</p> <p>This can be specified in the range of 2 to 64 digits, but the maximum number of digits depends on the used tag.</p>												
o:	AFI code	<p>Application Family Identifier. Specify a hexadecimal number from 0H to 1FFH. To write as AFI, specify the ninth bit (MSB) as 1.</p>												
m:	Locking	<p>5-digit binary number Set the bit of the bank to be locked as 1.</p> <p>If you specify the access code, it results in a "password lock", and if you omit the access code, it results in a "permanent lock".</p> <table border="1"> <thead> <tr> <th>Bit</th><th>Section to be locked</th></tr> </thead> <tbody> <tr> <td>bit0 (LSB)</td><td>EPCdata</td></tr> <tr> <td>bit1</td><td>KillCode</td></tr> <tr> <td>bit2</td><td>AccessCode</td></tr> <tr> <td>bit3</td><td>TIDdata</td></tr> <tr> <td>bit4 (MSB)</td><td>UserMemory</td></tr> </tbody> </table> <p>Example: If only the EPCdata area is locked "m: 00001"</p>	Bit	Section to be locked	bit0 (LSB)	EPCdata	bit1	KillCode	bit2	AccessCode	bit3	TIDdata	bit4 (MSB)	UserMemory
Bit	Section to be locked													
bit0 (LSB)	EPCdata													
bit1	KillCode													
bit2	AccessCode													
bit3	TIDdata													
bit4 (MSB)	UserMemory													
k:	kill code	<p>8-digit HEX code Used when writing the kill code.</p> <p>Specify other than "00000000" in an eight-digit HEX number sequence configured by numbers from 0 to 9, and alphabets from A to F. The purpose of this parameter is only to write the kill code. You cannot kill the tag actually.</p>												
a:	access code	<p>This is an eight-digit number sequence specified when applying the password lock.</p> <p>You can use an eight-digit HEX number sequence configured by numbers from 0 to 9, and alphabets from A to F. To apply the password lock, specify other than "00000000". If you omit this parameter, and specify m: Locking, a permanent lock is applied on the specified area.</p>												
p:	password code	<p>This is an eight-digit number sequence used for rewriting the tags on which a password lock has already been applied.</p> <p>It is an eight-digit HEX number sequence configured by numbers from 0 to 9, and alphabets from A to F that is used when writing in a tag on which a password lock has been applied. Specify the same number sequence as the access code used at the time of locking.</p> <p>By specifying a number sequence same as the access code specified at the time of password lock in the "password code", and specifying "00000000" in the "access code", the tag on which a password lock has been applied can be returned to an open state.</p>												

Coding examples of one-character parameter identifiers
(SSCC96 code conversion / SGTIN96 code conversion / free mapping)

[Coding example 1] Country code 49 /Company code 12345 / Serial no. 789

When SSCC 96 data is written to a Gen2 corresponding tag
<A>
<V>50<H>50<XM>49123450000000789
<IP0>e:a,c:7,s:10,f:1,d:49123450000000789;
<Q>1
<Z>

[Coding example 2] Country code 49 /Company code 12345 / Item 67890 / Serial no. 789

When SGTIN96 data is written to a Gen2 corresponding tag
<A>
<V>50<H>50<XM>4912345067890000000000789
<IP0>e:c,c:7,t:6,f:1,d:4912345067890,n:0000000000789;
<Q>1
<Z>

[Coding example 3]

When free mapping data is written in the EPC area of a Gen2 corresponding tag
<A>
<V>50<H>50<BD>101080*301803CB4F48B38000000001*
<IP0>e:z,d:301803CB4F48B38000000001;
<Q>1
<Z>

[Coding example 4]

When data is written in free mapping in the EPC area of a Gen2 corresponding tag, data is written in the user area, and at the same time, a permanent lock is applied to both the EPC and USER areas
<A>
<V>50<H>50<BD>101080*0123456789ABCDEF01234567*
<IP0>e:z,d:0123456789ABCDEF01234567,u:0123456789ABCDEF0123456789ABCDEF,m:10001;
<Q>1
<Z>

[Coding example 5]

When data is written in free mapping in the EPC area of a Gen2 corresponding tag, and a password lock is applied to the EPC area. When the password is set as 12345678
<A>
<V>50<H>50<BD>101080*0123456789ABCDEF01234567*
<IP0>e:z,d:0123456789ABCDEF01234567,a:12345678,m:00101;
<Q>1
<Z>

[Supplemental explanation]

1. This command can be used only once between the data transmit start <A> to the data transmit end <Z>.
2. When print data is to be included beside EPC code write, multiple labels can be specified. If there is no print data as in Example 2, media is not fed. If a blank media is to be fed after EPC code write, specify feeding without print as in Example 3.

[Example 1] If print data is included, the QTY can be specified.

```
<A>
<V>50<H>50<XM>0123456789ABCDEF01234567
<IP0>e:z,d:0123456789ABCDEF01234567:
<Q>1
<Z>
```

[Example 2] If you specify EPC code write without print data, the media is not fed, and QTY cannot be specified.

```
<A>
<IP0>e:z,d:0123456789ABCDEF01234567:
<Z>
```

[Example 3] If there is no print data, but you have specified feeding without print in EPC code write, the media is fed, and QTY can be specified.

```
<A><IP0>e:z,d:0123456789ABCDEF01234567,q:1;<Q>2<Z>
or
<A><IP0>e:h,epc:0123456789ABCDEF01234567,fsw:1;<Q>2<Z> (for the standard format)
```

	Example 1	Example 2	Example 3
When EPC code write is successful	Print, feed	Don't feed Two short beeps	Feed a blank label
When EPC code write has failed	Print tag error Retry operation	Six short beeps	Print tag error Retry operation

* If you have set TAG OFFSET to other than the default value, or if you have specified temporary tag offset, feeding is performed in Example 2 as well.

3. The buzzer sounds as described below.

If an EPC code write that does not accompany print data is specified, the buzzer sounds to notify you whether the EPC code write succeeded.

EPC code write successful: Two short beeps

EPC code write unsuccessful: Six short beeps

Note that the buzzer sounds for EPC code write success or failure vary depending on the "Sound" > "Error Sound" settings in the System menu.

4. Unused parameters can be omitted.

5. For details on the filter value to be used with SSCC96/SGTIN96, refer to the table below according to the purpose of use.

Filter value standard table

Filter value	SSCC96	SGTIN96
0	All Others	All Others
1	Reserved	Point of Sale (POS) Trade Item
2	Full Case for Transport	Full Case for Transport
3	Reserved	Reserved
4	Reserved	Inner Pack Trade Item Grouping for Handling
5	Reserved	Reserved
6	Unit Load	Unit Load
7	Reserved	Unit inside Trade Item or component inside a product not intended for individual sale

6. SSCC96 code conversion

This function is used to generate a code according to the SSCC96 standard when a company prefix, serial reference, and filter value are applied. For the time being, the usage method is explained by using an example in which the following numbers have been applied. All numbers are in decimals.

Company prefix: 4011661

Serial reference: 3000000001

Filter value: 0 (Select the filter value from the filter value standard table described earlier according to the purpose of use. In this example, the filter value is 0 from "All Others")

According to the standard, the company prefix and serial reference are combined together to result in 17 digits. Of these 17 digits, the proportion of the company prefix and the serial reference can be selected from the seven combinations described in the table below.

Partition value	Number of digit of the company prefix	Number of digits of the serial reference
0	12	5
1	11	6
2	10	7
3	9	8
4	8	9
5	7	10
6	6	11

In the case shown in this example, the following combination is assumed:

Number of digits of the company prefix: 7

Number of digits of serial reference: 10

The partition value is 5, but since this value is generated within the PC, it need not be specified.

Under this condition, if the format of EPC code write <IP0> is applied, it results in the following:

When the standard format is used

<IP0>e:h,enc:a,com:4011661,srl: 3000000001,flt:0;

Description of each parameter

e:h,----- Specifies the standard format

enc:a----- Specifies SSCC96 code conversion

com:4011661,---- The company prefix is **4011661**

srl:3000000001,-- The serial reference is **3000000001** 17 digits when combined with com:

flt:0 ----- The filter value is All Others

;----- End terminal

When the one-character parameter identifier in the conventional format is used

<IP0>e:a,c:7,s:10,f:0,d:4011661300000001;

Description of each parameter

e:a,----- Specifies SSCC96 code conversion

c:7,----- The company prefix is 7 digits

s:10,----- The serial reference is 10 digits 17 digits when combined with c:

f:0,----- The filter value is All Others

d:4011661300000001 --Number in which the company prefix and serial reference are joined together It is 17 digits.

;----- End terminal

When these commands are executed, the above parameters are converted to SSCC96 code 3114F4DA34B2D05E01000000 and 24 characters (18 characters in actuality), and are written in a tag.

7.SGTIN96 code conversion

This function is used to generate a code according to the SGTIN96 standard when a company prefix, item reference, filter value, and serial number are applied. For the time being, the usage method is explained by using an example in which the following numbers have been applied. All numbers below are in decimals.

Company prefix: 003885

Item reference: 4006606

Filter value: 0 (Select the filter value from the filter value standard table described earlier according to the purpose of use. In this example, the filter value is 0 from "All Others")

Serial number: 000000000001 (fixed as 12 digits)

According to the standard, the company prefix and item reference are combined together to result in 13 digits. Of these 13 digits, the proportion of the company prefix and the item reference can be selected from the seven combinations described in the table below.

Partition value	Number of digit of the company prefix	Number of digit of the item reference
0	12	1
1	11	2
2	10	3
3	9	4
4	8	5
5	7	6
6	6	7

In the case shown in this example, the following combination is assumed:

Number of digits of the company prefix: 6

Number of digits of item reference: 7 If both items combined together do not form 13 digits, 0 is entered before the number to fill up the lacking number of digits.

The partition value is 6, but since this value is generated within the PC, it need not be specified.

Under this condition, if the format of <IP0> EPC code write is applied, it results in the following:

When the standard format is used

<IP0>e:h,enc:c,com:003885,itm:4006606,flt:0,srl:000000000001;

Description of each parameter

e:h,----- Specifies the standard format
enc:c,----- Specifies SGTIN96 code conversion
com:003885,----- The company prefix is 6 digits
itm:4006606,----- The item reference is 7 digits 13 digits when combined with com:
flt:0 ----- The filter value is All Others
srl:000000000001--- Serial number, fixed at 12 digits274877906943 or a smaller number.
;----- End terminal

When the one-character parameter identifier in the conventional format is used

<IP0>e:c,c:6,t:7,f:0,d:0038854006606,n:000000000001;

Description of each parameter

e:c,----- Specifies SGTIN96 code conversion
c:6,----- The company prefix is 6 digits
t:7,----- The item reference is 7 digits 13 digits when combined with c:
f:0,----- The filter value is All Others
d:0038854006606, -Number in which the company prefix and item reference are joined together It is 13 digits.
n:000000000001--- Serial number, fixed at 12 digits274877906943 or a smaller number.
;----- End terminal

When these commands are executed, the above parameters are converted to SGTIN96 code 301803CB4F48B38000000001 and 24 characters, and are written in a tag.

EPC Sequential Number(UHF)**ESC+F**

Command	ESC	F	Parameter
HEX code	<1B> ₁₆	<46> ₁₆	aaaabccc(,dd,ee,f)
Default Value	Nil		

Valid range and term of command	When turning off the power switch	The set command is not maintained.
	Valid range within item	The set parameter becomes invalid.
	Valid range between items	The set parameter becomes invalid.

[Function]

This command is set before EPC code write (<IP0> command), and is used to write the sequential number of the specified data.

[Format]

<F>aaaabcccc(,dd,ee,f)

•Parameter

aaaa	"Number of printing for the same contents"	=	Valid range	:	1 to 9999
b	"Increment/decrement setting"	=	+ -	:	Addition Subtraction
cccc	"Increment/decrement value setting"	=	Valid range	:	1 to 9999
dd	"Sequential numbering digits"	=	Valid range	:	1 to 24 24 if omitted (can be omitted)
ee	"Lower disabled digits"	=	Valid range	:	0 to 99 0 if omitted (can be omitted)
f	"Decimal or HEX serial number"	=	0 1	:	Decimal 0 if omitted (can be omitted) HEX

[Coding Example]

Number of printing for the same contents: 1, Increment/Decrement:+, Increment/decrement value: 1,
Sequential numbering digits: 5, Lower disabled digits: 0

```
<A>
<V>100<H>100<P>2<L>0202
<F>1+1, 5, 0<IP0>e:h,epc:0123456789ABCDEF1200000;
<Q>2
<Z>
```

[Supplemental explanation]

1. The EPC sequential number location in one item is one location.
2. Inverse printing <(> of the sequential number data cannot be used.
3. Automatic line feed <E> cannot be used.
4. EPC sequential numbering is enabled only if specified immediately before EPC code write (<IP0> command).
5. This command cannot be used in items that include the <TU> command.

Antenna Output Power(UHF)**ESC+IP5**

Command	ESC	IP5	Parameter
HEX code	<1B> ₁₆	<49> ₁₆ <50> ₁₆ <35> ₁₆	aaa(,bbb)
Default Value	Nil		

Valid range and term of command	When turning off the power switch	The set command is maintained.
	Valid range within item	The set parameter becomes valid.
	Valid range between items	The set parameter becomes valid.

[Function]

This command specifies the antenna output power.

The antenna output power for the write command and the antenna output power for the read command can be set to separate values.

[Format]

<IP5>aaa(,bbb)

•Parameters

- aaa =000 to 240. Antenna output power. Three-digit number with 10 times the dBm value
- bbb =000 to 240. Antenna output power of the read command. Three-digit number with 10 times the dBm value (can be omitted)
 - If you specify only aaa, the antenna output power is set with both the write command and read command having the same value.
 - When both aaa and bbb are specified, the antenna output power setting is made by using the value of aaa for the write command and the value of bbb for the read command.
 - For details on the actual antenna output power, refer to the antenna output power setting table.

[Coding Example 1]

<A>
<IP5>170
<Z>

The antenna output power is changed to 17.0 dBm without restarting the printer, and this value is maintained even when the printer is turned OFF.

<A>
<IP5>120,090
<Z>

The antenna output power of the write command is changed to 12.0 dBm, and the antenna output power of the read command is changed to 9.0 dBm without restarting the printer. These settings are maintained after turning off the printer.

[Supplemental explanation]

1. This command cannot be used in combination with other than <A> and <Z>.
2. This command is not processed when receiving during printing. Will be processed after printing is completed.
3. Since the antenna output power changes, it may not be possible to read or write some tags depending on their type.
4. If you specify a value outside the range of parameters, a command error occurs.
5. The default factory setting is 100.
6. While the same setting can be performed with the [DC2] PA command, this command can instantaneously change the radio output power without having to restart the printer.
7. While a value from 0 to 240 can be recorded in the nonvolatile memory of the printer, the units place is rounded off to 0 during transmission to the reader/writer module.
8. A number that is less than 100 is set to three digits by supplementing with a zero in the high order digit.

Antenna output power table

Parameter aaa	Antenna output power		Parameter aaa	Antenna output power	
	(dBm)	(mW)		(dBm)	(mW)
0 to 9	0	1.0	130 to 139	13.0	19.9
10 to 19	1.0	1.2	140 to 149	14.0	25.1
20 to 29	2.0	1.5	150 to 159	15.0	31.6
30 to 39	3.0	1.9	160 to 169	16.0	39.8
40 to 49	4.0	2.5	170 to 179	17.0	50.1
50 to 59	5.0	3.1	180 to 189	18.0	63.0
60 to 69	6.0	3.9	190 to 199	19.0	79.4
70 to 79	7.0	5.0	200 to 209	20.0	100.0
80 to 89	8.0	6.3	210 to 219	21.0	125.8
90 to 99	9.0	7.9	220 to 229	22.0	158.4
100 to 109	10.0	10.0	230 to 239	23.0	199.5
110 to 119	11.0	12.5	240	24.0	250.0
120 to 129	12.0	15.8			

Note: While a value from 0 to 240 can be recorded in the nonvolatile memory of the printer, the units place is rounded off to 0 during transmission to the reader/writer module.

Example: Even when 199 is specified, actually, 19.0 dBm is set.

16.4 RFID

Trademark Print(UHF)

ESC+TM

Command	ESC	TM	Parameter
HEX code	<1B>16	<54>16<4D>16	a
Default Value	Nil		

Valid range and term of command	When turning off the power switch	The set parameter is maintained.
	Valid range within item	The set parameter becomes invalid.
	Valid range between items	The set parameter becomes invalid.

[Function]

This command specifies the printing of the trade mark in the tag label.

[Format]

<TM>a

• Parameter

a = [Logo number]

1:



2:



[Coding example 1]

<A>
<V>50<H>50<TM>1
<Z>

[Coding example 2]

<A>
<V>50<H>50<TM>2
<Z>



[Valid command]

Modification command	<V>	<H>	<L>	<%>					

[Supplemental explanation]

1. The specification of coordinates <V><H>, rotation <%>, and magnification <L> is enabled.
2. To perform magnification <L>, the command must be specified immediately before the trade mark print command <TM>.
3. The image size of trade mark is (Image 1: W143XH101 dots, Image 2: 202 XH101 dots). (when magnification is not specified)

Printing Tag Data(UHF)

ESC+TU

Command	ESC	TU	Parameter
HEX code	<1B> ₁₆	<54> ₁₆ <55> ₁₆	a (,bbcccdddn~n)
Default Value	Nil		

Valid range and term of command	When turning off the power switch	The set command is not maintained.
	Valid range within item	The set parameter is in effect until a new specification is made.
	Valid range between items	The set parameter becomes invalid.

[Function]

Reads data from RFID tag and develops to specified direction to make it possible to print on label.

[Format]

<TU>a (,bbcccdddn~n)

•Parameters

a = To use this functionality or not
 1: Read data and start using
 0: Cancel use

bb = Block number
 01 : EPC area
 02 : TID area
 03 : USER area

ccc = Start address of memory (HEX)
 ddd = End address of memory (HEX)

The amount of information per one address is 2 bytes (4 characters) in case of Gen2.

An RFID tag error occurs if you specify an address that exceeds tag capacity.

The difference between "Start address of memory" and "End address of memory" shall be kept within 7 because the maximum amount of read data is 32 characters.

n = Specify ID. Specify any string within 4 to 16 characters to be used for assigning data.
 (All parameters should be in the ASCII format)

[Coding Sample1]

A sample specifying 32 digits from start address 00 to end address 07 in EPC area of Gen2 tag, using SATO as ID.
(Amount of information per 1 address: 4 characters)

<A>
<TU>1,01000007SATO
<%>0
<V>0410
<H>0090
<P>00
<L>0101
<XM>SATO
<%>0
<V>0060
<H>0040
<D>102120*SATO*
<%>0
<V>0195
<H>0055
<P>00
<L>0101
<XM>*SATO*
<%>1
<V>0595
<H>0520
<D>102060*SATO*
<TU>0
<Q>00001
<Z>

[Coding Sample2]

sample specifying 16 digits from start address 02h to end address 05h in the USER area (03) on Gen2 tag, using SATO as ID. (Amount of information per 1 address: 4 characters)

<A>
<TU>1,03002005SATO
<%>0
<V>0410
<H>0090
<P>00
<L>0101
<XM>SATO
<%>0
<V>0060
<H>0040
<D>102120*SATO*
<%>0
<V>0195
<H>0055
<P>00
<L>0101
<XM>*SATO*
<%>1
<V>0595
<H>0520
<D>102060*SATO*
<TU>0
<Q>00001
<Z>



[Valid command]

font	<X20>	<X21>	<X22>	<X23>	<X24>	<XM>	<XS>	<XU>	<XB>	<XL>
Barcode		<BC>	<BG>	<BI>	<BZ>	<D>	<BD>			
	<2D10>	<2D12>	<2D20>	<2D30>	<2D31>	<2D50>	<DN>	<DS>		

[Supplemental explanation]

1. If you specify reading data and start use (<TU>1), specify cancel use (<TU>0) within the same print job if.
2. Only one pair of this command (<TU>1, <TU>0) can be specified in one print job.
3. This command cannot be specified together with sequential printing or registering formats.
4. You cannot specify multiple labels for print jobs that include this command. Even if you specify 2 or more labels with<Q> command, it will be interpreted as 1.
5. This command cannot be used in combination with other RFID commands.
6. When you specify the user ID by using <DN> in the data part during the use of 2D codes, specify the number of characters of the user ID in the number of data items.

Example: <TU>1,01000007SATO
<DN>0004,SATO

7. This command will not be executed while the printer is printing. It will be executed after the print is complete.
8. This command is enabled in sequential printing, cutter (behavior 1), dispenser (behavior 2). It cannot be used in tear-off mode, cutter(behavior 2) and dispenser(behavior 2).
9. This command will not work correctly if the tag offset is set anywhere other than default position.
10. In case if tag data could not be read, error message will be printed and will retry with the next label or discard depending on the retry/release setting.
11. This command does not support reprinting with reprint command<C>, external reprint signal or reprint button.
12. In case of a command error due to erroneous format of print job that includes this command, printer will not print label (so as not to waste label) but will ring the buzzer once short to go to OFFLINE. The label will not be printed as long as the reason of command error is not removed.
13. In case if the settings are made to ignore the sensor, this command will have command error.
14. The only barcode type allowed in (ratio 1:3) and <D>(ratio 1:2) is "1:CODE39".
15. QR code <2D30>, <2D31> are available, but they cannot be specified in numerical mode and Kanji mode. Micro QR code are not available due to limitations in the number of data.
16. The maximum number of print elements (valid commands that include ID) to be converted for this command is 20. Avoid exceeding this maximum. When exceeded, the exceeded print element may become erroneous data.
17. For valid command with limited digit number in target data, it is necessary to fill valid command with data if data obtained from RFID tag do not have enough digit number after it is specified by this command.

Example: <TU>1, 01000003SATO
<BI>020502SATO0

16.6 RFID

EPC/TID Return(UHF)

ESC+RU

Command	ESC	RU	Parameter
HEX code	<1B> ₁₆	<52> ₁₆ <55> ₁₆	,aa
Default Value	0		

Valid range and term of command	When turning off the power switch	The set command is not maintained.
	Valid range within item	The set parameter is in effect until a new specification is made.
	Valid range between items	The set parameter is in effect until a new specification is made.

[Function]

This command is used to return EPC/TID together with the result when data is written to the RFID tag by the <IP0> command.

[Format]

Return specification : <RU>,aa
Request to return : [DC2]PK

● Parameters

Symbol	Parameter name	Valid range
a	Identifier	00: Not returned (default setting) 01: Validate return Obtain return data by sending [DC2]PK

[[DC2]PK return data format (normal)]

[STX]a...a,b,c,d[ETX]

[Return data]

Symbol	Parameter name	Valid range
a	Total number of data byte * This is the total number of bytes after parameter b. The delimiting comma between parameters a and b, and the ETX are not included.	Data size from the first write result status until before [ETX] Maximum 5 digits
b	Write result status	0: Write failure 1: Write success Note: Specified in text format
c	Error symbol	N : No error E : EPC write error T : TID read error M : MCS error (Chip inconsistent or not supported) A : All errors Note: Specified in text format
d	EPC/TID return data	Refer to "EPC/TID return data" below. Note: Specified in text format

[Format of EPC/TID return data]

“Specify memory”+“.”+“Data” +“Line feed(0DH、0AH)”

ee:f...f,gg:h...h)[CR][LF]

Specifying the memory to be record

[DC2]PA-printer setting IF:RFID setting section parameter

DATA_TO_RECODE : read data depends on RFID data record as below.

"0": BOTH (EPC and TID are returned)

"1": EPC (only EPC is returned)

"2": TID (only TID is returned)

Below is the sample of [DC2]PA setting.

<A>

[DC2]PA,24,IF,18,DATA_TO_RECODE:0[CR][LF]

<Z>

To set the above from settings menu, you can do the same from “Interface”->“RFID”->“Data to Record”

[EPC/TID return data]

Symbol	Parameter name	Valid range
e(g...)	Memory	EP: EPC ID: TID
f(h...)	Data	Maximum 256 digits

Data Example)

EP:E0123456789ABCDEF0123456, ID:E200680612345678

[Return data format (when a command error occurs)]

[NAK]<15>16

[Exception processing]

Parameter name	Exception condition	
	A value outside the range is specified	The specified size and received size are different
Identifier	Command error	Invalid receive data

Terminology	Description
Command error	The data received after a command error is determined is not considered as a parameter of this command.
Invalid receive data	The data corresponding to Byte 2 and thereafter of the identifier is ignored.

[Coding example]

```
<A>
<RU>,01
<IP0>e:h,epc:E0123456789ABCDEF0123456;
<XM>E0123456789ABCDEF0123456
<Z>
```

[Return status example]

When only the return of TID is specified, the E200680612345678 tag is used in the TID, and [DC2]PK is received

- Write success (TID read success)
[STX]25,1,N,ID:E200680612345678[CR][LF][ETX]

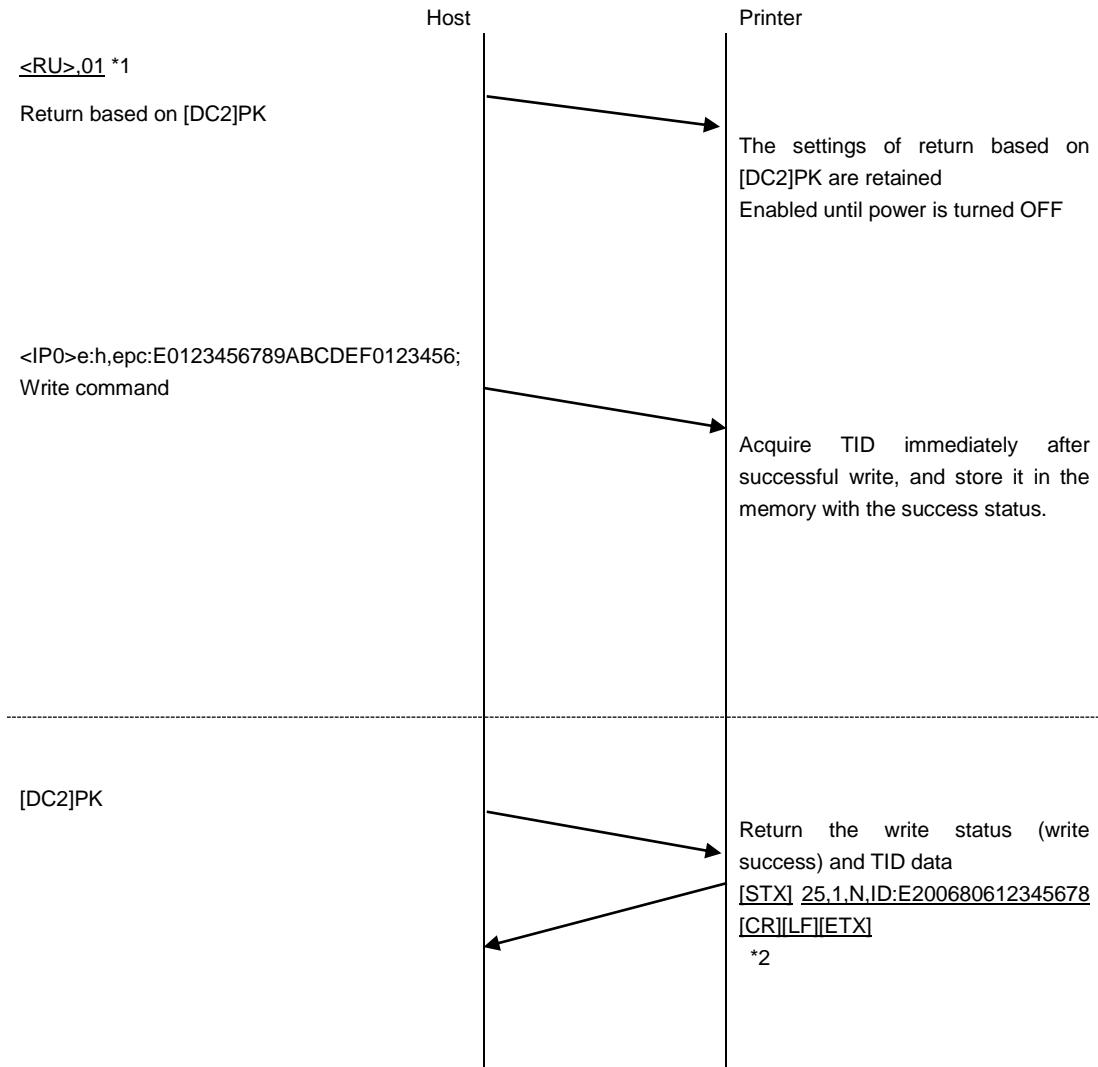
- Write success (TID read failure)
[STX]9,1,T,ID:[CR][LF][ETX]

- Write failure (EPC write failure)
[STX]9,0,E,ID:[CR][LF][ETX]

[Supplemental explanation]

- 1.The result of writing and EPC/TID is returned when [DC2]PK is received after RFID writing has been performed.
- 2.Although write is successful status will be returned without data if you fail to read EPC/TID since EPC/TIC read will be done separately from write.
- 3.Return data remains the same when EPC code write is specified without print data. Previous value will be returned.

<RU>,01 return sequence (for a Gen2 tag having the TID of E0123456789ABCDEF0123456)



*1. Most common commands such as <A>, <Z> are not described in the above diagram.

*2. The content of the return EPC/TID is an example. The actual value varies depending on the tag.

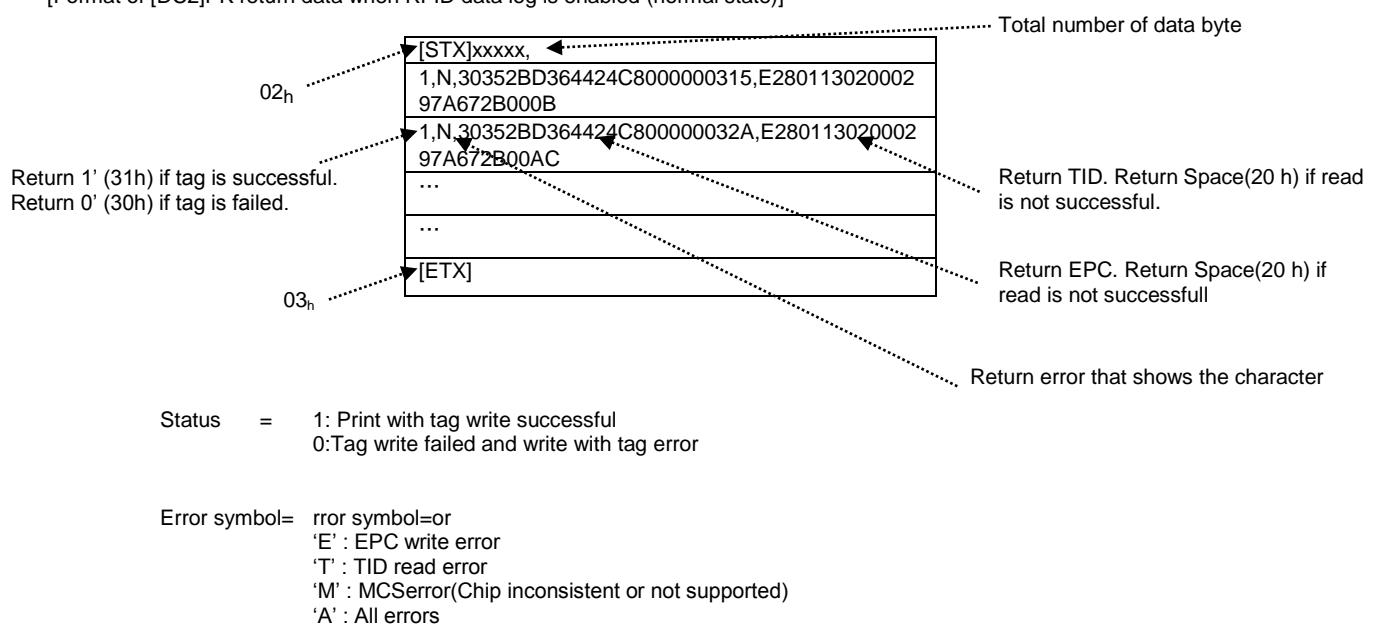
[Supplemental explanation]

1. Keep the EPC/TID data to be returned within 256 characters.
2. The printer operation corresponding to the <IP0> command is performed in the order of writing the data to the tag, and then performing EPC/TID reading.

Specification to record RFID data log

1. For logging RFID data, select “Data To Record” and “Log RFID Data” from “Interfaces”->“RFID” section.
2. If MCS is disabled, printer will write the data to tag first then read EPC/TID when <IP0> command is received. If MCS is enabled, printer reads the TID first then writes the data to tag.
3. If MCS is enabled but fails to read TID, EPC will not be written and it will print as invalid tag.
4. If RFID data log(Log RFID Data) is enabled, the 5KB buffer (the storage area for 100 logs to store both EPC and TID) will be saved in printer’s RAM. When the buffer is filled with logs, the new log will overwrite from the oldest log.
5. When RFID data log (Log RFID Data) is enabled, the log data is returned in chronological order when it receives [DC2] PK. After the log data returns, the buffer is thoroughly cleared.
6. When RFID data log (LogRFID Data) is disabled, it returns 1 log. It doesn’t get cleared after the data is returned with [DC2] PK.
7. If the printer is powered off, all log data will be lost.
8. When <RU>,00 is set, the whole log buffer will be cleared.
9. If EPC/TID read is not successful, space (0x20) will be returned instead of EPC/TID reply.
10. No log is recorded when EPC code write is specified without print data.

[Format of [DC2]PK return data when RFID data log is enabled (normal state)]



16.7 RFID

RFID Write(ISO/IEC15693)

ESC+RK

Command	ESC	RK	Parameter
HEX code	<1B>16	<52>16<4B>16	See under "Parameters".
Default Value	Nil		

Valid range and term of command	When turning off the power switch	The set command is not maintained.
	Valid range within item	The set parameter becomes invalid.
	Valid range between items	The set parameter becomes invalid.

[Function]

Specifies the data to write on RFID tag that supports ISO/IEC15693.

[Format]

[Standard format]

```
<RK>a,(b,)Dmmmm,n~n(iso:c) (,wsb:sss)(,lbs:xxx,ln:yyy)(,eas:v)(,afi:ww)(,dsf:xx)(,eal:g)(,afl:h)
  (,dsl:i) (,eap:jjjjjjj)(,eai:kkkk)(,pw0-4:eeeeeee)(,aw0-4:fffffff)(,kpw:ggggggg)(,pps:lll,m) (,fsw:f)
```

[Conventional format]

```
<RK>a,(b,)Dmmmm,n~n(Ws:sss)(,Ls:xxx,Ln:yyy)(,Ea:v)(,Af:ww)(,Ds:xx)(,Al:h)(,Dl:i)(,Fs:f)
```

[Conventional format] is meant for the compatibility with models prior to CL4NX. For CL4NX and models onwards, create with [Standard format] when using commands as new parameters.

•Parameter

Specification of inlet type									
	Valid range for models with Takaya module : 2,3,5 2 : ICODE								
a	<table border="1"> <thead> <tr> <th>Product</th> <th>Maximum number of bytes</th> </tr> </thead> <tbody> <tr> <td>ICODE SLI</td> <td>112</td> </tr> <tr> <td>ICODE SLIX</td> <td>112</td> </tr> <tr> <td>ICODE SLIX-S</td> <td>160</td> </tr> </tbody> </table>	Product	Maximum number of bytes	ICODE SLI	112	ICODE SLIX	112	ICODE SLIX-S	160
Product	Maximum number of bytes								
ICODE SLI	112								
ICODE SLIX	112								
ICODE SLIX-S	160								
	3 : Tag-it								
a	<table border="1"> <thead> <tr> <th>Product</th> <th>Maximum number of bytes</th> </tr> </thead> <tbody> <tr> <td>Tag-it HF-I Plus</td> <td>256</td> </tr> <tr> <td>Tag-it HF-I Pro</td> <td>32</td> </tr> <tr> <td>Tag-it HF-I Standard</td> <td>32</td> </tr> </tbody> </table>	Product	Maximum number of bytes	Tag-it HF-I Plus	256	Tag-it HF-I Pro	32	Tag-it HF-I Standard	32
Product	Maximum number of bytes								
Tag-it HF-I Plus	256								
Tag-it HF-I Pro	32								
Tag-it HF-I Standard	32								
	5 : my-d								
a	<table border="1"> <thead> <tr> <th>Product</th> <th>Maximum number of bytes</th> </tr> </thead> <tbody> <tr> <td>my-d vp SRF55V10P(custom)</td> <td>1000</td> </tr> <tr> <td>my-d vp SRF55V10P(ISO)</td> <td>992</td> </tr> </tbody> </table>	Product	Maximum number of bytes	my-d vp SRF55V10P(custom)	1000	my-d vp SRF55V10P(ISO)	992		
Product	Maximum number of bytes								
my-d vp SRF55V10P(custom)	1000								
my-d vp SRF55V10P(ISO)	992								
Note: A tag error occurs when data exceeds the maximum number of bytes for each product.									

Ignore RFID tag error (omissible)	
b	<p>Valid range : 0~9</p> <p>0 : Unspecified This mode stops every time a tag error occurs.</p> <p>1~9 : Specify how many labels to ignore for RFID tag error When tag error occurs, retries with next label up to the maximum number of labels to ignore. With this mode, printer stops when a series of tag errors occur that exceeds the specified number of errors.</p> <p>Note: If this parameter is omitted, the number of retries set under the menu Interfaces-> RFID->Retries ([DC2]PA's identifier IF, MAX_RETRY_LABEL) is applied instead</p>

Data input format + number of data to write in bytes						
Dmmmm or dmmmm	Number of data to write D" or "d" shows that this field is for the number of data to write. Capital "D" indicates that the data is in ASCII, lower-case "d" indicates the data is in HEX. Specify the length of data in bytes with the number(mmmm) that comes after "D" or "d".	<p>Specifies the number of bytes for the next parameter "n: data array to write". This portion should be written in bytes, so the number specified for this field does not change regardless of data format, whether ASCII or HEX.</p> <p>Maximum number depends on inlet type. Valid range : ICODE (a=2) : "0~160" Tag-it (a=3) : "0~256" my-d (a=5) : "0~1000" Note: Command error occurs if you specify a value that exceeds the maximum.</p> <p>Specify 0 if there is no data to write to user memory.</p>				

Data array to write						
n	Data array to write	The character code and maximum number of characters depends on the data input/output format (ASCII/HEX) as below:				
		ASCII	Range of available character codes : (00H) - (FFH) Valid number of characters : ICODE (a=2) : 0-160 characters Tag-it (a=3) : 0-256 characters my-d (a=5) : 0-1000 characters			
		HEX	The maximum number of digits are equivalent to the maximum byte size that can be specified for each inlet.			
		HEX	Range of available character codes: 0(30H) -9(39H),A(41H) -F(46H) Valid number of characters : ICODE (a=2) : 0-320 characters Tag-it (a=3) : 0-512 characters my-d (a=5) : 0-2000 characters			
The maximum number of digits are twice the maximum byte size that can be specified for each inlet.						

Availability ofmissible parameters for each product(except for Ignoare RFID tag error)

Inlet type	ICODE(a=2)			Tag-it(a=3)			my-d(a=5)	
Product	SLI	SLIX	SLIX-S	HF-I Plus	HF-I Pro	HF-I Standard	vp SRF55V10P (Custom)	vp SRF55V10P (ISO)
Parameter (Standard format)	iso	x	x	x	x	x	x	o
	wsb	o	o	o	o	o	o	o
	lbs	o	o	o	o	o	x	o
	lbn	o	o	o	o	o	x	o
	eas	o	o	o	x	x	x	x
	afi	o	o	o	x	x	o	o
	dsf	o	o	o	x	x	x	x
	eal	o	o	o	x	x	x	x
	afl	o	o	o	x	x	o	o
	dsl	o	o	o	x	x	x	x
	eap	x	o	x	x	x	x	x
	eai	x	x	o	x	x	x	x
	pw0,1	x	x	o	x	x	x	x
	pw2,3,4	x	x	o	x	x	x	x
	aw0,1	x	x	o	x	x	x	x
	aw2,4	x	x	o	x	x	x	x
	kpw	x	x	o	x	x	x	x
	pps	x	x	o	x	x	x	x
	fsw	o	o	o	o	o	o	o

o : Operable / x : Inoperable

my-d ISO operation(omissible)	
iso:	Valid range : 0~1 Specify 1 to access my-d using ISO-15693 standard. My-d custom command is used to access my-d if this field is not specified or is 0. Note : Specify 1 to this field so that it can be used with ISO when you write to my-d light SRF550V01P since this chip does not support custom commands.
Parameters from here can be specified in any order.	

Parameters related to specifying block to start writing (omissible)		
wsb: (former Ws:)	Specify block to start writing	Specifies the block to start writing the data. The 0 th block is specified if omitted. Block is a unit to write to user memory. The following values in the table are allowed based on the type of inlets. A maximum up to a 3-digit decimal can be specified, but a parameter error occurs if it exceeds the maximum amount for the specified inlet. Please see the following table.

Mapping table of inlet type and number of blocks, and total capacity

Inlet Type	Product	Capacity of 1 block.	The number of the overall blocks.	Total capacity.
ICODE(a=2)	ICODE SLI	4bytes	28blocks	112bytes
	ICODE SLIX	4bytes	28blocks	112bytes
	ICODE SLIX-S	4bytes	40blocks	160bytes
Tag-it(a=3)	Tag-it HF-I Plus	4bytes	64blocks	256bytes
	Tag-it HF-I Pro	4bytes	8blocks	32bytes
	Tag-it HF-I Standard	4bytes	8blocks	32bytes
my-d(a=5)	my-d vp SRF55V10P(Custom)	8bytes	125blocks	1000bytes
	my-d vp SRF55V10P(ISO)	4bytes	248blocks	992bytes

Parameters for Block Lock (omissible)		
lbs: (former Ls:)	Block to start locking	Available to specify up to 3 digits in decimals. A parameter error occurs when it exceeds the maximum for the specified inlet.
lbn: (former Ln:)	Number of blocks to lock	Available to specify up to 3 digits in decimals. A parameter error occurs when it exceeds the maximum for the specified inlet.
Allows to lock specified blocks (making it read-only). Specify the block to start locking with "lbs:" and specify the number of blocks to lock with "lbn:". 1 is assigned to "lbn:" if only "lbs:" was specified without specifying "lbn:". 0 is assigned to "lbs:" if only "lbn" was specified without specifying "lbs". The block will not be locked if 0 was specified to "lbn:" or both of the parameters were omitted.		
Note that once locked, the block area becomes read-only and cannot be reset.		
In applying lock for my-d, specify 1 for "iso:" and access with ISO-15693 standard.		
Multiple Block Locks Supports locking of multiple blocks, up to 16 positions may be locked, and a parameter error will occur if that number is exceeded. Blocks should be specified with the following pair of parameters: (,lbs:xxx,lbn:yyy). A parameter error will occur if not specified in pairs. This option can only be used with the standard format. A parameter error will occur if used with the conventional format. E.g.: <RK>2,D40,0000000AAAAAAA4444444BBBBBBBBB88888888,lbs:0,lbn:2,lbs:4,lbn:2,lbs:8,lbn:2		

Parameters related to option flag data control (omissible)		
eas: (former Ea:)	EAS bit operation	Writes "v" value to EAS(Electronic Article Surveillance) bit. Valid range:0 to 1
afi: (former Af:)	AFI operation	Writes value to AFI(Application Family Identifier). Inlets that don't support AFI cannot be operated. Valid range:00 to FF (HEX)
dsf: (former Ds:)	DSFID operation	Writes value to DSFID(Data Storage Format Identifier) Inlets that don't support DSFID cannot be operated. Valid range: 00 to FF(HEX)

Parameters related to perma-lock (omissible)		
eal:	Perma-lock for EAS flag	Locks EAS flag,cannot be unlocked after perma-lock Perma-lock is implemented when 1 is specified. Nothing is implemented when 0. Valid range: 0 to 1
afl: (former Al:)	Perma-lock for AFI code	Locks AFI code, cannot be unlocked after perma-lock Perma-lock is implemented when 1 is specified. Nothing is implemented when 0. Valid range: 0 to 1.
dsl: (former Di:)	Perma-lock for DSFID code	Locks DSFID code, cannot be unlocked after perma-lock Perma-lock is implemented when 1 is specified. Nothing is implemented when 0. Valid range:0 to 1

Parameters related to password lock (omissible)		
eap:	EAS password lock	Locks EAS with specified password. Valid range: 00000000-FFFFFF, 8-digit hexadecimal

Parameters related to ID write (omissible)		
eai:	EAS ID write.	Writes EAS ID with specified ID. Valid range: 0000-FFFF, 4-digit hexadecimal

Parameters related to various password settings for ICODE(omissible)		
pw0:	Read/Write protect User memory	Locks EAS flag with specified password. Valid range: 00000000-FFFFFF, 8-digit hexadecimal
pw1:	Write-protect user memory	Sets password for write protection. Valid range: 00000000-FFFFFF, 8-digit hexadecimal
pw2:	Privacy mode setting	Sets password for privacy mode. Valid range: 00000000-FFFFFF, 8-digit hexadecimal
pw3:	Disable tag	Sets password to disable tag. Valid range: 00000000-FFFFFF, 8-digit hexadecimal
pw4:	EAS protect	Sets password to protect EAS (shoplifting prevention) function. Valid range: 00000000-FFFFFF, 8-digit hexadecimal

Parameters related to passwords to access ICODE (omissible)		
aw0:	Read protect authentication for user memory	Authenticates with password to access tags that are read/write protected with pw0:. Valid range: 00000000-FFFFFF, 8-digit hexadecimal
aw1:	Write protect authentication for user memory	Authenticates with password to access tags that are write protected with pw1:. Valid range: 00000000-FFFFFF, 8-digit hexadecimal
aw2:	Authentication to set/reset Privacy mode	Authenticates with password to access tags that are in Privacy mode by pw2:. Valid range: 00000000-FFFFFF, 8-digit hexadecimal
aw4:	Authentication to reset EAS protect	Authenticates with password to access tags that are protected by pw4:. Valid range: 00000000-FFFFFF, 8-digit hexadecimal

Parameters related to setting password for kill command in Tag-it (omissible)		
kpw:	Kill command password	Sets password to disable tag. Sets password only. The tag itself is not disabled. Valid range: 00000000-FFFFFF, 8-digit hexadecimal

Parameters related to page protection settings(omissible)																	
pps:	Page protection	<p>Valid range : lilm l = Page address(3-digit decimal) m = Type of condition (refer to the following table)</p> <p>Switches specified page address from the initial "Public" to other modes. If individual page addresses are specified, up to 8 sets can be specified per tag write.</p> <table border="1"> <thead> <tr> <th>Type of condition</th><th>Mode</th><th>Behavior</th></tr> </thead> <tbody> <tr> <td>0</td><td>Public</td><td>No authentication mode (default)</td></tr> <tr> <td>1</td><td>Read-protect</td><td>Password authentication required for read</td></tr> <tr> <td>2</td><td>Write-protect</td><td>Password authentication required for write</td></tr> <tr> <td>3</td><td>Read/Write-protect</td><td>Password authentication required for both read/write</td></tr> </tbody> </table>	Type of condition	Mode	Behavior	0	Public	No authentication mode (default)	1	Read-protect	Password authentication required for read	2	Write-protect	Password authentication required for write	3	Read/Write-protect	Password authentication required for both read/write
Type of condition	Mode	Behavior															
0	Public	No authentication mode (default)															
1	Read-protect	Password authentication required for read															
2	Write-protect	Password authentication required for write															
3	Read/Write-protect	Password authentication required for both read/write															

Parameters related to feed control (omissible)		
fsw: (former Fs:)	Feed without printing	<p>Normally, RFID write print jobs that don't include print data writes but don't feed label.(Except for cases with tag offset as default)</p> <p>When 1 is specified for this parameter, even the print jobs that don't include print data will feed.</p> <p>When 0 is specified, print jobs that don't include print data will not feed, which is the same as not specifying fsw:.</p> <p>Also, printer only writes without feeding or printing when 0 is specified for print jobs that include print data, which allows write test without having to waste label.</p> <p>If don't feed, Short buzzer will sound 2 times when write is successful. Short buzzer will the sound 6 times when it fails to write.</p> <p>In addition, if 2 is specified for the item including print data, a write test can be performed without consuming a label as only write is executed without feed/print.</p> <p>Valid range : 0-2</p>

[Coding sample 1](When data format is set to ASCII)

When writing 13-byte data "4912345678904" to Tag-it HF-I RFID tag, with "Ignore RFID tag error" omitted

```
<A>
<V>50<H>50<BD>3020654912345678904
<RK>3,D13,4912345678904
<Q>2
<Z>
```

[Coding sample 2]

When writing 13-byte data "4912345678904" to Tag-it HF-I RFID tag, continuously printing while ignoring errors up to 3 labels (data format set to ASCII)

```
<A>
<V>50<H>50<BD>3020654912345678904
<RK>3,3,D13,4912345678904
<Q>2
<Z>
```

[Coding sample 3]

When writing 13-byte data "4912345678904" to Tag-it HF-I RFID tag, with "Ignore RFID tag error" omitted (data format set to HEX)

```
<A>
<V>50<H>50<BD>3020654912345678904
<RK>3,d13,34393132333435363738393034
<Q>2
<Z>
```

[Coding sample 4](data format set to ASCII)

When writing 13-byte data "4912345678904" to Tag-it HF-I RFID tag from block 5 (with b "Ignore RFID tag error" omitted)

```
<A>
<V>50<H>50<BD>3020654912345678904
<RK>3,D13,4912345678904,wsb:5
<Q>1
<Z>
```

Tag-it HF-I tag data after executing the command

Block No.	0	1	2	3	4	5	6	7	8	9.....63
Data						4912	3456	7890	4XXX	The data is maintained for the non-write block	

↑

Specify the block to start writing with wsb:

Note: XXX is the data that was there before write

[Coding sample 5](data format set to ASCII)

When writing 13-byte data "4912345678904" to Tag-it HF-I RFID tag from block 5 and lock the 4 continuous blocks from block 5 at the same time (with b "Ignore RFID tag error" omitted)

```
<A>
<V>50<H>50<BD>3020654912345678904
<RK>3,D13,4912345678904,wsb:5,lbs:5,lbn:4
<Q>1
<Z>
```

Tag-it HF-I data after executing the command

Block No.	0	1	2	3	4	5	6	7	8	9.....63
Data						4912	3456	7890	4XXX		

↑

Specify number of continued blocks with lbs:

Note: XXX is the data that existed before the write

Specify the starting block with lbs:

Locked block

[Coding sample 6](data format set to ASCII)

When writing 13-byte data "4912345678904" to Tag-it HF-I RFID tag, setting EAS bit to ON and writing 10H to AFI.
(with b "Ignore RFID tag error" omitted)

<A>
<V>50<H>50<XM>4912345678904 and EAS:SET AFI:10H
<RK>2,D13,4912345678904,eas:1,afi:10
<Q>1
<Z>

[Coding sample 7](data format set to ASCII)

When setting EAS bit to ON and writing 10H to AFI without changing tag registration data ofICODE SLI. (data array to write n~n omitted)

<A>
<V>50<H>50<XM>EAS:SET AFI:10H
<RK>2,D0,,eas:1,afi:10
<Q>1
<Z>

[Coding sample 8](data format set to ASCII)

When writing 13-byte data "4912345678904" to my-d RFID tag. (with b "Ignore RFID tag error" omitted)

<A>
<V>50<H>50<XM>4912345678904
<RK>5,D13,4912345678904,iso:1
<Q>1
<Z>

[Supplemental explanation]

1. This command allows printing for continuous printing, cutter printing, dispenser printing and tear-off.
2. This command cannot be specified multiple times in between <A>(start of data transmission) through <Z>(end of data transmission). Neither can it be specified together with <IP0>(EPC code write) command.
3. Contents of sequential printing or calendar cannot be written as information to the tag.
4. The sent information and written information are verified before printing when information is written to tag with this command.
5. The default value of parameter b is 0 (stop without ignoring tag error).
6. If printing object doesn't exist for the print job that includes this command, printer only writes for RFID and doesn't feed label. The buzzer will sound 6 times if it fails to write to tag. If successful, the buzzer is sounded 2 times but does not feed the label. If you want to feed or print as blank label specify 1 for the "fsw: feed without printing" field.
7. Refer to the following chart if you want to specify the alphabet "A" in ASCII/HEX data formats.

Mode	ASCII	HEX
Data	'A'	"41"
Code	41H	34H,31H

Printing Tag Data (ISO/IEC15693)

ESC+TU

Command	ESC	TU	Parameter
HEX code	<1B>16	<54>16<55>16	a,(n~n)
Default Value	Nil		

Valid range and term of command	When turning off the power switch	The set command is not maintained.
	Valid range within item	The set parameter is in effect until a new specification is made.
	Valid range between items	The set parameter becomes invalid.

[Function]

Reads UID data from RFID tag and develops to specified direction to make it possible to print on label.

[Format]

<TU>a,(n~n)

•Parameters

a = To use this functionality or not 1: Read UID data and start using
0: Cancel use

n = ID converted to a UID in the data area of each UID command (only when a = 1)
Character size: 4-16 bytes
Character type: Any (excluding line feed and cancel codes)
(All parameters should be in the ASCII format)

[Coding Sample] A sample using SATO as ID.

```

<A>
<RK>4,D0,,df2:FFE0
<TU>1,SATO
<%>0
<V>0410
<H>0090
<P>00
<L>0101
<XM>SATO
<%>0
<V>0060
<H>0040
<D>102120*uSATO*
<%>0
<V>0195
<H>0055
<P>00
<L>0101
<XM>*SATO*
<%>1
<V>0595
<H>0520
<D>102060*uSATO*
<TU>0
<%>1
<V>0595
<H>0035
<P>00
<L>0101
<XM>SATO
<Q>00001
<Z>

```



[UID format]

UID(**UID**) 16-digit hexadecimal sequence is the following configuration.

UID(16-digit)

E0123456789ABCDE

The above numeric is an example.

[Valid command]

font	<X20>	<X21>	<X22>	<X23>	<X24>	<XM>	<XS>	<XU>	<XB>	<XL>
Barcode		<BC>	<BG>	<BD>	<D>					
	<2D10>	<2D12>	<2D20>	<2D30>	<2D31>	<2D50>	<DN>	<DS>		

[Supplemental explanation]

1. If you specify reading UID data and start use (<TU>1), specify cancel use (<TU>0) within the same print job if.
2. Only one pair of this command (<TU>1, <TU>0) can be specified in one print job.
3. This command cannot be specified together with sequential printing or registering formats.
4. You cannot specify multiple labels for print jobs that include this command. Even if you specify 2 or more labels with <Q> command, it will be interpreted as 1.
5. When you specify the user ID by using <DN> in the data part during the use of 2D codes, specify the number of characters of the user ID in the number of data items.

Example : <TU>1,SATO
 <DN>0004,SATO

6. This command will not be executed while the printer is printing. It will be executed after the print is complete.
7. This command is enabled in sequential printing, cutter (behavior 1), dispenser (behavior 2). It cannot be used in tear-off mode, cutter()behavior 2) and dispenser (behavior 2).
8. This command will not work correctly if the tag offset is set anywhere other than default position.
9. In case if UID data could not be read, error message will be printed and will retry with the next label or discard depending on the maximum retry setting.
10. Do not specify 2 for parameter a when using ISO/IEC 15693 tag. Two is dedicated for ISO/IEC14443 TypeA. So the number of UID readout digits will be limited to 14.
11. The only barcode type allowed in (ratio 1:3) and <D> (ratio 1:2) is "1:CODE39".
12. QR code <2D30>, <2D31> are available, but they cannot be specified in numerical mode and Kanji mode. Micro QR code are not available due to limitations in the number of data.
13. The maximum number of print elements (valid commands that include ID) to be converted for this command is 20. Avoid exceeding this maximum. When exceeded, the exceeded print element may become erroneous data.

UID Return(ISO/IEC15693)

ESC+RU

Command	ESC	RU	Parameter
HEX code	<1B>16	<52>16<55>16	,aa
Default Value	aa=00		

Valid range and term of command	When turning off the power switch	The set command is not maintained.
	Valid range within item	The set parameter is in effect until a new specification is made.
	Valid range between items	The set parameter is in effect until a new specification is made.

[Function]

This command is used to return UID together with the result when data is written to the RFID tag by the <RK> command.

[Format]

Return specification : <RU>,aa
Request to return : [DC2]PK

•Parameters6

Symbol	Parameter name	Valid range
a	Identifier	00: Not returned (default setting) 01: Validate return. Obtain return data by sending [DC2]PK.

[[DC2]PK return data format (normal)]
[STX]a...a,b,c,d...d[ETX]

[Return data]

Symbol	Parameter name	Valid range
a	Total number of data byte * This is the total number of bytes after parameter b. The delimiting comma between parameters a and b, and the ETX are not included.	Data size from the first write result status until before [ETX] Maximum 5 digits
b	Write result status *Text format	0: Write failure 1: Write success Note: Specified in text format.
c	Error symbol	N : No error U : UID read error A : All errors Note: Specified in text format
d	UID return data	Refer to "UID return data" as below Note: Specified in text format

[Format of UID return data]

“Specify memory”+“:”+“Data” +“Line feed(0DH、0AH)”
ee:f’ feed(0DH)

[UID return data]

Symbol	Parameter name	Valid range
e	Specify memory	UI : UID
f	Data	Maximum 16 digits

[Return data format (when a command error occurs)]

[NAK]<15>₁₆

[Exception processing]

Parameter name	Exception condition	
	A value outside the range is specified	The specified size and received size are different
Identifier	Command error	Identifier

Terminology	Description
Command error	The data received after a command error is determined is not considered as a parameter of this command.
Invalid receive data	The data corresponding to byte 2 and thereafter of the identifier is ignored.

[Coding Sample]

```
<A>
<RU>,01
<RK>2,D13,4912345678904
<XM>4912345678904
<Z>
```

[Sample of status reply]

When [DC2]PK is received using a tag with E0123456789ABCDE of UID.

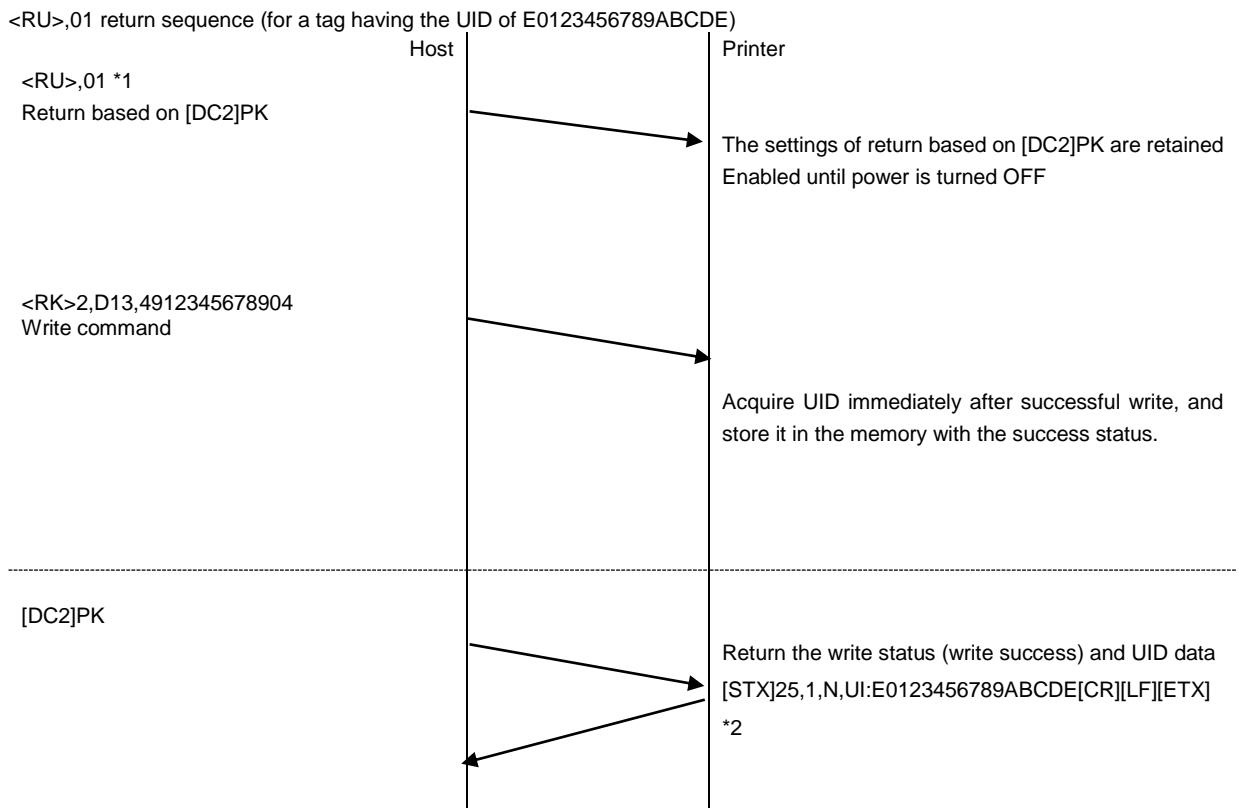
■Write successful (UID read successful)
[STX]25,1,N,UI:E0123456789ABCDE[CR][LF][ETX]

■Write successful(UID read fail)
[STX]9,1,U,UI:[CR][LF][ETX]

■Write fail(UID write failed)
[STX]9,0,U,UI:[CR][LF][ETX]

[Supplemental explanation]

- 1.The write status and UID is returned when [DC2]PK is received after RFID write.
- 2.Although write is successful status will be returned without data if you fail to read UID since UID read will be done separately from write.
- 3.Return data remains the same when code write is specified without print data. Previous value will be returned.



*1. Most common commands such as `<A>`, `<Z>` are not described in the above diagram.

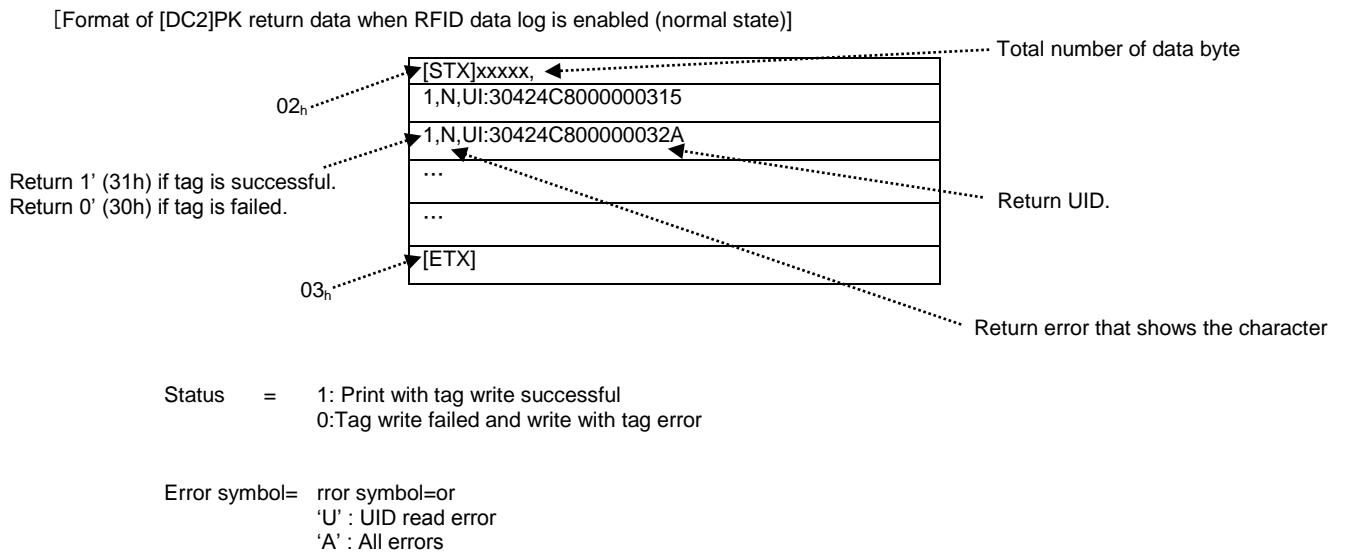
*2. The content of the return UID is an example. The actual value varies depending on the tag.

[Supplemental explanation]

The printer operation corresponding to the `<RK>` command is performed in the order of writing the data to the tag, and then performing UID reading.

Specification to record RFID data log

1. For logging RFID data, select "Data To Record" and "Log RFID Data" from "Interfaces->RFID" section.
- 2.If RFID data log(Log RFID Data) is enabled, the buffer (the storage area for 100 logs to store UID) will be saved in printercluded. printer's RAM. When the buffer is filled with logs, the new log data will overwrite from the oldest log.
- 3.When RFID data log (Log RFID Data) is enabled, the log data is returned in chronological order when it receives [DC2] PK. After the log data returns, the buffer is thoroughly cleared.
- 4.When RFID data log (LogRFID Data) is disabled, it returns 1 log. It doesn't get cleared after the data is returned with [DC2] PK.
- 5.If the printer is powered off, all log data will be lost.
- 6.When <RU>,00 is set, the whole log buffer will be cleared.
7. No log is recorded when code write is specified without print data.



16.10 RFID

RFID Write (ISO/IEC14443 TypeA)

ESC+RK

Command	ESC	RK	Parameter
HEX code	<1B>16	<52>16<4B>16	Refer to Parameters page
Initial value	Nil		

Valid range and term of command	When power switch is OFF	The set command will not be maintained.
	Valid range within items	The set parameter becomes invalid.
	Valid range between items	The set parameter becomes invalid

[Function]

Specifies the data to write on RFID tag that supports ISO/IEC14443 Type A.

[Format]

[When setting NFC(NDEF) format user data]

```
<RK>a,(b),NFC:x,(ict:xx),(lck:xxxx)(,dlk:yyyyyy)(,spl:x)(,ptl:xx)(,ecd:x)(,lgc:aaaaaa...aaaa)(,idt:xxx...xxx)
(,ndd:mmmm,nnnnn...nnnn)(,hma:xxxxxxxxxx)(,dnm:aaaaaa...aaaa)(,dcl:xxxxx)(,scl:xxxx)(,ver:x,x) (,rfb:x)
(,ssi:xxx,aaa...aaa)(,nky:xxx,aaa...aaa)(,atp:xxxx)(,etp:xxxx)(,amc:e)(,ams:hhh)(,amb:f)(,ame:g)(,nce:l)(,cfl:o)
(,lma:ii)(,prt:j)(,acl:k)(,lim:p)(,apw:ssssssss)(pck:ttt)(,psw:ssssssss)(,sa0:uu)(,sa1:vv)(,sak:www...www)
(,aky:www...www)(,fsw:r)
```

[When setting free format user data / when there is no user data]

```
<RK>a,(b),Dmmmm,n~n(NFC:f) ,(ict:xx),(wsb:sss)(,lck:xxxx)(,dlk:yyyyyy)(,amc:e)(,ams:hhh)(,amb:f)(,ame:g)
(,cfl:o)(,lma:iii)(,prt:j)(,acl:k)(,lim:p)(,apw:ssssssss)(pck:ttt)(,psw:ssssssss)(,sa0:uu)(,sa1:vv)(,sak:www...www)
(,aky:www...www)(,fsw:r)
```

•Parameter

Specification of inlet type	
a	Valid range for models with module supporting ISO/IEC14443 TypeA : 1 1 : NTAG、MIFARE、my-d(supports NFC)

Ignore RFID tag error (ommissible)	
b	Valid range : 0 to 9 0 : Unspecified This mode stops every time a tag error occurs. 1 to 9 : Specify how many labels to ignore for RFID tag error When tag error occurs, retries with next label up to the maximum number of labels to ignore. This mode will stop the printer when the series of tag errors exceeds the specified number. Note: If this parameter is omitted, the number of retries set under the menu Interfaces-> RFID->Retries ([DC2]PA's identifier IF, MAX_RETRY_LABEL) is applied instead

Data input format + number of data to write in bytes		
Dmmmm or dmmmm	<p>Number of data to write</p> <p>"D" or "d" shows that this field is for specifying the number of data to write.</p> <p>Capital "D" indicates that the data is in ASCII, lower-case "d" indicates the write data is in HEX.</p> <p>Specify the length of data in bytes with the number(mmmm) that comes after "D" or "d".</p>	<p>This parameter is used when the user data is set by using free format or when there is no user data.</p> <p>Specifies the number of bytes for the next parameter "n:data array to write". This portion should be written in bytes, so the number specified for this field will not change regardless of data format, whether ASCII or HEX.</p> <p>Specify 0 if there is no data to write to user memory, in which case specify nothing but the comma for the succeeding "n: data array to write".</p>

Data array to write						
n	Data array to write	<p>This parameter is used when the user data is set by using free format or when there is no user data.</p> <p>The character code and maximum number of characters varies depending on the data input/output format (ASCII/HEX) as below:</p> <table border="1"> <tr> <td>ASCII</td><td>Range of available character codes :(00H) - (FFH) See "Mapping table of IC chip type, number of blocks and total capacity" for the valid number of characters. It can be specified by unit of 1 character, so it is the same as maximum number of bytes allowed for each IC chip.</td></tr> <tr> <td>HEX</td><td>Range of available character codes : 0(30H)~9(39H),A(41H)~F(46H) Specify digits with multiples of 2. The number of valid characters would be twice the number of characters available for the maximum number of bytes for each IC chip, mentioned in "Mapping table of IC chip type, number of blocks and total capacity".</td></tr> </table>	ASCII	Range of available character codes :(00H) - (FFH) See "Mapping table of IC chip type, number of blocks and total capacity" for the valid number of characters. It can be specified by unit of 1 character, so it is the same as maximum number of bytes allowed for each IC chip.	HEX	Range of available character codes : 0(30H)~9(39H),A(41H)~F(46H) Specify digits with multiples of 2. The number of valid characters would be twice the number of characters available for the maximum number of bytes for each IC chip, mentioned in "Mapping table of IC chip type, number of blocks and total capacity".
ASCII	Range of available character codes :(00H) - (FFH) See "Mapping table of IC chip type, number of blocks and total capacity" for the valid number of characters. It can be specified by unit of 1 character, so it is the same as maximum number of bytes allowed for each IC chip.					
HEX	Range of available character codes : 0(30H)~9(39H),A(41H)~F(46H) Specify digits with multiples of 2. The number of valid characters would be twice the number of characters available for the maximum number of bytes for each IC chip, mentioned in "Mapping table of IC chip type, number of blocks and total capacity".					

Specifying NFC(NDEF) format	
NFC:	<p>Specify this parameter when you set data in NDEF(NFC Data Exchange Format) format stipulated by NFC forum. Valid range : 1~6,f</p> <p>[When setting NFC(NDEF) format user data] 1: user data is regarded as URI format. 2: user data is regarded as TEXT format. 3: user data is regarded as smart poster format. 4: user data is regarded as handover (Bluetooth) format. 5: user data is regarded as handover (Wi-Fi) format. 6: user data is regarded as handover(mixture of Bluetooth/Wi-Fi) format.</p> <p>[When setting free format user data] f: User data is written as a free format NDEF message. Note:Of a case and the user data that user data is not NDEF form when there is not it, this designation is unnecessary.</p>

Parameters from here can be specified in any order.

IC chip type (The default is, IC chip type become 00 "NTAG203")

ict:	Specify IC chip type to write data. The maximum number of bytes depends on the type of chip specified here.			
	IC chip type	Name of product		Maximum number of bytes
	00	NTAG	NTAG203	144
	01		NTAG210	48
	03		NTAG213	144
	04		NTAG215	496
	05		NTAG216	888
	30	MIFARE	MIFARE Ultralight	48
	31		MIFARE Ultralight (EV1) (MF0UL11)	48
	33		MIFARE Ultralight C	144
	62	my-d (NFC support)	my-d move NFC	128
<p>[Note] A command error will occur if you specify a value over maximum number of bytes. (e.g. specifying "D0889" for number of data to write for NTAG216)</p>				

Availability of various ommissible parameters for each product(except for Ignore RFID tag error and IC chip type)

IC Chip type	00	01	03	04	05	30	31	33	62
Product	NTAG 203	NTAG 210	NTAG 213	NTAG 215	NTAG 216	MIFARE Ultralight	MIFARE Ultralight (EV1) (MF0UL11)	MIFARE Ultralight C	my-d move NFC
Parameter	wsb	○	○	○	○	○	○	○	○
	lck	○	○	○	○	○	○	○	○
	dlk	○	✗	○	○	○	✗	○	○
	spl	○	○	○	○	○	○	○	○
	ptl	○	○	○	○	○	○	○	○
	ecd	○	○	○	○	○	○	○	○
	lgc	○	○	○	○	○	○	○	○
	idt	○	○	○	○	○	○	○	○
	ndd	○	○	○	○	○	○	○	○
	hma	○	○	○	○	○	○	○	○
	dnm	○	○	○	○	○	○	○	○
	dcl	○	○	○	○	○	○	○	○
	scl	○	○	○	○	○	○	○	○
	ver	○	○	○	○	○	○	○	○
	rbf	○	○	○	○	○	○	○	○
	ssi	○	○	○	○	○	○	○	○
	nky	○	○	○	○	○	○	○	○
	atp	○	○	○	○	○	○	○	○
	etp	○	○	○	○	○	○	○	○
	amc	✗	○	○	○	✗	✗	✗	✗
	ams	✗	○	○	○	✗	✗	✗	✗
	amb	✗	○	○	○	✗	✗	✗	✗
	ame	✗	✗	○	○	✗	○	✗	✗
	nce	✗	✗	○	○	✗	✗	✗	✗
	cfl	✗	✗	○	○	✗	✗	✗	✗
	lma	✗	○	○	○	✗	○	✗	✗
	prt	✗	○	○	○	✗	○	✗	○
	acl	✗	○	○	○	✗	○	✗	✗
	lim	✗	○	○	○	✗	○	✗	○
	apw	✗	○	○	○	✗	○	✗	○
	pck	✗	○	○	○	✗	○	✗	✗
	psw	✗	○	○	○	✗	○	✗	○
	sa0	✗	✗	✗	✗	✗	✗	○	✗
	sa1	✗	✗	✗	✗	✗	✗	○	✗
	sak	✗	✗	✗	✗	✗	✗	○	✗
	aky	✗	✗	✗	✗	✗	✗	○	✗
	fsw	○	○	○	○	○	○	○	○

○ : Operable ✗ : Inoperable (command error occurs)

Parameters related to specify block to start writing(omissible)		
wsb:	Specify block to start writing	Specifies the block to start writing the data. Block is a unit to write to user memory. The following values in the table are allowed based on the type of inlets. A maximum up to 3 digits in decimal can be specified. A parameter error will occur if it exceeds the maximum amount for the specified inlet. Please see the following table.
Take note that this parameters related to write starting block cannot be used for writing data in NFC(NDEF) format.		

Mapping table of IC chip type and number of blocks, and total capacity

IC chip type	Product	Capacity of 1 block	Total number of blocks	Total capacity	Valid range of number of blocks
00	NTAG203	4bytes	36blocks	144bytes	0 to 35
01	NTAG210	4bytes	12blocks	48bytes	0 to 11
03	NTAG213	4bytes	36blocks	144bytes	0 to 35
04	NTAG215	4bytes	124blocks	496bytes	0~123
05	NTAG216	4bytes	222blocks	888bytes	0 to 221
30	MIFARE Ultralight	4bytes	12blocks	48bytes	0 to 11
31	MIFARE Ultralight(EV1)(MF0UL11)	4bytes	12blocks	48bytes	0 to 11
33	MIFARE Ultralight C	4bytes	36blocks	144bytes	0 to 35
62	my-d move NFC	4bytes	32blocks	128bytes	0 to 31

Parameters for Block Lock (omissible)																																			
		<p>The specified block control can be applied to 12 blocks of user memory. Please set a fixed, 4-digit hexadecimal.</p> <p>See bit image as below.</p>																																	
		<table border="1"> <thead> <tr> <th>Bit position</th><th>7</th><th>6</th><th>5</th><th>4</th><th>3</th><th>2</th><th>1</th><th>0</th></tr> </thead> <tbody> <tr> <td>1st byte</td><td>L 7</td><td>L 6</td><td>L 5</td><td>L 4</td><td>L CC</td><td>BL 15-10</td><td>BL 9-4</td><td>BL CC</td></tr> <tr> <td>2nd byte</td><td>L 15</td><td>L 14</td><td>L 13</td><td>L 12</td><td>L 11</td><td>L 10</td><td>L 9</td><td>L 8</td></tr> </tbody> </table> <p>CC: Block that indicate inlet specification</p>							Bit position	7	6	5	4	3	2	1	0	1 st byte	L 7	L 6	L 5	L 4	L CC	BL 15-10	BL 9-4	BL CC	2 nd byte	L 15	L 14	L 13	L 12	L 11	L 10	L 9	L 8
Bit position	7	6	5	4	3	2	1	0																											
1 st byte	L 7	L 6	L 5	L 4	L CC	BL 15-10	BL 9-4	BL CC																											
2 nd byte	L 15	L 14	L 13	L 12	L 11	L 10	L 9	L 8																											
lck:	Static lock	<p>The lock types are locking for individual blocks (L) and block locking for segments of 6 blocks (BL). Numbers indicate the numbers of the locked blocks.</p> <p>Specifying 1 in location L prevents writing to the block with the specified number (changes it to read-only).</p> <p>Specifying 1 in location BL locks the current restrictions on the blocks in the applicable range.</p> <p>The target range of blocks will be fixed with the current restrictions when you specify 1 in place of BL. The block without L-lock cannot be made read-only, so it will constantly be read-write.</p>																																	
dlk:	Dynamic lock	<p>If the capacity of user memory exceeds 12 blocks, control can be applied to specified blocks from the 13th block onwards.</p> <p>Please set a fixed, 6-digit hexadecimal.</p> <p>Please set a 4-digit hexadecimal for NTAG203 and MIFARE Ultralight-C Set an 8-digit hexadecimal for my-d move NFC.</p> <p>There are two types of bit images, locking multiple blocks (L) and block-locking multiple blocks (BL). It depends on the product as to which block will be allocated for each bit (See the following bit image chart for specifying dynamic block lock)</p> <p>The specified block will be write protected when you specify 1 in place of L (will be made read-only).</p> <p>The target range of blocks will be fixed with the current restrictions when you specify 1 in place of BL. The block without L-lock cannot be made read-only, so it will constantly be read-write.</p>																																	
<p>Note that once 1 (lock) has been specified in a location, it cannot be returned to 0 (unlock).</p>																																			

Bit image of dynamic block lock

--- : Unused

(*1) Note: There is no bit image of the 3rd byte for NTAG203 and MIFARE Ultralight-C

(*2) There is bit image of the 4th byte for my-d move NFC only.

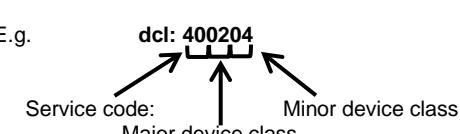
(*3) This is a lock for the configuration data setting area.

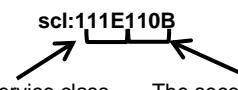
ISO/IEC14443 Type A memory structure

Block type / memory structure	
Block position (decimal)	
0	Manufacturer data and area to set static block lock
1	
2	
3	CC
4	User memory 0
5	User memory 1
6	User memory 2
7	User memory 3
8	User memory 4
9	User memory 5
10	User memory 6
11	User memory 7
12	User memory 8
13	User memory 9
14	User memory 10
15	User memory 11
16	User memory 12
.	.
.	.
.	.
n	User memory m
n+1	Dynamic lock and area to set configuration data
n+2	
n+3	
n+4	
n+5	

Applicable scope of Ick :

Applicable scope of dlk :
The value of n/m depends on printer model

Parameters related to NFC(NDEF) support (omissible)																							
spl:	Specify format of detailed record	Furthermore, specify the user data format in the case of NFC:3. Valid range : 1~4 1: treats user data as URI record 2: treats user data as title(TEXT) record 3: treats user data as action record 4: treats user data as icon Record ※For smart poster, make sure to specify the URI record. As other records are treated as options, specify if necessary.																					
ptl:	Protocol	For NFC:1 or NFC:3 (spl:1), specify the protocol (scheme) corresponding number to 1~3 digit decimal. The valid range is 1~255 (refer to the table of "Setting value of protocol (ptl:)"). ※Considering the extensibility of the function, only the valid range is checked instead of its content.																					
ecd:	Character code	For NFC:2 or NFC:3 (spl:2), specify the character code. Valid range 0~1 0:UTF-8 1:UTF-16																					
lgc:	Language code	For NFC:2 or NFC:3 (spl:2), specify the name that complies with RFC5646 to 2~63 digit. Usable characters are 0~9, A~Z, a~z and - (hyphen). E.g.: French(fr), Japanese(ja), English(en), American English(en-US)																					
idt:	Icon data type	For NFC:3 (spl:4), specify the icon data type to MIME type that complies with RFC2046. 1 ~ 64 digits. E.g.: PNG image⇒[image/png]																					
ndd:	Write user data	<p>Specify user data. Command error will occur if this is not specified. The size information for the data area is required before the data. For example, if the data size was 64, it should be specified as ndd:64,abcde...</p> <table border="1"> <thead> <tr> <th>NFC:</th><th>spl:</th><th>Setting value</th></tr> </thead> <tbody> <tr> <td>1</td><td>-</td><td>Specify the resource with UTF-8 character code.</td></tr> <tr> <td>3</td><td>1</td><td></td></tr> <tr> <td>2</td><td>-</td><td>Specify any string. Specify with consideration of character code and language code.</td></tr> <tr> <td>3</td><td>2</td><td></td></tr> <tr> <td>3</td><td>3</td><td>Specify the following value: Valid range : 0~2 0:Do the action (Send SMS to start browser) 1:Save for later (Save process) 2:Open for editing (SMS, UR edit)</td></tr> <tr> <td>3</td><td>4</td><td>Specify the icon data (binary data) to hexadecimal which digit is 2's multiples.</td></tr> </tbody> </table>	NFC:	spl:	Setting value	1	-	Specify the resource with UTF-8 character code.	3	1		2	-	Specify any string. Specify with consideration of character code and language code.	3	2		3	3	Specify the following value: Valid range : 0~2 0:Do the action (Send SMS to start browser) 1:Save for later (Save process) 2:Open for editing (SMS, UR edit)	3	4	Specify the icon data (binary data) to hexadecimal which digit is 2's multiples.
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3	4	Specify the icon data (binary data) to hexadecimal which digit is 2's multiples.																					
ver:	Version	For NFC:4~6, specify the handover version number to decimal. Specify major and minor numbers delimited by a period character. For example, specify as ver:2.1 if the major number is 2 and minor number is 1. Note: It is possible to specify 2 versions when NFC:6. One will be reflected to Bluetooth record, and the other will be reflected to Wi-Fi record. The version will not be reflected to Wi-Fi record if you have specified only one.																					
hma:	MAC Address for handover	For NFC:4~6, specify the MAC address to a fixed 12-digit hexadecimal. Note: It is possible to specify 2 MAC addresses when NFC:6. One will be reflected to Bluetooth record, and the other will be reflected to Wi-Fi record. The version will not be reflected to Wi-Fi record if you have specified only one.																					
dnm:	Device name	For NFC:4 or NFC:5 ~ 6 (wcc:1), specify the device name. Specify a string within 16 characters from 0~9, A~Z, a~z, - (hyphen) and _ (underscore).																					
dcl:	Class of Device	<p>For NFC:4, specify the device class to a fixed 6-digit hexadecimal. ※Considering the extensibility of the function, only the digit number is checked instead of its content.</p> <p>Specify service code for the first 2 digits (refer to "Service code of the device class" table in 12.3.1(14443 TypeA<RK>)). Specify major device class for 3, 4 digits and the last 2 digits for minor device class (refer to "Major device class and minor device class of the device class" table in 12.3.1(14443 TypeA<RK>)).</p> <p>E.g. </p>																					

Parameters related to NFC(NDEF) support (omissible)																																	
scl:	Service Class UUID	<p>For NFC:4, specify more than 1 service class (refer to "Service class" table). Specify to hexadecimal which digit is 4's multiples. ※Considering the extensibility of the function, only the digit number is checked instead of its content.</p> <p>E.g.  The first service class The second service class</p> <p>Up to 8 service classes can be specified.</p>																															
rfb:	RF Bands	<p>For NFC:5~6, specify the wireless frequency band when using Wi-Fi to a fixed 2-digit hexadecimal.</p> <table border="1"> <thead> <tr> <th>Value</th><th>Encryption type</th></tr> </thead> <tbody> <tr> <td>01</td><td>2.4GHz</td></tr> <tr> <td>02</td><td>5.0GHz</td></tr> <tr> <td>04</td><td>60GHz</td></tr> </tbody> </table>	Value	Encryption type	01	2.4GHz	02	5.0GHz	04	60GHz																							
Value	Encryption type																																
01	2.4GHz																																
02	5.0GHz																																
04	60GHz																																
ssi:	SSID	<p>For NFC:5~6, specify the recognition name of the access point to 1 ~ 32 digit. Usable characters are 0~9, A~Z, a~z and the following symbols: <table border="1"> <tr><td>!</td><td>"</td><td>#</td><td>\$</td><td>%</td><td>&</td><td>'</td><td>(</td><td>)</td><td>*</td><td>+</td><td>,</td><td>-</td><td>.</td><td>/</td><td>:</td></tr> <tr><td>:</td><td><</td><td>=</td><td>></td><td>?</td><td>@</td><td>[</td><td>¥</td><td>]</td><td>^</td><td>_</td><td>,</td><td>{</td><td>}</td><td>~</td></tr> </table> ※Space cannot be used.</p> <p>The size information of the front data delimited by a comma is necessary. For example if the data size is 32, specify as ssi:32,abcde...</p>	!	"	#	\$	%	&	'	()	*	+	,	-	.	/	:	:	<	=	>	?	@	[¥]	^	_	,	{	}	~
!	"	#	\$	%	&	'	()	*	+	,	-	.	/	:																		
:	<	=	>	?	@	[¥]	^	_	,	{	}	~																			
nky:	Network key	<p>For NFC:5~6, specify the network key of the access point to 8 ~ 63 digit. Usable characters are 0~9, A~Z, a~z and the following symbols: <table border="1"> <tr><td>!</td><td>"</td><td>#</td><td>\$</td><td>%</td><td>&</td><td>'</td><td>(</td><td>)</td><td>*</td><td>+</td><td>,</td><td>-</td><td>.</td><td>/</td><td>:</td></tr> <tr><td>:</td><td><</td><td>=</td><td>></td><td>?</td><td>@</td><td>[</td><td>¥</td><td>]</td><td>^</td><td>_</td><td>,</td><td>{</td><td>}</td><td>~</td></tr> </table> ※Space cannot be used.</p> <p>The size information of the front data delimited by a comma is necessary. For example if the data size is 8, specify as nky:8,AbCdEfGh.</p>	!	"	#	\$	%	&	'	()	*	+	,	-	.	/	:	:	<	=	>	?	@	[¥]	^	_	,	{	}	~
!	"	#	\$	%	&	'	()	*	+	,	-	.	/	:																		
:	<	=	>	?	@	[¥]	^	_	,	{	}	~																			
atp:	Authentication Type	<p>For NFC:5~6, specify the authentication type of the access point to a fixed 4-digit hexadecimal. Valid range: 0001~FFFF (refer to "Setting value of the authentication type" table).</p> <p>※Considering the extensibility of the function, only the digit number is checked instead of its content.</p>																															
etp:	Encryption Type	<p>For NFC:5~6, specify the encryption type of the access point to a fixed 4-digit hexadecimal. Valid range: 0001~FFFF (refer to "Setting value of the encryption type" table).</p> <p>※Considering the extensibility of the function, only the digit number is checked instead of its content.</p>																															
<ul style="list-style-type: none"> Take note that the parameters related to NFC(NDEF) support cannot be used when not writing data in NFC(NDEF) format. The data write will fail if the created data specified by the parameters related to NFC(NDEF) support exceeds the maximum byte of the targeted IC chip. 																																	

NFC(NDEF)formats and availabilities for each parameter

NFC(NDEF) format(NFC:)	1	2	3	4	5
	URI	TEXT	Smart poster	Handover (Bluetooth)	Handover (Wi-Fi)
Parameter	spl	—	—	O	—
	ptl	O	—	—	—
	ecd	—	O	—	—
	lgc	—	O	—	—
	idt	—	—	—	—
	ndd	O	O	—	—
	ver	—	—	—	O
	mac	—	—	—	O
	dnm	—	—	—	O
	dcl	—	—	—	—
	scl	—	—	—	O
	rfb	—	—	—	O
	ssi	—	—	—	O
	nky	—	—	—	O
	atp	—	—	—	O
	etp	—	—	—	O

※If handover (mixture of Bluetooth/Wi-Fi)(NFC:6) is specified, the following combinations can be used.

①Bluetooth + Wi-Fi(WSC)

Detailed record for smart poster

Format (spl:)	1	2	3	4
	URI	Title	Action	Icon
Parameter	ptl	O	—	—
	ecd	—	O	—
	lgc	—	O	—
	idt	—	—	O
	ndd	O	O	O

Various setting value for each parameter

(1)Setting value of protocol (ptl:)

value	Protocol	value	Protocol
1	http://www.	2	https://www.
3	http://	4	https://
5	tel:	6	mailto:
7	ftp://anonymous:anonymous@	8	ftp://ftp.
9	ftps://	10	sftp://
11	smb://	12	nfs://
13	ftp://	14	dav://
15	news:	16	telnet://
17	imap:	18	rtsp://
19	urn:	20	pop:
21	sip:	22	sips:
23	tftp:	24	btspp://
25	btl2cap://	26	btgoep://
27	tcpobex://	28	irdaobex://
29	file://	30	urn:epc:id:
31	urn:epc:tag:	32	urn:epc:pat:
33	urn:epc:raw:	34	urn:epc:
35	urn:nfc:	36~255	reserved

(2)Setting value of Class of Device(dcl:)

Code	Data type name
01	Positioning (Location identification)
02	Networking (LAN, Ad hoc, ...)
04	Rendering (Printing, Speakers, ...)
08	Capturing (Scanner, Microphone, ...)
10	Object Transfer (v-Inbox, v-Folder, ...)
20	Audio (Speaker, Microphone, Headset service, ...)
40	Telephony (Cordless telephony, Modem, Headset service, ...)
80	Information (WEB-server, WAP-server, ...)

(3)Major device classes and minor device classes of device class (dcl:)

Major Device Classes		Minor Device Class	
Code	Data type name	Code	Data type name
01	Computer (desktop, notebook, PDA, organizer, ...)	04	Desktop workstation
		08	Server-class computer
		0C	Laptop
		10	Handheld PC/PDA (clamshell)
		14	Palm-size PC/PDA
		18	Wearable computer (watch size)
		1C	Tablet
02	Phone (cellular, cordless, pay phone, modem, ...)	00	Uncategorized, code for device not assigned
		04	Cellular
		08	Cordless
		0C	Smartphone
		10	Wired modem or voice gateway
		14	Common ISDN access
03	LAN / Network Access point	00	Uncategorized, code for device not assigned
		20	1% to 17% utilized
		40	17% to 33% utilized
		60	33% to 50% utilized
		80	50% to 67% utilized
		A0	67% to 83% utilized
		C0	83% to 99% utilized
		E0	No service available
04	Audio/Video (headset, speaker, stereo, video display, VCR, ...)	00	Fully available
		04	Wearable Headset Device
		08	Hands-free Device
		10	Microphone
		14	Loudspeaker
		18	Headphones
		1C	Portable Audio
		20	Car audio
		24	Set-top box
		28	HiFi Audio Device
		2C	VCR
		30	Video Camera
		34	Camcorder
		38	Video Monitor
		3C	Video Display and Loudspeaker
		40	Video Conferencing
		48	Gaming/Toy
		00	Uncategorized, code not assigned

Major Device Classes		Minor Device Class	
Code	Data type name	Code	Data type name
05	Peripheral (mouse, joystick, keyboard, ...)	04	Joystick
		08	Gamepad
		0C	Remote control
		10	Sensing device
		14	Digitizer tablet
		18	Card Reader (e.g. SIM Card Reader)
		1C	Digital Pen
		20	Handheld scanner for bar-codes, RFID, etc.
		24	Handheld gestural input device (e.g., "wand" form factor)
		40	Keyboard (above mentioned 0x04~0x24 plus)
		80	Pointing device (above mentioned 0x04~0x24 plus)
		C0	Combo keyboard / pointing device (above mentioned 0x04~0x24 plus)
		00	Uncategorized device
06	Imaging (printer, scanner, camera, display, ...)	10	Display
		20	Camera
		40	Scanner
		80	Printer
07	Wearable	04	Wristwatch
		08	Pager
		0C	Jacket
		10	Helmet
		14	Glasses
08	Toy	04	Robot
		08	Vehicle
		0C	Doll / Action figure
		10	Controller
		14	Game
09	Health	04	Blood Pressure Monitor
		08	Thermometer
		0C	Weighing Scale
		10	Glucose Meter
		14	Pulse Oximeter
		18	Heart/Pulse Rate Monitor
		1C	Health Data Display
		20	Step Counter
		24	Body Composition Analyzer
		28	Peak Flow Monitor
		2C	Medication Monitor
		30	Knee Prosthesis
		34	Ankle Prosthesis
		38	Generic Health Manager
		3C	Personal Mobility Device
		00	Undefined
0F	Uncategorized: device code not specified	00	Uncategorized, code for device not assigned
All other values	reserved	All other values	reserved

(4)Setting value of Service Class UUID(scl):

Code	Service class name	Code	Service class name
1000	ServiceDiscoveryServerServiceClassID	1001	BrowseGroupDescriptorServiceClassID
1101	SerialPort	1102	LANAccessUsingPPP
1103	DialupNetworking	1104	IrMCSync
1105	OBEXObjectPush	1106	OBEXFileTransfer
1107	IrMCSyncCommand	1108	Headset
1109	CordlessTelephony	110A	AudioSource
110B	AudioSink	110C	A/V_RemoteControlTarget
110D	AdvancedAudioDistribution	110E	A/V_RemoteControl
110F	A/V_RemoteControlController	1110	Intercom
1111	Fax	1112	Headset - Audio Gateway (AG)
1113	WAP	1114	WAP_CLIENT
1115	PANU	1116	NAP
1117	GN	1118	DirectPrinting
1119	ReferencePrinting	111A	Basic Imaging Profile
111B	ImagingResponder	111C	ImagingAutomaticArchive
111D	ImagingReferencedObjects	111E	Handsfree
111F	HandsfreeAudioGateway	1120	DirectPrintingReferenceObjectsService
1121	ReflectedUI	1122	BasicPrinting
1123	PrintingStatus	1124	HumanInterfaceDeviceService
1125	HardcopyCableReplacement	1126	HCR_Print
1127	HCR_Scan	1128	Common_ISDN_Access
112D	SIM_Access	112E	Phonebook Access - PCE
112F	Phonebook Access - PSE	1130	Phonebook Access
1131	Headset - HS	1132	Message Access Server
1133	Message Notification Server	1134	Message Access Profile
1135	GNSS	1136	GNSS_Server
1137	3D Display	1138	3D Glasses
1139	3D Synchronization	113A	MPS Profile UUID
113B	MPS SC UUID	1200	PnPInformation
1201	GenericNetworking	1202	GenericFileTransfer
1203	GenericAudio	1204	GenericTelephony
1205	UPNP_Service	1206	UPNP_IP_Service
1300	ESDP_UPNP_IP_PAN	1301	ESDP_UPNP_IP_LAP
1302	ESDP_UPNP_L2CAP	1303	VideoSource
1304	VideoSink	1305	VideoDistribution
1400	HDP	1401	HDP Source
1402	HDP Sink	All other values	reserved

(5)Setting value of Authentication Type (atp:)

Value	Type
0001	Open(Default)
0002	WPA-Personal
0004	Shared
0008	WPA-Enterprise
0010	WPA2-Enterprise
0020	WPA2-Person
All other values	reserved

(6)Setting value of Encryption Type (etp:)

Value	Type
0001	None(Default)
0002	WEP
0004	TKIP
0008	AES
000C	AES/TKIP
All other values	reserved

Reference: NDEF record image for storage location

(1) URI format, TEXT format

Record header	Payload
1 record per 1 user data	

(2) Smart poster

Record header	Payload				
	Record header (1)	Payload(1)	...	Record header (n)	Payload(n)

Multiple records are stored for 1 user data. At least one URI format record needs to be stored here.

(3) Handover (Bluetooth)

Record header	Payload(1)							
	Version	Record header for handover	Payload for handover	Record header for Bluetooth	ID for Bluetooth	Payload for Bluetooth		
OOB option data								
OOB Data length	Address for Bluetooth device	EIR data length (1)	EIR data type(1)	EIR data(1)	...	EIR data length (n)	EIR data type(n)	EIR data(n)

(4) Handover (Wi-Fi)

Record header	Payload(2)					
	Version	Record header for handover	Payload for handover	Record header for Wi-Fi	ID for Wi-Fi	Payload for Wi-Fi
Option data						
Data type (1)	Data length (1)	Data(1)	...	Data type (n)	Data length (n)	Data(n)

(5) Handover (mixture of Bluetooth/Wi-Fi)

Record header	Payload(1) for Bluetooth	Payload(2) for Wi-Fi
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Parameters related to ASCII mirroring(omissible)																							
amc:	Specify ASCII mirroring data	<p>Specify the original data to reflect to user data. Valid range : 0~3 0: Nothing is reflected 1: The UID written on the tag is reflected 14 characters are reflected. 2: The NFC counter written on the tag is reflected 6 characters are reflected. 3: Both UID and NFC counter is reflected 21 characters are reflected. (UID 14 characters + NFC counter 6 characters + 1 separating character in between)</p>																					
ams:	Specify the page to start ASCII mirroring	<p>Specify which page to start reflecting from in the user memory for the data specified with amc. Valid range: 0~255, a 3-digit decimal A parameter error will occur when a value that exceeds specified inlet capacity is specified.</p> <table border="1"> <thead> <tr> <th>IC Chip type</th><th>Product</th><th>Valid range</th></tr> </thead> <tbody> <tr> <td>00</td><td>NTAG203</td><td>-</td></tr> <tr> <td>01</td><td>NTAG210</td><td>0~11</td></tr> <tr> <td>02</td><td>NTAG212</td><td>0~31</td></tr> <tr> <td>03</td><td>NTAG213</td><td>0~35</td></tr> <tr> <td>04</td><td>NTAG215</td><td>0~123</td></tr> <tr> <td>05</td><td>NTAG216</td><td>0~221</td></tr> </tbody> </table> <p>- : No ASCII mirroring</p>	IC Chip type	Product	Valid range	00	NTAG203	-	01	NTAG210	0~11	02	NTAG212	0~31	03	NTAG213	0~35	04	NTAG215	0~123	05	NTAG216	0~221
IC Chip type	Product	Valid range																					
00	NTAG203	-																					
01	NTAG210	0~11																					
02	NTAG212	0~31																					
03	NTAG213	0~35																					
04	NTAG215	0~123																					
05	NTAG216	0~221																					
amb:	Specify start byte for ASCII mirroring	<p>Specify start byte to reflect the page specified in ams. Valid range : 0~3</p>																					
<p>When specifying these parameters, it is necessary to consider the character number reflected by the user data. E.g. NFC:2,ecd:0,lgc:en,ndd:28,AB:0000000000000000x000000:EFG,amc:3,ams:0,amb:3</p> <p>When accessing the tag with this setting, the following is reflected. E.g. UID:04-E1-41-12-4C-28-80, NFC counter:00-3F-31 「AB:04E141124C2880x003F31:EFG」</p> <p>※For NTAG213, NTAG215 and NTAG216, the data specified by amc: is reflected. However, for NTAG210 and NTAG212, as there is no NFC counter structurally, UID will be reflected automatically.</p>																							

Parameters modulation mode(omissible)		
ame:	modulation mode	<p>Defines the modulation mode. Valid range : 0~1 0: strong modulation mode disabled. 1: strong modulation mode enabled.</p>

Parameters related to NFC counter (omissible)		
nce:	NFC counter update	<p>CFG1:ACCESS:NFC_CNT_EN Valid range: 0-1 Sets availability of NFC counter automatic update. 1: enabled (automatically updates counter when READ command is executed) 0: disabled</p>
cfl:	NFC counter password restriction	<p>CFG1:ACCESS:NFC_CNT_PWD_PROT Valid range: 0-1 Sets availability of NFC counter password restriction. 0: disabled (password not valid) 1: enabled (password is valid)</p>

Parameters related to configuration for authentication (omissible)					
		Sets the address to the block that requires password check. Valid range: 0-255, 3-digit decimal A parameter error will occur if a value exceeding specified inlet capacity is specified.			
lma:	Set address for password-lock	IC Chip type	Product	Valid address	
		00	NTAG203	-	
		01	NTAG210	0 to 11	
		03	NTAG213	0 to 35	
		04	NTAG215	0 to 123	
		05	NTAG216	0 to 221	
		30	MIFARE Ultralight	-	
		31	MIFARE Ultralight(EV1)(MF0UL11)	0 to 11	
		33	MIFARE Ultralight C	-	
		62	my-d move NFC	(*)	
		- : No password * : my-d move NFC is excluded because it is applied to a fixed area			
prt:	Set protection format	Sets the type of restriction. Valid range:0-1 0: write protect 1: read-write protect Note: When designated for my-d move NFC, regardless of set value this setting: (1) Cannot be cancelled (2) "dlk" cannot be used			
acl:	Lock authentication configuration information	Locks authentication configuration except for password. Unlockable after locking. Perma-lock is implemented when 1 is specified. Nothing is implemented when 0. Valid range: 0 to 1			
lim:	Set number of retries for authentication	Sets number of retries when password authentication fails. Valid range: 0-7 Note: When set to 7 or multiple instances add up to 7 or more with my-d move NFC, setting cannot be changed.			

Parameters related to access password(omissible)		
apw:	Access password	Specify an 8-digit fixed hexadecimal when you want to lock/read-protect with password.
pck:	Set data to return when password confirmation is successful	Specify a 4-digit fixed hexadecimal data to return when the password check is successful
psw:	Specify unlock password	Specify the same numerals used to lock the area which is password locked/read-locked.
sa0:	Access restriction area	Specify a 2-digit fixed decimal within 00-35 for the block to protect, dedicated for MIFARE Ultralight C.
sa1:	Access restriction method	Specify the contents of restriction dedicated for MIFARE Ultralight C. 00: read-write protect 01: write protect
sak:	Specify access password	Specify a 32-character fixed hexadecimal when locking/read-protecting with password, dedicated for MIFARE Ultralight C.
aky:	Specify unlock password	Specify the same numerals used to lock the area which is password locked/read-locked, dedicated for MIFARE Ultralight C.

Parameters related to feed control(omissible)		
fsw:	Specify feed without printing	Normally, RFID write print jobs that don't include print data writes but don't feed label.(Except for cases with tag offset as default) When 1 is specified for this parameter, even the print jobs that don't include print data will feed. When 0 is specified, print jobs that don't include print data will not feed, which is the same as not specifying fsw. Also, printer only writes without feeding or printing when 0 is specified for print jobs that include print data, which allows write test without having to waste label. If don't feed, Short buzzer will sound 2 times when write is successful. Short buzzer will the sound 6 times when it fails to write. In addition, if 2 is specified for the item including print data, a write test can be performed without consuming a label as only write is executed without feed/print. Valid range : 0-2

【Coding sample 1】 (When setting NFC(NDEF) format user data)

Registering "http://www.sato.com" in URI format to NTAG210 RFID tag, omitting the ignore RFID tag error parameter

<A>
<V>50<H>50<BD>3020654912345678904
<RK>1,NFC:1,ict:01.ptl:1,ndd:8,sato.com

① ② ③

<Q>1

<Z>

Memory data after execution
(Note: 1 block= 4 bytes)

Block	Data
0	
1	
2	
3	
4	NFC(NDEF) message
.	
.	
7	
8	
.	
.	
15	
16	
17	
18	
19	

NFC(NDEF) message

Bytes position	Format	Data
0	Start code	0x03
1	Number of bytes from 2 nd byte	0x0D
2	Record header	0xD1
3		0x01
4	Number of bytes in the payload	0x09
5	Format (1)	0x55[U]
6	Payload	0x01 (http://www.)
7		0x73[s]
8		0x61[a]
9		0x74[t]
10		0x6F[o]
11		0x2E[.]
12		0x63[c]
13		0x6F[o]
14		0x6D[m]
15		Terminator code
		0xFE

Data in the byte position outside for writing is maintained.

【Coding sample 2】 (When setting NFC(NDEF) format user data)

When recording the URI "https://www.sato2.co.jp" and text "OMP" in smart poster format to MIFARE Ultralight RFID tag in UTF-8 English(en)

<A>

<V>50<H>50<BD>3020654912345678904

<RK>1,NFC:3.ict:30.spl:1.ptl:2.ndd:11,sato2.co.jp.spl:2.ecd:0.lgc:2.en.ndd:3.OMP

① ② ③ ④ ← First record → | ← ⑤ ⑥ ⑦ second record → | ⑧

<Q>1

<Z>

Memory data after execution

NFC(NDEF) message

Block	Data	Bytes position	Format	Data
0		0	Start code	0x03
1		1	Number of bytes from 2 nd byte	0x1F
2		2	Record header	Record information
3		3		0xD1
4	NFC(NDEF) message	4		Number of characters in the format
.		5		0x02
.		6		Number of bytes in the payload
7		7	Payload	0x1A
8		8	Record header	Format (1)
9		9		0x53[S]
10		10		0x70[p]
11		11	Payload	0x91
12		12	Record header	Number of characters in the format
13		13		0x01
14		14		Number of bytes in the payload
15		15	Payload	0x0C
16		16	Protocol number(2)	Format (2)
17		17		0x55[U]
18		18	Resource data (4)	Protocol number(2)
19		19		(https://www.)
20		20		0x73[s]
21		21		0x61[a]
22		22		0x74[t]
23		23	Record header	0x6F[o]
24		24		0x32[2]
25		25		0x2A[.]
26		26	Record header	0x63[c]
27		27		0x6F[o]
28		28	Payload	0x2A[.]
29		29	Character code (6) and number of characters for language code	0x6A[j]
30		30		0x70[p]
31		31		0x70[p]
32		32	Payload	0x11
33		33	Record header	Number of characters in the format
				0x01
				Number of bytes in the payload
			Payload	0x06
			Format(5)	0x54[T]
			Character code (6) and number of characters for language code	Character code (6) and number of characters for language code
				0x02
			Language code (7)	Language code (7)
				0x65[e]
			Text data(8)	0x6e[n]
				0x4F[O]
				0x4D[M]
				0x50[P]
			Terminator code	0xFE

Data in the byte position outside for writing is maintained.

【Coding sample 3】 (When setting NFC(NDEF) format user data)

When recording the following data in handover format (Bluetooth) in NTAG215 RFID tag, omitting the ignore RFID tag error parameter:

Version:2.1

Device address: 01:02:03:04:05:06

Device class: "DeviceName"

Class of Device: Phone / Smartphone

Service classes:Telephony

<A>

<V>50<H>50<BD>3020654912345678904

<RK>1,NFC:4.ict:04.ver:2.1.hma:010203040506.dnm:DeviceName.dcl:40020C.scl:111E110B

(1)

(2)

(3)

(4)

(5)

(6)

<Q>1

<Z>

Memory data after execution

NFC(NDEF) message

Block	Data	Bytes position	Format	Data
0		0	Start code	0x03
1		1	Number of bytes from 2 nd byte	0x4A
2		2	Record header	Record information
3		3		0x91
4	NFC(NDEF) message		Number of characters in the format	0x02
5		4	Number of bytes in the payload	0x43
6		5	Format (1)	0x48[H] 0x73[S]
7		6	Payload	Version(2)
8		7		0x21 Major:2 Minor:1
9		8	Record header	0xD1
10		9		Number of characters in the format
11		10		0x02
12		11		Number of bytes in the payload
13		12		0x04
14		13		Format
15		14		0x01[a] 0x03[c]
16		15	Payload	Handover carrier flag
17		16		0x03 (unknown)
18		17		Handover carrier data length
19		18		0x00 (none)
20		19		Handover carrier data
21		20		0x30[0]
22		21		Handover ancillary data count
23		22	Record header	0x03 (unknown)
24		23		Record information
25		24		0x5A
.		25		Number of characters in the format
.		26		0x20
.		27		Number of bytes in the payload
		28		0x14
		29		Number of bytes for ID
		30		0x01
		31		Format(1)
		32		0x61[a] 0x70[p]
		33		0x70[p] 0x6C[l]
		34		0x69[i] 0x63[c]
		35		0x61[a] 0x74[t]
		36		0x69[i] 0x6F[o]
		37		0x6E[n] 0x2F[j]
		38		0x76[v] 0x6E[n]
		39		0x64[d] 0x2E[.]
		40		0x62[b] 0x6C[l]
		41		0x75[u] 0x65[e] 0x74[t]

User memory area

42			0x6F[o]
43			0x6F[o]
44			0x74[t]
45			0x68[h]
46			0x2E[.]
47			0x65[e]
48			0x70[p]
49			0x2E[.]
50			0x6F[o]
51			0x6F[o]
52			0x62[b]
53			0x30[0]
54		Payload	Bluetooth OOB data length
55			0x14
56			0x00
57			Bluetooth device address(3)
58			0x06
59			0x05
60			0x04
61			0x03
62			0x02
63			0x01
64			EIR data length
65			0x04
66			EIR datatypes
67			0x0D
68			Bluetooth device class (5)
69			0x0C
70			0x02
71			0x40
72			EIR data length
73			0x05
74			EIR datatypes
75			0x03
76			Bluetooth service class (6)
77			0x1E
78			0x11
79			0x0B
80			0x11
81			EIR data length
82			0x0B
83			EIR datatype
84			0x09
85			Bluetooth local device name(4)
			0x44[D]
			0x65[e]
			0x76[v]
			0x69[i]
			0x63[c]
			0x65[e]
			0x4E[N]
			0x61[a]
			0x6D[m]
			0x65[e]
			Terminator code
			0xFE

Data in the byte position outside for writing is maintained.

【Coding sample 4】 (When setting NFC(NDEF) format user data)

When recording the following data to RFID tag of my-d move NFC with handover (Wi-Fi WSC) format, omit the ignore RFID tag error parameter:

Version: 2.1
 MAC Address: 01:02:03:04:05:06
 RF Band: 2.4GHz
 SSID: DeviceName
 Network key: abcdefgh
 Authentication Type: WPA-Personal
 Encryption Type: WEP

<A>
 <V>50<H>50<BD>3020654912345678904
<RK>1.NFC:5.ict:62.ver:2.1.hma:010203040506.rfb:01.ssi:10.DeviceName,
 (1) (2) (3) (4) (5)
nky:8,abcdefgh,atp:0002,etp:0002
 (6) (7) (8)
 <Q>1
 <Z>

Memory data after execution

NFC(NDEF) message

Block	Data	Bytes position	Format	Data
0		0	Start code	0x03
1		1	Number of bytes from 2 nd byte	0x6E
2		2	Record header	Record information
3		3		0x91
4	NFC(NDEF) message	4		Number of characters in the format
5		5		0x02
6		6		Number of bytes in the payload
7		7	Payload	0x0A
8		8	Record header	Format(1)
9		9		0x48[H]
10		10		0x73[s]
11		11		0x10
12		12	Payload	Record information
13		13		0xD1
14		14		Number of characters in the format
15		15		0x02
16		16		Number of bytes in the payload
17		17	Record header	Format
18		18		0x01[a]
19		19		0x03[c]
20		20		Handover carrier flag
21		21		0x01
22		22	Payload	Handover carrier data length
23		23		0x01
24		24		Handover carrier data
25		25		0x30[0]
26		26		Handover ancillary data count
27		27	Record header	0x00
28		28		Record information
29		29		0x5A
30		30		Number of characters in the format
31		31		0x17
32		32	Record header	Number of bytes in the payload
33		33		0x43
34		34		Number of bytes for ID
35		35		0x01
36		36		Format(1)
37		37		0x61[a]

User memory area

			38				0x66[f]
			39				0x61[a]
			40				0x2E[.]
			41				0x77[w]
			42				0x73[s]
			43				0x63[c]
			44			ID	0x30[0]
			45		Payload	Attribute type	0x10
			46				0x0E
			47			Attribute data size	0x00
			48				0x3F
			49			Attribute type (5)	0x10
			50				0x45(SSID)
			51			Attribute data size (5)	0x00
			52				0x0A
			53			Attribute data (5)	0x44[D]
			54				0x65[e]
			55				0x76[v]
			56				0x69[ij]
			57				0x63[c]
			58				0x65[e]
			59				0x4E[N]
			60				0x61[a]
			61				0x6d[m]
			62				0x65[e]
			63			Attribute type (4)	0x10
			64				0x3C(RF Band)
			65			Attribute data size (4)	0x00
			66				0x01
			67			Attribute data (4)	0x01
			68			Attribute type (3)	0x10
			69				0x20 (MAC address)
			70			Attribute data size (3)	0x00
			71				0x06
			72			Attribute data (3)	0x01
			73				0x02
			74				0x03
			75				0x04
			76				0x05
			77				0x06
			78			Attribute type (6)	0x10
			79				0x27(Network key)
			80			Attribute data size (6)	0x00
			81				0x08
			82			Attribute data (6)	0x61[a]
			83				0x62[b]
			84				0x63[c]
			85				0x64[d]
			86				0x65[e]
			87				0x66[f]
			88				0x67[g]
			89				0x68[h]
			90			Attribute type (7)	0x10
			91				0x03 (Authentication type)
			92			Attribute data size (7)	0x00
			93				0x02
			94			Attribute data (7)	0x00
			95				0x02
			96			Attribute type (8)	0x10
			97				0x0F(Encryption type)
			98			Attribute data size (8)	0x00
			99				0x02
			100			Attribute data (8)	0x00
			101				0x02
			102			Attribute type	0x10
			103				0x49(Vendor extension)
			104			Attribute data size	0x00
			105				0x06
			106			Attribute data	0x00

33		107				0x37
34		108				0x2A
35		109				0x00(Version2(2))
36		110				0x01
37		111				0x21 Major:2 Minor:1
		112	Terminator code			0xFE

Data in the byte position outside for writing is maintained.

[Coding sample 5](data format set to ASCII)

When writing 13-byte characters “4912345678904” to NTAG203 RFID tag, with “Ignore RFID tag error” omitted

```
<A>
<V>50<H>50<BD>3020654912345678904
<RK>1,D13,4912345678904
<Q>2
<Z>
```

Memory data after execution

Block	0	1	2	3	4	5	6	7	8....39	40	41
Data					4912	3456	7890	4XXX	Any data outside of the range written to is not affected.		

*XXX is data present before this command was set.

[Coding sample 6](data format set to HEX)

When writing 13-byte characters “4912345678904” to NTAG210 RFID tag, with “Ignore RFID tag error” omitted

```
<A>
<V>50<H>50<BD>3020654912345678904
<RK>1,d13,34393132333435363738393034
<Q>2
<Z>
```

[Coding sample 7](data format set to ASCII)

In case where 13 bytes characters [4912345678904] is recorded to RFID tag of MIFARE Ultralight from block of user memory 5 , with “Ignore RFID tag error” omitted

```
<A>
<V>50<H>50<BD>3020654912345678904
<RK>1,D13,4912345678904,wsb:5
<Q>1
<Z>
```

Memory data after execution

Block	0	1	2	3	4	5	6	7	8....15
Data					4912	3456	7890	4XXX	Any data outside of the range written to is not affected.

*XXX is data present before this command was set.

specify the block to start writing with wsb:

Refer to “ISO/IEC14443 Type A memory structure”

[Coding sample 8](data format set to ASCII)

When writing 13-byte characters “4912345678904” to NTAG213 RFID tag, locking 4 continuous blocks simultaneously with “Ignore RFID tag error” omitted

```
<A>
<V>50<H>50<BD>3020654912345678904
<RK>1,D13,4912345678904,lck:0F00
<Q>2
<Z>
```

Memory data after execution

Block	0	1	2	3	4	5	6	7	8....38	39	40
Data					4912	3456	7890	4XXX	Any data outside of the range written to is not affected.		

*XXX is data present before this command was set.

Specify lock block with lck:

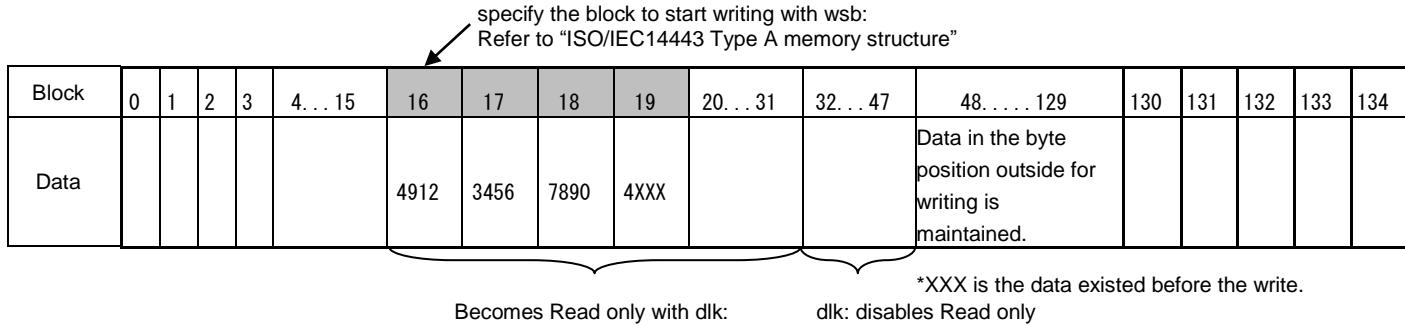
Locked block

[Coding sample 9](data format set to ASCII)

In case where 13 bytes characters of [4912345678904] is recorded to RFID tag of NTAG215 from a block of user memory 12 and target block is locked simultaneously (lock L and BL at the same time), with "Ignore RFID tag error" omitted

```
<A>
<V>50<H>50<BD>3020654912345678904
<RK>1,D13,4912345678904,ict:04,wsb:12,dlk:010001
<Q>2
<Z>
```

Memory data after execution



[Supplemental explanation]

1. This command allows to print for continuous printing, cutter printing, dispenser printing and tear-off.
2. This command cannot be specified multiple times in between <A>(start of data transmission) through <Z>(end of data transmission).
3. Contents of sequential printing or calendar cannot be written as information to the tag.
4. The sent information and written information are verified before printing when information is written to tag with this command.
5. The default value of parameter b is 0 (stop without ignoring tag error).
6. If printing object doesn't exist for the print job that includes this command, printer only writes for RFID and doesn't feed label. The buzzer will sound 6 times if it fails to write to tag. If successful, the buzzer is sounded 2 times but does not feed the label. If you want to feed or print as blank label specify 1 for the "fsw: feed without printing" field.
7. Refer to the following chart if you want to specify the alphabet "A" in ASCII/HEX data formats.

Mode	ASCII	HEX
Data	'A'	"41"
Code	41H	34H,31H

16.11 RFID

Printing Tag Data (ISO/IEC14443 TypeA)

ESC+TU

Command	ESC	TU	Parameter
HEX code	<1B>16	<54>16<55>16	a,(n~n)
Default Value	Nil		

Valid range and term of command	When turning off the power switch	The set command is not maintained.
	Valid range within item	The set parameter is in effect until a new specification is made.
	Valid range between items	The set parameter becomes invalid.

[Function]

Reads UID data from NTAG or MIFARE tag and develops to specified direction to make it possible to print on label.

[Format]

<TU>a,(n~n)

•Parameters

a = To use this functionality or not

2: Read UID data and start using
(Declare the 14-digit UID by using the 2.)

0: Cancel use

n = ID converted to a UID in the data area of each UID command (only when a = 1)

Character size: 4-16 bytes

Character type: Any (Alphanumeric)

(All parameters should be in the ASCII format)

[Coding Sample] A sample using SATO as ID.

```

<A>
<RK>4,D0,,df2:FFE0
<TU>2,SATO
<%>0
<V>0410
<H>0090
<P>00
<L>0101
<XM>SATO
<%>0
<V>0060
<H>0040
<D>102120*uSATO*
<%>0
<V>0195
<H>0055
<P>00
<L>0101
<XM>*SATO*
<%>1
<V>0595
<H>0520
<D>102060*uSATO*
<TU>0
<%>1
<V>0595
<H>0035
<P>00
<L>0101
<XM>SATO
<Q>00001
<Z>

```



[UID format]

UID(UID) 14-digit hexadecimal sequence is the following configuration.

UID(14-digit)

04123456789ABC

The above numeric is an example.

[Valid command]

font	<X20>	<X21>	<X22>	<X23>	<X24>	<XM>	<XS>	<XU>	<XB>	<XL>
Barcode		<BC>	<BG>	<BD>	<D>					
	<2D10>	<2D12>	<2D20>	<2D30>	<2D31>	<2D50>	<DN>	<DS>		

[Supplemental explanation]

1. If you specify reading UID data and start use (<TU>2), specify cancel use (<TU>0) within the same print job if.
2. Only one pair of this command (<TU>2, <TU>0) can be specified in one print job.
3. This command cannot be specified together with sequential printing or registering formats.
4. You cannot specify multiple labels for print jobs that include this command. Even if you specify 2 or more labels with <Q> command, it will be interpreted as 1.
5. When you specify the user ID by using <DN> in the data part during the use of 2D codes, specify the number of characters of the user ID in the number of data items.

Example : <TU>2,SATO
 <DN>0004,SATO

6. This command will not be executed while the printer is printing. It will be executed after the print is complete.
7. This command is enabled in sequential printing, cutter (behavior 1), dispenser (behavior 2). It cannot be used in tear-off mode, cutter()behavior 2) and dispenser (behavior 2).
8. This command will not work correctly if the tag offset is set anywhere other than default position.
9. In case if UID data could not be read, error message will be printed and will retry with the next label or discard depending on the maximum retry setting.
10. When using ISO/IEC14443 Type A tags, specify 2 in parameter a. The use of a 14-digit UID is declared. Note that specifying 1 in parameter a declares the use of a 16-digit UID, and any surplus at the end will be filled using "00".
11. The only barcode type allowed in (ratio 1:3) and <D> (ratio 1:2) is "1:CODE39".
12. QR code <2D30>, <2D31> are available, but they cannot be specified in numerical mode and Kanji mode. Micro QR code are not available due to limitations in the number of data.
13. The maximum number of print elements (valid commands that include ID) to be converted for this command is 20. Avoid exceeding this maximum. When exceeded, the exceeded print element may become erroneous data.

16.12 RFID

UID Return (ISO/IEC14443 TypeA)

ESC+RU

Command	ESC	RU	Parameter
HEX code	<1B>16	<52>16<55>16	,aa
Default Value	aa=00		

Valid range and term of command	When turning off the power switch	The set command is not maintained.
	Valid range within item	The set parameter is in effect until a new specification is made.
	Valid range between items	The set parameter is in effect until a new specification is made.

[Function]

This command is used to return UID together with the result when data is written to the RFID tag by the <RK> command.

[Format]

Return specification : <RU>,aa

Request to return : [DC2]PK

•Parameters

Symbol	Parameter name	Valid range
a	Identifier	00: Not returned (default setting) 01: Validate return. Obtain return data by sending[DC2]PK.

[[DC2]PK return data format (normal)]

[STX]a...a,b,c,d...d[ETX]

[Return data]

Symbol	Parameter name	Valid range
a	Total number of data byte * This is the total number of bytes after parameter b. The delimiting comma between parameters a and b, and the ETX are not included.	Data size from the first write result status until before [ETX] Maximum 5 digits
b	Write result status	0: Write failure 1: Write success Note: Specified in text format.
c	Error symbol	N : No error D : UID read error A : All errors Note: Specified in text format
d	UID return data	Refer to "UID return data" as below Note: Specified in text format

[Format of UID return data]

“Specify memory”+“:”+“Data” +“Line feed(0DH、0AH)”
ee:f...f[CR][LF]

[UID return data]

Symbol	Parameter name	valid range
e	Specify memory	UD : UID
f	Data	Maximun 14 digits

[Return data format (when a command error occurs)]

[NAK]<15>16

[Exception processing]

Parameter name	Exception condition	
	A value outside the range is specified	The specified size and received size are different
Identifier	Command error	Invalid receive data

Terminology	Description
Command error	The data received after a command error is determined is not considered as a parameter of this command.
Invalid receive data	The data corresponding to byte 2 and thereafter of the identifier is ignored.

[Coding Sample]

```
<A>
<RU>,01
<RK>1,D13,4912345678904
<XM>4912345678904
<Z>
```

[Sample of status reply]

When [DC2]PK is received using a tag with 04123456789ABC of UID.

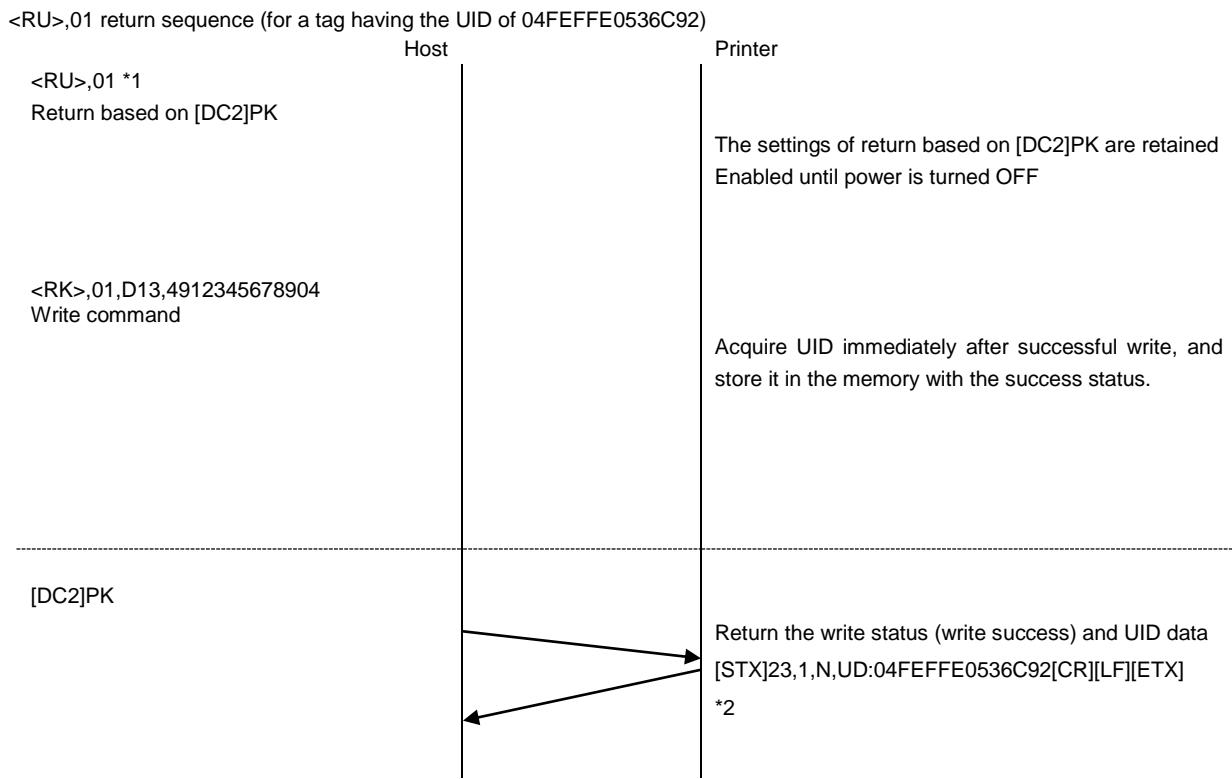
- Write successful (UID read successful)
[STX]23,1,N,UD:04123456789ABC[CR][LF][ETX]

- Write successful(UID read fail)
[STX]9,1,D,UD:[CR][LF][ETX]

- Write fail (UID read failed)
[STX]9,0,D,UD:[CR][LF][ETX]

[Supplemental explanation]

- 1.The write status and UID is returned when [DC2]PK is received after RFID write.
- 2.Although write is successful status will be returned without data if you fail to read UID since UID read will be done separately from write.
- 3.Return data remains the same when code write is specified without print data. Previous value will be returned.



*1. Most common commands such as <A>, <Z> are not described in the above diagram.

*2. The content of the return UID is an example. The actual value varies depending on the tag.

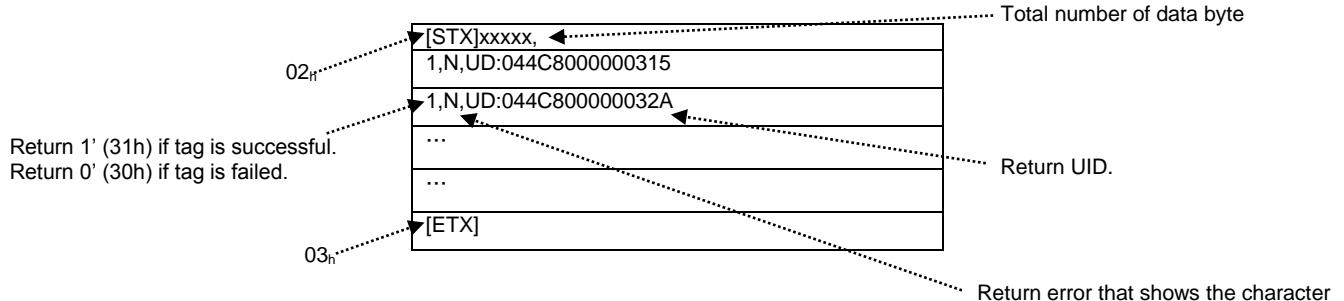
[Supplemental explanation]

The printer operation corresponding to the <RK> command is performed in the order of writing the data to the tag, and then performing UID reading.

Specification to record RFID data log

1. For logging RFID data, select "Data To Record" and "Log RFID Data" from "Interfaces"->"RFID" section.
2. If RFID data log(Log RFID Data) is enabled, the buffer (the storage area for 100 logs to store UID) will be saved in printercluded. printer's RAM. When the buffer is filled with logs, the new log data will overwrite from the oldest log.
3. When RFID data log (Log RFID Data) is enabled, the log data is returned in chronological order when it receives [DC2] PK. After the log data returns, the buffer is thoroughly cleared.
4. When RFID data log (Log RFID Data) is disabled, it returns 1 log. It doesn't get cleared after the data is returned with [DC2] PK.
5. If the printer is powered off, all log data will be lost.
6. When <RU>,00 is set, the whole log buffer will be cleared.
7. No log is recorded when code write is specified without print data.

[Format of [DC2]PK return data when RFID data log is enabled (normal state)]



Status = 1: Print with tag write successful 0: Tag write failed and write with tag error

Error symbol= rror symbol=or
'D' : UID read error
'A' : All errors

16.13 RFID

RFID write (FeliCa)

ESC+RK

Command	ESC	RK	Parameter
Hexadecimal code	<1B>16	<52>16<4B>16	Refer to Parameters page
Initial value	None		

Valid range and term of command	When power switch is OFF	The set command will not be maintained.
	Valid range within items	The set parameter becomes invalid.
	Valid range between items	The set parameter becomes invalid.

[Function]

Specify data to write to FeliCa Lite and FeliCa Lite-S tags.

This command also write to the system area (one time output).

[Format]

[When setting NFC(NDEF) format user data]
 <RK>a,(b),D0,(,rga:g~g),(rgb:h~h),(rgc:i~i),(sdk:jj..jj),(ckv:kkkk),(df1:llll),(df2:oooo)
 (,eid:pp..pp),(lck:tt..tt),(lsy:uu),(nfc:q),(spl:x),(ptl:xx),(ecd:x),(lgc:aaaaa...aaaa)
 (,idt:xxx...xxx),(ndd:mmmm,nnnnn...nnnn),(hma:xxxxxxxxxx),(dnm:aaaaa...aaa)
 (,dcl:xxxxxx),(scl:xxxx)(,ver:x,x) (,rfb:x),(ssi:xxx,aaa...aaa),(nky:xxx,aaa...aaa)
 (,atp:xxxx)(,etp:xxxx) (,fsw:r)

[When setting free format user data / when there is no user data]

<RK>a,(b),Dmmmm,n~n,(wsb:ee),(blt:f0,f1~f12,f13),(rga:g~g),(rgb:h~h),(rgc:i~i)
 (,sdk:jj..jj),(ckv:kkkk),(df1:llll),(df2:oooo),(eid:pp..pp),(lck:tt..tt),(lsy:uu) (,nfc:q),(fsw:r)

●Parameter

Specification of inlet type	
a	Valid range for models with UF-S923S/UF-S959S module : 4 4 : FeliCa Lite / FeliCa Lite-S
Ignore RFID tag error (ommissible)	
b	Valid range : 0~9 0 : Unspecified This mode stops every time a tag error occurs. 1~9 : Specify how many labels to ignore for RFID tag error When tag error occurs, retries with next label up to the maximum number of labels to ignore. With this mode, printer stops when a series of tag errors occur that exceeds the specified number of errors. Note:If this parameter is omitted, the number of retries set under the menu Interfaces-> RFID->Retries ([DC2]PA's identifier IF, MAX_RETRY_LABEL) is applied instead

Data input format + number of data to write in bytes		
Dmmmm or dmmmm	<p>Number of data to write D" or "d" shows that this field is for the number of data to write.</p> <p>Capital "D" indicates that the data is in ASCII, lower-case "d" indicates the data is in HEX.</p> <p>Specify the length of data in bytes with the number(mmmm) that comes after "D" or "d".</p>	<p>Specifies the number of bytes for the next parameter "n: data array to write". This portion should be written in bytes, so the number specified for this field does not change regardless of data format, whether ASCII or HEX.</p> <p>Valid range : FeliCa Lite/FeliCa Lite-S(a=4) : "0~224" Note: Command error occurs if you specify a value that exceeds the maximum.</p> <p>Specify 0 if the data of clutch pad is not specified, and do not specify anything for the next [n:Write Data] except for a comma only at the end.</p> <p>Specify 0 if parameters related to NFC(NDEF) are used, and do not specify anything for the next [n:Write Data] except for a comma only at the end.</p>

Data array to write						
n	Data array to write	<p>The character code and maximum number of characters depends on the data input/output format (ASCII/HEX) as below:</p> <table border="1"> <tr> <td>ASCII</td><td>Range of available character codes : (00H)~(FFH) Valid number of characters : FeliCa Lite/FeliCa Lite-S(a=4): 0~224 characters 1 character as a step can be specified.</td></tr> <tr> <td>HEX</td><td>Range of available character codes: 0(30H)~9(39H),A(41H)~F(46H) Valid number of characters : FeliCa Lite/FeliCa Lite-S(a=4): 0~448 characters Specify it with the multiples of 2 digits.</td></tr> </table>	ASCII	Range of available character codes : (00H)~(FFH) Valid number of characters : FeliCa Lite/FeliCa Lite-S(a=4): 0~224 characters 1 character as a step can be specified.	HEX	Range of available character codes: 0(30H)~9(39H),A(41H)~F(46H) Valid number of characters : FeliCa Lite/FeliCa Lite-S(a=4): 0~448 characters Specify it with the multiples of 2 digits.
ASCII	Range of available character codes : (00H)~(FFH) Valid number of characters : FeliCa Lite/FeliCa Lite-S(a=4): 0~224 characters 1 character as a step can be specified.					
HEX	Range of available character codes: 0(30H)~9(39H),A(41H)~F(46H) Valid number of characters : FeliCa Lite/FeliCa Lite-S(a=4): 0~448 characters Specify it with the multiples of 2 digits.					

Parameters from here can be specified in any order.

Parameters related to specifying block to start writing (omissible)											
wsb:	Specify block to start writing	<p>Specifies the block to start writing the data. The 0th block is specified if omitted. Block is a unit to write to user memory. The following values in the table are allowed based on the type of inlets. A maximum up to a 2-digit decimal can be specified, but a parameter error occurs if it exceeds the maximum amount for the specified inlet (14 and above). See the following table.</p> <table border="1"> <thead> <tr> <th>Inlet type</th><th>Capacity of 1 block</th><th>Total number of blocks</th><th>Total capacity</th></tr> </thead> <tbody> <tr> <td>FeliCa Lite FeliCa Lite-S</td><td>16bytes</td><td>14blocks</td><td>224bytes</td></tr> </tbody> </table> <p>Cannot be used together with blt:. Cannot be used together with parameters related to NFC(NDEF).</p>	Inlet type	Capacity of 1 block	Total number of blocks	Total capacity	FeliCa Lite FeliCa Lite-S	16bytes	14blocks	224bytes	
Inlet type	Capacity of 1 block	Total number of blocks	Total capacity								
FeliCa Lite FeliCa Lite-S	16bytes	14blocks	224bytes								

Parameters related to write block list (omissible)																
blt:	Write block list	<p>It is possible to write to block of uncontinuous data when specifying a block list format which block number is delimited by comma.</p> <p>The scratch pad (user area) of FeliCa Lite/FeliCa Lite-S comprises 14 blocks, each block can be specified to 0 ~ 13.</p> <p>The number of the block list is calculated as 16 bytes per block, with the condition that the data length specified by D (or d) parameter fulfills the following relation:</p> <p>number of the block list = specified data length ÷ 16 (+1 if there is remainder)</p> <p>For example, if the data length specified by D (or d) parameter is 52 bytes, although $52 \div 16 = 3$, the number should be $3+1=4$ as there is remainder.</p> <p>If 52 bytes are divided into 4 sets of 16 byte and write the data to each 0, 2, 8, 13 block, specify as blt:0,2,8,13.</p> <p>In the 4th block, the area after the remaining data will be filled with NULL.</p> <p>E.g.:</p> <pre><A> <RK>4,D52,ABCDEFHIJKLMNOPQRSTUVWXYZabcdefgijklmnopqrstuvwxyz wxyz,blt:0,1,8,13 <Z></pre> <p>The scratch pad data after executing the example above</p> <table border="1"> <thead> <tr> <th>Block number</th><th>Data after write</th></tr> </thead> <tbody> <tr> <td>0</td><td>ABCD EFGH IJKL MNOP</td></tr> <tr> <td>1</td><td>QRST UVWX YZab cdef</td></tr> <tr> <td>:</td><td>:</td></tr> <tr> <td>8</td><td>ghij klmn opqr stuv</td></tr> <tr> <td>:</td><td>:</td></tr> <tr> <td>13</td><td>wxyz</td></tr> </tbody> </table> <p>Note 1: The area is written with NULL. Note 2: No change to the data which block is not specified. Note 3: This data is an example for describing RFID command output.</p> <p>Cannot be used together with wsb:. Cannot be used together with parameters related to NFC(NDEF).</p>	Block number	Data after write	0	ABCD EFGH IJKL MNOP	1	QRST UVWX YZab cdef	:	:	8	ghij klmn opqr stuv	:	:	13	wxyz
Block number	Data after write															
0	ABCD EFGH IJKL MNOP															
1	QRST UVWX YZab cdef															
:	:															
8	ghij klmn opqr stuv															
:	:															
13	wxyz															

Parameters related to subtraction register (omissible)		
rga:	Specify the subtraction register A.	Set a decimal from 0~4,294,967,295. The register value for inlet shipping is 4,294,967,295. Write is possible only when the setting value is below the value stored in the register. (※1)
rgb:	Specify the subtraction register B.	Set a decimal from 0~4,294,967,295. The register value for inlet shipping is 4,294,967,295. Write is possible only when the setting value is below the value stored in the register. (※1)
rgc:	Specify the subtraction register C.	Set a fixed 16-digit hexadecimal. Specify an even number for the number of digit. The hexadecimal for inlet shipping is FFFFFFFFFFFFFF. This register without subtraction function is regarded as normal memory.

※1: When writing a value larger than the original data in subtraction register A or B, VERIFY TAG ERR error will occur.

Parameters related to individualized master key (omissible)

※Specify this parameter to automatically set the individualized card key based on the card key block.

(Set different key for each card)

sdk:	Specify the individualized master key.	Set a fixed 48-digit hexadecimal. The individualized card key cannot be set if omitted. Note: If the individualized master key leaks out, the "individual key" for all cards can be created easily. As such, manage and use the individualized master key in a fully secured environment.
-------------	--	---

Parameters related to card key version (omissible)

ckv:	Specify the card key version.	Set a fixed 4-digit hexadecimal. With sdk: specified and ckv: omitted, the card key version is written as 0000.
-------------	-------------------------------	--

Parameters related to data format code (omissible)

Note: A parameter error will occur if df1: and df2: are specified together.

df2: can be used only for FeliCa Lite.

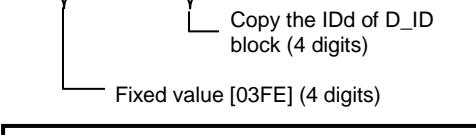
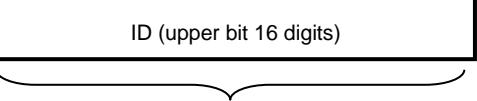
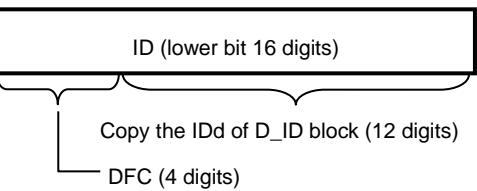
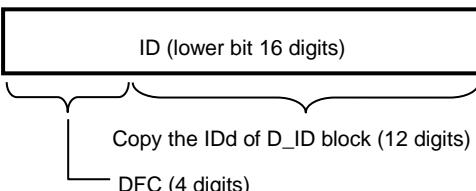
df1:	Data format code case 1	Set a fixed 4-digit hexadecimal. Even if this parameter is specified, the data is written to the ID block only. The IDm of Polling response is not changed as shown below. E.g.: IDm before setting: 3031323334353637 ↓ Data format code: FFE0 ↓ IDm after setting: 3031323334353637
df2:	Data format code case 2	Set a fixed 4-digit hexadecimal. If this parameter is specified, the IDm of Polling response is changed as shown below. E.g.: IDm before setting: 3031323334353637 ↓ Data format code: FFE0 ↓ IDm after setting: 03FEFF034353637 If the data format code is changed, this area will be overwritten to 03FE.

Parameters related to ID block random code (omissible)

eid:	ID block random code	Set a fixed 12-digit hexadecimal.
-------------	----------------------	-----------------------------------

[Note]

By specifying the parameters related to data format code (df1:、df2:) and parameters related to ID block random code (eid:), the IDm of Polling response and ID block value are updated as shown below.

Data format code	Case 1 (df1: specified or df1: and df2: omitted)	Case 2 (df2: specified) (Only when using FeliCa Lite)
D_ID Block	IDd (16 digits)	IDm (16 digits)
	PMm (16 digits)	PMm (16 digits)
Polling Response	IDm (16 digits)	ID (upper bit 16 digits)
	PMm (16 digits)	 ID (lower bit 16 digits)
ID Block	 Copy the IDd of D_ID block (16 digits)	 Copy the IDd of D_ID block (16 digits)
	 Copy the IDd of D_ID block (12 digits) DFC (4 digits)	 Copy the IDd of D_ID block (12 digits) DFC (4 digits)

※If the data format code is not specified (df1: and df2: omitted), DFC is set to [0000].

※For FeliCa Lite-S, case 2 cannot be used according to the IC chip specification.

※The IDd copy process of D_ID block to ID block upper bit 16 digits is a feature available only when using FeliCa Lite.

FeliCa Lite-S is registered during the manufacturing stage of IC chip.

※If the ID block random code is omitted, [000000000000] will be set.

Parameters related to locking user block and subtraction register (omissible)

lck:

User block lock

Set a fixed 15-digit binary.

The bitmap image corresponds to the 14 scratch pad blocks (00H~0DH) and 1 subtraction block (0EH), and the block sequence is 00H~0EH from the left.

0 1 D E



Subtraction block (1 digit)

Scratch pad block (14 digits)

If this parameter is specified, the block specified to 1 can be locked (read-only). Specified the block not to be locked to 0.

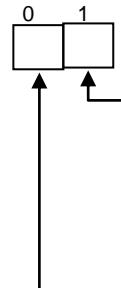
Note that once you lock the blocks, the locked blocks become read-only and you cannot unlock them.

Parameters related to system block lock (omissible)

lsy:

System block lock

Set a fixed 2-digit binary.



System blocks (block number: 82H, 83H, 84H, 86H, 87H) and MC blocks (MC[2]~MC[5]) lock
※For FeliCa Lite, the lock range of MC block is MC[2]~MC[4].

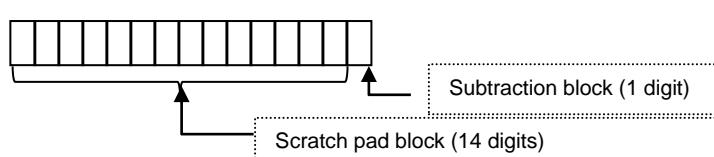
MC blocks (MC[0]~MC[1], MC[6]~MC[12]) lock
※For FeliCa Lite, the lock range of MC block is MC[0]~MC[1].

If this parameter is specified, the system block specified to 1 can be locked. Specified the block not to be locked to 0.

Note that once you lock the blocks, the locked blocks become read-only and you cannot unlock them.

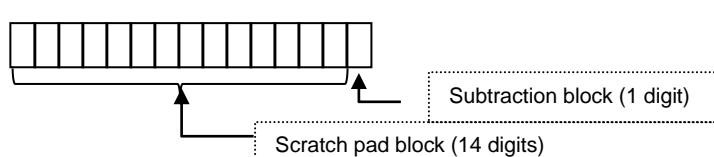
Parameters related to read after authentication of user block and subtraction register (omissible)

Note: can be used only for FeliCa Lite-S.

aar: Read after authentication of user block	<p>Set a fixed 15-digit binary.</p> <p>The bitmap image corresponds to the 14 scratch pad blocks (00H~0DH) and 1 subtraction block (0EH), and the block sequence is 00H~0EH from the left.</p> <p>0 1 D E</p>  <p>If this parameter is specified, read after authentication can be performed for the block specified to 1. Specify the block that does not require read after authentication to 0.</p> <p>Note that once you set to 1, the block cannot be set back to 0.</p>
--	---

Parameters related to write after authentication of user block and subtraction register (omissible)

Note: can be used only for FeliCa Lite-S.

aaw: Write after authentication of user block	<p>Set a fixed 15-digit binary.</p> <p>The bitmap image corresponds to the 14 scratch pad blocks (00H~0DH) and 1 subtraction block (0EH), and the block sequence is 00H~0EH from the left.</p> <p>0 1 D E</p>  <p>If this parameter is specified, write after authentication can be performed for the block specified to 1. Specify the block to 0 when authentication is not required for write.</p> <p>Note that once you set to 1, the block cannot be set back to 0.</p>
---	--

Parameters related to write (MAC inclusive) of user block and subtraction register (omissible)

Note: can be used only for FeliCa Lite-S.

mac: Write (MAC inclusive) of user block	<p>Set a fixed 15-digit binary.</p> <p>The bitmap image corresponds to the 14 scratch pad blocks (00H~0DH) and 1 subtraction block (0EH), and the block sequence is 00H~0EH from the left.</p> <p>0 1 D E</p> <p>If this parameter is specified, write (MAC inclusive) can be performed for the block specified to 1. Specify the block to 0 when MAC is not required for write.</p> <p>Note that once you set to 1, the block cannot be set back to 0.</p>
--	---

Parameters related to write (MAC inclusive) of system block (omissible)

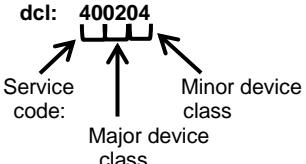
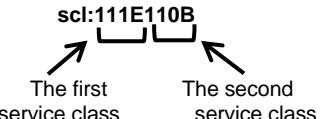
Note: can be used only for FeliCa Lite-S.

msy: Write (MAC inclusive) of system block	<p>Set a fixed 2-digit binary.</p> <p>If this parameter is specified, write (MAC inclusive) can be performed for the system block specified to 1. Specify the block to 0 when MAC is not required for write.</p> <p>Note that once you set to 1, the block cannot be set back to 0.</p>
--	---

Parameters related to NFC(NDEF) support (omissible)		
nfc:	NFC(NDEF) support	<p>Use for handling record with NDEF (NFC Data Exchange Format) stipulated by NFC Forum.</p> <p>※Set to respond as NFC Type3 Tag.</p> <p>Specify 1 to enable NFC support or 0 to disable NFC support. Valid range: 0 ~ 1</p>

Detailed parameters of NFC(NDEF) support (omissible)																							
ndf:	Specifying NFC(NDEF) format	<p>Specify this parameter when you set data in NDEF(NFC Data Exchange Format) format stipulated by NFC forum.</p> <p>Valid range : 1~6</p> <p>1: user data is regarded as URI format. 2: user data is regarded as TEXT format. 3: user data is regarded as smart poster format. 4: user data is regarded as handover (Bluetooth) format. 5: user data is regarded as handover (Wi-Fi) format. 6: user data is regarded as handover (mixture of Bluetooth/Wi-Fi) format.</p>																					
spl:	Specify format of detailed record	<p>Furthermore, specify the user data format in the case of ndf:3.</p> <p>Valid range : 1~4</p> <p>1: treats user data as URI record 2: treats user data as title(TEXT) record 3: treats user data as action record 4: treats user data as icon Record</p> <p>*For smart poster, make sure to specify the URI record. As other records are treated as options, specify if necessary.</p>																					
ptl:	Protocol	<p>For ndf:1 or ndf:3 (spl:1), specify the protocol (scheme) corresponding number to 1~3 digit decimal.</p> <p>The valid range is 1~255 (refer to the table of "Setting value of protocol (ptl:)" in 16.10(14443 TypeA<RK>)).</p> <p>※Considering the extensibility of the function, only the valid range is checked instead of its content.</p>																					
ecd:	Character code	<p>For ndf:2 or ndf:3 (spl:2), specify the character code.</p> <p>Valid range 0~1 0:UTF-8 1:UTF-16</p>																					
lgc:	Language code	<p>For ndf:2 or ndf:3 (spl:2), specify the name that complies with RFC5646 to 2~63 digit.</p> <p>Usable characters are 0~9, A~Z, a~z and - (hyphen).</p> <p>E.g.: French(fr), Japanese(ja), English(en), American English(en-US)</p>																					
idt:	Icon data type	<p>For ndf:3 (spl:4), specify the icon data type to MIME type that complies with RFC2046. 1 ~ 64 digits.</p> <p>E.g.: PNG image⇒[image/png]</p>																					
ndd:	Write user data	<p>Specify user data. Command error will occur if this is not specified. The size information for the data area is required before the data. For example, if the data size was 64, it should be specified as ndd:64,abcde...</p> <table border="1"> <thead> <tr> <th>ndf:</th><th>spl:</th><th>Setting value</th></tr> </thead> <tbody> <tr> <td>1</td><td>-</td><td>Specify the resource with UTF-8 character code.</td></tr> <tr> <td>3</td><td>1</td><td></td></tr> <tr> <td>2</td><td>-</td><td>Specify any string. Specify with consideration of character code and language code.</td></tr> <tr> <td>3</td><td>2</td><td></td></tr> <tr> <td>3</td><td>3</td><td> <p>Specify the following value: Valid range : 0~2 0:Do the action (Send SMS to start browser) 1:Save for later (Save process) 2:Open for editing (SMS, UR edit)</p> </td></tr> <tr> <td>3</td><td>4</td><td>Specify the icon data (binary data) to hexadecimal which digit is 2's multiples.</td></tr> </tbody> </table>	ndf:	spl:	Setting value	1	-	Specify the resource with UTF-8 character code.	3	1		2	-	Specify any string. Specify with consideration of character code and language code.	3	2		3	3	<p>Specify the following value: Valid range : 0~2 0:Do the action (Send SMS to start browser) 1:Save for later (Save process) 2:Open for editing (SMS, UR edit)</p>	3	4	Specify the icon data (binary data) to hexadecimal which digit is 2's multiples.
ndf:	spl:	Setting value																					
1	-	Specify the resource with UTF-8 character code.																					
3	1																						
2	-	Specify any string. Specify with consideration of character code and language code.																					
3	2																						
3	3	<p>Specify the following value: Valid range : 0~2 0:Do the action (Send SMS to start browser) 1:Save for later (Save process) 2:Open for editing (SMS, UR edit)</p>																					
3	4	Specify the icon data (binary data) to hexadecimal which digit is 2's multiples.																					
ver:	Version	<p>For ndf:4~6, specify the handover version number to decimal.</p> <p>Specify major and minor numbers delimited by a period character. For example, specify as ver:2.1 if the major number is 2 and minor number is 1.</p> <p>Note: It is possible to specify 2 versions when ndf:6. One will be reflected to Bluetooth record, and the other will be reflected to Wi-Fi record. The version will not be reflected to Wi-Fi record if you have specified only one.</p>																					
hma:	MAC Address for handover	<p>For ndf:4~6, specify the MAC address to a fixed 12-digit hexadecimal.</p> <p>Note: It is possible to specify 2 MAC addresses when ndf:6. One will be reflected to Bluetooth record, and the other will be reflected to Wi-Fi record. The version will not be reflected to Wi-Fi record if you have specified only one.</p>																					

Detailed parameters of NFC(NDEF) support (omissible)

dnm:	Device name	For ndf:4 or ndf:5 ~ 6 (wcc:1), specify the device name. Specify a string within 16 characters from 0~9, A~Z, a~z, - (hyphen) and _ (underscore).																																
dcl:	Class of Device	For ndf:4, specify the device class to a fixed 6-digit hexadecimal. ※ Considering the extensibility of the function, only the digit number is checked instead of its content. Specify service code for the first 2 digits (refer to "Service code of the device class" table in 16.10(14443 TypeA<RK>)). Specify major device class for 3, 4 digits and the last 2 digits for minor device class (refer to "Major device class and minor device class of the device class" table in 16.10(14443 TypeA<RK>)). E.g. 																																
scl:	Service Class UUID	For ndf:4, specify more than 1 service class (refer to "Service class") in 16.10. (14443 TypeA<RK>). Specify to hexadecimal which digit is 4's multiples. ※ Considering the extensibility of the function, only the digit number is checked instead of its content. E.g.  Up to 8 service classes can be specified.																																
rfb:	RF Bands	For ndf:5~6, specify the wireless frequency band when using Wi-Fi to a fixed 2-digit hexadecimal.																																
		<table border="1" data-bbox="774 1170 1267 1275"> <thead> <tr> <th>Value</th><th>Encryption type</th></tr> </thead> <tbody> <tr> <td>01</td><td>2.4GHz</td></tr> <tr> <td>02</td><td>5.0GHz</td></tr> <tr> <td>04</td><td>60GHz</td></tr> </tbody> </table>	Value	Encryption type	01	2.4GHz	02	5.0GHz	04	60GHz																								
Value	Encryption type																																	
01	2.4GHz																																	
02	5.0GHz																																	
04	60GHz																																	
ssi:	SSID	For ndf:5~6, specify the recognition name of the access point to 1 ~ 32 digit. Usable characters are 0~9, A~Z, a~z and the following symbols: <table border="1" data-bbox="774 1343 1462 1410"> <tr> <td>!</td><td>"</td><td>#</td><td>\$</td><td>%</td><td>&</td><td>'</td><td>(</td><td>)</td><td>*</td><td>+</td><td>,</td><td>-</td><td>.</td><td>/</td><td>:</td> </tr> <tr> <td>;</td><td><</td><td>=</td><td>></td><td>?</td><td>@</td><td>[</td><td>\</td><td>]</td><td>^</td><td>_</td><td>`</td><td>{</td><td> </td><td>}</td><td>~</td> </tr> </table> ※ Space cannot be used. The size information of the front data delimited by a comma is necessary. For example if the data size is 32, specify as ssi:32,abcde...	!	"	#	\$	%	&	'	()	*	+	,	-	.	/	:	;	<	=	>	?	@	[\]	^	_	`	{		}	~
!	"	#	\$	%	&	'	()	*	+	,	-	.	/	:																			
;	<	=	>	?	@	[\]	^	_	`	{		}	~																			
nky:	Network Key	For ndf:5~6, specify the network key of the access point to 8 ~ 63 digit. Usable characters are 0~9, A~Z, a~z and the following symbols: <table border="1" data-bbox="774 1574 1462 1641"> <tr> <td>!</td><td>"</td><td>#</td><td>\$</td><td>%</td><td>&</td><td>'</td><td>(</td><td>)</td><td>*</td><td>+</td><td>,</td><td>-</td><td>.</td><td>/</td><td>:</td> </tr> <tr> <td>;</td><td><</td><td>=</td><td>></td><td>?</td><td>@</td><td>[</td><td>\</td><td>]</td><td>^</td><td>_</td><td>`</td><td>{</td><td> </td><td>}</td><td>~</td> </tr> </table> ※ Space cannot be used. The size information of the front data delimited by a comma is necessary. For example if the data size is 8, specify as nky:8,AbCdEfGh.	!	"	#	\$	%	&	'	()	*	+	,	-	.	/	:	;	<	=	>	?	@	[\]	^	_	`	{		}	~
!	"	#	\$	%	&	'	()	*	+	,	-	.	/	:																			
;	<	=	>	?	@	[\]	^	_	`	{		}	~																			
atp:	Authentication Type	For ndf:5~6, specify the authentication type of the access point to a fixed 4-digit hexadecimal. Valid range: 0001~FFFF (refer to "Setting value of the authentication type" table in 16.10(14443 TypeA<RK>)). ※ Considering the extensibility of the function, only the digit number is checked instead of its content.																																

Detailed parameters of NFC(NDEF) support (omissible)

etp:	Encryption Type	<p>For ndf:5~6, specify the encryption type of the access point to a fixed 4-digit hexadecimal. Valid range: 0001~FFFF(refer to "Setting value of the encryption type" table in 16.10(14443 TypeA<RK>)).</p> <p>※ Considering the extensibility of the function, only the digit number is checked instead of its content.</p> <ul style="list-style-type: none"> • Detailed parameters related to NFC(NDEF) support is available if nfc: is set to 1. In addition, if nfc: is omitted, it will be processed as 1 is set in NFC(NDEF) support parameters. • Not available if nfc:is set to 0. • Cannot be used together with wbs: and blt:. • The data write will fail if the created data specified by the detailed parameters related to NFC(NDEF) support exceeds the maximum byte of the targeted IC chip. <p>Maximum byte: 224 bytes (for both FeliCa Lite and FeliCa Lite-S)</p>
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Parameters related to feed control (omissible)

fsw:	Feed without printing	<p>Normally, RFID write print jobs that don't include print data writes but don't feed label. (Except for cases with tag offset as default) When 1 is specified for this parameter, even the print jobs that don't include print data will feed. When 0 is specified, print jobs that don't include print data will not feed, which is the same as not specifying fsw: Also, printer only writes without feeding or printing when 0 is specified for print jobs that include print data, which allows write test without having to waste label.</p> <p>If don't feed, Short buzzer will sound 2 times when write is successful. Short buzzer will the sound 6 times when it fails to write.</p> <p>In addition, if 2 is specified for the item including print data, a write test can be performed without consuming label as only write is executed without feed/print.</p> <p>Valid range : 0-2</p>
-------------	-----------------------	---

[Coding example 1] (data input format is set to ASCII)

Record 13 bytes character of [4912345678904] on the scratch pad

(A format omitting RFID tag error ignore)

<A>

<V>50<H>50<BD>3020654912345678904

<RK>4,D13,4912345678904

<Q>2

<Z>

[Coding example 2] (data input format is set to ASCII)

Record 13 bytes character of [4912345678904] from block 5 on the scratch pad

(A format omitting b,RFID tag error ignore)

<A>

<V>50<H>50<BD>3020654912345678904

<RK>4,D13,4912345678904,wsb:5

<Q>1

<Z>

The scratch pad data after executing the example

Block	0	1	2	3	4	5	6	7	8	9....13
Data						4912345678904XXX				Data in the block outside for writing is maintained.

wsb: Specify write start block

※The remaining byte XXX will be filled with NULL.

[Coding example 3] (data input format is set to ASCII)

Record 13 bytes character of [4912345678904] from block 5 on the scratch pad, and lock the specified block

(A format omitting b,RFID tag error ignore)

<A>

<V>50<H>50<BD>3020654912345678904

<RK>4,D13,4912345678904,wsb:5,lck:0010010010000000

<Q>1

<Z>

The scratch pad data after executing the example

Block	0	1	2	3	4	5	6	7	8	9...13
Data						4912345678904XXX				

Use lck: to lock block

※The remaining byte XXX will be filled with NULL.

Block to be locked

[Coding sample 4]

An example of rewriting only DFC (Data Format Code) to [FFE0H] without printing on the surface nor changing the content of the scratch pad.

***In this case too, data is written to ID block.**

<A>

<RK>4,D0,,df2:FFE0,fsw:1

<Q>10

<Z>

[Coding sample 5]

An example to record a URI "http://www.sato.com" of NFC(NDEF) format

<A>

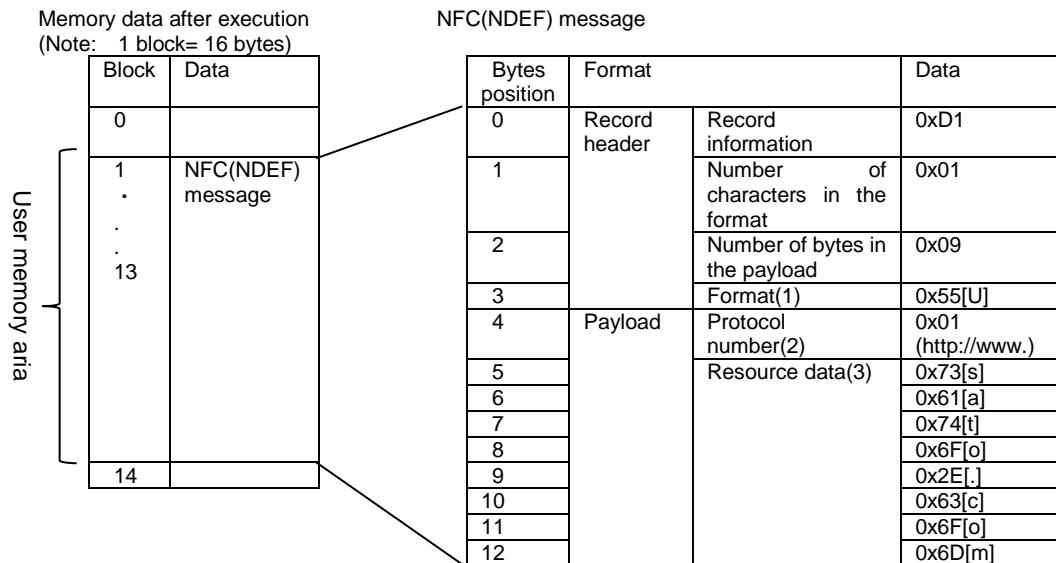
<V>50<H>50<BD>3020654912345678904

<RK>4,D0,,nfc:1,ndf:1,ptl:1,ndd:8,sato.com

(1) (2) (3)

<Q>1

<Z>



[Note]

1. This command allows printing for continuous printing, cutter printing, dispenser printing and tear-off.
2. This command cannot be specified multiple times in between <A>(start of data transmission) through <Z>(end of data transmission). Neither can it be specified together with <IP0>(EPC code write) command.
3. Contents of sequential printing or calendar cannot be written as information to the tag.
4. The sent information and written information are verified before printing when information is written to tag with this command.
5. The default value of parameter b is 0 (stop without ignoring tag error).
6. If printing object doesn't exist for the print job that includes this command, printer only writes for RFID and doesn't feed label. The buzzer will sound 6 times if it fails to write to tag. If successful, the buzzer is sounded 2 times but does not feed the label. If you want to feed or print as blank label specify 1 for the "fsw: feed without printing" field.
7. Refer to the following chart if you want to specify the alphabet "A" in ASCII/HEX data formats.

Mode	ASCII	HEX
Data	'A'	"41"
Code	41H	34H,31H

16.14 RFID

Printing tag data (FeliCa)

ESC+TU

Command	ESC	TU	Parameter
HEX code	<1B>16	<54>16<55>16	a(,n~n)
Default Value	Nil		

Valid range and term of command	When turning off the power switch	The set command is not maintained.
	Valid range within item	The set parameter is in effect until a new specification is made.
	Valid range between items	The set parameter becomes invalid.

[Function]

Reads 16-digit hexadecimal numeric sequence from Felica Lite, FeliCa Lite-S tag and renders to the specified direction to make it possible to print on label.

[Format]

<TU>a(,n~n)

•Parameters

a = To use this functionality or not	1 : Read IDm data and start using
	0 : Cancel use

n = ID that is converted to IDm in the data area of each command for the ID in use (only when a=1).

Character size: 4-16 bytes

Character type: Any (alphanumeric)

(All parameters should be in the ASCII format)

[Coding Sample] A sample using SATO as ID

```
<A>
<RK>4,D0,,df2:FFEO
<TU>1, SATO
<%>0
<V>0410
<H>0090
<P>00
<L>0101
<%>0
<V>0410
<H>0090
<P>00
<XM>SATO
<%>0
<V>0060
<H>0040
<D>102120*SATO*
<%>0
<V>0195
<H>0055
<P>00
<L>0101
<XM>*SATO*
<%>1
<V>0595
<H>0520
<D>102060*SATO*
<TU>0
<%>1
<V>0595
<H>0035
<P>00
<L>0101
<XM>SATO
<Q>00001
<Z>
```



[**IDm** format]

IDm(IDm) 16-digit hexadecimal sequence is the following configuration.

IDm(16-digit)

03FEFFE0536C92A8

The above numeric is an example.

[Valid command]

font	<X20>	<X21>	<X22>	<X23>	<X24>	<XM>	<XS>	<XU>	<XB>	<XL>
Barcode		<BC>	<BG>	<D>	<BD>					
	<2D10>	<2D12>	<2D20>	<2D30>	<2D31>	<2D50>	<DN>	<DS>		

[Supplementary Explanation]

1. If you specify reading UID data and start use (<TU>1), specify cancel use (<TU>0) within the same print job if.
2. Only one pair of this command (<TU>1, <TU>0) can be specified in one print job.
3. This command cannot be specified together with sequential printing or registering formats.
4. You cannot specify multiple labels for print jobs that include this command. Even if you specify 2 or more labels with <Q> command, it will be interpreted as 1.
5. When you specify the user ID by using <DN> in the data part during the use of 2D codes, specify the number of characters of the user ID in the number of data items.

Example : <TU>2,SATO

<DN>0004,SATO

6. This command will not be executed while the printer is printing. It will be executed after the print is complete.
7. This command is enabled in sequential printing, cutter (behavior 1), dispenser (behavior 2). It cannot be used in tear-off mode, cutter()behavior 2) and dispenser(behavior 2).
8. This command will not work correctly if the tag offset is set anywhere other than default position.
9. In case if IDm data could not be read, error message will be printed and will retry with the next label or discard depending on the maximum retry setting.
10. Prints IDm polled after configuration when data format code is configured.
11. Do not specify "2" for parameter "a" when using FeliCa Lite and FeliCa Lite-S. "2" is dedicated for IS/IEC14443 Type A, which limits the number of UID readable digits to 14.
12. The only barcode type allowed in (ratio 1:3) and <D>(ratio 1:2) is "1:CODE39"
13. QR code <2D30>, <2D31> are available, but they cannot be specified in numerical mode and Kanji mode. Micro QR code are not available due to limitations in the number of data.
14. The maximum number of print elements (valid commands that include ID) to be converted for this command is 20. Avoid exceeding this maximum. When exceeded, the exceeded print element may become erroneous data.

16.15 RFID

IDm return (FeliCa)

ESC+RU

Command	ESC	RU	Parameter
HEX code	<1B>16	<52>16<55>16	,aa
Default Value	aa=00		

Valid range and term of command	When turning off the power switch	The set command is not maintained.
	Valid range within item	The set parameter is in effect until a new specification is made.
	Valid range between items	The set parameter is in effect until a new specification is made.

[Function]

Returns the result of RFID tag write using <RK> command together with a 64-digit hexadecimal numeric sequence as a result of IDm+PMm+ID block.

[Format]

Return specification : <RU>,aa

Request to return : [DC2]PK

•Parameters

Symbol	Parameter name	Valid range	
a	Identifier	00: Not returned (default setting) 01: Validate return Obtain return data by sending [DC2]PK.	Two character fixation

[[DC2]PK return data format (normal)]

[STX]a...a,b,c,d...d[CR][LF][ETX]

[Return data]

Symbol	Parameter name	Valid range
a	Total number of data byte * This is the total number of bytes after parameter b. The delimiting comma between parameters a and b, and the ETX are not included.	Data size from the first write result status until before [ETX] Maximum 5 digits
b	Write result status	0: Write failure 1: Write success Note: Specified in text format.
c	Error symbol	N : No error I : IDm read error A : All errors Note: Specified in text format
d	IDm return data	Refer to "IDm return data" as below Note: Specified in text format

[Format of UID return data]

“Specify memory”+“:”+“Data” +“Line feed(0DH、0AH)”
ee:f...f[CR][LF]

[IDm return data]

Symbol	Parameter	Valid range
e	Specifies memory	DM : IDm + PMm + ID block
f	Data	Maximum 64 digits

[IDm return format]

Returns a 64-digit hexadecimal numeric block as a result of IDm+PMm+ID block

IDm(16 digits)	PMm(16 digits)	ID block (32 digits)
03FEFFE0536C92A8	03014B024F4993FF	3031323334353637 FFE0123456789ABC

The above is just a sample.

Sample data)

DM: 03FEFFE0536C92A803014B024F4993FF3031323334353637FFE0123456789ABC

[Return data format (when a command error occurs)]

[NAK]<15>16

[Exception processing]

Parameter name	Exception condition	
	A value outside the range is specified	The specified size and received size are different
Identifier	Command error	Invalid receive data

Terminology	Description
Command error	The data received after a command error is determined is not considered as a parameter of this command.
Invalid receive data	The data corresponding to Byte 2 and thereafter of the identifier is ignored.

[Coding Sample]

```
<A>
<RU>,01
<RK>4,D13,4912345678904
<XM>4912345678904
<Z>
```

[Sample of status reply]

When [DC2]PK is received using a tag with 03FEFFE0536C92A8 of IDm.

■ Write successful (IDm read successful)

[STX]70,1,N,DM:03FEFFE0536C92A8·····[CR][LF][ETX]

■ Write successful(IDm read fail)

[STX]9,1,I,DM:[CR][LF][ETX]

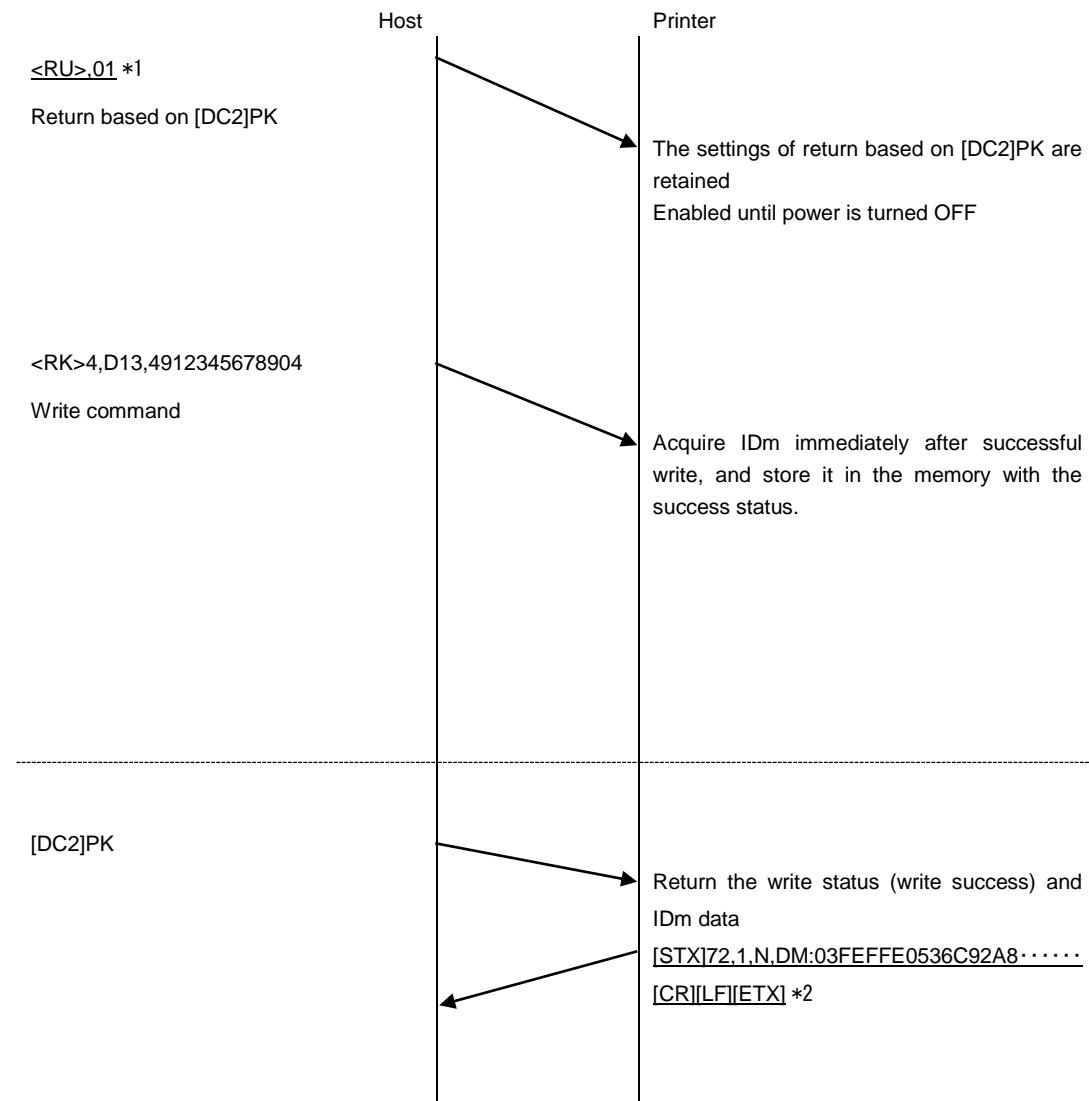
■ Write fail (IDm read failed)

[STX]9,0,I,ID:[CR][LF][ETX]

[Supplementary Explanation]

1. The write status and IDm is returned when [DC2]PK is received after RFID write.
2. Although write is successful status will be returned without data if you fail to read IDm since IDm read will be done separately from write.
3. Return data remains the same when code write is specified without print data. Previous value will be returned.

<RU>,01 return sequence (for a tag having the IDm of 03FEFFE0536C92A8)



*1. Most common commands such as <A>, <Z> are not described in the above diagram.

*2. The content of the return IDm is an example. The actual value varies depending on the tag.

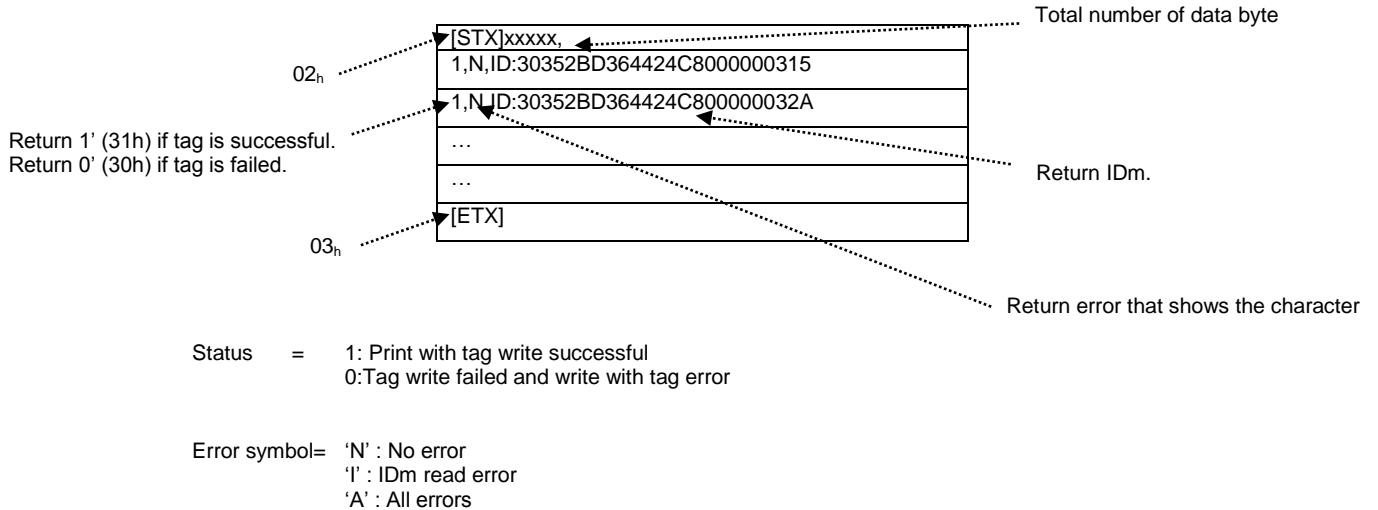
[Supplementary Explanation]

The printer operation corresponding to the <RK> command is performed in the order of writing the data to the tag, and then performing IDm reading.

Specification to record RFID data log

1. For logging RFID data, select "Data To Record" and "Log RFID Data" from "Interfaces->RFID" section.
2. If RFID data log(Log RFID Data) is enabled, the buffer (the storage area for 100 logs to store UID) will be saved in printer's RAM. When the buffer is filled with logs, the new log data will overwrite from the oldest log.
3. When RFID data log (Log RFID Data) is enabled, the log data is returned in chronological order when it receives [DC2] PK. After the log data returns, the buffer is thoroughly cleared
4. When RFID data log (LogRFID Data) is disabled, it returns 1 log. It doesn't get cleared after the data is returned with [DC2] PK.
5. If the printer is powered off, all log data will be lost.
6. When "<RU>,00" is set, the whole log buffer will be cleared.
7. No log is recorded when code write is specified without print data.

[Format of [DC2]PK return data when RFID data log is enabled (normal state)]



17 Common Commands for All Languages

The common commands are the commands independent from the applications such as SBPL, SZPL, SIPL.

The common specifications of the common command for all languages will be described as follows.

1. The structure begins from [DC2]<12>16 and two characters follow it.
2. When the two characters follow [DC2] are not the common commands, nothing will be returned and the data after that will be ignored.
3. The command to specify the data size will wait the data until the data size satisfies the specified size and no data will be returned.
4. When initializing the printer, turning the printer's power off and updating the printer, [NAK]<15><16> will be returned. However, the cancel request command can be received.
5. It runs after resuming from power-save mode when the printer is in power-saving mode or resuming from power-save mode, and returns [ACK]<06>16 or [NAK]<15>16. However, the reset command and the power off command and the cancel request command can be received.
6. The common commands cannot be used when the printer is set to the non-standard mode.

17.1 Common Commands for All Languages

Printer setting command

DC2+PA

Command	DC2	PA	Parameter
HEX code	<12> ₁₆	<50> ₁₆ <41> ₁₆	a...a.bb,c...c,d...d,(ee,f...f,g...g,h...h,i...i)...
Default Value	Nil		

Valid range and term of command	When turning off the power switch	The set parameter is maintained.
	Valid range	The set parameter is valid until the next setting.
	Printer operation in progress	The command cannot be received during the printer operation. ([NAK] return)
	Error	Commands cannot be received even if an error is occurring. ([NAK] return)

[Function]

These are commands to save printer settings.

[Format]

DC2(12H) + PA,a...a,bb,c...c,d...d,(ee,f...f,g...g,h...h)...

Data sample)

[PA], PA,87,CA,35,SPEED:2

LABELV:12345

LABELH:456

,SB,39,ZEROSLASH:0

SHOTAI:0

PROPORTIONAL:0

[Parameters]

Symbol	Parameter name	Valid range	Acquisition method
a	Total number of data in bytes *Total number of data in bytes after parameter "b". Does not include the comma in between parameter "a" and "b".	0 to 524277	Acquire until ","
b(e...)	Identifier	CA: Common settings CB: Notification system II: IEEE1284 settings IR: RS-232C settings IL: LAN settings IU: USB settings IW: WLAN settings IB: Bluetooth settings IE: EXT settings IF: RFID settings SB: SBPL setting SZ: SZPL settings SI: SIPL settings SD: SDPL settings ST: STCL settings SA: AEP settings SE: SEPL settings	Acquire fixed two-character
c(f...)	Data size of settings in bytes The size of setting information is equivalent to the bytes by section from parameter d. The comma in between the sections is not included.	0 to 524277	Acquire until ","
d(g...)	Setting data *text format *Items that need to be encrypted to perform encryption	Refer to the following the format.	Data sized of setting information

[Setting data format]

"Name of setting item" ":" + "Setting data" + "Line feed(0DH, 0AH)"

h...h:i...i[CR][LF](j...j:k...k[CR][LF])...

[Setting data]

Symbol	Parameter name	Valid range	Acquisition method
h(j...)	Setting item	See Settings Table	Valid until ":"
i(k...)	Setting data	See Settings Table	Valid until "[CR][LF]"

Data sample)

SPEED:4

LEVEL:5

[Return data format (normal)]

[ACK]<06>₁₆

[Return data format (when a command error occurs)]

[NAK]<15>₁₆

[Exception processing]

Parameter name	Exception condition	
	A value outside the range is specified	The specified size and received size are different
Total number of data in bytes	Command Error	Command Error (*1) (*2)
Identifier	Invalid identifier (skip)	Command Error
Data size of settings in bytes	Command Error	Command Error (*3)
Setting item	Invalid setting item (skip)	
Setting data	Invalid setting item (skip)	

(*1) If the data size from the first identifier (bb) to the last data item doesn't match the data size of setting information, and the data size calculated from the format, a command error will occur.

(*2) However, nothing will be returned until receiving the number of data equals to the total number of data bytes.

(*3) If the data during the receipt of the setting information data size from the beginning of the setting information data is not "", a command error occurs.

Terminology	Description
Command Error	All items are not set. The data received after a command error is determined is not considered as a parameter of this command.
Invalid identifier	The corresponding setting information data (data equivalent to the succeeding setting information data size) is ignored.
Invalid item	The data of one item (data up to [CR] [LF]) is ignored.

[Supplementary information]

- If the sum of the total data size and configuration information data size does not match, an error will occur and they will not be set.
- If the data size of settings and data size of actual settings do not match, an error will occur and the value will not be set.
- Setting for each identifier and setting item can be omitted.
- Setting for each identifier and setting item can be in random order.
- When re-setting a setting with same identifier, the last value that was set will be enabled.
- If the value in setting was out of range, then the setting item will have an error and will be skipped.
- No malfunction will occur when a character string with the same name as the setting item was set.
e.g.) When you set "DeviceName" as setting value for the setting item named "DeviceName".
- Do not send this command when the printer is printing. Use this command in the standby status.

[Setting saving function]

This command proceeds the setting when the item name and the setting value were specified basically. However, the problem may occur when the setting data are set in order of receiving the data because the setting item can be omitted and set in random order. These items will be saved firstly and set after all the received data were analyzed.

The target items and their setting process are described as follows.

Target item	Setting process															
[PRINTER]Time zone [PRINTER]Date [PRINTER]Time	The time zone must be set firstly because the time difference calculated from the local time is necessary for setting the date and time.															
[PRINTER]Main port [PRINTER]Sub port	Settings of the main port and sub-port cannot be duplicated, and the duplicated code will be ignored.															
[BLUETOOTH]ISI [BLUETOOTH]ISW [BLUETOOTH]PSI [BLUETOOTH]PSW	<p>When "ISI" is smaller than "ISW", it is not set. There is a function that when "0" is set to both "ISI" and "ISW", Bluetooth module doesn't respond to the search. Regarding this function, to avoid conflicting settings, setting it under following condition.</p> <table border="1"> <thead> <tr> <th>ISI</th> <th>ISW</th> <th>Process</th> </tr> </thead> <tbody> <tr> <td>= "0"</td> <td>= "0"</td> <td>Set</td> </tr> <tr> <td>= "0"</td> <td>≠ "0"</td> <td>Don't set</td> </tr> <tr> <td>≠ "0"</td> <td>= "0"</td> <td>Don't set</td> </tr> <tr> <td>≠ "0"</td> <td>≠ "0"</td> <td>Set</td> </tr> </tbody> </table> <p>When "PSI" is smaller than "PSW", it is not set.</p>	ISI	ISW	Process	= "0"	= "0"	Set	= "0"	≠ "0"	Don't set	≠ "0"	= "0"	Don't set	≠ "0"	≠ "0"	Set
ISI	ISW	Process														
= "0"	= "0"	Set														
= "0"	≠ "0"	Don't set														
≠ "0"	= "0"	Don't set														
≠ "0"	≠ "0"	Set														
[BLUETOOTH]Deletepairing information	There are 10 paring information and they are arrayed. You cannot delete them one by one because the deleted area is filled with next data and the number will be inconsistent. You can delete the data when you know all the paring information to be deleted.															
[SBPL]STX [SBPL]ETX [SBPL]ESC [SBPL]ENQ [SBPL]CAN [SBPL]NULL [SBPL]OFFLINE	Each control code cannot be duplicated, and the duplicated code will be ignored.															
[SZPL] Command Head [SZPL]Control head [SZPL]Delimiter	Each control code cannot be duplicated, and the duplicated code will be ignored.															
[SDPL]SOH [SDPL]STX [SDPL]CR [SDPL]CNT	Each control code cannot be duplicated, and the duplicated code will be ignored.															
[STCL]Command Head1 to 3	Each control code cannot be duplicated, and the duplicated code will be ignored.															

[Encryption of data]

The method for encryption shall be bit inversion plus conversion of binary to ASCII. Therefore there will be twice as much data after encryption.

Table of encryption code

Original		Encrypted		Original		Encrypted		Original		Encrypted	
Character	code [HEX]	Character (SJIS)	code [HEX]	Character	code [HEX]						
Space	20	df	64 66	@	40	bf	62 66	`	60	9f	39 66
!	21	de	64 65	A	41	be	62 65	a	61	9e	39 65
"	22	dd	64 64	B	42	bd	62 64	b	62	9d	39 64
#	23	dc	64 63	C	43	bc	62 63	c	63	9c	39 63
\$	24	db	64 62	D	44	bb	62 62	d	64	9b	39 62
%	25	da	64 61	E	45	ba	62 61	e	65	9a	39 61
&	26	d9	64 39	F	46	b9	62 39	f	66	99	39 39
'	27	d8	64 38	G	47	b8	62 38	g	67	98	39 38
(28	d7	64 37	H	48	b7	62 37	h	68	97	39 37
)	29	d6	64 36	I	49	b6	62 36	i	69	96	39 36
*	2A	d5	64 35	J	4A	b5	62 35	j	6A	95	39 35
+	2B	d4	64 34	K	4B	b4	62 34	k	6B	94	39 34
,	2C	d3	64 33	L	4C	b3	62 33	l	6C	93	39 33
-	2D	d2	64 32	M	4D	b2	62 32	m	6D	92	39 32
.	2E	d1	64 31	N	4E	b1	62 31	n	6E	91	39 31
/	2F	d0	64 30	O	4F	b0	62 30	o	6F	90	39 30
0	30	cf	63 66	P	50	af	61 66	p	70	8f	38 66
1	31	ce	63 65	Q	51	ae	61 65	q	71	8e	38 65
2	32	cd	63 64	R	52	ad	61 64	r	72	8d	38 64
3	33	cc	63 63	S	53	ac	61 63	s	73	8c	38 63
4	34	cb	63 62	T	54	ab	61 62	t	74	8b	38 62
5	35	ca	63 61	U	55	aa	61 61	u	75	8a	38 61
6	36	c9	63 39	V	56	a9	61 39	v	76	89	38 39
7	37	c8	63 38	W	57	a8	61 38	w	77	88	38 38
8	38	c7	63 37	X	58	a7	61 37	x	78	87	38 37
9	39	c6	63 36	Y	59	a6	61 36	y	79	86	38 36
:	3A	c5	63 35	Z	5A	a5	61 35	z	7A	85	38 35
;	3B	c4	63 34	[5B	a4	61 34	{	7B	84	38 34
<	3C	c3	63 33	\	5C	a3	61 33		7C	83	38 33
=	3D	c2	63 32]	5D	a2	61 32	}	7D	82	38 32
>	3E	c1	63 31	^	5E	a1	61 31	~	7E	81	38 31
?	3F	c0	63 30	_	5F	a0	61 30				

[PRINTER] section

Name of Setting item	Setting value	Default Vale.	R/W	initial	Contents of Setting item
				CA	
SPEED	"2": 2 inches/sec "3": 3 inches/sec "4": 4 inches/sec "5": 5 inches/sec "6": 6 inches/sec "7": 7 inches/sec "8": 8 inches/sec "9": 9 inches/sec "10": 10 inches/sec "11": 11 inches/sec "12": 12 inches/sec "13": 13 inches/sec "14": 14 inches/sec [CL4NX] 203dpi : 2-10 inches/sec (Linerless:2-6)(Dispenser:2-10) 305dpi : 2-8 inches/sec (Linerless:2-6) (Dispenser:2-10) 609dpi : 2-6 inches/sec (Linerless:2-6) (Dispenser:2-10) [CL6NX] 203dpi : 2-10 inches/sec 305dpi : 2-8 inches/sec		R/W	○	Print speed <CS>
LEVEL	"1": Darkness 1 "2": Darkness 2 "3": Darkness 3 "4": Darkness 4 "5": Darkness 5 "6": Darkness 6 "7": Darkness 7 "8": Darkness 8 "9": Darkness 9 "10": Darkness 10	5	R/W	○	Print darkness level <#F>
CONCENTRATION	"A" "B" "C" "D" "E" "F"	A	R/W	○	Print darkness <#F>
LABELV	[CL4NX] 609dpi:"1" to "9600"(dot) 305dpi:"1" to "18000"(dot) 203dpi:"1" to "20000"(dot) [CL6NX] 305dpi:"1" to "18000" (dot) 203dpi:"1" to "20000" (dot)	[CL4NX] 609dpi:9600 305dpi:18000 203dpi:20000 [CL6NX] 305dpi:18000 203dpi: 20000	R/W	○	Vertical size of label
LABELH	[CL4NX] 609dpi:"1" to "2496" (dot) 305dpi:"1" to "1248" (dot) 203dpi:"1" to "832" (dot) [CL6NX *1] 305dpi:"1" to "1984"(dot) 203dpi:"1" to "1216"(dot) [CL6NX *2] 305dpi:"1" to "2010" (dot) 203dpi:"1" to "1340" (dot)	[CL4NX] 609dpi: 2496 305dpi: 1248 203dpi: 832 [CL6NX *1] 305dpi:1984 203dpi:1216 [CL6NX *2] 305dpi: 2010 203dpi: 1340	R/W	○	Horizontal size of label *1: Head Base Position=Standard *2: Head Base Position=Left-justify
PITCHOFFSET	"-99" to "99"(dot)	0	R/W	○	Pitch offset
BASEV	"-792" to "792"(dot)	0	R/W	○	Offset of vertical base reference point <A3>
BASEH	"-792" to "792"(dot)	0	R/W	○	Offset of horizontal base reference point <A3>
PRINT_AUTO	"0": disable "1": Enable	1	R/W	○	Automatic selection of behavior mode

Name of Setting item	Setting value	Default Vale.	R/W	initial	Contents of Setting item
				CA	
PRINT	"0": Continuous "1": Tear-off "2": Dispenser "3": Cutter "4": Linerless "5": Cut while printing	1 Standard:1, With cutter:3, With dispenser:2 Linerless:4	R/W	○	Print motion
PEEL	"0": Motion 3 (No backfeed) "1": Motion 1 (Print head position) "2": Motion 2 (Dispenser position)	1	R/W	○	Dispenser motion (backfeed motion) <PM>
CUTTER	"0": Motion 3 (No backfeed) "1": Motion 1 (Print head position) "2": Motion 2 (Cutter position)	1	R/W	○	Cutter motion <PM>
NONSEPA	"2": Motion 2 (Dispenser position)	2	R/W	○	Linerless motion (Backfeed motion) <PM>
TEAR_OFFSET	"-99" to "99"(dot)	0	R/W	○	Tear-off Offset adjust <PO>
CUT_OFFSET	"-99" to "99"(dot)	0	R/W	○	Cutter Offset adjust <PO>
DISP_OFFSET	"-99" to "99"(dot)	0	R/W	○	Dispenser Offset adjust <PO>
TYPE	"0": Thermal transfer "1": Direct thermal	0	R/W	○	Print method <PH>
SENSOR	"0": Disable sensor "1": GAP "2": I-MARK (Linerless : 0,2) (Tear-off or Dispenser or Cut while printing : 1,2) (Continuous or cutter : 0,1,2)	1 (Linerless:0)	R/W	○	Sensor type <IG> Sensor value of the active print mode.
PEND_TYPE	"0": I-MARK "1": GAP	0	R/W	○	Type of paper end sensor
EJECT_CUT	"0" to "5"(sec)	0	R/W	○	Eject cut settings
MEDIA_CHECK	"0": Disable "1": Enable	0	R/W	○	Media check
HEADCHECK	"0": Disable "1": Normal range "2": Barcode range	0	R/W	○	Head check
HEADCHECK_MODE	"0": Check one page "1": Specify start and end "2": Specify number of pages	0	R/W	○	Head check mode
HEADCHECK_PAGE	"1" to "999999"	1	R/W	○	Number of headcheck pages

Name of Setting item	Setting value	Default Vale.	R/W	initial	Contents of Setting item
				CA	
LANGUAGE	"0": English "1": German "2": French "3": Spanish "4": Italian "5": Portuguese(Europe) "6": Czech "7": Danish "8": Dutch "9": Finnish "10": Greek "11": Hungarian "12": Norwegian "13": Polish "14": Romanian "15": Russian "16": Slovakian "17": Swedish "18": Turkish "19": Chinese(Simplified) "20": Chinese(Traditional) "21": Korean "22": Japanese "23": Arabic "24": Thai "25": Vietnamese "26": Farsi "27": Indonesian "28": Hindi "29": Portuguese(Brazil)	0	R/W	○	Language settings
TIMEZONE	Refer to a table of the timezone	Europe/London	R/W	○	Time zone
DATE_SET	" YYYY/MM/DD " Y: Year M: Month D: Date Min:2000/01/01 00:00:00 Max:2035/12/31 23:59:00	2013/01/01	R/W	○	Set calendar (date)
TIME_SET	"HH:NN:SS" H: Hour N: Minute S: Second	00:00:00	R/W	○	Set calendar(time)
POWER_SAVE	0:Disable 1 to 3600sec *Setup in minutes	3600	R/W	○	Power saving setting
BUZZER	"0": Buzzer off "1": Volume low "2": Volume medium "3": Volume large	2	R/W	○	Buzzer volume
LCDVOLUME	"0"~"9"	7	R/W	-	LCD Brightness
ADJUSTPITCH	[CL4NX] 609dpi:"-90" to "90" (dot) 305dpi:"-45" to "45" (dot) 203dpi:"-30" to "30" (dot) [CL6NX] 305dpi:"-45" to "45" (dot) 203dpi:"-30" to "30" (dot)	0	R/W	-	Adjust print position
ADJUSTOFFSET	[CL4NX] 609dpi:"-90" to "90" (dot) 305dpi:"-45" to "45" (dot) 203dpi:"-30" to "30" (dot) [CL6NX] 305dpi:"-45" to "45" (dot) 203dpi:"-30" to "30" (dot)	0	R/W	-	Offset adjust
OPTIONTIME	"0", "5" to "200"(x100ms)	0	R/W	○	Waiting time in tear-off mode for next data <TW>

Name of Setting item	Setting value	Default Vale.	R/W	initial	Contents of Setting item
				CA	
AUTO_MEASURE	"0": Disable "1": Enable	0	R/W	○	Automatic measurement of label length
AUTO_ONLINE	"0": Disable "1": Enable	1	R/W	○	Auto online <AO>, <LD>
FEED	"0": Disable "1": Enable	0	R/W	○	Initial feed
ONLINE_FEED	"0": Disable "1": Enable	0	R/W	○	Online feed <LF>
IGNORE_CRLF	"0": Do not remove CR/LF "1": Remove CR/LF	0	R/W	○	Ignore CR/LF <CL>
BYTECOMMAND	"0": Disable "1": Enable	0	R/W	○	Remove CAN/DLE <1B>
IMLVL_RL	"0" to "127": reflective sensor level(Receiving light)	64	R/W	-	Adjust reflective sensor level(Receiving light)
IMLVL_LE	"0" to "7": reflective sensor level (Light emission)	3	R/W	-	Adjust reflective sensor level(Light emission)
IM_SL	"0.0": Automatic setting "0.1" to "3.3": Manual setting	0.0	R/W	-	Reflective sensor slice level
GAPLVL_RL	"0" to "127": transmissive sensor level(Receiving light)	64	R/W	-	Adjust transmissive sensor level(Receiving light)
GAPLVL_LE	"0" to "7": transmissive sensor level (Light emission)	3	R/W	-	Adjust transmissive sensor level(Light emission)
GAP_SL	"0.0": Automatic setting "0.1" to "3.3": Manual setting	0.0	R/W	-	Transmissive sensor slice level
RB_NEND	"0": Disable "1": Enable	1	R/W	○	Detect ribbon near end
PRIORITY	"0": Prioritize command "1": Prioritize LCD setting	0	R/W	○	Priority setting
PRINT_AREA	"0": Normal "1": Move (3mm to the back of print head)	0	R/W	○	Move printable area * The head base position and the Print area are changed in CL6NX.
ADJUSTDARK	"0" to "99"	50	R/W	-	Adjust darkness
OP_FEED	[CL4NX] 609dpi:"0" to "6120" (dot) 305dpi:"0" to "3060" (dot) 203dpi:"0" to "2040" (dot) [CL6NX] 305dpi:"0" to "3060" (dot) 203dpi:"0" to "2040" (dot)	0	R/W	○	Optional feed volume
PASS_SET	"0": Disable "1": Enable	0	R/W	-	Input password
ALL_QTY	"0": Disable "1": Enable	0	R/W	○	Display total number of labels to print
HEX_DUMP_MODE	"0": Disable "1": Enable	0	R/W	○	HEX DUMP MODE of Enable/Disable
APP_MODE	"00": AUTO "SB": SBPL "SZ": SZPL "SI": SIPL "SD": SDPL "ST": STCL	00	R	-	Application mode
APP_MODE_AUTO	"00": AUTO "SB": SBPL "SZ": SZPL "SI": SIPL "SD": SDPL "ST": STCL	00	R	-	Application mode of AUTO mode
CALENDAR_CHECK	"0": Disable "1": Enable	1	R/W	○	Calendar check
REPRINT	"0": Disable "1": Enable	0	R/W	○	Reprint
INSTALL_SECURITY	"0" : Disable "1" : USB "2" : Always	0	R/W	-	Install Security Password control for pkg install

Name of Setting item	Setting value	Default Vale.	R/W	initial	Contents of Setting item
				CA	
PRINTEND_POSITION	[CL4NX] 609dpi:"0" to "9600"(dot) 305dpi:"0" to "18000"(dot) 203dpi:"0" to "20000"(dot) [CL6NX] 305dpi:"0" to "18000"(dot) 203dpi:"0" to "20000"(dot)	0	R/W	○	Print End Position
SENSOR_CONTINUOUS	"0" : Disable sensor "1" : GAP "2" : I-MARK	1	R/W	○	Sensor type (Continuous)
SENSOR_TEAROFF	"1" : GAP "2" : I-MARK	1	R/W	○	Sensor type (Tear-off)
SENSOR_PEELE	"1" : GAP "2" : I-MARK	1	R/W	○	Sensor type (Dispenser)
SENSOR_CUTTER	"0" : Disable sensor "1" : GAP "2" : I-MARK	1	R/W	○	Sensor type (cutter)
SENSOR_LINERLESS	"0" : Disable sensor "2" : I-MARK	0	R/W	○	Sensor type (Linerless)
SENSOR_CUTPRINT	"1" : GAP "2" : I-MARK	1	R/W	○	Sensor type (Cut while printing)
AC_POWERON	"0" : Disable "1" : Enable	0	R/W	-	AC Power On
UNIT	"0" : dot "1" : inch "2" : mm	0	R/W	○	Unit
BV_MODE	"0" : Disabled "1" : Readable "2" : Comparison	0	R/W	○	Barcode check mode
BV_START_POSITION	203dpi : "10"- "20000" dot 305dpi : "15"- "18000" dot 609dpi : "30"- "9600" dot	203dpi : 72 305dpi : 108 609dpi : 216	R/W	○	Barcode check start position
BV_VOID_PRINT	"0" : Disabled "1" : Enabled	0	R/W	○	Barcode printing VOID
BV_RETRY_COUNT	"0"- "5" Count	0	R/W	○	Barcode check the number of retries
BV_HOST_NOTIFICATION	"0" : Disabled "1" : Enabled	0	R/W	○	Barcode check result host notification

[COUNT] section

Name of Setting item	Setting value	Default Value	R/W	initial	Contents of Setting item
				CB	
PRTCLN	"0": Disable "1": Enable	0	R/W	○	Notification for printer cleanup
PRTCLN_ITV_COUNT	"10" to "1000"(m)	400	R/W	○	Distance to display notification for printer cleanup
PRTCLN_COUNT	"XXXX" *Unit: 1 / 24 mm	-	R	-	Cleaning distance
HDCHG	"0": Disable "1": Enable	0	R/W	○	Notification for replacing print head
HDCHG_ITV_COUNT	"10" to "100"(km)	100	R/W	○	Distance to display notification for replacing print head
HDCHG_COUNT	"XXX" *Unit: 1 / 24 mm	-	R	-	Print distance of a print head
CUTUNT	"0": Disable "1": Enable	0	R/W	○	Notification for replacing cutter unit
CUTUNT_ITV_COUNT	"10" to "1000" (K cuts)	1000	R/W	○	Distance to display notification for replacing cutter unit
CUTUNT_COUNT	"XX"	-	R	-	Cut count
ROLLER	"0": Disable "1": Enable	0	R/W	○	Notification for replacing platen roller
ROLLER_ITV_COUNT	"10" to "100"(km)	100	R/W	○	Distance to display notification for replacing platen roller
ROLLER_COUNT	"XXX" *Unit: 1 / 24 mm	-	R	-	Distance of the platen roller

[IEEE1284] section

Name of Setting item	Setting value	Default Value	R/W	initial	Contents of Setting item
				II	
PROTOCOL	"0": Status4 MULTI "2": Status5 "3": None	0	R/W	○	Communication protocol (for SBPL)
STATUS5_BCC	"0": Disable "1": Enable	0	R/W	○	BCC check <CR>

[RS-232C] section

Name of Setting item	Setting value	Default Value	R/W	initial	Contents of Setting item
				IR	
BOURATE	"0": 2400bps "1": 4800bps "2": 9600bps "3": 19200bps "4": 38400bps "5": 57600bps "6": 115200bps	6	R/W	○	Baud rate
DATABIT	"0": 8bit "1": 7bit	0	R/W	○	Data bit
PARITYBIT	"0": None "1": Odd number "2": Even number	0	R/W	○	Parity bit
STOPBIT	"0": 1bit "1": 2bit	0	R/W	○	Stop bit
CONTROL	"1": READY/BUSY MULTI "3": XON/XOFF MULTI "4": Status4 "5": Status 3 "6": Status 5 "7": None	4	R/W	○	Communication protocol (for SBPL)
STATUS5_BCC	"0": Disable "1": Enable	0	R/W	○	BCC check <CR>

[LAN] section

Name of Setting item	Setting value	Default Value	R/W	initial	Contents of Setting item
				IL	
DHCPv4	"0": Disable "1": Enable	1	R/W	-	DHCPv4 setting W:LAN/WLAN both R:Active Interface
IPv4_ADDRESS	AAA.BBB.CCC.DDD Allow "0" to "255" for A - D	0.0.0.0	R/W	-	Ipv4 Address W:LAN/WLAN both R:Active Interface
IPv4_SUBNET MASK	AAA.BBB.CCC.DDD Allow "0" to "255" for A - D	255.255.255.0	R/W	-	IPv4 Subnet mask W:LAN/WLAN both R:Active Interface
IPv4_DEFGATE WAY	AAA.BBB.CCC.DDD Allow "0" to "255" for A - D	0.0.0.0	R/W	-	IPv4 Default gateway W:LAN/WLAN both R:Active Interface
IPv4_DNSPrimary IPAddress	AAA.BBB.CCC.DDD Allow "0" to "255" for A - D	0.0.0.0	R/W	-	IPv4 DNS primary address W:LAN/WLAN both R:Active Interface
IPv4_DNSSecondaryIPAddress	AAA.BBB.CCC.DDD Allow "0" to "255" for A - D	0.0.0.0	R/W	-	IPv4 DNS secondary address W:LAN/WLAN both R:Active Interface
IPv6_ADDSET	"0": AUTO "1": DHCP "2": Manual Setting "3": Disable	3	R/W	-	IPv6 address setting W:LAN/WLAN both R:Active Interface
IPv6_ADDRESS	AAAA:BBBB:CCCC:DDDD: EEEE:FFFF:GGGG:HHHH Specified in the ASCII of 128bit A to H is "0" to "FFF" A to H is Omissible.	0:0:0:0:0:0:0	R/W	-	IPv6 address W:LAN/WLAN both R:Active Interface
IPv6_ROUTER	AAAA:BBBB:CCCC:DDDD: EEEE:FFFF:GGGG:HHHH Specified in the ASCII of 128bit A to H is "0" to "FFF" A to H is Omissible.	0:0:0:0:0:0:0	R/W	-	Ipv6 Default Router W:LAN/WLAN both R:Active Interface
IPv6_PREFIX	1 to 128	64	R/W	-	Ipv6 Subnet prefix W:LAN/WLAN both R:Active Interface
IPv6_DNSPrimary IPAddress	AAAA:BBBB:CCCC:DDDD: EEEE:FFFF:GGGG:HHHH Specified in the ASCII of 128bit A to H is "0" to "FFF" A to H is Omissible.	0:0:0:0:0:0:0	R/W	-	IPv6 DNS primary address W:LAN/WLAN both R:Active Interface
DHCPv4_LAN	"0": Disable "1": Enable	1	R/W	○	DHCPv4 setting
IPv4_ADDRESS_LAN	AAA.BBB.CCC.DDD Allow "0" to "255" for A - D	0.0.0.0	R/W	○	Ipv4 Address
IPv4_SUBNETMASK_LAN	AAA.BBB.CCC.DDD Allow "0" to "255" for A - D	255.255.255.0	R/W	○	IPv4 Subnet mask
IPv4_DEFGATEWAY_LAN	AAA.BBB.CCC.DDD Allow "0" to "255" for A - D	0.0.0.0	R/W	○	IPv4 Default gateway
IPv4_DNSPrimaryIPAddress_LAN	AAA.BBB.CCC.DDD Allow "0" to "255" for A - D	0.0.0.0	R/W	○	IPv4 DNS primary address
IPv4_DNSSecondaryIPAddress_LAN	AAA.BBB.CCC.DDD Allow "0" to "255" for A - D	0.0.0.0	R/W	○	IPv4 DNS secondary address
IPv6_ADDSET_LAN	"0": AUTO "1": DHCP "2": Manual Setting "3": Disable	3	R/W	○	IPv6 address setting
IPv6_ADDRESS_LAN	AAAA:BBBB:CCCC:DDDD: EEEE:FFFF:GGGG:HHHH Specified in the ASCII of 128bit A to H is "0" to "FFF" A to H is Omissible.	0:0:0:0:0:0:0	R/W	○	IPv6 address

Name of Setting item	Setting value	Default Value	R/W	initial	Contents of Setting item
				IL	
IPv6_ROUTER_LAN	AAAA:BBBB:CCCC:DDDD:EEEE:FFFF:GGGG:HHHH Specified in the ASCII of 128bit A to H is "0" to "FFFF" A to H is Omissible.	0:0:0:0:0:0:0	R/W	○	Ipv6 Default Router
IPv6_PREFIX_LAN	1 to 128	64	R/W	○	Ipv6 Subnet prefix
IPv6_DNSPrimary_PAddress_LAN	AAAA:BBBB:CCCC:DDDD:EEEE:FFFF:GGGG:HHHH Specified in the ASCII of 128bit A to H is "0" to "FFFF" A to H is Omissible.	0:0:0:0:0:0:0	R/W	○	IPv6 DNS primary address
ARP_Announcement.Additional	"0" : Disable "1" : Enable	1	R/W	○	ARP Announcement Additional
ARP_Announcement.Periodic	"0"~"600"(sec)	0	R/W	○	ARP Announcement Periodic
KEEPALIVETIME	"30" to "300"(seconds)	180	R/W	○	Keep alive time
KEEPALIVE_COUNT	"1" to "99"(times)	17	R/W	○	Keep alive count
SOCKET_CANCEL	"0": Normal mode "1": Compatible mode	0	R/W	○	Socket compatibility
PROTOCOL	"0": Status 4 (Periodic) "1": Status 4 (ENQ) "2": Status 3 "3": Status 5 "4": None	1	R/W	○	Communication protocol (For SBPL)
LEGACY_MODE	"0": Disable "1": Enable	0	R/W	○	Legacy Status setting
MULTIPLE_CONNECTIONS	"0": Disable "1": Enable	0	R/W	○	Multiple Connections
STATUS5_BCC	"0": Disable "1": Enable	0	R/W	○	BCC check <CR>
POR1T	"1" to "65535"	1024	R/W	○	Port 1
POR1T2	"1" to "65535"	1025	R/W	○	Port 2 The number is set in priority order of Port 3>Port 2>Port1
POR1T3	"1" to "65535"	9100	R/W	○	Port 3 The number is set in priority order of Port 3>Port 2>Port1
MACADDRESS	"AA:BB:CC:DD:EE:FF"	-	R	-	MAC address
SNTP_ENABLED	"0": Disable "1": Enable	0	R/W	○	SNTP function
NTP_IPv4_ADD	AAA.BBB.CCC.DDD Allow "0" to "255" for A - D	0.0.0.0	R/W	○	NTP IPv4 server address
SNTP_ERROR	"0": Disable "1": Enable	0	R/W	○	SNTP error notification
SNMP_SYSCONTACT	String of 0 to 255 digits	NULL	R/W	○	Contact Information
SNMP_SYSNAME	String of 0 to 255 digits	NULL	R/W	○	Equipment name
SNMP_SYSLOCATION	String of 0 to 255 digits	NULL	R/W	○	Installation location
SNMP	"0": Disable "1": Enable	1	R/W	○	SNMP settings
SNMP_R_VERS1ON	"0" : 1 2c 3 "1" : 1 2c "2" : 3 "3" : Disable	0	R/W	○	SNMP Version
SNMP_R_COMMUNITY_NAME	Max 32 digit character *Encrypted data	public (empty string to disable)	R/W	○	Read-only community name
SNMP_R_USER_NAME	Max 32 digit character *Encrypted data	rouser (empty string to disable)	R/W	○	Read-only user name

Name of Setting item	Setting value	Default Value	R/W	initial	Contents of Setting item
				IL	
SNMP_R_SECURITY	"0":None "1":Authentication "2":Privacy	none	R/W	○	Read-only security
SNMP_R_AUTH PROTCOL	"0":MD5 "1":SHA	0	R/W	○	Read-only Authentication protocol
SNMP_R_AUTH PASS	String of 8 to 32 digits *Encrypted data	mypassword	R/W	○	Read-only Authentication password
SNMP_R_PRIV PROTCOL	"0":DES "1":AES	0	R/W	○	Read-only Encryption protocol
SNMP_R_PRIV PASS	String of 8 to 32 digits *Encrypted data	mypassword	R/W	○	Read-onlyEncryption password
SNMP_RW_VERSSION	"0" : 1 2c 3 "1" : 1 2c "2" : 3 "3" : Disable	3	R/W	○	SNMP Version
SNMP_RW_COMMUNITY_NAME	Max 32 digit character *Encrypted data	private (empty string to disable)	R/W	○	Read Write community name
SNMP_RW_USER_NAME	Max 32 digit character *Encrypted data	rwuser (empty string to disable)	R/W	○	Read Write user name
SNMP_RW_SEURITY	"0":None "1":Authentication "2":Privacy	none	R/W	○	Read Write security
SNMP_RW_AUTHPROTCOL	"0":MD5 "1":SHA	0	R/W	○	Read WriteAuthentication protocol
SNMP_RW_AUTHPASS	String of 8 to 32 digits *Encrypted data	mypassword	R/W	○	Read WriteAuthentication password
SNMP_RW_PRI_VPROTOCOL	"0":DES "1":AES	DES	R/W	○	Read Write Encryption protocol
SNMP_RW_PRI_VPASS	String of 8 to 32 digits *Encrypted data	mypassword	R/W	○	Read Write Encryption password
SNMP_TRAP	"0": Disable "1": Enable	0	R/W	○	Trap
SNMP_TRAP_VERSSION	"0": SNMPv1 "1": SNMPv2c "2": SNMPv3	0	R/W	○	Trap version
SNMP_TRAP_DESTINATIONS	"1": Destination1 "2": Destination2 "3": Destination3	1	R/W	○	Trap Destinations
SNMP_TRAP_IPVERSION	"4":IPv4 "6":IPv6	4	R/W	○	Trap IP Version
SNMP_TRAP_DESTINATION1v4	AAA.BBB.CCC.DDD Allow "0" to "255" for A - D	0.0.0.0	R/W	○	IPv4 Trap Destination1
SNMP_TRAP_DESTINATION1v6	AAAA:BBBB:CCCC:DDDD: EEEE:FFFF:GGGG:HHHH Specified in the ASCII of 128bit A to H is "0" to "FFFF" A to H is Omissible.	0:0:0:0:0:0:0	R/W	○	IPv6 Trap Destination1
SNMP_TRAP_DESTINATION2v4	AAA.BBB.CCC.DDD Allow "0" to "255" for A - D	0.0.0.0	R/W	○	IPv4 Trap Destination2
SNMP_TRAP_DESTINATION2v6	AAAA:BBBB:CCCC:DDDD: EEEE:FFFF:GGGG:HHHH Specified in the ASCII of 128bit A to H is "0" to "FFFF" A to H is Omissible.	0:0:0:0:0:0:0	R/W	○	IPv6 Trap Destination2
SNMP_TRAP_DESTINATION3v4	AAA.BBB.CCC.DDD A to D [≠"0" to "255" Allow "0" to "255" for A - D	0.0.0.0	R/W	○	IPv4 Trap Destination3
SNMP_TRAP_DESTINATION3v6	AAAA:BBBB:CCCC:DDDD: EEEE:FFFF:GGGG:HHHH Specified in the ASCII of 128bit A to H is "0" to "FFFF" A to H is Omissible.	0:0:0:0:0:0:0	R/W	○	IPv6 Trap Destination3
SNMP_TRAP_COMMUNITY	Max 32 digit character * Encrypted data	trapcom	R/W	○	Trap community name
SNMP_TRAP_USER	Max 32 digit character *Encrypted data	trapuser	R/W	○	Trapuser name

Name of Setting item	Setting value	Default Value	R/W	initial	Contents of Setting item
				IL	
SNMP_TRAP_ENGINED	Even number 10 to 64 digits	Number generated from Unique Code	R/W	○	TrapEngine ID
SNMP_TRAP_SECURITY	"0":None "1":Authentication "2":Privacy	none	R/W	○	Trap Security
SNMP_TRAP_AUTHPROTOCOL	"0":MD5 "1":SHA	0	R/W	○	TrapAuthentication protocol
SNMP_TRAP_AUPTHPASS	String of 8 to 32 digits *Encrypted data	mypassword	R/W	○	TrapAuthentication password
SNMP_TRAP_PRIVPROTCOL	"0":DES "1":AES	DES	R/W	○	Trap Encryption protocol
SNMP_TRAP_PRIVPASS	String of 8 to 32 digits *Encrypted data	mypassword	R/W	○	Trap Encryption password
DNSLOOKUP	"0": Disable "1": Enable	1	R/W	○	DNS Lookup
LPD	"0": Disable "1": Enable	1	R/W	○	LPD
FTP	"0": Disable "1": Enable	0	R/W	○	FTP
FTP_TIMEOUT	"10"~"3600" sec	300	R/W	○	FTP Timeout
SELECT_NETWORK	"0" : Auto "1" : LAN "2" : WLAN	0	R/W	○	LAN/WLAN Switching Please reboot in order to make a setup reflect.
ACTIVE_NETWORK	"1" : LAN "2" : WLAN	-	R	-	LAN/WLAN Switching (Auto)

[USB] section

Name of Setting item	Setting value	Default Value	R/W	initial	Contents of Setting item
				IU	
PROTOCOL	"0": Status4 "1": Status5 "2": None	0	R/W	○	Communication protocol (for SBPL)
STATUS5_BCC	"0": Disable "1": Enable	0	R/W	○	BCC check <CR>

[WLAN] section

Name of Setting item	Setting value	Default Value	R/W	initial	Contents of Setting item
				IW	
DHCPv4_WLAN	"0": Disable "1": Enable	1	R/W	○	DHCPv4 setting
IPv4_ADDRESS_WLAN	AAA.BBB.CCC.DDD Allow "0" to "255" for A - D	0.0.0.0	R/W	○	Ipv4 Address
IPv4_SUBNETMASK_WLAN	AAA.BBB.CCC.DDD Allow "0" to "255" for A - D	255.255.255.0	R/W	○	IPv4 Subnet mask
IPv4_DEF_GATEWAY_WLAN	AAA.BBB.CCC.DDD Allow "0" to "255" for A - D	0.0.0.0	R/W	○	IPv4 Default gateway
IPv4_DNSPrimaryIPAddress_WLAN	AAA.BBB.CCC.DDD Allow "0" to "255" for A - D	0.0.0.0	R/W	○	IPv4 DNS primary address
IPv4_DNSSecondaryIPAddress_WLAN	AAA.BBB.CCC.DDD Allow "0" to "255" for A - D	0.0.0.0	R/W	○	IPv4 DNS secondary address
IPv6_ADDSET_WLAN	"0": AUTO "1": DHCP "2": Manual Setting "3": Disable	3	R/W	○	IPv6 address setting
IPv6_ADDRESS_WLAN	AAAA:BBBB:CCCC:DDDD: EEEE:FFFF:GGGG:HHHH Specified in the ASCII of 128bit A to H is "0" to "FFFF" A to H is Omissible.	0:0:0:0:0:0:0	R/W	○	IPv6 address
IPv6_ROUTER_WLAN	AAAA:BBBB:CCCC:DDDD: EEEE:FFFF:GGGG:HHHH Specified in the ASCII of 128bit A to H is "0" to "FFFF" A to H is Omissible.	0:0:0:0:0:0:0	R/W	○	Ipv6 Default Router
IPv6_PREFIX_WLAN	1 to 128	64	R/W	○	Ipv6 Subnet prefix
IPv6_DNSPrimaryIPAddress_WLAN	AAAA:BBBB:CCCC:DDDD: EEEE:FFFF:GGGG:HHHH Specified in the ASCII of 128bit A to H is "0" to "FFFF" A to H is Omissible.	0:0:0:0:0:0:0	R/W	○	IPv6 DNS primary address
WLANMODE	"0": Infrastructure mode "1": Adhoc mode	1	R/W	○	Select WLAN Mode
ESSID	1 to 32 digit long character	SATO_PRINT_ER	R/W	○	SSID
HIDEESSID	"0":Disable "1":Enable	1	R/W	○	Hidden SSID
CHANNEL	"1" to "11" "1" to "13" *The range follows Region.	6	R/W	○	Channel number
WLANNETWORK_SECINF	"0":None "1":WEP "2":WPA+WPA2 "3":WPA2 "4":Dynamic WEP	0	R/W	○	Infrastructure mode Network security
WLANNETWORK_SECAD	"0":None "1":WEP	0	R/W	○	Adhoc mode Network security
WEPAUTH	"0":Open System "1":Shared Key	0	R/W	○	WEP key
WEPKEY1	5 or 13 digit character 10 or 26 digit hexadecimal *Encrypted data	String of empty	W	○	Wep key 1
WEPKEY2	5 or 13 digit character 10 or 26 digit hexadecimal *Encrypted data	String of empty	W	○	Wep key 2
WEPKEY3	5 or 13 digit character 10 or 26 digit hexadecimal *Encrypted data	String of empty	W	○	Wep key 3

Name of Setting item	Setting value	Default Value	R/W	initial	Contents of Setting item
				IW	
WEPKEY4	5 or 13 digit character 10 or 26 digit hexadecimal *Encrypted data	String of empty	W	○	Wep key 4
WEPKEYINDEX	"1" to "4"	1	R/W	○	Wep key index
WPAAUTH	"0":Personal (PSK), "1":Enterprise (802.1x) "2":CCKM	0	R/W	○	WPA authentication
PSK	8-63 ASCII or 64 HEX digits *Encrypted data	String of empty	W	○	PSK *WPA Auth is PSK
EAPMODE	"0":FAST "1":LEAP "2":PEAP "3":TLS "4":TTLS	0	R/W	○	EAP Mode *WPA Auth is not PSK
INNER_FAST	"0":MSCHAPv2 "1":GTC "2":TLS	"0":MSCHAPv2	R/W	○	Inner Method if EAP Mode=FAST
INNER_PEAP	"0":MSCHAPv2 "1":GTC "2":MD5 "3":OTP "4":TLS	"0":MSCHAPv2	R/W	○	Inner Method if EAP Mode=PEAP
INNER_TTLS	"0":MSCHAPv2 "1":MSCHAP "2":CHAP "3":PAP "4":EAP-GTC "5":EAP-MD5 "6":EAP-MSCHAPv2 "7":EAP-OTP "8":EAP-TLS	"0":MSCHAPv2	R/W	○	Inner Method if EAP Mode=TTLS
EAP_USERNAME	0-63 digit long characters	NULL	R/W	○	EAP authentication user name
EAP_PASSWORD	0-32 digit long characters *Encrypted data	String of empty	W	○	EAP authentication password
EAP_ANON	0-63 digit long characters	NULL	R/W	○	Anon. Outer ID If EAP Mode=FASE,PEAP,TTLS
EAP_VERIFY	"0":Disable "1":Enable	1	R/W	○	Verify Server Cert. Not for LEAP
EAP_PRIVATEKEY	0-64 digit long characters *Encrypted data	String of empty	W	○	Private Key P/W
EAP_AUTO_PAC	"0":Disable "1":Enable	0	R/W	○	PAC Auto Provisioning If EAP Mode=FAST
EAP_PAC_PASS	0-64bytes * Encrypted data	String of empty	W	○	PAC Password If EAP=FAST & Auto prov.=off
SignalLevel1	-85 dBm	-	R	-	Threshold for electrical field strength 1
SignalLevel2	-74 dBm	-	R	-	Threshold for electrical field strength 2
SignalLevel3	-64 dBm	-	R	-	Threshold for electrical field strength 3
FWversion	X.X.X.	-	R	-	Firmware version for WLAN module
MACADDRESS	"AA:BB:CC:DD:EE:FF"	-	R	-	MAC address
WIFI_DEVICE_NAME	1-32 digit long characters	SATO_PRINT_ER	R/W	○	Wi-Fi Direct Device Name

[BLUETOOTH] section

Name of Setting item	Setting value	Default Value	R/W	initial	Contents of Setting item
				IB	
BLUETOOTH	"0": Disable "1": Enable	1	R/W	○	Bluetooth
PROTOCOL	"0": status3 "1": status4 "2": None	1	R/W	○	Communication protocol (for SBPL)
BLUELEVEL	"0": No authentication "1": Auth. level 2-1 "2": Auth. level 2-2 "3": Auth. level 3 "4": Auth. level 4	0	R/W	○	Authentication level
PINCODE	0-16 digit characters (except "") *Encrypted data	0000	R/W	○	PIN code
DEVICENAME	0-53 digit characters	SATO PRINTER — xxxxxxxxx xxx	R/W	○	Device name
ISI	"0", "12" to "1000"(hexadecimal)	800	R/W	○	ISI Value will be set to Bluetooth module after deducting 1 from the value when odd number is set with ISI
ISW	"0", "11" to "1000"(hexadecimal)	12	R/W	○	ISW Set ISI≥ISW
PSI	"12" to "1000"(hexadecimal)	800	R/W	○	PSI value will be set to Bluetooth module after deducting 1 from the value when odd number is set with PSI
PSW	"11" to "1000"(hexadecimal)	12	R/W	○	PSW Set ISI≥ISW
BLUEADDRESS	"aabbcccddeeff"	-	R	-	BD address
BLUEVERSION	"spp3_vX.YY"	-	R	-	Bluetooth firmware version
CRC	"0": Disabled "1": Enabled	0	R/W	○	CRC mode
PAIRING1	"0": Do not remove "1": Remove	0	W	-	Remove paring information1 or not
PAIRING2	"0": Do not remove "1": Remove	0	W	-	Remove paring information2 or not
PAIRING3	"0": Do not remove "1": Remove	0	W	-	Remove paring information3 or not
PAIRING4	"0": Do not remove "1": Remove	0	W	-	Remove paring information4 or not
PAIRING5	"0": Do not remove "1": Remove	0	W	-	Remove paring information5 or not
PAIRING6	"0": Do not remove "1": Remove	0	W	-	Remove paring information6 or not
PAIRING7	"0": Do not remove "1": Remove	0	W	-	Remove paring information7 or not
PAIRING8	"0": Do not remove "1": Remove	0	W	-	Remove paring information8 or not
PAIRING9	"0": Do not remove "1": Remove	0	W	-	Remove paring information9 or not
PAIRING10	"0": Do not remove "1": Remove	0	W	-	Remove paring information10 or not
SPP_TIME	"0" to "10" (Unit:seconds)	0	R/W	○	Time to timeout for disconnection (SPP layer)
LMP_TIME	"0" to "999" (Unit:0.1 seconds)	100	R/W	○	Time to timeout for disconnection (LMP layer)
PAIRING_INFO1	"aabbcccddeeff" (BD address only)	-	R	-	Paring information 1
PAIRING_INFO2	"aabbcccddeeff" (BD address only)	-	R	-	Paring information 2
PAIRING_INFO3	"aabbcccddeeff" (BD address only)	-	R	-	Paring information 3
PAIRING_INFO4	"aabbcccddeeff" (BD address only)	-	R	-	Paring information 4
PAIRING_INFO5	"aabbcccddeeff" (BD address only)	-	R	-	Paring information 5
PAIRING_INFO6	"aabbcccddeeff" (BD address only)	-	R	-	Paring information 6

Name of Setting item	Setting value	Default Value	R/W	initial	Contents of Setting item
				IB	
PAIRING_INFO7	"aabbccddeeff" (BD address only)	-	R	-	Paring information 7
PAIRING_INFO8	"aabbccddeeff" (BD address only)	-	R	-	Paring information 8
PAIRING_INFO9	"aabbccddeeff" (BD address only)	-	R	-	Paring information 9
PAIRING_INFO10	"aabbccddeeff" (BD address only)	-	R	-	Paring information 10

[EXT] section

Name of Setting item	Setting value	Default Value	R/W	initial	Contents of Setting item
				IE	
EXTSIG	"0": Disable "1": Enable	0	R/W	○	External signal
EXTMODE	"0": TYPE1 "1": TYPE2 "2": TYPE3 "3": TYPE4	3	R/W	○	External signal switch
EXTRETRY	"0": Disable "1": Enable	0	R/W	○	Signal for reprint
EXTPRTSTAT	"2": 5 pins "4": 7 pins	2	R/W	○	Start print signal
EXTREISUU	"2": 5 pins "4": 7 pins	4	R/W	○	Reprint signal
EXTPAPEREND	"0": 1 pin "2": 3 pins "4": 4 pins "16": 6 pins "64": 9 pins "32": 10 pins "0": Do not specify	8	R/W	○	Paper end signal
EXTRBNEND	"8": 1 pin "2": 3 pins "4": 4 pins "16": 6 pins "64": 9 pins "32": 10 pins "0": Do not specify	2	R/W	○	Ribbon end signal
EXTMCNERR	"8": 1 pin "2": 3 pins "4": 4 pins "16": 6 pins "64": 9 pins "32": 10 pins "0": Do not specify	4	R/W	○	Machine error signal
EXTPRNCOMP	"8": 1 pin "2": 3 pins "4": 4 pins "16": 6 pins "64": 9 pins "32": 10 pins "0": Do not specify	16	R/W	○	Print complete signal
EXTOFFLINE	"8": 1 pin "2": 3 pins "4": 4 pins "16": 6 pins "64": 9 pins "32": 10 pins "0": Do not specify	64	R/W	○	Offline signal
EXTRBNNEAR	"8": 1 pin "2": 3 pins "4": 4 pins "16": 6 pins "64": 9 pins "32": 10 pins "0": Do not specify	32	R/W	○	Ribbon near end signal
EXTRDISPCOMP	"8": 1 pin "2": 3 pins "4": 4 pins "16": 6 pins "64": 9 pins "32": 10 pins "0": Do not specify	0	R/W	○	Dispenser completion signal
EXT_9PIN	"0": MODE1 (With or not remaining items to print) "1": MODE2 (Online / offline status)	0	R/W	○	Output mode of 9-pin external signal

[RFID] section

Name of Setting item	Setting value	Default Value	R/W	initial	Contents of Setting item
				IF	
RFID_LIFE_COUNT_SUCCESS	"0" to "999999"	0	R	-	RFID success count of life SOH+RB
RFID_LIFE_COUNT_FAILURE	"0" to "999999"	0	R	-	RFID failure count of life SOH+RB
RFID_LIFE_COUNT_TOTAL	"0" to "999999"	0	R	-	RFID print count of life SOH+RB
RFID_COUNT_SUCCESS	"0" to "999999"	0	R	○	RFID success count SOH+RB
RFID_COUNT_FAILURE	"0" to "999999"	0	R	○	RFID failure count SOH+RB
RFID_COUNT_TOTAL	"0" to "999999"	0	R	○	RFID print count SOH+RB
CLEAR_RFID_COUNT	"0": Disable "1": Enable	0	W	○	RFID counter clear <RA>2,RC:
READER_MODEL	"XXXXXXXXXXXXXXXXXX"	-	R	-	Model of reader
READER_VERSION	"XXXXXXXXXXXXXXXXXX"	-	R	-	Version of reader
RFID_PITCH	"0": STANDARD "1": SMALL	0	R/W	○	RFID antenna pitch
RFID_LABEL_DATA	"0": RETRY "1": RELEASE	0	R/W	○	RFID Retry mode <RA>2,Ed:
MAX_RETRY_LABEL	"0" to "9"	1	R/W	○	RFID Retry print <RA>2,Ec:
MAX_RETRY_COUNT	"0" to "9"	4	R/W	○	RFID Retry count <RA>2,Rt:
RFID_ERROR_SLASH	"0": Disable "1": Enable	1	R/W	○	RFID Error slanted line printing <RA>2,Es:
RFID_TAG_OFFSET	"0" to "240"mm	0	R/W	○	RFID Offset of a tag <RA>2,To:
ANTENNA_POWER(WRITE)	"0" to "240": Unitx0.1dBm	100 (x0.1dBm)	R/W	○	Antenna output(WRITE) <RA>2,Pw:
ANTENNA_POWER(READ)	"0" to "240": Unitx0.1dBm	100 (x0.1dBm)	R/W	○	Antenna output (READ)
RFID_ERROR_OUTPUT	"0": PULSE "1": LEVEL	1	R/W	○	RFID error output type <RA>2,Pm:
LENGTH_OF_PULSE	"0": 100ms "1": 200ms "2": 300ms "3": 400ms "4": 500ms	0	R/W	○	RFID Error pulse time <RA>2,Pl:
MCS_SERIALIZE	"0": Disable "1": Enable	0	R/W	○	MCS Serialization
TAG_CHIP_MAKER	"0": IMPNJP "1": ALIEN "2": NXP	0	R/W	○	Tag chip manufacturers
PRE-ENCODED_TAG	"0": Disable "1": Enable	0	R/W	○	Pre-encoding tag
MCS_PREFIX_DIGIT	"3": 3 "2": 2 "1": 1 "0": None	3	R/W	○	MCS prefix digit
ASSIGN_PREFIX	"0": AUTO "1": MANUAL	0	R/W	○	Prefix insertion setting
INPUT_PREFIX	"0": 000 "1": 001 "2": 010 "3": 011 "4": 100 "5": 101 "6": 110 "7": 111	0	R/W	○	Prefix input data
NON_RFID_WARNING	"0": Disable "1": Enable	0	R/W	○	NON-RFID Warning
LOG_RFID_DATA	"0": Disable "1": Enable	0	R/W	○	RFID data log record
DATA_TO_RECORD	"0": BOTH "1": EPC "2": TID	0	R/W	○	RFID record data type

[SBPL]section

Name of Setting item	Setting value	Default Value	R/W	initial	Contents of Setting item
				SB	
ZEROSLASH	"0": Disable "1": Enable	1	R/W	○	Zero slash <LH>,<LD>
SHOTAI	"1": Gothic "0": Mincho	1	R/W	○	Type face <KG>, <KM>
PROPORTIONAL	"0": Fixed pitch "1": Proportional pitch	1	R/W	○	Proportional pitch <PS>, <PR>
STDCODE	"0": Standard code "1": Non-standard code	0	R/W	○	Protocol code
CMDERR	"0": Disable "1": Enable	0	R/W	○	Command error
STXCODE	"0" to "255"	standard 2(0x02)	non-standard 123(0x7B)	R/W	○ STX <LD>
ETXCODE	"0" to "255"	3(0x03)	125(0x7D)	R/W	○ ETX <LD>
ESCCODE	"0" to "255"	27(0x1B)	94(0x5E)	R/W	○ ESC <LD>
ENQCODE	"0" to "255"	5(0x05)	64(0x40)	R/W	○ ENQ <LD>
CANCODE	"0" to "255"	24(0x18)	33(0x21)	R/W	○ CAN <LD>
NULLCODE	"0" to "255"	0(0x00)	126(0x7E)	R/W	○ NULL <LD>
OFFLINECODE	"0" to "255"	64(0x40)	93(0x5D)	R/W	○ OFFLINE <LD>
EUROCODE	"0" to "255"	213(0xD5)	213(0xD5)	R/W	○ EURO <LD>
KANJI	"0": JIS code "1": SJIS code "2": Unicode(UTF16) "3": GB18030 "4": BIG5 "5": KSC5601	3		R/W	○ Kanji code <KC>
KNJ_MODE	"0": JIS X0208compatible "1": JIS X0208 "2": JIS X0213 "3": GB18030 "4": BIG5 "5": KSC5601	3		R/W	○ Kanji mode
CODE_PAGE	"0": UTF8 "1": CP858 "2": ISO8859-1 "3": ISO8859-2 "4": ISO8859-9 "5": CP737 "6": CP855 "7": CP850 "8": CP852 "9": CP857 "10": CP866 "11": CP1250 "12": CP1251 "13": CP1252 "14": CP1253 "15": CP1254 "16": CP1257 "17": CP869 "18": JIS X0201	1		R/W	○ Code page
Orientation	"0":Portrait "1":Landscape "2":Inv. Portrait "3":Inv. Landspace	0		R/W	○ Orientation
CODE128(C)_Zero_Fill	"0":Disable "1":Enable	0		R/W	○ Compatible Code128
KANJI_COMMAND	"0": Disable "1": Enable	0		R/W	○ Compatibility of Chinese characters command
CALL_FONTLOGO	"0": Disable "1": Enable	0		R/W	○ Character code compatible at Download Font / Log call
M-8400_COMPATTI	"0": Disable "1": Enable	0		R/W	○ Compatibility of M-8400

[SZPL]section

Name of Setting item	Setting value	Default Value	R/W	initial	Contents of Setting item
				SZ	
PITCH_OFFSET	"-120" to "120"(dot)	0	R/W	○	Pitch offset at top of label
SHIFT_OFFSET	609dpi:"-2496" to "2496"(dot) 305dpi:"-1248" to "1248"(dot) 205dpi:"-832" to "832"(dot)	0	R/W	○	Label shift offset
PROTOCOL	"0": None "1": ACK/NAK	0	R/W	○	Protocol
CMD_HEAD	"0" to "255"	94	R/W	○	Command head
CTR_HEAD	"0" to "255"	126	R/W	○	Control head
DELIMITER	"0" to "255"	44	R/W	○	Delimiter
DATE_FORM	"0": Normal "1": MM/DD/YY(24 hours) "2": MM/DD/YY(12 hours) "3": DD/MM/YY(24 hours) "4": DD/MM/YY(12 ours)	0	R/W	○	Date and time format

[SIPL]section

Name of Setting item	Setting value	Default Value	R/W	initial	Contents of Setting item
				SI	
ZEROSLASH	"0": Disable "1": Enable	0	R/W	○	Zero slash
EUROCODE	"0" to "255"	213(0xD5)	R/W	○	EURO
CODE_PAGE	"0":737, "1":850, "2":852, "3":855, "4":857, "5":858, "6":862, "7":864, "8":866, "9":869, "10":874, "11":1250, "12":1251, "13":1252, "14":1253, "15":1254, "16":1255, "17":1256, "18":1257, "19":88591, "20":88592, "21":88599, "22":UTF8	13(1252)	R/W	○	Code page
PROPORTIONAL	"0" : Disable "1" : Enable	0	R/W	○	Proportional
FONTMODE	"0" : Disable "1" : Enable	0	R/W	○	Newfontencoding

[SDPL]section

Name of Setting item	Setting value	Default Value	R/W	initial	Contents of Setting item
				SD	
CONTROL_CODE	"0": Standard code "1": Alternate code 1 "2": Alternate code 2 "3": User code	0	R/W	○	Protocol code
SOHCODE	"0" to "255"	1 (0x01)	R/W	○	SOH
STXCODE	"0" to "255"	2 (0x02)	R/W	○	STX
CRCODE	"0" to "255"	13 (0xD)	R/W	○	CR
CNTCODE	"0" to "255"	94 (0xE)	R/W	○	CNT
LABEL_ROTATION	"0": Disable(R0) "1": Enable(R180)	0	R/W	○	Label Rotation
FORMAT_ATTRIBUTE	"0": XOR "1": Transparent "2": Opaque "3": Inverse	0	R/W	○	Format Attribute
PAUSE_MODE	"0": Disable "1": Enable	0	R/W	○	Pause Mode
SOP_EMULATION	"0": Disable "1": Prodigy Plus - 110 "2": Allegro - 220 "3": Prodigy - 250 "4": Auto	4 (Auto)	R/W	○	SOP Emulation
1BYTE_CODEPAGE	"0": UTF8 "1": 8859-1 "2": 8859-2 "3": 8859-5 "4": 852 "5": 850 "6": 858 "7": 1252	5 (850)	R/W	○	1 Byte Codepage
COMPATIBLE_TTF	"0": Disable "1": Enable	0	R/W	○	Compatibility TTF
UNIT	"0":inch "1":mm	0	R/W	○	SDPL Measure Unit

[STCL]section

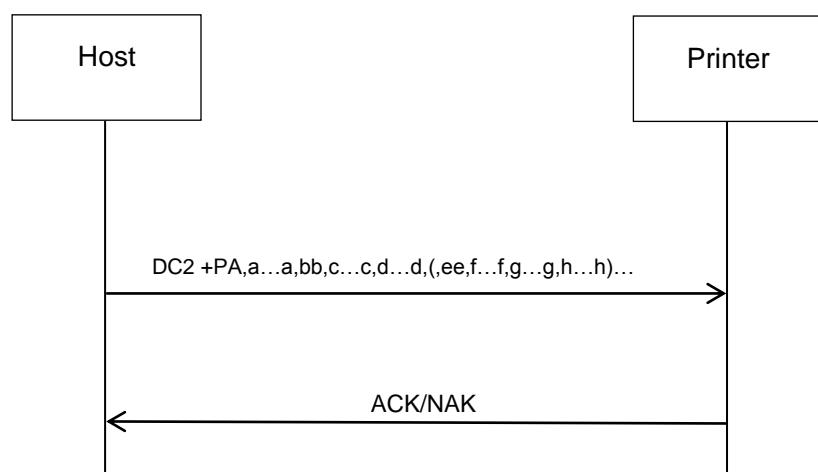
Name of Setting item	Setting value	Default Value	R/W	initial	Contents of Setting item
				ST	
CONTROL_CODE	"0": AUTO "1": ESC LF NUL "2": 7B 7C 7D "3": CUSTOM	0	R/W	○	Control Code
CMD_HEAD1	"0" to "255"	27 (0x1B)	R/W	○	Command Head1
CMD_HEAD2	"0" to "255"	10 (0xA)	R/W	○	Command Head2
CMD_HEAD3	"0" to "255"	0 (0x00)	R/W	○	Command Head3
EUROCODE	"0" to "255"	213(0xD5)	R/W	○	EURO
ZEROSLASH	"0": Disable "1": Enable	0	R/W		Zero slash

[AEP]section

Name of Setting item	Setting value	Default Value	R/W	initial	Contents of Setting item
				AE	
ENABLE	"0": Disable "1": Enable	0	R/W	○	AEP Enable or Disable

[SEPL]section

Name of Setting item	Setting value	Default Value	R/W	initial	Contents of Setting item
				SE	
HOME_HORZ_OFFSET	"0" to "400"(dot)	0	R/W	○	Label home position horizontal offset.
HOME_VERT_OFFSET	609dpi:"0" to "400"(dot) 305dpi:"0" to "400"(dot) 205dpi:"0" to "400"(dot)	0	R/W	○	Label home position vertical offset.
MEMORY_DEVICE	"0": Internal RAM "1": Internal FLASH "2": Front USB "3": Rear USB	1	R/W	○	Memory Device use for storing and recalling fonts, forms and graphics objects.
SIM_300DPI_HOLD	"0": Disable "1": Enable	0	R/W	○	Simulates 300 dpi size and positioning of objects on the 305 dpi printer model.



17.2 Common Commands for All Languages

Printer Setting Information Acquisition

DC2+PB

Command	DC2	PB	Parameter
HEX code	<12> ₁₆	<50> ₁₆ <42> ₁₆	(,aa,(b...b))+ EOT(04h)
Default Value	None		

Valid range and term of command	When turning off the power switch	
	Valid range	
	Printer operation in progress	The command can be received even during the printer operation.
	Error	The command can be received even if an error is occurring.

[Function]

This command is used to acquire the printer information.

[Format]

[DC2]PB(aa,(b...b))[EOT]

[Parameters]

Symbol	Parameter name	Valid range	Note
a	Identifier	CA: Common settings CB: Warning function II: IEEE1284 settings IR: RS-232C settings IL: LAN settings IU: USB settings IW: WLAN settings IB: Bluetooth settings IE: EXT settings IF: RFID settings IN: NFC settings SB: SBPL settings SZ: SZPL settings SI: SIPL settings SD: SDPL settings ST: STCL settings SE: SEPL settings	*When omitted, all items will be returned.
b	Setting Item name	Refer to 17.1 [DC2] + PA command	Acquire up to [EOT]

[Return data format (normal)]

[STX]a...a,bb,c...c,d...d,(ee,f...f,g...g)...[ETX]

[Return data]

Symbol	Parameter name	Valid range
a	Total number of data byte *This is the total number of bytes after parameter b. The delimiting comma between parameters a and b, and the ETX are not included.	Data size from the first identifier until before [ETX]
b(e)	Identifier	CA: Common settings CB: Warning function II: IEEE1284 settings IR: RS-232C settings IL: LAN settings IU: USB settings IW: WLAN settings IB: Bluetooth settings IE: EXT settings IF: RFID settings SB: SBPL settings SZ: SZPL settings SI: SIPL settings SD: SDPL settings ST: STCL settings SA: AEP settings
c(f)	Setting information data size *Number of bytes of the section unit after parameter d. The delimiting comma between sections is not included.	Size of the corresponding setting information data
d(g)	Setting information data *Text format	Refer to "Setup information data" below.

[Setting information data format]

"Setting item name" + ":" + "Setting data" + "Line feed (0DH, 0AH)"
h...h:i...i[CR][LF](j...j:k...k[CR][LF])...

[Setting information data]

Symbol	Parameter name	Valid range
h(j...)	Setting Item name	Refer to the printer status information list
i(k...)	Setting data	Refer to the printer status information list

Data Example)

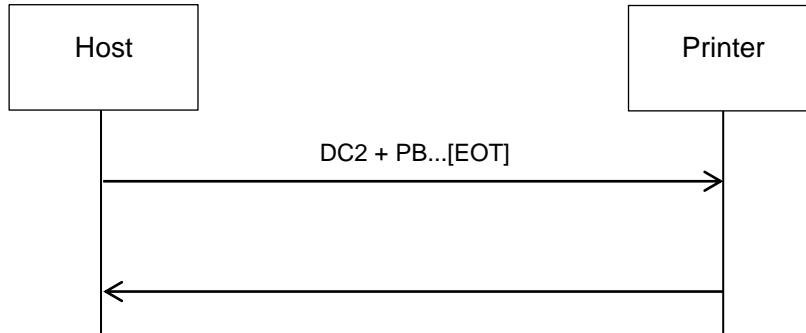
CA,12345,SPEED:4
LEVEL:5
CONCENTRATION:A

[Return data format (when a command error occurs)]

[NAK]<15>₁₆

[Exception processing]

Parameter name	Exception condition	
	A value outside the range is specified	The specified size and received size are different
Identifier	Command error	Invalid receive data
Terminology		Description
Command error		The data received after a command error is determined is not considered as a parameter of this command.



[Note]

1. When identifiers are omitted, all data will be returned.
2. When setting item names are specified, setting information of the item which was set will be returned.

17.3 Common Commands for All Languages

Printer Device Information Acquisition

DC2+PC

Command	DC2	PC	Parameter
HEX code	<12> ₁₆	<50> ₁₆ <43> ₁₆	None
Default value	None		

Valid range and term of command	When turning off the power switch	
	Valid range	
	Printer operation in progress	The command can be received even during the printer operation.
	Error	Commands can be received even if an error is occurring.

[Function]

This command returns the printer device information.

[Format]

DC2 (12H)+ PC

[Return data format (normal)]

[STX]a...a,b...b:c...c[CR][LF](d...d:e...e[CR][LF]) ... [ETX]

Symbol	Parameter name	Valid range
a	Total number of data byte *This is the total number of bytes after parameter b. The delimiting comma between parameters a and b, and the ETX are not included.	Data size from the first device information name up to before [ETX]
b(d)	Device information name *Text format	Refer to the printer device information list
c(e)	Device information data *Text format	Refer to the printer device information list

Data Example)

[STX]12345,MODEL: Model name[CR][LF]FW Ver:1.0.0[CR][LF]...[CR][LF] [ETX]

[Printer device information list]

No	Description	Device information name	Device information data
1	Model name	MODEL	M...M M: Model name
2	Kernel version	KERNEL Ver	R...R R: OS release number
3	Main firmware version	MAIN FW Ver	V...VS V: Version
4	Main firmware Creation date	MAIN FW Date	YYYYMMDD_HHMMSS TTT T: Time zone
5	Printer module Boot firmware Version	MODULE BOOT FW Ver	P...P.boot-V.V.V-S...S P: Platform name V: Version S: Release = Release version Alpha/Beta = Test version xxxuser = Custom version urgent = Urgent version
6	Printer module Boot firmware Creation date	MODULE BOOT FW Date	YY.MM.DD
7	Printer module Boot firmware Check sum	MODULE BOOT FW CHECKSUM	CCCC C: Check sum
8	Printer module Main firmware Version	MODULE MAIN FW Ver	P...P.main-V.V.V-S...S P: Platform name V: Version S: Release = Release version Alpha/Beta = Test version xxxuser = Custom version urgent = Urgent version
9	Printer module Main firmware Creation date	MODULE MAIN FW Date	YY.MM.DD

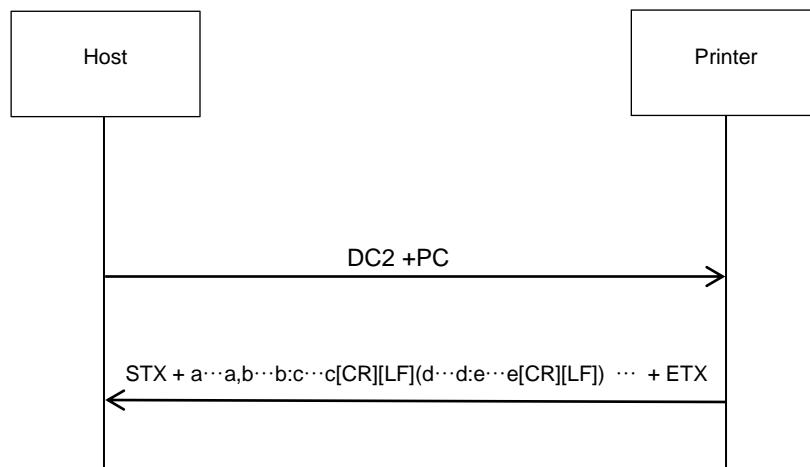
No	Description	Device information name	Device information data
10	PLD version of CONT board	CONT PLD Ver	VV V : Version
11	PLD version and FPGA version of interface board.	INTF PLD/FPGA Ver	V1V1/V2V2 V1 : Version V2 : Version
12	Printer module Main firmware Check sum	MODULE MAIN FW CHECKSUM	CCCC C: Check sum
13	LAN MAC Address	LAN MAC	XX:XX:XX:XX:XX:XX X: Alphanumeric
14	WLAN MAC address	WLAN MAC	XX:XX:XX:XX:XX:XX X: Alphanumeric
15	BD Address	BD	xxxxxxxxxx x: Alphanumeric
16	Head counter 1	Head Count1	Numeric value (unit: mm)
17	Head counter 2	Head Count2	Numeric value (unit: mm)
18	Head counter 3	Head Count3	Numeric value (unit: mm)
19	Life counter	Life Count	Numeric value (unit: mm)
20	Cutter counter	Cut Count	Numeric value (unit: count)
21	Dispenser counter	Disp Count	Numeric value (unit: (unit: 1/24mm))
22	Free space size in user area	MEM_FROM	Numeric value (unit: byte)
23	USB memory available size (Printer front port connection)	MEM_USB1	Numeric value (unit: byte)
24	USB memory available size (Printer rear port connection)	MEM_USB2	Numeric value (unit: byte)
25	SBPL form overlay SLOT1 Number of registered counts, number of registered bytes	SBPL_FOL_SLOT1	XXXX,YYYYYYYYYYYY X: Registration count Y: Number of registered bytes
26	SBPL form overlay SLOT1 Registration number	SBPL_FOL_SLOT1_No	XXX,(XXX,XXX···) X: Registration No., *Repeated as many times as the registration numbers *If the registration count is zero, the value is ignored.
27	SBPL format SLOT1 Number of registered counts, number of registered bytes	SBPL_FMT_SLOT1	XXXX,YYYYYYYYYYYY X: Registration count Y: Number of registered bytes
28	SBPL format SLOT1 Registration number	SBPL_FMT_SLOT1_No	XXX,(XXX,XXX···) X: Registration No., *Repeated as many times as the registration numbers *If the registration count is zero, the value is ignored.
29	SBPL graphic SLOT1 Number of registered counts, number of registered bytes	SBPL_GRA_SLOT1	XXXX,YYYYYYYYYYYY X: Registration count Y: Number of registered bytes
30	SBPL graphic SLOT1 Registration number	SBPL_GRA_SLOT1_No	XXX,(XXX,XXX···) X: Registration No., *Repeated as many times as the registration numbers *If the registration count is zero, the value is ignored.
31	SBPL BMP file SLOT1 Number of registered counts, number of registered bytes	SBPL_BMP_SLOT1	XXXX,YYYYYYYYYYYY X: Registration count Y: Number of registered bytes
32	SBPL BMP file SLOT1 Registration number	SBPL_BMP_SLOT1_No	XXX,(XXX,XXX···) X: Registration No., *Repeated as many times as the registration numbers. *If the registration count is zero, the value is ignored.
33	SBPL PCX file SLOT1 Number of registered counts, number of registered bytes	SBPL_PCX_SLOT1	XXXX,YYYYYYYYYYYY X: Registration count Y: Number of registered bytes
34	SBPL PCX file SLOT1 Registration number	SBPL_PCX_SLOT1_No	XXX,(XXX,XXX···) X: Registration No., *Repeated as many times as the registration numbers. *If the registration count is zero, the value is ignored.
35	SBPL external character SLOT1 Number of registered counts, number of registered bytes	SBPL_EXC_SLOT1	XXXX,YYYYYYYYYYYY X: Registration count Y: Number of registered bytes

No	Description	Device information name	Device information data
36	SBPL external character SLOT1 Registration number	SBPL_EXC_SLOT1_No	XXX,(XXX,XXX···) X: Registration No., *Repeated as many times as the registration numbers. *If the registration count is zero, the value is ignored.
37	SBPL TrueType font SLOT1 Number of registered counts, number of registered bytes	SBPL_TTF_SLOT1	XXXX,YYYYYYYYYYYY X: Registration count Y: Number of registered bytes
38	SBPL TrueType font SLOT1 Registration number	SBPL_TTF_SLOT1_No	XXX,(XXX,XXX···) X: Registration No., *Repeated as many times as the registration numbers. *If the registration count is zero, the value is ignored.
39	SBPL form overlay SLOT2 Number of registered counts, number of registered bytes	SBPL_FOL_SLOT2	XXXX,YYYYYYYYYYYY X: Registration count Y: Number of registered bytes
40	SBPL form overlay SLOT2 Registration number	SBPL_FOL_SLOT2_No	XXX,(XXX,XXX···) X: Registration No., *Repeated as many times as the registration numbers. *If the registration count is zero, the value is ignored.
41	SBPL format SLOT2 Number of registered counts, number of registered bytes	SBPL_FMT_SLOT2	XXXX,YYYYYYYYYYYY X: Registration count Y: Number of registered bytes
42	SBPL format SLOT2 Registration number	SBPL_FMT_SLOT2_No	XXX,(XXX,XXX···) X: Registration No., *Repeated as many times as the registration numbers. *If the registration count is zero, the value is ignored.
43	SBPL graphic SLOT2 Number of registered counts, number of registered bytes	SBPL_GRA_SLOT2	XXXX,YYYYYYYYYYYY X: Registration count Y: Number of registered bytes
44	SBPL graphic SLOT2 Registration number	SBPL_GRA_SLOT2_No	XXX,(XXX,XXX···) X: Registration No., *Repeated as many times as the registration numbers. *If the registration count is zero, the value is ignored.
45	SBPL BMP file SLOT2 Number of registered counts, number of registered bytes	SBPL_BMP_SLOT2	XXXX,YYYYYYYYYYYY X: Registration count Y: Number of registered bytes
46	SBPL BMP file SLOT2 Registration number	SBPL_BMP_SLOT2_No	XXX,(XXX,XXX···) X: Registration No., *Repeated as many times as the registration numbers. *If the registration count is zero, the value is ignored.
47	SBPL PCX file SLOT2 Number of registered counts, number of registered bytes	SBPL_PCX_SLOT2	XXXX,YYYYYYYYYYYY X: Registration count Y: Number of registered bytes
48	SBPL PCX file SLOT2 Registration number	SBPL_PCX_SLOT2_No	XXX,(XXX,XXX···) X: Registration No., *Repeated as many times as the registration numbers. *If the registration count is zero, the value is ignored.
49	SBPL external character SLOT2 Number of registered counts, number of registered bytes	SBPL_EXC_SLOT2	XXXX,YYYYYYYYYYYY X: Registration count Y: Number of registered bytes
50	SBPL external character SLOT2 Registration number	SBPL_EXC_SLOT2_No	XXX,(XXX,XXX···) X: Registration No., *Repeated as many times as the registration numbers. *If the registration count is zero, the value is ignored.
51	SBPL TrueType font SLOT2 Number of registered counts , number of registered bytes	SBPL_TTF_SLOT2	XXXX,YYYYYYYYYYYY X: Registration count Y: Number of registered bytes
52	SBPL TrueType font SLOT2 Registration number	SBPL_TTF_SLOT2_No	XXX,(XXX,XXX···) X: Registration No., *Repeated as many times as the registration numbers.

No	Description	Device information name	Device information data
			*If the registration count is zero, the value is ignored.

[Precautions during use]

1. The printer device information update cycle must be five seconds or longer. When sending this command in continuation, be sure to set an interval of five seconds or more.
2. When a USB memory is used, only the available space of the memory connected first is returned even when a connection is established via the HUB.
3. It takes more than one second to create the return data immediately after the startup in order to obtain the checksum of the module.
4. It takes more time to create the return data when there are a lot of registrations by SBPL command.
(It takes approx. 1.5 seconds to register 10,000 data.)



17.4 Common Commands for All Languages

Each Sensor Information Acquisition

DC2+PD

Command	DC2	PD	Parameter
HEX code	<12> ₁₆	<50> ₁₆ <44> ₁₆	None
Default value	None		

Valid range and term of command	When turning off the power switch	
	Valid range	
	Printer operation in progress	The command can be received even during the printer operation.
	Error	Commands can be received even if an error is occurring.

[Function]

This command is used to acquire the information of each sensor. The sensor information corresponds to the information immediately after the reception of the command.

[Format]

DC2 (12H) + PD

[Return data format (normal)]

[STX]a...a,b...b:c...c,(d...d:e...e) ... [ETX]

Symbol	Parameter name	Valid range
a	Total number of data byte *This is the total number of bytes after parameter b. b. The delimiting comma between parameters a and b, and the ETX are not included.	Data size from the first identifier until before [ETX]
b(d)	Sensor information name *Text format	Refer to the sensor information data list
c(e)	Sensor information data *Text format	Refer to the sensor information data list

[Data Example)

[STX]xx,IM:0.2/SL1.5,GAP:0.9/SL1.0...[ETX]

[Return data format (when a command error occurs)]

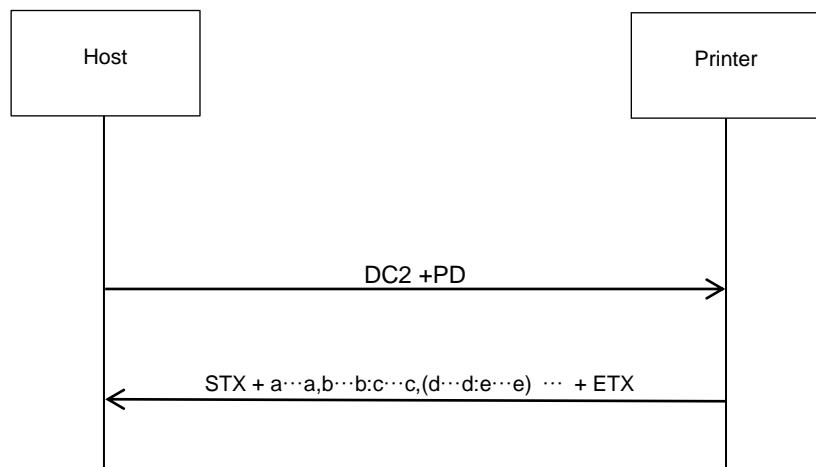
[NAK]<15>₁₆

[Sensor information data list]

No	Sensor information name	Description	Sensor information data
1	IM	I-Mark sensor	X.X/SLY.Y X.X = 0.0 to 3.3 : Sensor level Y.Y = 0.0 to 3.3 : Slice level
2	GAP	Gap sensor	X.X/SLY.Y X.X = 0.0 to 3.3 : Sensor level Y.Y = 0.0 to 3.3 : Slice level
3	HEAD OPEN	Head Open	0: Close, 1: Open
4	CUTTER OPEN	Cutter open	0: Close, 1: Open
5	DISPENSER	Dispenser sensor	0: Without label, 1: With label
6	HEAD TEMP	Head thermistor	-XX to XX: Thermistor temperature
7	RIBBON	Ribbon slit sensor	0: Slit ON, 1: Slit OFF
8	SENSOR HIGH	High value of active sensors	X.X = 0.0 to 3.3 : Sensor level
9	SENSOR LOW	Low value of active sensors	X.X=0.0 to 3.3 : Sensor level

[Notes]

1. When sending this command in continuation, be sure to set a fixed interval (100 msec or more).
2. If the sensor information acquisition processing for each sensor does not finish within 100 msec, a timeout is thought to have occurred, and [NAK] is returned. A timeout may occur during the printer operation.
3. SENSOR HIGH, SENSER LOW is the value of the last label that passed through the sensor. Therefore it may sometimes be different from test printing results (the value is measured with the label before printing).
4. If the sensor type is set to NONE, the SENSOR HIGH and SENSOR LOW values return as 0.0



17.5 Common Commands for All Languages

Printer Status Information Acquisition

DC2+PG

Command	DC2	PG	Parameter
HEX code	<12> ₁₆	<50> ₁₆ <47> ₁₆	None
Default value	None		

Valid range and term of command	When turning off the power switch	
	Valid range	
	Printer operation in progress	The command can be received even during the printer operation.
	Error	Commands can be received even if an error is occurring.

[Function]

This command returns the printer status.

[Format]

DC2 (12H) + PG

[Return data format (normal)]

[STX]a...a,b...bc,d...de,...[ETX] *There is no ", (comma)" before ETX

Symbol	Parameter name	Valid range
a	Total number of data byte *This is the total number of bytes after parameter b. The delimiting comma between parameters a and b, and the ETX are not included.	Data size from the first identifier until before [ETX]
b(d)	Printer status information name *Text format	Refer to the printer status information list
c(e)	Printer status information data *Text format	Refer to the printer status information list

[Data Example)

[STX]32,PS0,RS0,RE0,PE0,EN00,BT0,Q000000[ETX]

[Printer status information data list]

No	Description	Printer status information name	Printer status information data
1	Printer status	PS	0: Standby (waiting for receiving data) 1: Waiting for dispensing 2: Analyzing 3: Printing 4: Offline 5: Error
2	Receive buffer status	RS	0: Buffer available 1: Buffer near full 2: Buffer full
3	Ribbon status *Monitoring can be performed during printing and feeding The correct value cannot be acquired when the operation has stopped	RE	0: Ribbon present 1: Ribbon near end 2: No ribbon 3: Direct thermal model
4	Media status *Monitoring can be performed during printing and feeding The correct value cannot be acquired when the operation has stopped	PE	0: Media present (including during startup) 2: No media

No	Description	Printer status information name	Printer status information data
5	Error No. *1	EN	00:Online *Not an error. Return is performed 01:Offline *Not an error. Return is performed 02: Machine error 03: Memory error 04: Program error 05: Setting information error (FLASH-ROM error) 06: Setting information error (EE-PROM error) 07: Download error 08: Parity error 09: Over run 10: Framing error 11: LAN timeout error 12: Buffer over 13: Head open 14: Paper end 15: Ribbon end 16: Media error 17: Sensor error 18: Printhead error 19: Cover open error 20: Memory/Card type error 21: Memory/Card read/write error 22: Memory/Card full error 23: Memory/Card no battery error 24: Ribbon saver error 25: Cutter error 26: Cutter sensor error 27: Stacker full error 28: Command error 29: Sensor error at Power-On 30: RFID tag error 31: Interface card error 32: Rewinder error 33: Other error 34: RFID control error 35: Head density error 36: Kanji data error 37: Calendar error 38: Item No error 39: BCC error 40: Cutter cover open error 41: Ribbon rewind non-lock error 42: Communication timeout error 43: Lid latch open error 44: No media error at Power-On 45: SD card access error 46: SD card full error 47: Head lift error 48: Head overheat error 49: SNTP time correction error 50: CRC error 51: Cutter motor error 52: WLAN module error 53: Scanner reading error 54: Scanner checking error 55: Scanner connection error 56: BluetoothModuleerror 57: EAP authentication error(EAP failed) 58: EAP authentication error(Time out) 59: Battery error 60: Low Battery error 61: Low Battery error (Charging) 62: Battery not installed error 63: Battery temperature error 64: Battery deterioration error 65: Motor temperature error 66: Inside chassis temperature error 67: Jam error

No	Description	Printer status information name	Printer status information data
			68:S IPL Field full error 69: Power off error when charging 70: WLAN module error 71: Option mismatch error 72: Battery deterioration error (Notice) 73: Battery deterioration error (Warning) 74: Power off error 75: NonRFID Warning Error 76: Barcode reader connection error 77: Barcode reading error 78: Barcode verification error 79: Barcode reading error (Verification start position abnormality)
6	Battery status	BT	0: Normal 1: Battery near end 2: Battery error
7	Remaining number of print	Q	000000 to 999999: 6-digit remaining number of print

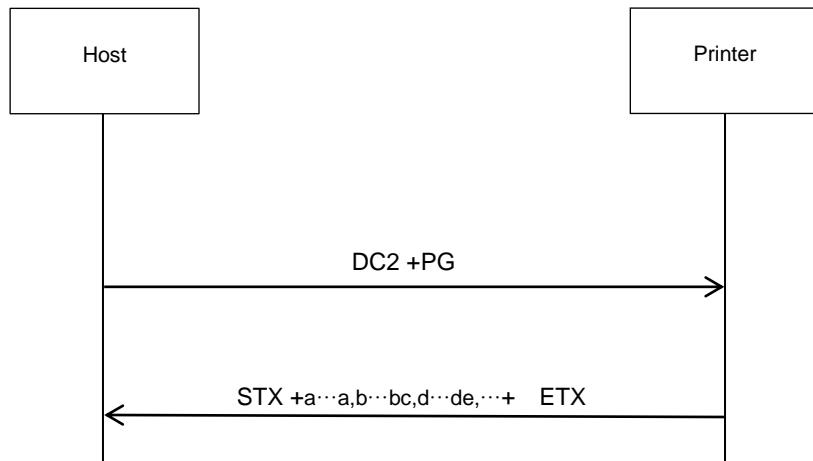
*1) Described error numbers contain errors which will never occur on this printer.

[Return data format (when a command error occurs)]

[NAK]<15>₁₆

[Supplemental explanation]

1. In the case of power supply, the battery status is always returned as 0: Normal.
2. The media status is returned as "Media present" unless paper end has reached during printing.
3. The correct value will be returned for receive buffer, ribbon end, media status, and battery when the error is updated.



17.6 Common Commands for All Languages

Cancel Request

DC2+PH

Command	DC2	PH	Parameter
HEX code	<12> ₁₆	<50> ₁₆ <48> ₁₆	None
Default value	None		

Valid range and term of command	When turning off the power switch	
	Valid range	
	Printer operation in progress	The command can be received even during the printer operation.
	Error	Commands can be received even if an error is occurring.

[Function]

This command cancels print jobs and clears the entire contents of receive buffer.

[Format]

[DC2] PH

[Return data format (normal)]

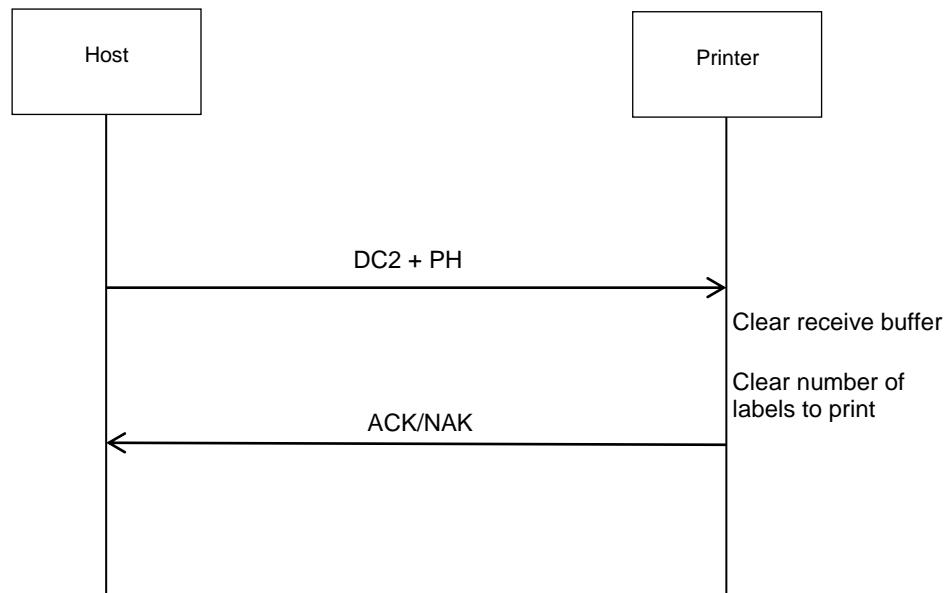
[ACK]<06>₁₆

[Return data format (when a command error occurs)]

[NAK]<15>₁₆

[Supplemental explanation]

1. The response data is returned after the cancel processing ends.
2. After sending the cancel request command, wait for response reception before sending the next data.



17.7 Common Commands for All Languages

Application Change

DC2+PI

Command	DC2	PI	Parameter
HEX code	<12> ₁₆	<50> ₁₆ <49> ₁₆	,aa
Default Value	None		

Valid range and term of command	When turning off the power switch	
	Valid range	
	Printer operation in progress	The command cannot be received during the printer operation. ([NAK] return)
	Error	The command cannot be received while an error is occurring. ([NAK] return)
	Others	Commands cannot be received other than when the screen is Online or Offline. ([NAK] return.)

[Function]

This command is used to switch applications such as SBPL and SZPL.

[Format]

DC2 (12H) + PI,aa

[Parameters]

Symbol	Parameter name	Valid range	Acquisition method
aa	Identifier	00:AUTO SB: SBPL SZ: SZPL SI: SIPL SD: SDPL ST: STCL SE: SEPL	Two characters fixed acquisition

[Return data format (normal)]

[ACK]<06>₁₆

[Return data format (when a command error occurs)]

[NAK]<15>₁₆

[Exception processing]

Parameter name	Exception condition	
	A value outside the range is specified	The specified size and received size are different
Identifier	Command error	Invalid receive data

Terminology	Description
Command error	The data received after a command error is determined is not considered as a parameter of this command.
Invalid receive data	The data corresponding to Byte 2 and thereafter of the identifier is ignored.

[Supplemental explanation]

- Setting value of the printer will be switched when switching the application. So, obtaining and saving the setting of the application before switching, then switching it, and then put it back to the original application, after that set it by previously saved settings, and it performs the operation before switching it.

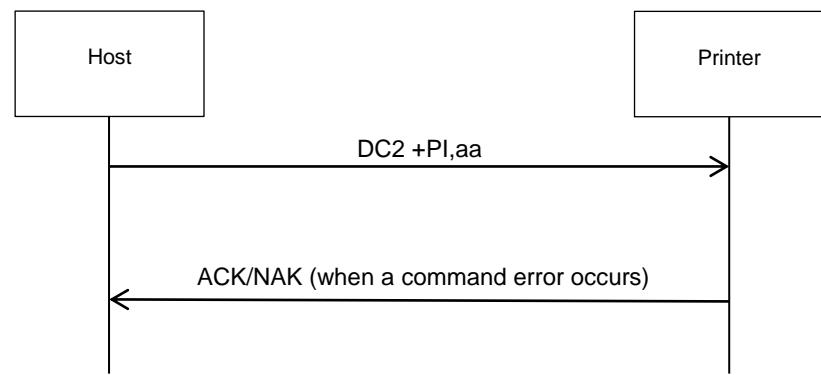
e.g.) When switching the application such as SBPL - STCL - SBPL

- Obtain and save the setting value of SBPL state (obtain the setting value by AIOT, [DC2]PB[EOT] and so on)
- Switch the application to STCL.
- Switch the application to SBPL.
- Set the setting value obtained and saved in the step 1).

- Please send this command in a state which the printer is not working anything in Offline or Online standby state waiting state.

The result of this command sent in pause status during cancellation is not guaranteed. In such case, restart the printer.

- AUTO mode will not be available unless you reboot after switching to AUTO mode.
The printer works with the application before the change until it reboots.



17.8 Common Commands for All Languages

EPC Code Read(UHF)

DC2+PJ

Command	DC2	PJ	Parameter
HEX code	<12> ₁₆	<50> ₁₆ <4A> ₁₆	,aa,bb
Default Value	None		

Valid range and term of command	When turning off the power switch	
	Valid range	
	Printer operation in progress	The command cannot be received during the printer operation. ([NAK] return)
	Error	Commands can be received even if an error is occurring.

[Function]

Read the information of Gen2 (Class1Generation2) corresponding tags and IC chip manufacturer extended specifications tag (UHF).

[Format]

[DC2]PJ,aa,(aa)(,aa),(aa),bb

[Parameters]

Symbol	Parameter name	Valid range	Acquisition method
a	Identifier	U1: EPC area U2: TID area U3: USER area U4: PC/AFI area	Two characters fixed acquisition Note: More than 1 can be specified
b	Options identifier	NO: No option identifier RS:RSSI/ RSSI(Received Signal Strength Indicator) MT: Module temperature	Two characters fixed acquisition

[Return data format (normal)]

[STX]a...a,b...b,(c...c)[ETX]

[Return data]

Symbol	Parameter name	Valid range
a	Total number of data byte *This is the total number of bytes after parameter b. The delimiting comma between parameters a and b, and the ETX are not included.	Data size from the first memory data item until before [ETX] Maximum 3 digits
b (d)	Memory data *Text format	During a tag error, "EPC_Tag_Err" is set.
c	Option data ("Option identifier" + ":" + "Data") *Text format	Options identifier RS: RSSI (Received Signal Strength Indicator) MT: Module temperature Data Maximum 3 digits

[Return data format (when a command error occurs)]

[NAK]<15>₁₆

[Exception processing]

Parameter name	Exception condition
	A value outside the range is specified
Identifier	Command error

Terminology	Description
Command error	The data received after a command error is determined is not considered as a parameter of this command.

[Coding sample1]

<A>
[DC2]PJ,U1,NO
<Z> (Specify EPC area)

[Coding sample2]

<A>
[DC2]PJ,U2,RS
<Z> (Specify RSSI to TID area readout and option)

[Coding Sample 3]

[DC2]PJ,U1,U2,NO (Specifies EPC and TID area read)
[DC2]PJ,U3,U4,MT (Reads USER and PC/AFI area and specifies module temperature to option)

[Return status/ Format]

cc:d...d(cc:d...d)

Symbol	Name of Parameter	Description
c	Identifier	EP : EPC area TI : TID area UD : USER area PC : PC/AFI area
d	Data	

[Sample of status reply1]

- When EPC data "E0123456789ABCDEF0123456" is on Gen2 supported tag
[STX]24,E0123456789ABCDEF0123456[ETX]
- When Gen2 supported tag fails to read EPC data
[STX]11,EPC_Tag_Err[ETX]

[Sample of status reply 2]

When TID data "E200680612345678" is on Gen2 supported tag and RSSI is 10dBm
[STX]22,E200680612345678,RS:10[ETX]

[Sample of status reply3]

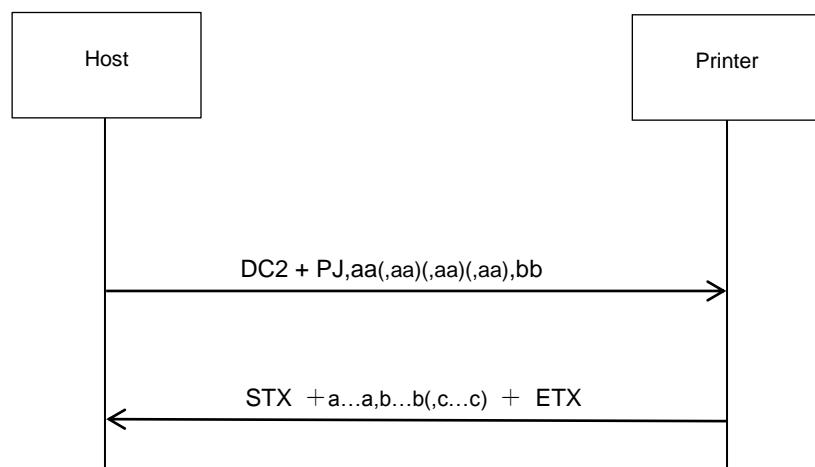
- To get both EPC and TID when EPC data "E0123456789ABCDEF0123456" and TID data "E200680612345678" are recorded
[STX]47,EP:E0123456789ABCDEF0123456,TI:E200680612345678[ETX]

[Sample of status reply 4]

- When failed to read EPC data that supports Gen2 tag
[STX]11,EPC_Tag_Err[ETX]

[Supplemental explanation]

1. This command cannot be used in combination with commands other than <A> and <Z>.
2. When this command is received during printing, it will not be processed. It will be processed after printing is complete.
3. It takes about 5 seconds to return all return status to the host after sending this command. If the port is disconnected before all statuses are returned to the host, RFID tag information will not be correctly returned and the data other than return status format is returned.
4. After sending this command, do not send the next command or data until all status replies are returned to host.
5. When this command turns into an error, it will return "EPC_Tag_Err" in Ascii.
6. When the communication protocol is used only for driver or set to Status 3, ACK/NAK is returned before status reply after this command is sent.
7. This command is available when printer is in continuous mode and cutter mode (motion 1), and dispenser mode (motion 1).
It is not available when in tear-off mode, cutter mode (motion 2) and dispenser mode(motion 2).
8. This command will not work properly when tag offset is set anywhere other than default position.
9. In case where lower power consumption mode is valid, [NAK] is returned until printer does wake up.



17.9 Common Commands for All Languages

EPC/TID Return Request(UHF)

DC2+PK

Command	DC2	PK	Parameter
HEX code	<12> ₁₆	<50> ₁₆ <4B> ₁₆	None
Default value	None		

Valid range and term of command	When turning off the power switch	
	Valid range	
	Printer operation in progress	The command cannot be received during the printer operation. ([NAK] return)
	Error	Commands can be received even if an error is occurring.

[Function]

Returns the status of RFID tag write by <IP0> command and EPC/TID.

[Format]

[DC2]PK

[[DC2]PK return data format (normal)]

[STX]a...a,b,c,d...d[CR][LF] [ETX]

[Return data]

Symbol	Parameter name	Valid range
a	Total number of data byte * This is the total number of bytes after parameter b. The delimiting comma between parameters a and b, and the ETX are not included.	Data size from the first write result status until before [ETX] Maximum 5 digits
b	Write result status *Text format	0: Write failure 1: Write success Note: Specified in text format.
c	Error symbol	N : No error E : EPC write error T : TID read error M : MCS error (Chip inconsistent or not supported) A : All errors Note: Specified in text format
d	EPC/TID return data	Refer to 【EPC/TID return data】 as below Note: Specified in text format

[Format of EPC/TID return data]

“Specify memory” + “.” + “Data” + “Line feed(0DH、0AH)”

ee:f...f,gg:h...h

Specifying the memory to be record

Parameters of the IF: RFID settings section of the [DC2]PA-Printer settings

DATA_TO_RECODE: The data to be read differs according to the settings of the RFID data record.

"0": BOTH (EPC and TID are returned)

"1": EPC (only EPC is returned)

"2": TID (only TID is returned)

A setup example of [DC2]PA is shown below.

[DC2]PA,24,IF,18, DATA_TO_RECODE:0[CR][LF]

To set the above from settings menu, you can do the same from “Interface”->“RFID”->“Data to Record”

[EPC/TID return data]

Symbol	Parameter name	Valid range
e(g...)	Specify memory	EP:EPC ID:TID
f(h...)	Data *Text format	Maximum 256 digits

Data sample)

EP:E0123456789ABCDEF0123456, ID:E200680612345678

[Return data format (when a command error occurs)]

[NAK]<15>₁₆

[Exception processing]

Parameter name	Exception condition	
	A value outside the range is specified	The specified size and received size are different
Identifier	Command error	Invalid receive data

Terminology	Description
Command error	The data received after a command error is determined is not considered as a parameter of this command.
Invalid receive data	The data corresponding to byte 2 and thereafter of the identifier is ignored.

[Coding sample]

<A>

<RU>01

<IP0>e:h,epc:E0123456789ABCDEF0123456;

<XM>E0123456789ABCDEF0123456

<Z>

[Sample of status reply]

When [DC2]PK is received using a tag with E200680612345678 for TID specified to return TID only.

- Write successful (TID read successful)

[STX]25,1,N,ID:E200680612345678[CR][LF][ETX]
- Write successful(TID read fail)

[STX]9,1,T,ID:[CR][LF][ETX]
- Write fail (EPC write failed)

[STX]9,0,E,ID:[CR][LF][ETX]

[Supplemental explanation]

1. The write status and EPC/TID is returned when [DC2]PK is received after RFID write.
2. Although write is successful status will be returned without data if you fail to read EPC/TID since EPC/TIC read will be done separately from write.
3. If the command has only EPC code write and does not have print data, the "Write status" in return data will be "0: Write failure" with "Error symbol" as "A: All errors".
4. For details on the return sequence, refer to 16.10 ESC+RU EPC/TID return.

17.10 Common Commands for All Languages

RFID reed (ISO/IEC15693)

DC2+PJ

Command	DC2	PJ	Parameter
HEX code	<12> ₁₆	<50> ₁₆ <4A> ₁₆	,aa,bb
Default Value	None		

Valid range and term of command	When turning off the power switch	
	Valid range	
	Printer operation in progress	The command cannot be received during the printer operation. ([NAK] return)
	Error	Commands can be received even if an error is occurring.

[Function]

The data of the RFID tag corresponding to ISO/IEC15693 is sent back to the host.

[Format]

[DC2]PJ,aa,(aa),(aa),bb

[Parameters]

Symbol	Parameter name	Valid range	Acquisition method
a	Identifier	H1 : USER data H2 : UID data H3 : Option flag data (DSFID data + AFI data + EASbit) HA : All data(USER data + UID data + Option flag data)	Refer to "Coding sample" below.
b	Options identifier	NO : No option identifier (When identifier H2,H3 is specified, it uses it. The user data becomes ASCII expression if it uses it when identifier H1 is specified.) AS : Data output form = ASCII HX : Data output form = HEX AI: Read my-d in accordance with ISO, data output form=ASCII HI: Read my-d in accordance with ISO, data output form=HEX *When the user data is sent back, it is reflected.	Two characters fixed acquisition

[Return data format (normal)]

[STX]a···a,b···b[ETX]

[Return data]

Symbol	Parameter name	Valid range
a	Total number of data byte *This is the total number of bytes after parameter b. The delimiting comma between parameters a and b, and the ETX are not included. *Data input and output form is which case of ASCII or HEX, but, as for the unit, the value becomes same for a byte.	Data size from the first memory data item until before [ETX] Maximum 4 digits
b	Memory data	Refer to "Return status format" below.

[Return data format (when a command error occurs)]
[NAK]<15>16

[Exception processing]

Parameter name	Exception condition
	A value outside the range is specified
Identifier	Command error

Terminology	Description
Command error	The data received after a command error is determined is not considered as a parameter of this command.

[Coding sample]

[DC2]PJ,H1,AS

* As for the identifier, two or more specification is possible excluding HA.

[DC2]PJ,H1,H2,AS

[DC2]PJ,H1,H2,H3,AS (Equal to [DC2]PJ,HA,AS)

[Return status format]

Current inlet type + "," + RFID data

	Description
Current inlet type	02 : ICODE 03 : Tag-it 05 : my-d 06 : RFID tag none/reading error
RFID data	Refer to "Data format of RFID data" below.

[Data format of RFID data]

(1) When the command is issued specifying "H1" (user data) for the identifier

cc:d...d,e...e

Symbol	Parameter name	description
c	Identifier	UD : USER data (ASCII) ud : USER data (HEX)
d	Bytes of data	Data input and output form is which case of ASCII or HEX, but, as for the unit, the value becomes same for a byte.
e	Data	Refer to "Maximum return data" below.

(2) When the command is issued specifying "H2" (UID data) for the identifier

cc:e...e

Symbol	Parameter name	description
c	Identifier	UI : UID data
e	Data	Refer to "Maximum return data" below.

(3) When the command is issued specifying "H3" (option flag data) for the identifier

cc:e...e,ff:h...h,ii:k...k

Symbol	Parameter name	description
c / f / i	Specify memory	DS : DSFID data AF : AFI data EA : EAS bit
e / h / k	Data	Refer to "Maximum return data" below.

[Maximum return data]

Command identifier	Current inlet type	Return number of bytes
H1:USER data	02:ICODE	160(ASCII) 320(HEX)
	03:Tag-it	256(ASCII) 512(HEX)
	05:my-d	(Custom) 1000(ASCII) 2000(HEX)
		(ISO) 992(ASCII) 1984(HEX)
H2:UID data	02:ICODE 03:Tag-it 05:my-d	16(HEX)
H3:Option flag data (DSFID data + AFI data + EAS bit)	02:ICODE 03:Tag-it 05:my-d	Both of DSFID data,AFI data,EAS bit 2(HEX)

[Sample of status reply1](format set to ASCII)

When '4912345678904' and DSFID code 55H, AFI code 10H, and EAS bit 1 are recorded in the RFID tag of ICODE SLI of "E004010001D9CA2D", UID :.

Command [DC2]PJ,H1,AS
 Status reply [STX]22,02,UD:13,4912345678904[ETX]

Command [DC2]PJ,H1,H3,AS
 Status reply [STX]40,02,UD:13,4912345678904,DS:55,AF:10,EA:01[ETX]

[Sample of status reply 2] (format set to HEX)

When '4912345678904' is recorded in the RFID tag of Tag-it HF-I of "E00700002AC1E2BF", UID :.
 (Data is not set to the optional flag data.)

Command [DC2]PJ,H1,HX
 Status reply [STX]22,03,ud:13,34393132333435363738393034[ETX]

Command [DC2]PJ,H1,H2,HX
 Status reply [STX]19,03,ud:13,34393132333435363738393034,UI:E00700002AC1E2BF[ETX]

[Sample of status reply 3]

When '4912345678904' and DSFID code 55H, AFI code 10H, and EAS bit 1 are recorded in the RFID tag of ICODE SLI of "E004010001D9CA2D", UID :.

Command [DC2]PJ,H2,NO
 Status reply [STX]22,02,UI:E004010001D9CA2D[ETX]

Command [DC2]PJ,H3,NO
 Status reply [STX]20,02,DS:55,AF:10,EA:01[ETX] tuika

Command [DC2]PJ,H2,H3,NO
 Status reply [STX]40,02,UI:E004010001D9CA2D,DS:55,AF:10,EA:01

[Sample of status reply 4] (format set to ASCII)

When there is not an RFID tag or when an RFID tag is bad.

Command [DC2]PJ,H1,AS

Status reply [STX]2,06[ETX]

Inlet type(RFID tag none/reading error)

Command [DC2]PJ,H1,H3,AS

Status reply [STX]2,06[ETX]

Inlet type(RFID tag none/reading error)

Command [DC2]PJ,HA,AS

Status reply [STX]2,06[ETX]

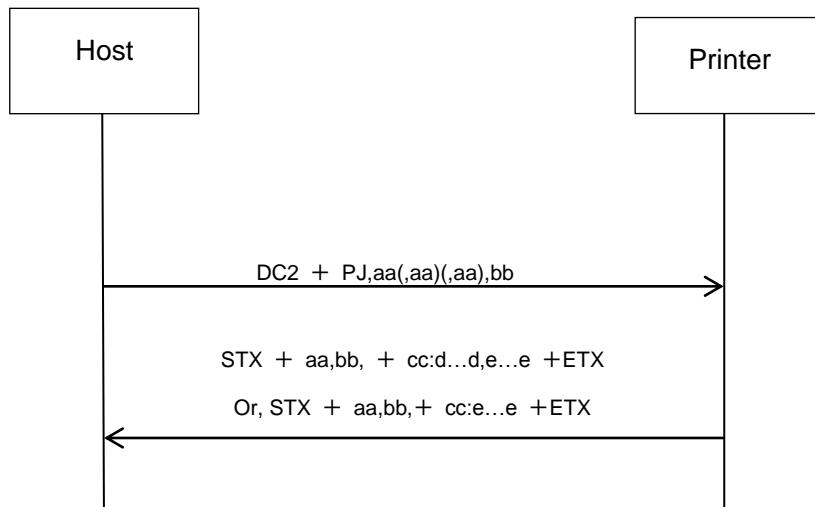
Inlet type(RFID tag none/reading error)

[Supplemental explanation]

1. This command cannot be used in combination with commands other than <A> and <Z>.
2. When the issue operation of the printer only is a continuous, cutter(motion 1), and dispenser(motion 1), this command can be used.
Not available for tear-off mode, cutter(motion 2), dispenser(motion 2).
3. This command will not work properly when tag offset is set anywhere other than default position.
4. Because this command cannot be received while printing it, information cannot be acquired in "Sequential number" and "Print Quantity" piece is specified.
5. After this command is transmitted, it will take about five seconds by the time all the sending return status is sent back by the host. Tag information is not correctly sent back when the port is cut before all the sending return status is sent back by the host, data other than the sending return status format are sent back, and operate it, please after selecting data.
6. Please do not transmit other commands and data until all the status of the defined size is received by the host after transmitting this command.
7. Refer to the following chart if you want to specify the alphabet "A" in ASCII/HEX data formats.

Mode	ASCII	HEX
Data	'A'	"41"
Code	41H	34H,31H

8. For my-d tag, custom mode is read by default. However, in order to force read with ISO mode, specify "AI" and "HI" as an option. "AI" stands for ASCII format and "HI" stands for HEX format data reply.
9. Only my-d tags can be specified for options "AI" and "HI". If you specify other than my-d, the options will be identified as "AS" and "HX".
10. If the printer is a low power consumption mode is enabled, until it wakes up will return a "NAK".



17.11 Common Commands for All Languages

UID return request (ISO/IEC15693)

DC2+PK

Command	DC2	PK	Parameter
HEX code	<12> ₁₆	<50> ₁₆ <4B> ₁₆	None
Default value	None		

Valid range and term of command	When turning off the power switch	
	Valid range	
	Printer operation in progress	The command cannot be received during the printer operation. ([NAK] return)
	Error	Commands can be received even if an error is occurring.

[Function]

Returns the status of RFID tag write by <RK> command and UID.

[Format]

[DC2]PK

[[DC2]PK return data format (normal)]

[STX]a...a,b,c,d...d[CR][LF] [ETX]

[Return data]

Symbol	Parameter name	Valid range
a	Total number of data byte * This is the total number of bytes after parameter b. The delimiting comma between parameters a and b, and the ETX are not included.	Data size from the first write result status until before [ETX] Maximum 5 digits
b	Write result status	0: Write failure 1: Write success Note: Specified in text format.
c	Error symbol	N : No error U : UID read error A : All errors Note: Specified in text format
d	UID return data	Refer to "UID return data" as below Note: Specified in text format

[Format of UID return data]

"Specify memory"+":"+"Data" + "Line feed(0DH、0AH)"
ee:f···f[CR][LF]

[UID return data]

Symbol	Parameter name	Valid range
e	Specify memory	UI : UID
f	Data	Maximum 16 digits

[Return data format (when a command error occurs)]

[NAK]<15>₁₆

[Exception processing]

Parameter name	Exception condition	
	A value outside the range is specified	The specified size and received size are different
Identifier	Command error	Identifier

Terminology	Description
Command error	The data received after a command error is determined is not considered as a parameter of this command.
Invalid receive data	The data corresponding to byte 2 and thereafter of the identifier is ignored.

[Coding Sample]

```
<A>
<RU>01
<RK>2,D13,4912345678904
<XM>4912345678904
<Z>
```

[Sample of status reply]

When [DC2]PK is received using a tag with E0123456789ABCDE of UID.

■Write successful (UID read successful)
[STX]25,1,N,UI:E0123456789ABCDE[CR][LF][ETX]

■Write successful(UID read fail)
[STX]9,1,U,UI:[CR][LF][ETX]

■Write fail(UID write failed)
[STX]9,0,U,UI:[CR][LF][ETX]

[Supplemental explanation]

1. The write status and UID is returned when [DC2]PK is received after RFID write.
- 2.Although write is successful status will be returned without data if you fail to read UID since UID read will be done separately from write.
3. Write a code; a case without the printing, the return data "Write result status" "0 :Write fail"; "Error symbol" "A :All errors".
- 4.For details on the return sequence, refer to 16.11 ESC+RU UID return(ISO/IEC15693).

17.12 Common Commands for All Languages

RFID read (ISO/IEC14443 TypeA)

DC2+PJ

Command	DC2	PJ	Parameter
HEX code	<12> ₁₆	<50> ₁₆ <4A> ₁₆	,aa,bb
Default Value	None		

Valid range and term of command	When turning off the power switch	
	Valid range	
	Printer operation in progress	The command cannot be received during the printer operation. ([NAK] return)
	Error	Commands can be received even if an error is occurring.

[Function]

The data of the RFID tag corresponding to ISO/IEC14443 Type A is sent back to the host.

[Format]

[DC2]PJ,aa(aa),bb

[Parameters]

Symbol	Parameter name	Valid range	Acquisition method
a	Identifier	N1 : USER data N2 : UID data NA : All data(USER data+UID data)	Refer to "Coding sample" below.
b	Options identifier	NO : No option identifier (When identifier N2 is specified, it uses it. The user data becomes ASCII expression if it uses it when identifier N1 is specified.) AS : Data output form = ASCII HX : Data output form = HEX *When the user data is sent back, it is reflected.	Two characters fixed acquisition

[Return data format (normal)]

[STX]a...a,b...b[ETX]

[Return data]

Symbol	Parameter name	Valid range
a	Total number of data byte *This is the total number of bytes after parameter b. The delimiting comma between parameters a and b, and the ETX are not included. *Data input and output form is which case of ASCII or HEX, but, as for the unit, the value becomes same for a byte.	Data size from the first memory data item until before [ETX] Maximum 4 digits
b	Memory data	

[Return data format (when a command error occurs)]

[NAK]<15>16

[Exception processing]

Parameter name	Exception condition
	A value outside the range is specified
Identifier	Command error

Terminology	Description
Command error	The data received after a command error is determined is not considered as a parameter of this command.

[Coding sample]

[DC2]PJ,N1,AS

* As for the identifier, two or more specification is possible excluding NA.

[DC2]PJ,N1,N2,AS (Equal to [DC2]PJ,NA,AS)

[Return status format]

Current inlet type + " + RFID data

Description	
Current inlet type	01 : ISO/IEC14443 TypeA 06 : RFID tag none/reading error
RFID data	Refer to "Data format of RFID data" below.

[Data format of RFID data]

(1) When the command is issued specifying "N1" (user data) for the identifier

cc:d...d,e...e

Symbol	Parameter name	description
c	Identifier	UD : USER data(ASCII) ud : USER data (HEX)
d	Bytes of data	Data input and output form is which case of ASCII or HEX, but, as for the unit, the value becomes same for a byte.
e	Data	Refer to "Maximum return data" below.

(2) When the command is issued specifying "N2" (UID data) for the identifier

cc:e...e

Symbol	Parameter name	description
c	Identifier	UI : UID data
e	Data	Refer to "Maximum return data" below.

[Maximum return data]

Command identifier	Current inlet type	Return number of bytes
N1 : USER data	01 : ISO/IEC14443 TypeA	2048(ASCII) 4096(HEX)
N2 : UID data	01 : ISO/IEC14443 TypeA	14(HEX)

[Sample of status reply1](format set to ASCII)

When '4912345678904' is recorded in the RFID tag of NTAG210 of "04 04 01 00 01 D9 CA", UID ::

Command [DC2]PJ,N1,AS

Status reply [STX]22,01,UD:13,4912345678904[ETX]

Inlet type(ISO/IEC14443 TypeA)
USER data

Command [DC2]PJ,N1,N2,AS

Status reply [STX]20,01,UD:13,4912345678904,UI:0404010001D9CA[ETX]

USER data
UID data
Inlet type (ISO/IEC14443 TypeA)

[Sample of status reply 2] (format set to HEX)

When '4912345678904' is recorded in the RFID tag of MIFARE Ultralight of "04 07 00 00 2A C1 E2", UID ::

Command [DC2]PJ,N1,HX

Status reply [STX]19,01,ud:13,34393132333435363738393034[ETX]

Inlet type (ISO/IEC14443 TypeA)
USER data

Command [DC2]PJ,N1,N2,HX

Status reply [STX]20,01, ← Inlet type (ISO/IEC14443 TypeA)
ud:13,34393132333435363738393034, ← USER data
UI:040700002AC1E2[ETX] ← UID data

* It actually becomes continuous data.

[Sample of status reply 3]

When '4912345678904' is recorded in the RFID tag of NTAG210 of "04 04 01 00 01 D9 CA", UID ::

Command [DC2]PJ,N2,NO

Status reply [STX]20,01,UI:0404010001D9CA[ETX]

UID data
Inlet type (ISO/IEC14443 TypeA)

[Sample of status reply 4] (format set to ASCII)

When there is not an RFID tag or when an RFID tag is bad.

Command [DC2]PJ,N1,AS

Status reply [STX]2,06[ETX]

Inlet type(RFID tag none/reading error)

Command [DC2]PJ,N1,N2,AS

Status reply [STX]2,06[ETX]

Inlet type(RFID tag none/reading error)

Command [DC2]PJ,NA,AS

Status reply [STX]2,06[ETX]

Inlet type(RFID tag none/reading error)

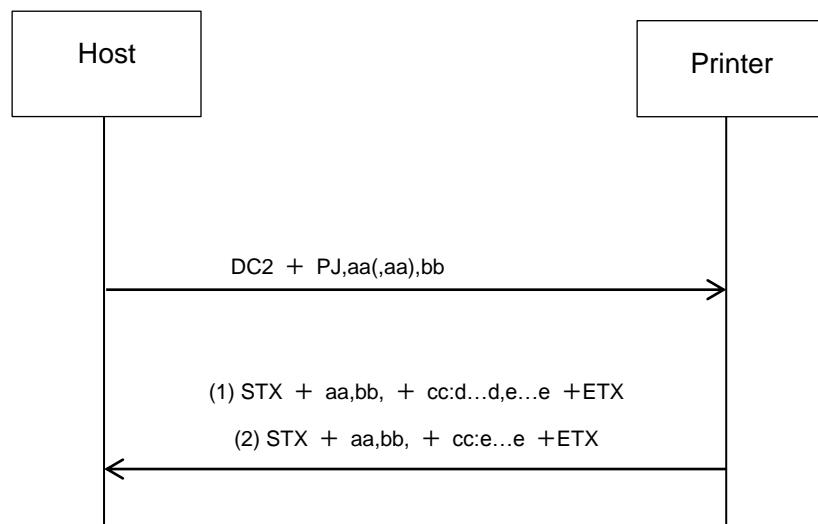
[Supplemental explanation]

1. This command cannot be used in combination with commands other than <A> and <Z>.
2. When the issue operation of the printer only is a continuous, cutter (motion 1), and Dispenser(motion 1), this command can be used.
It is not available in tear-off mode, cutter(motion 2) and dispenser(motion 2).
3. This command will not work properly when tag offset is set anywhere other than default position.
4. Because this command cannot be received while printing it, information cannot be acquired in "Sequential number" and "Print Quantity" piece is specified.
5. After this command is transmitted, it will take about five seconds by the time all the sending return status is sent back by the host. Tag information is not correctly sent back when the port is cut before all the sending return status is sent back by the host, data other than the sending return status format are sent back, and operate it, please after selecting data.
6. Please do not transmit other commands and data until all the status of the defined size is received by the host after transmitting this command.
7. Refer to the following chart if you want to specify the alphabet "A" in ASCII/HEX data formats.

Mode	ASCII	HEX
Data	'A'	"41"
Code	41H	34H,31H

8. If the printer is a low power consumption mode is enabled, until it wakes up will return a "NAK".

[Sequence]



17.13 Common Commands for All Languages

UID return request (ISO/IEC14443 TypeA)

DC2+PK

Command	DC2	PK	Parameter
HEX code	<12> ₁₆	<50> ₁₆ <4B> ₁₆	None
Default value	None		

Valid range and term of command	When turning off the power switch	
	Valid range	
	Printer operation in progress	The command cannot be received during the printer operation. ([NAK] return)
	Error	Commands can be received even if an error is occurring.

[Function]

Returns the status of RFID tag write by <RK> command and UID.

[Format]

[DC2]PK

[[DC2]PK return data format (normal)]

[STX]a...a,b,c,d...d[CR][LF] [ETX]

[Return data]

Symbol	Parameter name	Valid range
a	Total number of data byte * This is the total number of bytes after parameter b. The delimiting comma between parameters a and b, and the ETX are not included.	Data size from the first write result status until before [ETX] Maximum 5 digits
b	Write result status	0: Write failure 1: Write success Note: Specified in text format.
c	Error symbol	N : No error D : UID read error A : All errors Note: Specified in text format
d	UID return data	Refer to "UID return data" as below Note: Specified in text format

[Format of UID return data]

“Specify memory”+“:”+“Data” +“Line feed(0DH、0AH)”
ee:f...f[CR][LF]

[UID return data]

Symbol	Parameter name	valid range
e	Specify memory	UD : UID
f	Data	Maximun 14 digits

[Return data format (when a command error occurs)]

[NAK]<15>16

[Exception processing]

Parameter name	Exception condition	
	A value outside the range is specified	The specified size and received size are different
Identifier	Command error	Invalid receive data

Terminology	Description
Command error	The data received after a command error is determined is not considered as a parameter of this command.
Invalid receive data	The data corresponding to byte 2 and thereafter of the identifier is ignored.

[Coding Sample]

<A>
<RU>01
<RK>1,D13,4912345678904
<XM>4912345678904
<Z>

[Sample of status reply]

When [DC2]PK is received using a tag with 04123456789ABC of UID.

- Write successful (UID read successful)
[STX]23,1,N,UD:04123456789ABC[CR][LF][ETX]

- Write successful(UID read fail)
[STX]9,1,D,UD:[CR][LF][ETX]

- Write fail (UID read failed)
[STX]9,0,D,UD:[CR][LF][ETX]

[Supplemental explanation]

- 1.The write status and UID is returned when [DC2]PK is received after RFID write.
- 2.Although write is successful status will be returned without data if you fail to read UID since UID read will be done separately from write.
- 3.Write a code; a case without the printing, the return data "Write result status" "0 :Write fail"; "Error symbol" "A :All errors".
- 4.For details on the return sequence, refer to 16.12 ESC+RU UID return(ISO/IEC14443 TypeA).

17.14 Common Commands for All Languages

RFID read(FeliCa)

DC2+PJ

Command	DC2	PJ	Parameter
HEX code	<12>16	<50>16<4A>16	,aa,bb
Default Value	None		

Valid range and term of command	When turning off the power switch	
	Valid range	
	Printer operation in progress	The command cannot be received during the printer operation. ([NAK] return)
	Error	Commands can be received even if an error is occurring.

[Function]

Returns inlet type and data of FelicaLite and Felica Lite-S to host.

[Function]

[DC2]PJ,aa(aa),bb

[Parameters]

Symbol	Parameter name	Valid range	Acquisition method
a	Identifier	F1 : User data (scratch pad + subtract register) F2 : ID data (IDm+PMm+ID block) FA : All data(user data+ID data)	Refer to "Coding sample" below.
b	Options identifier	NO : No option identifier (When identifier H2,H3 is specified, it uses it. The user data becomes ASCII expression if it uses it when identifier H1 is specified.) AS : Data output form = ASCII HX : Data output form = HEX *When the user data is sent back,it is reflected.	Two characters fixed acquisition

[Return data format (normal)]

[STX]an data form

[Return data]

Symbol	Parameter name	Valid range
a	Total number of data byte *This is the total number of bytes after parameter b. The delimiting comma between parameters a and b, and the ETX are not included. *Data input and output form is which case of ASCII or HEX, but, as for the unit, the value becomes same for a byte.	Data size from the first memory data item until before [ETX] Maximum 4 digits
b	Memory data	Refer to "Return status format" below.

[Return data format (when a command error occurs)]
[NAK]<15>16

[Exception processing]

Parameter name	Exception condition
	A value outside the range is specified
Identifier	Command error

Terminology	Description
Command error	The data received after a command error is determined is not considered as a parameter of this command.

[Coding sample]

[DC2]PJ,F1,AS

* As for the identifier, two or more specification is possible excluding FA.

[DC2]PJ,F1,F2,AS (Equal to [DC2]PJ,FA,AS)

[Return status format]

Current inlet type + "," + RFID data

	Description
Current inlet type	04 : FeliCa Lite/FeliCa Lite-S 06 : RFID tag none/reading error
RFID data	Refer to "Data format of RFID data" below.

[Data format of RFID data]

(1) When the command is issued specifying "F1" (user data) for the identifier

cc:d...d,e...e

Symbol	Parameter name	description
c	Identifier	UD : USER data (ASCII) ud : USER data (HEX)
d	Bytes of data	Data input and output form is which case of ASCII or HEX, but, as for the unit, the value becomes same for a byte.
e	Data	Refer to "Maximum return data" below.

(2) When the command is issued specifying "F2" (ID data) for the identifier

cc:e...e,ff:h...h,ii:k...k

Symbol	Parameter name	description
c / f / i	Identifier	DM : IDm PM : PMm ID : ID Block
e / h / k	Data	Refer to "Maximum return data" below.

[Maximum return data]

Command identifier	Current inlet type	Return number of bytes
F1 : USER data	04 : FeliCa Lite/ FeliCa Lite-S	240(ASCII) 480(HEX) * Details: Scratch pad 224(ASCII) 448(HEX) Subtract register 16(ASCII) 32(HEX)
F2 : ID data (IDm + PMm + ID block)	04 : FeliCa Lite/ FeliCa Lite-S	IDm 16(HEX) PMm 16(HEX) ID block 32(HEX)

[Sample of status reply1] (format set to ASCII)

When "4912345678904" is recorded on FeliCa Lite/FeliCa Lite-S block 8000H with IDm="03FEFFE0536C92A8", PMm = "03014B024F4993FF" and ID block ="3031323334353637 FFE0123456789ABC"

Command [DC2]PJ,F1,AS

Status reply [STX]22,04,UD:13,4912345678904[ETX]

USER data

Inlet type (FeliCa Lite/FeliCa Lite-S)

Command [DC2]PJ,F1,F2,AS

Status reply [STX]98,04, ← Inlet type (FeliCa Lite/FeliCa Lite-S)

UD:13,4912345678904, ← USER data

DM:03FEFFE0536C92A8.PM:03014B024F4993FF, } ID data
ID:3031323334353637FFE0123456789ABC[ETX]

Note: All data are continuous in reality.

[Sample of status reply 2] (format set to HEX)

When "4912345678904" is recorded on FeliCa Lite/FeliCa Lite-S block 8000H with IDm="03FEFFE0536C92A8", PMm = "03014B024F4993FF" and ID block ="3031323334353637 FFE0123456789ABC" (subtract block set to default)

Command [DC2]PJ,F1,HX

Status reply [STX]22,04,ud:13,34393132333435363738393034[ETX]

USER data

Inlet type (FeliCa Lite/FeliCa Lite-S)

Command [DC2]PJ,F1,F2,HX

Status reply [STX]98,04, ← Inlet type (FeliCa Lite/FeliCa Lite-S)

ud:13,34393132333435363738393034, ← USER data

DM:03FEFFE0536C92A8.PM:03014B024F4993FF, } ID data
ID:3031323334353637FFE0123456789ABC[ETX]

Note: All data are continuous in reality.

[Sample of status reply 3]

When "4912345678904" is recorded on FeliCa Lite/FeliCa Lite-S block 8000H with IDm="03FEFFE0536C92A8", PMm = "03014B024F4993FF" and ID block ="3031323334353637 FFE0123456789ABC" (subtract block set to default)

Command [DC2]PJ,F2,NO

Status reply [STX]78,04, ← Inlet type (FeliCa Lite/FeliCa Lite-S)

DM:03FEFFE0536C92A8.PM:03014B024F4993FF, } ID data
ID:3031323334353637FFE0123456789ABC[ETX]

Note: All data are continuous in reality.

[Sample of status reply 4] (format set to ASCII)

When there is not an RFID tag or when an RFID tag is bad.

Command [DC2]PJ,F1,AS

Status reply [[STX]2,06[ETX]



Inlet type(RFID tag none/reading error)

Command [DC2]PJ,FA,AS

Status reply [[STX]2,06[ETX]



Inlet type(RFID tag none/reading error)

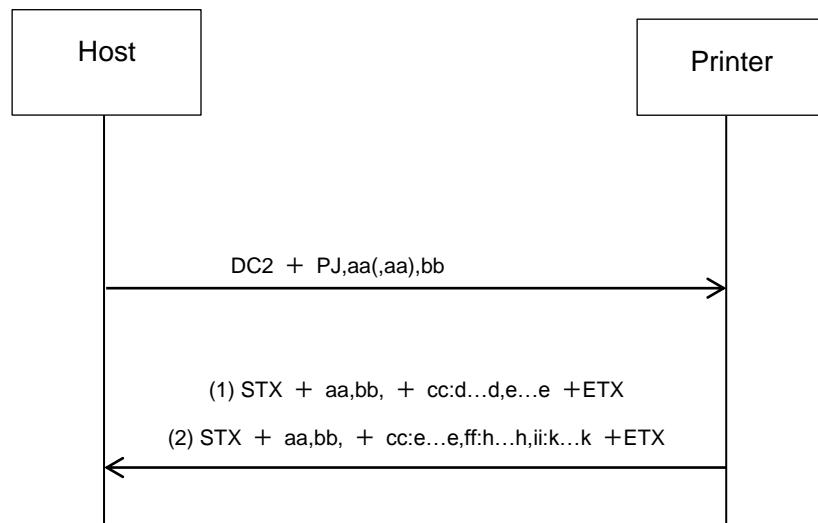
[Supplemental explanation]

1. This command cannot be used in combination with commands other than <A> and <Z>.
2. When the issue operation of the printer only is a continuous, cutter(motion 1), and Dispenser(motion 1), this command can be used.
It is not available in tear-off mode, cutter(motion 2) and dispenser(motion 2).
3. This command will not work properly when tag offset is set anywhere other than default position.
4. The command cannot be received while printing. Information cannot be obtained when you specify sequential printing and multiple labels to print.5.
5. After this command is transmitted, it will take about five seconds by the time all the sending return status is sent back by the host. Tag information is not correctly sent back when the port is cut before all the sending return status is sent back by the host, data other than the sending return status format are sent back, and operate it, please after selecting data.
6. Please do not transmit other commands and data until all the status of the defined size is received by the host after transmitting this command.
7. Refer to the following chart if you want to specify the alphabet "A" in ASCII/HEX data formats.

Mode	ASCII	HEX
Data	'A'	"41"
Code	41H	34H,31H

8. If the printer is a low power consumption mode is enabled, until it wakes up will return a "NAK".

[Sequence]



17.15 Common Commands for All Languages

IDm return(FeliCa)

DC2+PK

Command	DC2	PK	Parameter
HEX code	<12>16	<50>16<4B>16	None
Default value	None		

Valid range and term of command	When turning off the power switch	
	Valid range	
	Printer operation in progress	The command cannot be received during the printer operation. ([NAK] return)
	Error	Commands can be received even if an error is occurring.

[Function]

Returns the result of writing to RFID tag using <RK> command together with a 64-digit hexadecimal numeric sequence as a result of IDm+PMm+ID block

[Format]

[DC2]PK

[[DC2]PK return data format (normal)]

[STX]a...a,b,c,d...d[CR][LF][ETX]

[Return data]

Symbol	Parameter name	Valid range
a	Total number of data byte * This is the total number of bytes after parameter b. The delimiting comma between parameters a and b, and the ETX are not included.	Data size from the first write result status until before [ETX] Maximum 5 digits
b	Write result status *Text format	0: Write failure 1: Write success Note: Specified in text format.
c	Error symbol	N : No error I : IDm read error A : All errors Note: Specified in text format
d	IDm return data	Refer to [IDm return data] as below Note: Specified in text format

[Format of IDm return data]
"Specify memory"+":"+"Data" + "Line feed(0DH、0AH)"

ee:f...f [CR][LF]

[IDm return data]

Symbol	Parameter name	Valid range
e	Specify memory	DM : IDm + PMm + ID block
f	Data	Maximum 64 digits

[IDm return format]

Returns a 64-digit hexadecimal numeric block as a result of IDm+PMm+ID block

IDm(16 digits)	PMm(16 digits)	ID block(32 digits)
03FEFFE0536C92A8	03014B024F4993FF	3031323334353637 FFE0123456789ABC

The above is just a sample.

Sample data)

DM: 03FEFFE0536C92A803014B024F4993FF3031323334353637FFE0123456789ABC

[Return data format (when a command error occurs)]

[NAK]<15>₁₆

[Exception processing]

Parameter name	Exception condition	
	A value outside the range is specified	
Identifier	Command error	Identifier

Terminology	Description
Command error	The data received after a command error is determined is not considered as a parameter of this command.
Invalid receive data	The data corresponding to Byte 2 and thereafter of the identifier is ignored.

[Coding Sample]

<A>

<RU>01

<RK>2,D13,4912345678904

<XM>4912345678904

<Z>

[Sample of status reply]

When [DC2]PK is received with IDm using tag with "03FEFFE0536C92A8":

■Write successful (IDm read successful)

[STX]J0,1,N,DM:03FEFFE0536C92A8·····[CR][LF][ETX]

■Write successful(IDm read fail)

[STX]J0,1,I,DM:[CR][LF][ETX]

■Write fail(UID write failed)

[STX]J0,0,I,ID:[CR][LF][ETX]

[Supplemental explanation]

1. The write status and IDm is returned when [DC2]PK is received after RFID write.
2. Although write is successful status will be returned without data if you fail to read IDm since IDm read will be done separately from write.
3. Write a code; a case without the printing, the return data "Write result status" "0 :Write fail"; "Error symbol" "A :All errors".
4. For details on the return sequence, refer to 16.12 ESC+RU IDm return(FeliCa).

17.16 Common Commands for All Languages

Request to return label pitch size

DC2+PN

Command	DC2	PN	Parameter
HEX code	<12>16	<50>16<4E>16	,aa
Initial value	None		

Valid range and term of command	When power switch is OFF	
	Valid range	
	When printer is working	Command is accepted when printer is working
	During an error	Command is accepted during an error occurs

[Function]

Returns the result of label pitch measurement by each label by request from host.

[Format]

[DC2] PN

[Format of return data (normal case)]

[STX]a...a,bbb,cccccc[ETX]

Data sample)

[STX]10,203,002172[ETX]

Parameter	Details	Valid range
a	Total number of data in bytes *This is the total number of bytes from parameter b and beyond. The delimiter (comma ,) between parameters "a" and "b" and ETX are not counted.	Size of data from b to before [ETX]
b	Head resolution	203 : 203dpi 305 : 305dpi 609 : 609dpi
c	Label pitch size (dots)	A fixed 6-digit

[Return data format (when command error occurs)]

[NAK]<15>16

[Supplemental explanation]

1. I-Mark and Gap needs to pass over the sensor twice in order to measure the length of label gap. See below for the conditions to detect:
 - (1) Feed 2 labels by running <IK>0 command more than 2 times.
 - (2) Press FEED button on the printer twice to feed 2 labels.
2. 00000(0x30, 0x30, 0x30, 0x30, 0x30) is returned if the label pitch size for invalid sensor is not finalized for the 1st feed right after power on, right after head open/close and after sensor type switching.
3. The label length to be returned includes the gap between labels.
4. The label pitch size to be returned will show the value of last label that passes over the sensor. Therefore label will exist in between head and sensor with a short pitch label, and it may not be equal to the printed/ejected label's pitch size. The minimum label length would be 70 mm.
5. This is available only when sensor is enabled. Returns "000000" when sensor is disabled.
6. If there is a missing label in the roll in using gap sensor, the valid label length and the distance for the missing label are added together to be returned depending on sensor level.
7. The label length detected by the printer includes around the same amount of tolerance as print precision.
8. Print speed and print darkness gives little or no affect to the detected label length. However it may vary if you change print speed depending on the sensitivity of the sensor.
9. Label length is measured once again at FEED when the sensor type is switched from LCD menu. When you send DC2+PN command the label length before switching is returned. Then, printer returns the unfinalized 0 dot in the first FEED, followed by the re-measured label length at the 2nd FEED. And label length may vary depending on the characteristic of the sensor.

[Coding Example]

Get label length by feeding 2 labels

<A>

<IK>0 Feed 1st label

<Z>

<A>

<IK>0 Feed 2nd label

<Z>

Feed completed ←Label length is finalized here

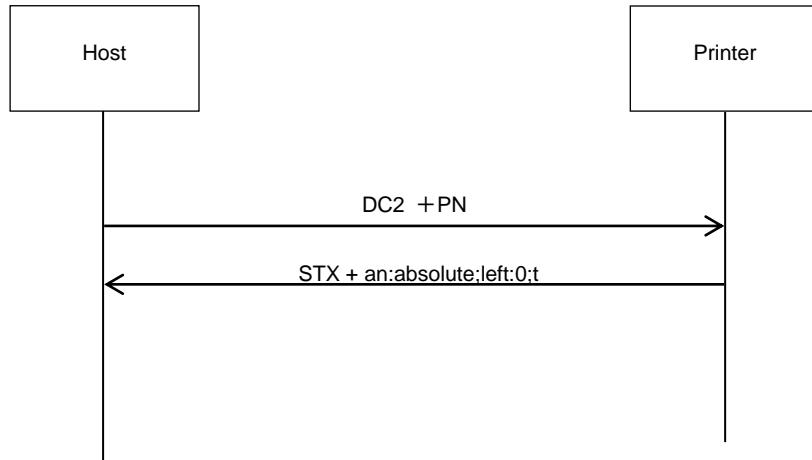
DC2+PN Request label length

Feeding necessary number of labels has been completed ←Label length is measured by each label and then finalized

DC2+PN Request for label length←You can get the latest label length

The correct label length is returned if you feed twice manually and request with DC2+PN after setting label, even without using <IK>0 command.

[Sequence]



17.17 Common Commands for All Languages

Initialization

DC2+DB

Command	DC2	DB	Parameter
HEX code	<12>16	<44>16<42>16	,aa
Default Value	None		

Valid range and term of command	When turning off the power switch	
	Valid range	
	Printer operation in progress	The command cannot be received during the printer operation. ([NAK] return)
	Error	The command cannot be received while an error is occurring. ([NAK] return)

[Function]

This command initializes the printer setting.

[Format]

[DC2] DB,aa

[Parameters]

Symbol	Parameter name	Valid range	Initialization target	Acquisition method
a	Identifier	CA: Common settings initialization CB: Warning function initialization II: IEEE1284 settings initialization IR: RS-232C settings initialization IL: LAN settings initialization IU: USB settings initialization IW: WLAN settings initialization IB: Bluetooth settings initialization IE: EXT settings initialization IF: RFID settings initialization SB: SBPL settings initialization SZ: SZPL settings initialization SI: SIPL settings initialization SD: SDPL settings initialization ST: STCL settings initialization SA: AEP settings initialization CX: Registration information initialization	[PRINTER] section [COUNT] section [IEEE1284] section [RS-232C] section [LAN] section [USB] section [WLAN] section [BLUETOOTH] section [EXT] section [RFID] section [SBPL] section [SZPL] section [SIPL] section [SDPL] section [STCL] section [AEP] section SBPL, SZPL, SIPL, SDPL, STCL,	Two characters fixed acquisition Donw font TrueType Log Image Hex Dump Error Key Date Head Buffer SBPL BMP Overlay Format PCX Graphic External character TrueType BJD

[Return data format (normal)]

[ACK]<06>₁₆

[Return data format (when a command error occurs)]

[NAK]<15>₁₆

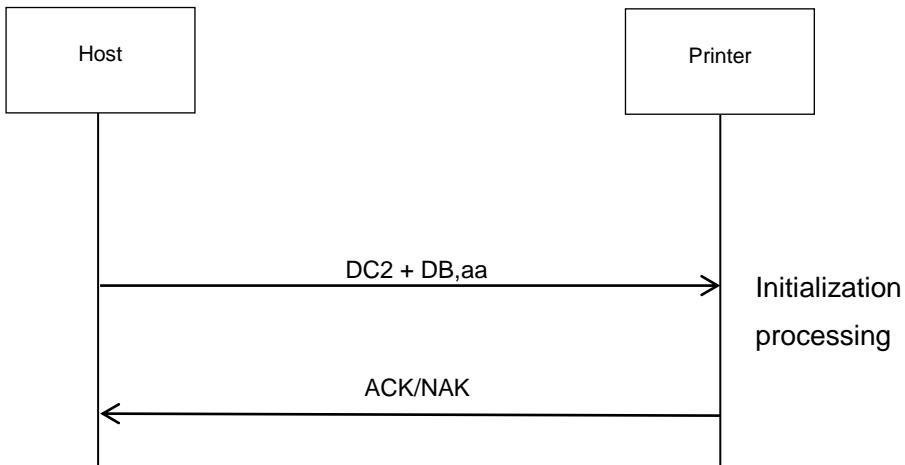
[Exception processing]

Parameter name	Exception condition	
	A value outside the range is specified	The specified size and received size are different
Identifier	Command error	Invalid receive data

Terminology	Description
Command error	Initialization not performed. The data received after a command error is determined is not considered as a parameter of this command.
Invalid receive data	The data corresponding to byte 2 and thereafter is ignored.

[Supplemental explanation]

1. Refer to 17.1 DC2+PA Printer setting command for the items to be initialized in each identifier.
2. If you initialize the interface settings, a response may not be returned.



17.18 Common Commands for All Languages

Reset

DC2+DC

Command	DC2	DC	Parameter
HEX code	<12> ₁₆	<44> ₁₆ <43> ₁₆	None
Default value	None		

Valid range and term of command	When turning off the power switch	
	Valid range	
	Printer operation in progress	The command cannot be received during the printer operation. ([NAK] return)
	Error	Commands can be received even if an error is occurring.

[Function]

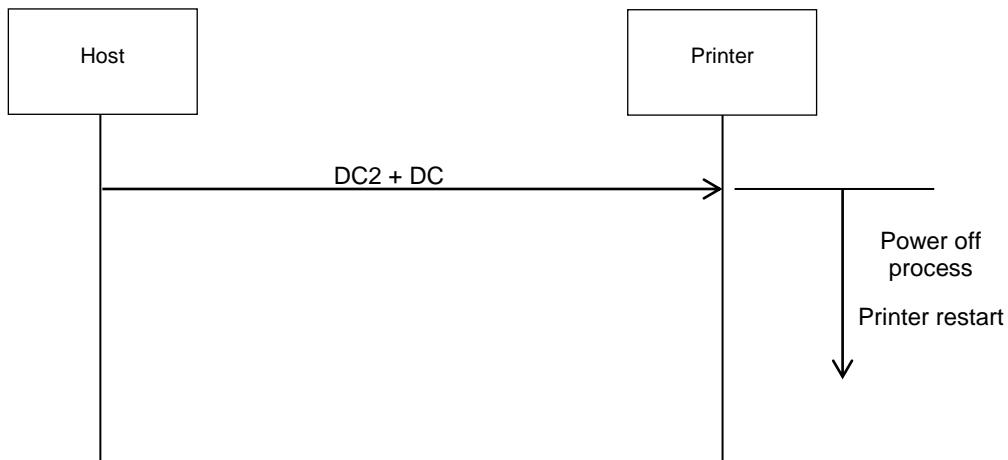
This command is used to restart the printer.

[Format]

[DC2] DC

[Response (only during printing)]

[NAK]<15>₁₆



17.19 Common Commands for All Languages

Power Off

DC2+DD

Command	DC2	DD	Parameter
HEX code	<12> ₁₆	<44> ₁₆ <44> ₁₆	None
Default value	None		

Valid range and term of command	When turning off the power switch	
	Valid range	
	Printer operation in progress	The command cannot be received during the printer operation. ([NAK] return)
	Error	Commands can be received even if an error is occurring.

[Function]

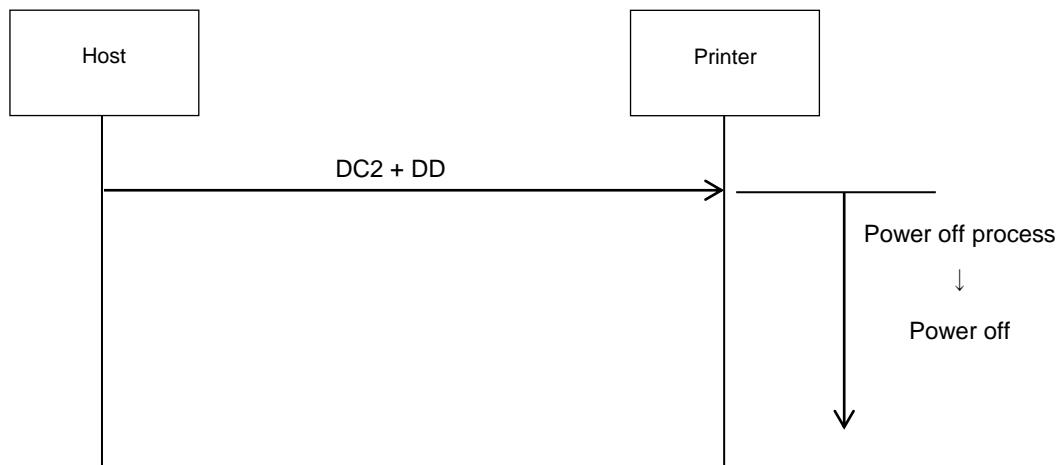
This command is used to turn OFF the printer.

[Format]

[DC2] DD

[Response (only during printing)]

[NAK]<15>₁₆



17.20 Common Commands for All Languages

File Download

DC2+DE

Command	DC2	DE	Parameter
HEX code	<12> ₁₆	<44> ₁₆ <45> ₁₆	,aa,b,c···c,d···d,e···e
Default Value	None		

Valid range and term of command	When turning off the power switch	The file is maintained.
	Valid range	
	Printer operation in progress	The command cannot be received during the printer operation. ([NAK] return)
	Error	Commands can be received even if an error is occurring.

[Function]

This command is used to download the specified file.

[Format]

[DC2]DE,aa,b,c···c,d···d,e···e

[Parameters]

Symbol	Parameter name	Valid range	Acquisition method
a	Identifier	SB: SBPL settings SZ: SZPL settings SI: SIPL settings SD: SDPL settings ST: STCL settings CA: Common settings (when specifying other than font logo and TrueType fonts)	Two characters fixed acquisition
b	File type	0: Font/logo 1: True Type font 2: Wireless LAN certificate (W-iFi Root CA) 3: Wireless LAN certificate (WiFi Client Certificate) 4: Wireless LAN certificate (Wi-Fi Private Key) 5: Wireless LAN certificate (Wi-Fi EAP_FAST PAC_file) 6: HTTPS certificate	One character fixed acquisition
c	File name	Data within 255 characters including the following character groups Alphabet Numeral Hyphen ("") Underscore ("_") Period (".")	Acquired up to ","
d	File size	0 to 999999999 (byte)	Acquired up to ","
e	File data		Equivalent to file size

[Return data format (normal)]

[ACK]<06>₁₆

[Return data format (when a command error occurs)]

[NAK]<15>₁₆

[Return data format (when the same file name error occurs)]

1<31>₁₆

[Exception processing]

Parameter name	Exception condition		
	A value outside the range is specified	The specified size and received size are different	When the same file name
Identifier	Command error	Command error	
File type	Command error	Command error	
File name	Command error		Same file name error
File size	Command error		
File data		Invalid receive data (*1)	

Terminology	Description
Command error	Downloading not performed. The data received after a command error is determined is not considered as a parameter of this command.
Same file name error	The file is not saved.
Invalid receive data	The data exceeding the file size is ignored.

[Supplemental explanation]

1. Send this command when printing has stopped. The content of the response data is not guaranteed even when this command is received during printing.
2. When you specify SZPL for "Parameter a: Identifier", "0:Font/logo", "1:TrueType font" settings of "Parameter b: File type" will be ignored.



17.21 Common Commands for All Languages

File Name Information Acquisition

DC2+DF

Command	DC2	DF	Parameter
HEX code	<12> ₁₆	<44> ₁₆ <46> ₁₆	,aa,b
Default Value	None		

Valid range and term of command	When turning off the power switch	
	Valid range	
	Printer operation in progress	The command cannot be received during the printer operation. ([NAK] return)
	Error	Commands can be received even if an error is occurring.

[Function]

This command returns a list of file names of the specified folder.

[Format]

[DC2]DF,aa,b

[Parameters]

Symbol	Parameter name	Valid range	Acquisition method
a	Language	SB: SBPL settings SZ: SZPL settings SI: SIPL settings SD: SDPL settings ST: STCL settings CA: Common settings (when specifying other than font logo and TrueType fonts)	Two characters fixed acquisition
b	File type	0: Font/logo 1: True Type font 2: Wireless LAN certificate (Wi-Fi Root CA) 3: Wireless LAN certificate (Wi-Fi Private Key) 4: Wireless LAN certificate (Wi-Fi Private Key) 5: Wireless LAN certificate (Wi-Fi EAP_FAST PAC_file) 6: HTTPS certificate	One character fixed acquisition

[Return data format (normal, data exists)]

[STX]a...a,b...b,(c...c)[ETX]

Data example) [STX]xxxx,SBPL_001.dfl, SBPL_002.dfl[ETX]

Symbol	Parameter name	Valid range
a	Total number of data byte *This is the total number of bytes after parameter b. The delimiting comma between parameters a and b, and the ETX are not included.	Data size from the first identifier until before [ETX]
b(c)	File name	

[Return data format (normal, no file)]

[STX]0[ETX]

[Return data format (when a command error occurs)]

[NAK]<15>₁₆

[Exception processing]

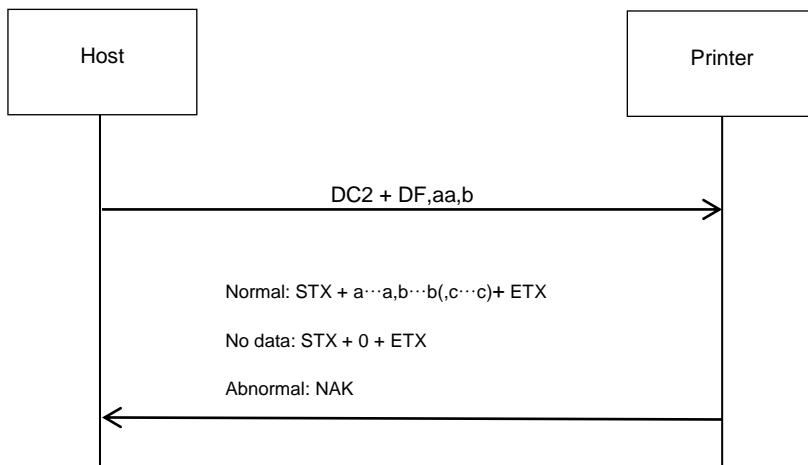
Parameter name	Exception condition	
	A value outside the range is specified	The specified size and received size are different
Language	Command error	Command error
File type	Command error	Invalid receive data

Conditions	Exception condition
When directory of the specified parameter doesn't exist. (Condition: Never registered in the past and so on.)	Command error

Terminology	Description
Command error	The file name list is not returned. The data received after a command error is determined is not considered as a parameter of this command.
Invalid receive data	The subsequent data is ignored.

[Supplemental explanation]

- Send this command when printing has stopped. The content of the response data is not guaranteed even when this command is received during printing.
- When you specify SZPL for "Parameter a: Language", "0:Font/logo", "1:TrueType font" settings of "Parameter b: File type" will be ignored. So all file names registered with SZPL will return.



17.22 Common Commands for All Languages

File Information Acquisition

DC2+DG

Command	DC2	DG	Parameter
HEX code	<12> ₁₆	<44> ₁₆ <47> ₁₆	,aa,b,cccccc,dddddd
Default Value	None		

Valid range and term of command	When turning off the power switch	
	Valid range	
	Printer operation in progress	The command cannot be received during the printer operation. ([NAK] return)
	Error	Commands can be received even if an error is occurring.

[Function]

This command returns the specified file data information.

[Format]

[DC2]DG,aa,b,cccccc,dddddd

[Parameters]

Symbol	Parameter name	Valid range	Acquisition method
a	Language	SB: SBPL settings SZ: SZPL settings SI: SIPL settings SD: SDPL settings ST: STCL settings	Two characters fixed acquisition
b	File type	0: Font/logo 1: True Type font	One character fixed acquisition
c	File name size (byte)	1 to 255	Acquired up to ","
d	File name *1 Only the file name is specified	Data including the following character groups Alphabet Numeral Hyphen ("") Underscore ("_") Period (".")	Acquired up to the file name size

[Return data format (normal, data exists)]

[STX]a...a,b...b[ETX]

Symbol	Parameter name	Valid range
a	Total number of data byte *This is the total number of bytes after parameter b. The delimiting comma between parameters a and b, and the ETX are not included.	Data size from the first identifier until before [ETX]
d	File data	

[Return data format (normal, no data)]

[STX]0[ETX]

[Return data format (when a command error occurs)]

[NAK]<15>₁₆

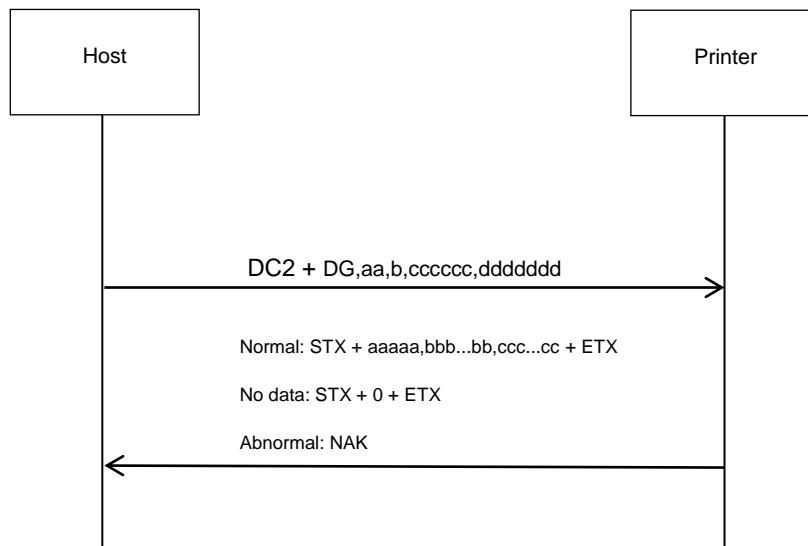
[Exception processing]

Exception condition		
Parameter name	A value outside the range is specified	The specified size and received size are different
Language	Command error	Invalid receive data
File type	Command error	Command error
File name size	Command error	Excessively small: Command error, Excessively large: Remaining data standby
File name	Command error	Excessively small: Remaining data standby, Excessively large: Command error

Terminology	Description
Command error	The file data is not returned. The data received after a command error is determined is not considered as a parameter of this command.
Invalid receive data	The subsequent data is ignored.

[Supplemental explanation]

1. When a file name is bigger than the size of the file name and still the file name is valid, it operates and finishes normally.
2. When you specify SZPL for "Parameter a: Language", "0:Font/logo", "1:TrueType font" settings of "Parameter b: File type" will be ignored.



17.23 Common Commands for All Languages

File Deletion

DC2+DH

Command	DC2	DH	Parameter
HEX code	<12> ₁₆	<44> ₁₆ <48> ₁₆	aa,b,c(,ddddd,eeeeee)
Default Value	None		

Valid range and term of command	When turning off the power switch	
	Valid range	
	Printer operation in progress	The command cannot be received during the printer operation. ([NAK] return)
	Error	Commands can be received even if an error is occurring.

[Function]

This command is used to delete the registered files.

[Format]

[DC2]DH,aa,b,c(,ddddd,eeeeee)

[Parameters]

Symbol	Parameter name	Valid range	Acquisition method
a	Language	SB: SBPL settings SZ: SZPL settings SI: SIPL settings SD: SDPL settings ST: STCL settings	Two characters fixed acquisition
b	File type	0: Font/logo 1: True Type font	One character fixed acquisition
c	Deletion type	0: File specification 1: All files	One character fixed acquisition
d	File name size (byte)	1 to 255	Acquired up to ","
e	File name *1 Only the file name is specified	Data including the following character groups Alphabet Numeral Hyphen ("-") Underscore ("_") Period (".")	Acquired up to the file name size

[Return data format (normal)]

[ACK]<06>₁₆

[Return data format (when a command error occurs)]

[NAK]<15>₁₆

[Exception processing]

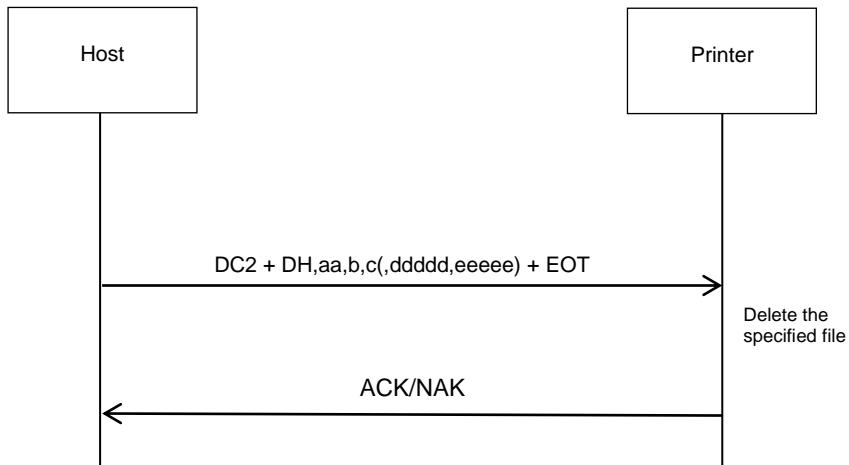
Parameter name	Exception condition	
	A value outside the range is specified	The specified size and received size are different
Language	Command error	Command error
File type	Command error	Command error
Deletion type	Command error	0: Command error 1: Invalid receive data *1
File name size	Command error	Command error
File name	Command error	

*1 Note that all data will be deleted even though subsequent data is not appropriate when specifying deleting all the files.

Terminology	Description
Command error	The file is not deleted. The data received after a command error is determined is not considered as a parameter of this command.
Invalid receive data	The subsequent data is ignored.

[Supplemental explanation]

1. Don't specify the parameter d and e when the parameter c specifies 1 (delete all files). When specified, the parameter d and e are not handled as data of this command.
2. When a file name is bigger than the size of the file name and still the file name is valid, it operates and finishes normally.
3. When you specify SZPL for "Parameter a: Language", "0:Font/logo", "1:TrueType font" settings of "Parameter b: file type" will be ignored. Beware that all files registered with SZPL will be deleted if you specify "1: All files" in "Parameter c: Deletion type"



17. 24 Time Zone List

Time zone name	UTC offset	Cover area
Africa		
Africa/Addis Ababa	+03:00	Addis Ababa (Ethiopia)
Africa/Algiers	+01:00	Alger (Algeria)
Africa/Cairo	+02:00	Egypt
Africa/Cape Town	+02:00	South Africa
Africa/Casablanca	+00:00	Morocco
Africa/Khartoum	+03:00	Sudan
Africa/Lagos	+01:00	Nigeria
Africa/Tripoli	+02:00	Libya
Africa/Tunis	+01:00	Tunisia
Asia		
Asia/Baghdad	+03:00	Iraq
Asia/Bangkok	+07:00	Thai
Asia/Beirut	+02:00	Lebanon
Asia/Brunei	+08:00	Brunei
Asia/Calcutta	+05:30	India
Asia/Dhaka	+06:00	Bangladesh
Asia/Dubai	+04:00	Dubai
Asia/Hong Kong	+08:00	Hong Kong
Asia/Hovd	+07:00	Ubs, Khovd (Mongol)
Asia/Irkutsk	+09:00	Irkutsk Oblast (Russia)
Asia/Jakarta	+07:00	Java, Sumatra (Indonesia)
Asia/Jerusalem	+02:00	Israel
Asia/Kabul	+04:30	Afghanistan
Asia/Karachi	+05:00	Pakistan
Asia/Krasnoyarsk	+08:00	Krasnoyarsk (Russia)
Asia/Kuala Lumpur	+08:00	Malaysia
Asia/Kuwait	+03:00	Kuwait
Asia/Magadan	+12:00	Magadan (Russia), Chisima islands
Asia/Makassar	+08:00	Borneo, Sulawesi, Bali Lesser Sunda, West Timor (Indonesian)
Asia/Manila	+08:00	Philippines
Asia/Novosibirsk	+07:00	Novosibirsk Novosibirsk Oblast (Russia)
Asia/Oral	+05:00	West Kazakhstan Province (Kazakhstan)
Asia/Phnom Penh	+07:00	Cambodia
Asia/Pontianak	+07:00	Borneo (Indonesia)
Asia/Rangoon	+06:30	Myanmar
Asia/Riyadh	+03:00	Saudi Arabia
Asia/Saigon	+07:00	Vietnam
Asia/Seoul	+09:00	Korea
Asia/Shanghai	+08:00	Shanghai
Asia/Singapore	+08:00	Singapore
Asia/Taipei	+08:00	Taiwan
Asia/Tehran	+03:30	Iran
Asia/Tokyo	+09:00	Japan
Asia/Ulaanbaatar	+08:00	Mongol (excluding Ubs, Khovd and Bayan Ologey)
Asia/Vientiane	+07:00	Laos
Asia/Vladivostok	+11:00	Jewish Autonomous Oblast, Khabarovsk region, maritime region Central part of Sakha Republic (Russia)
Asia/Yakutsk	+10:00	Amurskaya oblast, Zabaykal'skiy Kray East part of Sakha Republic (Russia)
Asia/Yekaterinburg	+06:00	Respublika Bashkortostan, Chelyabinsk Oblast, Khantia-Mansiya, Kurgan Oblast, Orenburg Oblast, Perm Krai, Sverdlovsk Oblast, Tyumen Oblast, Yamalo-Nenets Autonomous Okrug (Russia)
Australia		
Australia/Adelaide	+09:30	South Australia
Australia/Brisbane	+10:00	Queensland (Australia)
Australia/Canberra	+10:00	New South Wales (Australia)
Australia/Darwin	+09:30	Darwin (Australia)
Australia/Eucla	+08:45	Eucla (Australia)
Australia/Hobart	+10:00	Hobart (Australia)
Australia/Melbourne	+10:00	Melbourne (Australia)
Australia/Perth	+08:00	Perth (Australia)
Australia/Sydney	+10:00	New South Wales (Australia)

Time zone name	UTC offset	Cover area
Caribbean		
Caribbean/Havana	-05:00	Cuba
Caribbean/Kingston	-05:00	Jamaica
Caribbean/Nassau	-05:00	Bahamas
Caribbean/Port-au-Prince	-05:00	Haiti
Caribbean/San Juan	-04:00	San Juan (Argentina)
Caribbean/Santo Domingo	-04:00	Dominica
Central America		
Central America/Belmopan	-06:00	Belize
Central America/Guatemala	-06:00	Guatemala
Central America/Managua	-06:00	Nicaragua
Central America/Panama	-05:00	Panama
Central America/San Jose	-06:00	San Jose (America)
Central America/San Salvador	-06:00	El Salvador
Central America/Tegucigalpa	-06:00	Honduras
EUROPE		
Europe/Amsterdam	+01:00	Holland
Europe/Andorra	+01:00	Andorra
Europe/Athens	+02:00	Greek
Europe/Belfast	+00:00	The United Kingdom
Europe/Belgrade	+01:00	Serbia
Europe/Berlin	+01:00	Germany
Europe/Bratislava	+01:00	Czech
Europe/Brussels	+01:00	Belgium
Europe/Bucharest	+02:00	Rumania
Europe/Budapest	+01:00	Hungary
Europe/Busingen	+01:00	Busingen (Germany)
Europe/Chisinau	+02:00	Moldova
Europe/Copenhagen	+01:00	Denmark
Europe/Dublin	+00:00	Ireland
Europe/Gibraltar	+01:00	Gibraltar (The United Kingdom)
Europe/Gothenburg	+01:00	Sweden
Europe/Guernsey	+00:00	The United Kingdom
Europe/Helsinki	+02:00	Finland
Europe/Isle Of Man	+00:00	The United Kingdom
Europe/Istanbul	+02:00	Turkey
Europe/Jersey	+00:00	The United Kingdom
Europe/Kaliningrad	+03:00	Kaliningrad (Russia)
Europe/Kiev	+02:00	Ukrayina
Europe/Lisbon	+00:00	Portugal
Europe/Ljubljana	+01:00	Slovenia
Europe/London	+00:00	The United Kingdom
Europe/Luxembourg	+01:00	Luxembourg
Europe/Madrid	+01:00	Spain
Europe/Malta	+01:00	Malta
Europe/Mariehamn	+02:00	Finland
Europe/Minsk	+03:00	Belarus
Europe/Monaco	+01:00	Monaco
Europe/Moscow	+04:00	European Russia (Russia)
Europe/Nicosia	+02:00	Cyprus
Europe/Oslo	+01:00	Norway
Europe/Paris	+01:00	France
Europe/Podgorica	+01:00	Serbia
Europe/Prague	+01:00	Czech
Europe/Reykjavik	+00:00	Iceland
Europe/Riga	+02:00	Latvia
Europe/Rome	+01:00	Italy
Europe/Samara	+04:00	Samara, Udmurtskaya (Russia)
Europe/San Marino	+01:00	Italy
Europe/Sarajevo	+01:00	Serbia
Europe/Simferopol	+02:00	Ukrayina
Europe/Skopje	+01:00	Serbia
Europe/Sofia	+02:00	Bulgaria
Europe/Stockholm	+01:00	Sweden
Europe/Tallinn	+02:00	Estonia
Europe/Tirane	+01:00	Albania
Europe/Tiraspol	+02:00	Moldova
Europe/Torshavn	+00:00	Torshavn (Denmark)
Europe/Uzhgorod	+02:00	Ukrayina
Europe/Vaduz	+01:00	Liechtenstein

Time zone name	UTC offset	Cover area
Europe/Vatican	+01:00	Italy
Europe/Vienna	+01:00	Austria
Europe/Vilnius	+02:00	Lithuania
Europe/Volgograd	+04:00	Kirov, SaratovVolgograd Oblast, Astrakhan Oblast (Russia)
Europe/Warsaw	+01:00	Poland
Europe/Zagreb	+01:00	Serbia
Europe/Zaporozhye	+02:00	Ukrayina
Europe/Zurich	+01:00	Swiss
North America		
North America/Alaska	-09:00	Alaska (America)
North America/Aleutian	-10:00	Aleutian Islands (America)
North America/Arizona	-07:00	Arizona (America)
North America/Central	-06:00	Canada, America, Mexico
North America/Danmarkshavn	+00:00	Greenland (Denmark)
North America/East-Indiana	-05:00	Indiana (America)
North America/Eastern	-05:00	Canada, America, Mexico
North America/Edmonton	-07:00	Alberta (Canada)
North America/Halifax	-04:00	Nova Scotia (Canada)
North America/Hawaii	-10:00	Hawaii (America)
North America/Indiana-Starke	-06:00	Stark county (America)
North America/Ittoqqortoormiit	-01:00	Ittoqqortoormiit (Denmark)
North America/Mexico City	-06:00	Mexico
North America/Michigan	-05:00	Michigan (America)
North America/Montreal	-05:00	Quebec (Canada)
North America/Mountain	-07:00	Canada, America, Mexico
North America/Nuuk	-03:00	(Denmark)
North America/Pacific	-08:00	Canada, America, Mexico
North America/Qaanaaq	-04:00	(Denmark)
North America/Samoa	-11:00	Samoa
North America/St Johns	-03:30	Newfoundland, Labrador (Canada)
North America/Toronto	-05:00	Ontario (Canada)
North America/Vancouver	-08:00	British Columbia (Canada)
North America/Winnipeg	-06:00	Manitoba (Canada)
Pacific		
Pacific/Auckland	+12:00	New Zealand
Pacific/Port Moresby	+10:00	Papua New Guinea
South America		
South America/Asuncion	-04:00	Paraguay
South America/Bogota	-05:00	Colombia
South America/Buenos Aires	-03:00	Argentine
South America/Caracas	-04:30	Venezuela
South America/Guayaquil	-05:00	Ecuador
South America/La Paz	-04:00	Bolivia
South America/Lima	-05:00	Peru
South America/Manaus	-04:00	Amazon (Brazil)
South America/Montevideo	-03:00	Uruguay
South America/Port of Spain	-04:00	Trinidad, Tobago
South America/Santiago	-04:00	Chile
South America/Sao_Paulo	-03:00	Brazil

Part 2 Interface Specification

1 Overview

1.1 Overview

The CL4NX printer has two types of interfaces: a built-in interface on the printer to communicate data with host, and an external signal interface to connect printers and peripheral devices with.

The printer has the following built-in interfaces.

- 1) USB interface (USB2.0 High speed, type A connector/type B connector)
- 2) LAN interface (10BASE-T/100BASE-TX auto-detecting, RJ45 connector)
- 3) RS-232Cinterface (DB9pin (female terminal))
- 4) IEEE1284 interface (communication mode: ECP mode/compatible, amphenol 36 pin)
- 5) External signal interface (amphenol 14 pins)
- 6) Bluetooth interface (Ver.3.0 + EDR Class 2)

The following interfaces are optional.

- 1) Wireless LAN unit (802.11a/b/g/n)

1.2 Combination of Interfaces

The interfaces can have the combinations shown in the table below.

		CONT PCB		KB PCB		IF (COMBO) PCB			Optional PCB
		USB	LAN	Bluetooth	NFC	RS-232C	IEEE1284	EXT	Wireless LAN
CONT PCB	USB	X	O	O	O	O	O	O	O
	LAN	O	X	O	O	O	O	O	△
KB PCB	Bluetooth	O	O	X	O	O	O	O	O
	NFC	O	O	O	X	O	O	O	O
IF PCB (COMBO)	RS-232C	O	O	O	O	X	O	O	O
	IEEE1284	O	O	O	O	O	X	O	O
	EXT	O	O	O	O	O	O	X	O
Optional PCB	Wireless LAN	O	△	O	O	O	O	O	X

[○: configurable, X: not configurable]

[Note]

LAN and WLAN cannot be used together, but LAN or WLAN is selectable from LCD. For details, refer to 6.14 Switching LAN and WLAN.

2 Communication Protocols

2.1 Communication protocols and Receive Mode

The receive mode that can be used on the printer differs depending on the combination of interface and communication protocol.

1. Multiple receive mode

Enabling receiving data up to buffer near full size during printing.

2. Bidirectional communication (Status 3, Status 4, Status 5)

Monitoring printer status and perform data communication.

3. Unidirectional communication (READY/BUSY)

Data communication is controlled by the hardware.

Refer to each interface section for details on READY/BUSY, XON/XOFF, Status 3, Status 4 and Status 5.

Available communication protocol is as follows.

Interface Communication Protocol	RS-232C	IEEE1284	USB	LAN	Bluetooth	Wireless LAN (optional)
Multiple receive Unidirectional communication	×	○	×	×	×	×
READY/BUSY Multiple receive Unidirectional communication	○	×	×	×	×	×
XON/XOFF Multiple receive Bidirectional communication	○	×	×	×	×	×
Status 3 Multiple receive Bidirectional communication	○	×	×	○	○	○
Status 4 Multiple receive Bidirectional communication	○	○	○	○	○	○
Status 5 Multiple receive Bidirectional communication	○	○	○	○	×	○

[○: available, × : not available]

2.2 Return Status

Purpose of return status is to control the printer status from the host, and the printer returns the status after receiving the status request command.

There are three types of return status; STATUS 3, STATUS 4, and STATUS 5. The return status is as follows.
The printer returns the status after receiving the status request command.

Communication Protocol	Command	Command name	Note
READY/BUSY	—	—	
XON/XOFF	—	—	
Status 3	ENQ	Status request command	
	CAN	Cancel request command	
Status 4	ENQ	Status request command	
	CAN	Cancel request command	
	DLE	Print pause request command	
	DC1	Print resume request command	
Status 5	SOH + ENQ	Status request command	
	SOH + CAN	Cancel request command	
	SOH + DLE	Print pause request command	
	SOH + DC1	Print resume request command	

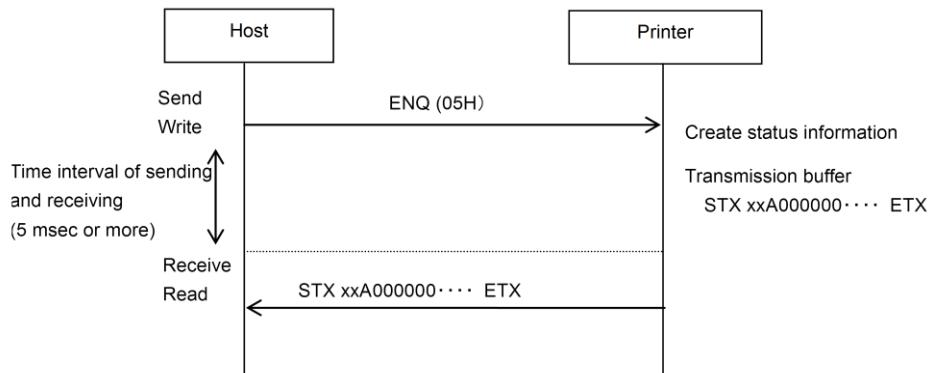
* In status 3 and 4, the printer processes the command for ESC+ENQ and ESC+CAN and then returns the status, however, for ESC+DLE and ESC+DC1, the printer neither processes the command, nor returns the status.

[Note]

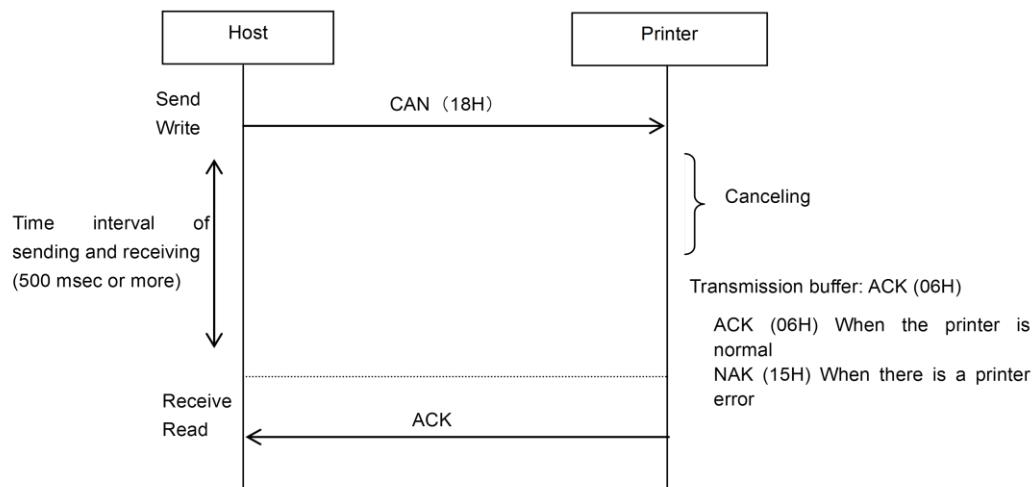
In order to obtain return status from the printer, insert the time interval of sending and receiving after sending each command to the printer.

Command	Command name	Time interval of sending and receiving (performance)
ENQ (05H)	Status request	5 msec or more * In case of wireless LAN, 300 msec or more
CAN (18H)	Cancel request	
DLE (10H)	Print pause request	500 msec or more
DC1 (11H)	Print resume request	

(1) ENQ (Status request)



(2) CAN (Cancel request)



The values stated above are reference of waiting time until the printer confirms the ACK return. Actual value varies depending on the type of interface, settings and the conditions.

Guideline of send and receive time interval of cancel request at buffer near full is more than 900 msec.

2.2.1 Return status of status 3

The printer returns the printer's status and reply as the status by receiving 3 types of request commands and print command with this communication protocol.

The details of each request command and return status are as follows.

1) Status request command

The printer returns the job ID number of receive data that is currently printing, the printer status and the number of remaining labels to print to the host by receiving this command. When the print is completed or when there is no receive data, the printer returns print quantity of all "0" (HEX 30H). If the command Job ID Number <ID> is not specified, the ID number returns space (HEX 20H).

Avoid sending ENQ while sending the print data (STX <A> - <Z> ETX). This may cause return status error or print error.

(1) Command ENQ (HEX 05H)

STX (HEX 02H)

(2) Return status format

ETX (HEX 03H)

When Legacy Status setting for Port 3 is invalid 0

STX 1byte 02H	ID number 5bytes	Status 1byte	No. of remaining labels 6bytes	ETX 1byte 03H
(Total:11 bytes)				

From 000000 to 999999
Set the job ID number by specifying the job ID number <ID> specified between ESC <A> and ESC <Z>. If there are several received data items, Set the job ID number of the received data item that is currently being printed.

When Legacy Status setting for Port 3 is invalid

Size 4bytes 000000BH	STX 1byte	ID number 5bytes	Status 1byte	No. of remaining labels 6bytes	ETX 1byte
(Total:15bytes)					

From 000000 to 999999
Set the job ID number by specifying the job ID number <ID> specified between ESC <A> and ESC <Z>. If there are several received data items, Set the job ID number of the received data item that is currently being printed.

(3) Status list

		DESCRIPTION	ASCII	HEX
OFFLINE STATE	NO ERROR		0	30
	RIBBON NEAR END		1	31
	BUFFER NEAR FULL		2	32
	RIBBON NEAR END & BUFFER NEAR FULL		3	33
	(NOT USED) BATTERY NEAR END		4	34
	(NOT USED) BATTERY NEAR END & RIBBON NEAR END		5	35
	(NOT USED) BATTERY NEAR END & BUFFER NEAR FULL		6	36
	((NOT USED) BATTERY NEAR END & RIBBON NEAR END & BUFFER NEAR FULL		7	37
ONLINE STATE	NO ERROR		A	41
	RIBBON NEAR END		B	42
	BUFFER NEAR FULL		C	43
	RIBBON NEAR END & BUFFER NEAR FULL		D	44
	(NOT USED) BATTERY NEAR END		!	21
	(NOT USED) BATTERY NEAR END & RIBBON NEAR END		"	22
	(NOT USED) BATTERY NEAR END & BUFFER NEAR FULL		#	23
	(NOT USED) BATTERY NEAR END & RIBBON NEAR END & BUFFER NEAR FULL		\$	24
	NO ERROR		G	47
	RIBBON NEAR END		H	48
WAIT TO RECEIVE	BUFFER NEAR FULL		I	49
	RIBBON NEAR END & BUFFER NEAR FULL		J	4A
	(NOT USED) BATTERY NEAR END		%	25
	(NOT USED) BATTERY NEAR END & RIBBON NEAR END		&	26
	(NOT USED) BATTERY NEAR END & BUFFER NEAR FULL		'	27
	(NOT USED) BATTERY NEAR END & RIBBON NEAR END & BUFFER NEAR FULL		(28
	NO ERROR		M	4D
	RIBBON NEAR END		N	4E
PRINTING	BUFFER NEAR FULL		O	4F
	RIBBON NEAR END & BUFFER NEAR FULL		P	50
	(NOT USED) BATTERY NEAR END)	29
	(NOT USED) BATTERY NEAR END & RIBBON NEAR END		*	2A
	(NOT USED) BATTERY NEAR END & BUFFER NEAR FULL		+	2B
	(NOT USED) BATTERY NEAR END & RIBBON NEAR END & BUFFER NEAR FULL		,	2C
	NO ERROR		S	53
	RIBBON NEAR END		T	54
STANDBY (Waiting for dispenser/cut)	BUFFER NEAR FULL		U	55
	RIBBON NEAR END & BUFFER NEAR FULL		V	56
	(NOT USED) BATTERY NEAR END		-	2D
	(NOT USED) BATTERY NEAR END & RIBBON NEAR END		.	2E
	(NOT USED) BATTERY NEAR END & BUFFER NEAR FULL		/	2F
	(NOT USED) BATTERY NEAR END & RIBBON NEAR END & BUFFER NEAR FULL		@	40
	NO ERROR			
	RIBBON NEAR END			
ANALYZING/ EDITING	BUFFER NEAR FULL			
	RIBBON NEAR END & BUFFER NEAR FULL			
	(NOT USED) BATTERY NEAR END			
	(NOT USED) BATTERY NEAR END & RIBBON NEAR END			
	(NOT USED) BATTERY NEAR END & BUFFER NEAR FULL			
	(NOT USED) BATTERY NEAR END & RIBBON NEAR END & BUFFER NEAR FULL			
	NO ERROR			
	RIBBON NEAR END			
ERROR DETECTION	BUFFER OVER*1		a	61
	HEAD OPEN		b	62
	PAPER END		c	63
	RIBBON END		d	64
	MEDIA ERROR		e	65
	SENSOR ERROR		f	66
	BARCODE READ/MATCHING ERROR		f	66
	BARCODE READER CONNECTION CHECK ERROR		f	66
	HEAD ERROR		g	67
	(NOT USED) COVER OPEN		h	68
	CUTTER OPEN ERROR		h	68
	(NOT USED) RIBBON CORE NON-LOCK ERROR		h	68
	CARD ERROR		i	69
	CUTTER ERROR		j	6A
	OTHER ERRORS		k	6B
	(NOT USED) CUTTER SENSOR ERROR		l	6C
	(NOT USED) STACKER OR REWINDER FULL WINDER FULL		m	6D
	RFID TAG ERROR		o	6F
	RFID PROTECT ERROR		p	70
	(NOT USED) BATTERY ERROR		q	71

Depending on the timing of analysis/editing, print quantity will not be set up properly

Depending on the timing of analysis/editing, print quantity may not be set up properly

*1 Occurring of buffer over depends on the interfaces

RS-232C	USB	LAN	Wireless LAN	Bluetooth	IEEE1284
○	×	×	×	×	×

[○: Interface that buffer-over occurs, ×: Interface that buffer-over doesn't occur]

2) Cancel request command

This command enables to cancel print jobs and to clear the entire contents of receive buffer.

The printer returns the printer status of after completion of current process.

*When the cancel request command has sent, wait more than 500 msec before sending the next data.

*This command shall not be used during sending printer data and other data.

(1) Command CAN (HEX 18H)

(2) Return status list

Return status	Description
ACK (HEX 06H)	No error in the printer
NAK (HEX 15H)	Error in the printer

3) Print Command

The printer starts printing by receiving the print command (STX <A> ~<Z> ETX).

The printer returns the printer status after receiving process is completed.

(1) Return status list (Printer status)

RS-232C or Bluetooth

Return status	Description
ACK (HEX 06H)	No error in the printer
NAK (HEX 15H)	Error in the printer

*In version after 1.8.0, Printer returns ACK not NAK when it is in Sleep mode and Wake Up mode.

Except RS-232C and Bluetooth

Return status	Description
None	Not return status

Example of the job ID number command <ID>

```
<A>
<ID>01
<V>100<H>100<P>2<L>0202<X20>,ABC
<Q>1
<Z>
```

Refer to the "Command Specification" for the details of job ID number command <ID>.

2.2.2 Return status of status 4

The printer returns its status and reply as the status upon receiving four types of request commands and print command with this communication protocol.

Details of request commands and return status are described below.

1) Status request command

The printer returns the job ID number of receive data that is currently printing, the printer status and the number of remaining labels to print to the host by receiving this command. When the print is completed or when there is no receive data, the printer returns print quantity of all "0" (HEX 30H). If the command for the designation of job ID number <ID> is not specified, the printer returns the space (HEX 20H) as the ID number.

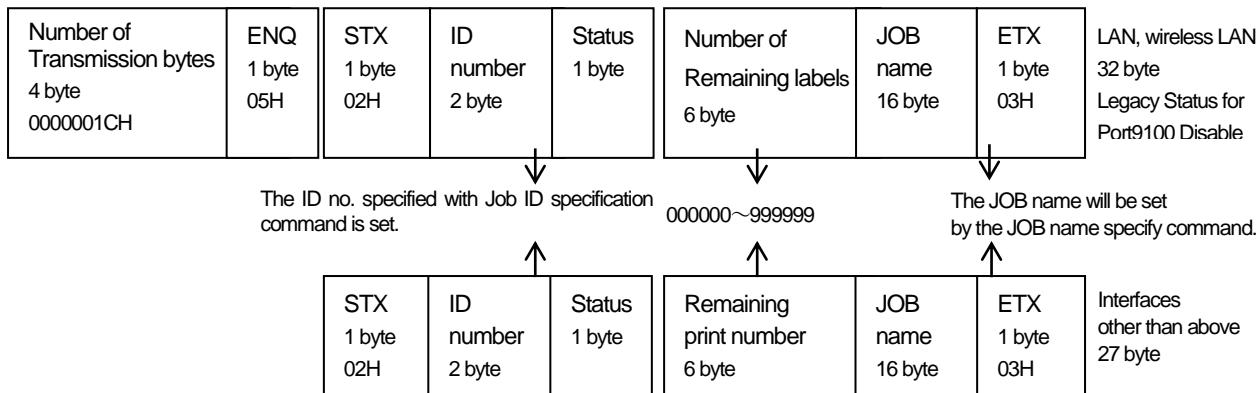
Avoid sending ENQ while sending the print data (STX <A> - <Z> ETX). This may cause return status error or print error.

(1) Command ENQ (HEX 05H)

(2) Return status format

LAN, Wireless LAN 36 bytes LAN
Legacy Status setting is valid.

Number of transmission bytes 4 bytes 00000020H	Number of transmission bytes 4 bytes 0000001CH	ENQ 1byte 05H	STX 1byte 02H	ID No. 2bytes	Status 1byte	No. of Remaining labels 6bytes	JOB name 16bytes	ETX 1byte 03H
--	--	---------------------	---------------------	------------------	-----------------	-----------------------------------	---------------------	---------------------



(3) Return status list

		DESCRIPTION	ASCII	HEX
OFFLINE STATE	NO ERROR		0	30
	RIBBON NEAR END		1	31
	BUFFER NEAR FULL		2	32
	RIBBON NEAR END & BUFFER NEAR FULL		3	33
	PRINT HALT (NO ERROR)		4	34
	(NOT USED) BATTERY NEAR END		5	35
	(NOT USED) BATTERY NEAR END & RIBBON NEAR END		6	36
	(NOT USED) BATTERY NEAR END & BUFFER NEAR FULL		7	37
	(NOT USED) BATTERY NEAR END & RIBBON NEAR END&BUFFER NEAR FULL		8	38
ONLINE STATE	NO ERROR		A	41
	RIBBON NEAR END		B	42
	BUFFER NEAR FULL		C	43
	RIBBON NEAR END & BUFFER NEAR FULL		D	44
	PRINT HALT (NO ERROR)		E	45
	(NOT USED) BATTERY NEAR END		!	21
	(NOT USED) BATTERY NEAR END & RIBBON NEAR END		"	22
	(NOT USED) BATTERY NEAR END & BUFFER NEAR FULL		#	23
	(NOT USED) BATTERY NEAR END & RIBBON NEAR END &BUFFER NEAR FULL		\$	24
	NO ERROR		G	47
WAIT TO RECEIVE	RIBBON NEAR END		H	48
	BUFFER NEAR FULL		I	49
	RIBBON NEAR END & BUFFER NEAR FULL		J	4A
	PRINT HALT (NO ERROR)		K	4B
	(NOT USED) BATTERY NEAR END		%	25
	(NOT USED) BATTERY NEAR END & RIBBON NEAR END		&	26
	(NOT USED) BATTERY NEAR END & BUFFER NEAR FULL		'	27
	(NOT USED) BATTERY NEAR END & RIBBON NEAR END &BUFFER NEAR FULL		(28
	NO ERROR		M	4D
PRINTING	RIBBON NEAR END		N	4E
	BUFFER NEAR FULL		O	4F
	RIBBON NEAR END & BUFFER NEAR FULL		P	50
	PRINT HALT (NO ERROR)		Q	51
	(NOT USED) BATTERY NEAR END)	29
	(NOT USED) BATTERY NEAR END & RIBBON NEAR END		*	2A
	(NOT USED) BATTERY NEAR END & BUFFER NEAR FULL		+	2B
	(NOT USED) BATTERY NEAR END & RIBBON NEAR END &BUFFER NEAR FULL		,	2C
	NO ERROR		S	53
STANDBY (Waiting for dispenser/cutter)	RIBBON NEAR END		T	54
	BUFFER NEAR FULL		U	55
	RIBBON NEAR END & BUFFER NEAR FULL		V	56
	PRINT HALT (NO ERROR)		W	57
	(NOT USED) BATTERY NEAR END		-	2D
	(NOT USED) BATTERY NEAR END & RIBBON NEAR END		.	2E
	(NOT USED) BATTERY NEAR END & BUFFER NEAR FULL		/	2F
	(NOT USED) BATTERY NEAR END & RIBBON NEAR END &BUFFER NEAR FULL		@	40
	HEAD OPEN		b	62
ANALYZING/ EDITING	PAPER END		c	63
	RIBBON END		d	64
	MEDIA ERROR		e	65
	SENSOR ERROR		f	66
	BARCODE READ/MATCHING ERROR		f	66
	BARCODE READER CONNECTION CHECK ERROR		f	66
	HEAD ERROR		g	67
	(NOT USED) COVER OPEN		h	68
	CUTTER OPEN ERROR		h	68
	(NOT USED) RIBBON CORE NON-LOCK ERROR		h	68
	CARD ERROR		i	69
	CUTTER ERROR		j	6A
	OTHER ERRORS		k	6B
	(NOT USED) CUTTER SENSOR ERROR		l	6C
	(NOT USED) STACKER OR REWINDER FULL WINDER FULL		m	6D
	RFID TAG ERROR		o	6F
	RFID PROTECT ERROR		p	70
	(NOT USED) BATTERY ERROR		q	71
Error detection	HEAD OPEN		b	62
	PAPER END		c	63
	RIBBON END		d	64
	MEDIA ERROR		e	65
	SENSOR ERROR		f	66
	BARCODE READ/MATCHING ERROR		f	66
	BARCODE READER CONNECTION CHECK ERROR		f	66
	HEAD ERROR		g	67
	(NOT USED) COVER OPEN		h	68
	CUTTER OPEN ERROR		h	68
	(NOT USED) RIBBON CORE NON-LOCK ERROR		h	68
	CARD ERROR		i	69
	CUTTER ERROR		j	6A
	OTHER ERRORS		k	6B
	(NOT USED) CUTTER SENSOR ERROR		l	6C
	(NOT USED) STACKER OR REWINDER FULL WINDER FULL		m	6D
	RFID TAG ERROR		o	6F
	RFID PROTECT ERROR		p	70
	(NOT USED) BATTERY ERROR		q	71

Depending on the timing of analysis/editing, print quantity will not be set up properly

*1 Buffer over may occur depending on interface

RS-232C	USB	LAN	Wireless LAN	Bluetooth	IEEE1284
○	×	×	×	×	×

[o: Interface that buffer-over occurs, x: Interface that buffer-over doesn't occur]

- **Cause of receive buffer near full**

Buffer near full occurs when remaining capacity of receive buffer (2.95MB) becomes 0.95 MB.

- **Factors to release receive buffer near full**

Receive buffer near full is released when remaining capacity of the receive buffer becomes 1.95 MB or more.

2) Cancel request command

This command enables to cancel print jobs and to clear the entire contents of receive buffer.

The printer returns the printer status of after completion of current process.

*When the cancel request command has sent, wait more than 500 msec before sending the next data.

Do not send cancel request command within STX <A>~<Z> ETX. CAN (cancel request) may not be send correctly.

(1) Command CAN (HEX 18H)

(2) Return status list

Return Status	Description
ACK (HEX 06H)	No error in the printer
NAK (HEX 15H)	Error in the printer

*In the case of LAN / wireless LAN interface, ACK hexadecimal 0000000106H, NAK will be hexadecimal 0000000115H on the condition that Legacy status is invalid.

3) Print Command

Print command (<A>~<Z>) starts the printing process.

The printer returns the printer status after receiving process is completed.

(1) Return status list

RS-232C or Bluetooth

Return Status	Description
ACK (HEX 06H)	No error in the printer
NAK (HEX 15H)	Error in the printer

*In version after 1.6.4, Printer returns ACK not NAK when it is in Sleep mode and Wake Up mode.

Except RS-232C and Bluetooth

Return Status	Description
None	Not return status

4) Print pause request command

This command stops the printing process.

The printer returns the printer status after receiving process is completed.

(1) Command DLE (HEX 10H)

(2) Return status list

Return Status	Description
ACK (HEX 06H)	No error in the printer
NAK (HEX 15H)	Error in the printer

* In the case of LAN / wireless LAN interface, ACK hexadecimal 0000000106H, NAK will be hexadecimal 0000000115H

Do not send print pause request command within STX <A>~<Z> ETX. DLE (print pause request) may not be send correctly. DLE (print pause request) in font data, graphics data and barcode data will not be processed.

5) Print resume request command

This command enables to release the print pause and resume printing.

The printer returns the printer status after receiving process is completed.

(1) Command DC1 (HEX 11H)

(2) Return status list

Return Status	Description
ACK (HEX 06H)	No error in the printer
NAK (HEX 15H)	Error in the printer

* In the case of LAN / wireless LAN interface, ACK hexadecimal 0000000106H, NAK will be hexadecimal 0000000115H.

2.2.3 Return status of status 5

The functions in this communication protocol are as follows.

1) Data transmission format

- (1) Control commands such as print data, status request, cancel request and so on need to be within STX (HEX 02H) and ETX (HEX 03H).
* No need to add STX (HEX 02H) and ETX (HEX 03H) for setting data.
- (2) Item No. should be added to the print data.
- (3) When BCC check function is enabled, it is necessary to put BCC at the end of item (<Z>).
However, there is no need for putting BCC at the end of information acquiring command such as status request.

Examples)

Print Data

STX	<A>	Print Data	<Z>	BCC	ETX
-----	-----	------------	-----	-----	-----

Status request

STX 1 byte 02H	SOH 1 byte 01H	ENQ 1 byte 05H	Item number 00000~99999 or *****	ETX 1 byte 05H
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2) Item Status Request Command

Upon receive of this command, the printer will search the specified item No. from the end of the history buffer, and return the status of appropriate item.

[Command]

SOH (HEX 01H) + ENQ (HEX 05H)

[Format]

STX + SOH + ENQ + aaaaa + ETX

Parameter

a "Item No." Valid range: 00000 to 99999

1. The parameter should be always 5 digits.
2. The parameter "*" is "HEX 2AH".
3. The item number is used for compatibility with the conventional models, and the specification of the item number is ignored.
Always the status of the last item is returned.

[Return status format] (Legacy Status setting is valid with LAN/Wireless LAN, Other I/F)

[1] STX 02H	[5] Specified item No. *1	[2] Specified item status *1	[5] Item No.in process	[2] Item status in process *2	[6] Print quantity of item in process	[1] ETX 03H
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LAN/W-LAN Legacy Status for Port9100 Enable

[4] Size	[1] STX 02H	[5] Specified item No. *1	[2] Specified item status *1	[5] Item No.in process	[2] Item status in process *2	[6] Print quantity of item in process	[1] ETX 03H
-------------	-------------------	------------------------------------	---------------------------------------	------------------------------	--	---	-------------------

Number in [] shows number of byte, and return status format consists of 22 byte (fix). Item No. is filled by "0".
Item No. in process becomes space (20H) when print completed.

*1 Specified item number is ***** (0xA2A2A2A2A2A) and the last item status is fixed ** (0xA2A).

*2 The first digit is the status and the second digit is the error in the currently processed item status.

The below is the currently processed item status list.

Digit position	Description	ASCII	HEX
1	Offline	0	30
	Online, waiting for receive	1	31
	Online, printing	2	32
	Online, standby (waiting for dispensing)	3	33
	Online, analyzing/editing	4	34
	* The "number of currently processed item" may not be set due to the timing.		
	Error	5	35
	Print pause (when received DLE command)	6	36

Off line	Description	ASCII	HEX
2	No error	0	30
	Ribbon near end	1	31
	Buffer near full	2	32
	Ribbon near end & Buffer near full	3	33
	Label near end	4	34
	Label near end & Ribbon near end	5	35
	Label near end & Buffer near full	6	36
	Label near end & Ribbon near end & Buffer near full	7	37
	Machine error	A	41
	Flash ROM error	B	42
	Head open	C	43
	Paper end	D	44
	Ribbon end	E	45
	Sensor error	F	46
	Head error	G	47
	Memory read/write error (Cartridge read/write error)	H	48
	Memory full(Cartridge full)	I	49
	Cutter error	J	4A
	Calendar error	K	4B
	Kanji data error (Kanji ROM error)	L	4C
	(Not used) Internal rewinder full	M	4D
	(Not used) Cutter bracket open error	N	4E
	RFID tag error	O	4F
	RFID protect error	P	50
	BCC error	Q	51
	(Not used) Item No. error	R	52
	Media error	S	53
	(Not used) Ribbon winding non lock error	T	54
	Other error	U	55
	(Not used) Cover open	V	56
	Barcode read/matching error	V	56
	Barcode reader connection check error	W	57

[Examples]

- (1) STX SOH ENQ 00001 ETX
- (2) STX SOH ENQ ***** ETX

[Supplemental explanation]

- 1. This command shall not be used during sending other data such as print data. The status may not be returned or print may not be finished correctly when sending this command during print data sending.
- 2. The printer returns the current status after receiving this command.

3) BCC check function

BCC (Block Check Code) is 1 byte data that is a result of calculation of XOR for one item of send data ($<A>\sim<Z>$). When sending a data to the printer from the host, you need to put BCC at the end of data (following to $<Z>$) of every items.

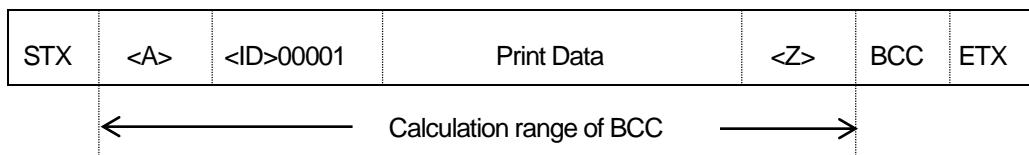
The printer calculates the BCC of every items of received data and checks the validity of the received data by comparing it with the BCC in the received data. When the calculated BCC is not the same as the BCC in the received data, the printer judges the data is incorrect, arises BCC error and stops printing.

There are 3 ways to release the BCC error.

Press the right soft button	The printer will resume the printing from the print data with the BCC error.
Send SUB command	The printer will resume the printing after releasing the BCC error. Upon reception of this command, it is possible to select if you want to print or cancel the data with the error.
Press the left soft button	The printer will cancel the entire print data and resume the printing from the next print data.

Calculation range of BCC

Print Data



[Supplemental explanation]

1. The BCC check is targeted only for the print data. Data without printing such as register data or printer setting commands are not targeted.
2. The data within $<A>\sim<Z>$ is the calculation range of the BCC.
3. BCC will be calculated by using exclusive OR to the data in the calculation range.

4) Cancel request command

The printer cancels all items upon receiving this command.

[Command]

SOH (HEX 01H) + CAN (HEX 18H)

[Format]

STX + SOH + CAN + aaaaa + ETX

•Parameter

a	"Item No."	Valid range:	00000 - 99999
---	------------	--------------	---------------

1. The parameter should be always 5 digits.
2. The parameter "*" is "HEX 2AH".
3. Regardless of the item number, all items are canceled.

[Examples]

- (1) STX SOH CAN 00001 ETX
- (2) STX SOH CAN ***** ETX

[Supplemental explanation]

1. This command shall not be used during sending other data such as print data.
2. There is no returned data to the command.

To check the result of the command, you need to send item status request command (SOH + ENQ).

5) Print pause request command

This command stops the printing process.

[Command]

SOH (HEX 01H) + DLE (HEX 10H)

[Format]

STX + SOH + DLE + ETX

[Examples]

STX SOHDLE ETX

[Supplemental explanation]

1. This command shall not be used during sending other data such as print data.
2. There is no returned data to the command.

To check the result of the command, you need to send item status request command (SOH + ENQ).

6) Print resume request command

Upon receive of this command, the printer release the print pause status specified by the print pause request command (SOH + DLE) and resume printing process.

[Command]

SOH (HEX 01H) + DC1 (HEX 11H)

[Format]

STX + SOH + DC1 + ETX

[Examples]

STX SOH DC1 ETX

[Supplemental explanation]

1. This command shall not be used during sending other data such as print data.
2. There is no returned data to the command. To check the result of the command, you need to send item status request command (SOH + ENQ).

7) Error release request command in status 5

Upon receive of this command, the printer releases the item No. error or BCC error, and resume printing from the item with the error.

[Command]

SOH (HEX 01H) + SUB (HEX 1AH)

[Format]

STX + SOH + SUB + a + ETX
a "Release" 0: Cancel the data with error
1: print the data with error

[Examples]

STX SOH SUB 0 ETX

[Supplemental explanation]

1. This command shall not be included in the print data (<A>~<Z>).
2. There is no returned data to the command. To check the result of the command, you need to send item status request command (SOH + ENQ).

2.3 REDY/BUSY

In this protocol, print data is controlled by hardware signal only without software procedures.
Refer to "3 RS-232C" for details.

2.4 XON/XOFF

This communication protocol tells printer status if it can receive any data or not to the host by sending "XON" (HEX 11H) or "XOFF" (HEX 13H) to the signal line.
Refer to "3 RS-232C" for details.

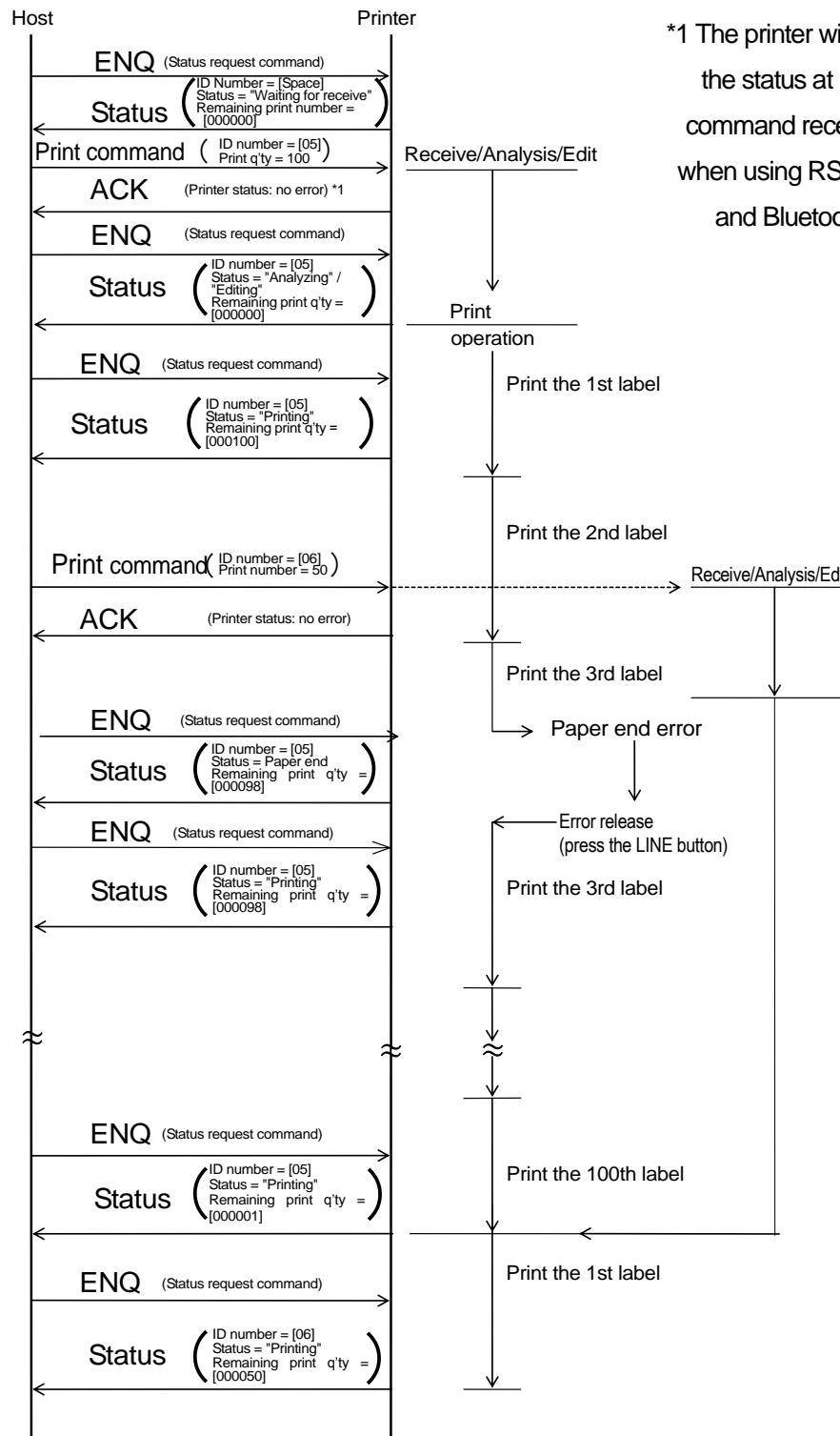
2.5 Status 3

This communication protocol returns the status corresponding to the request command from the host computer so that the host computer can control printer status.
Refer to [12.42.2.1 Return status of status 3] for details of the request command and the return status.

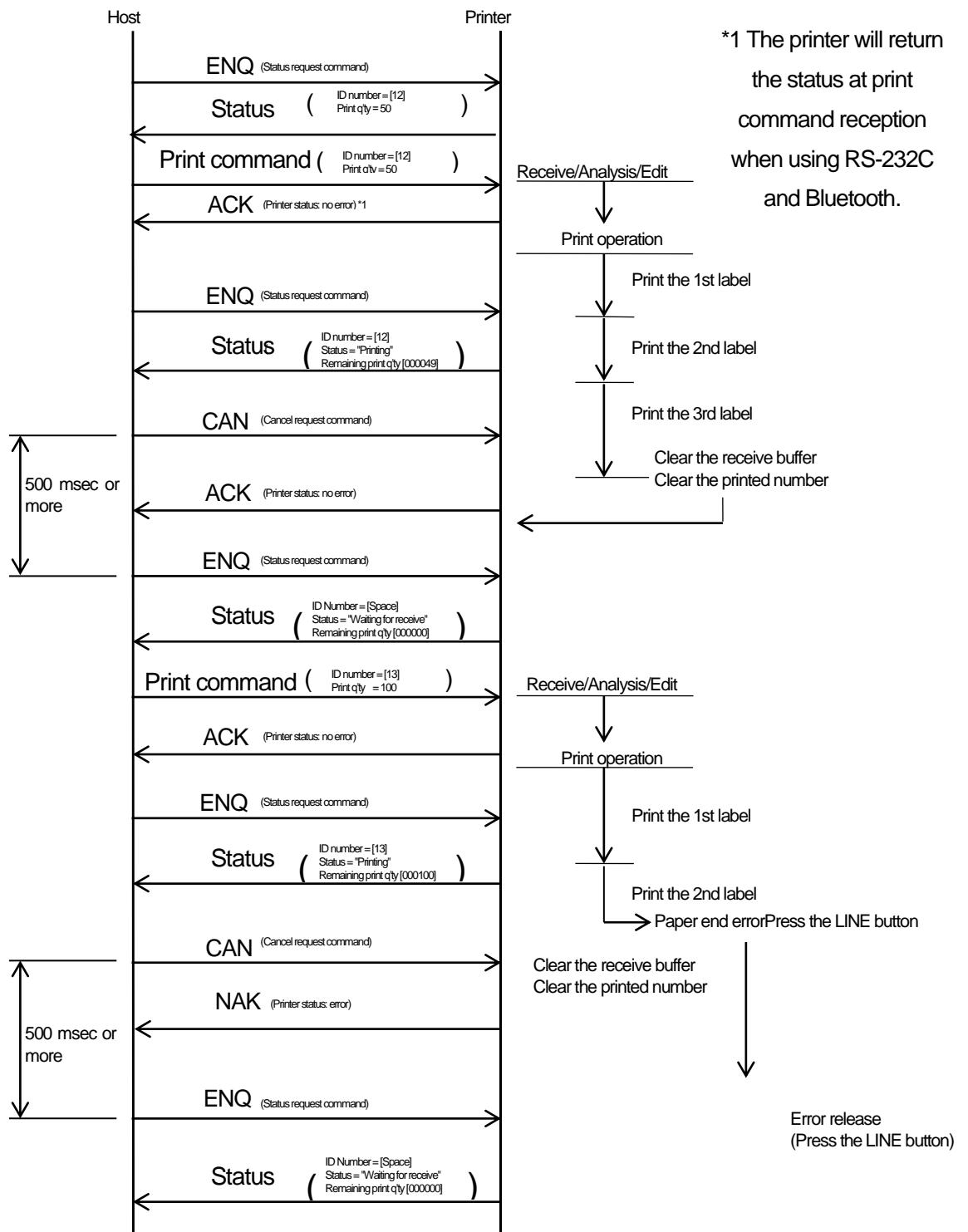
2.5.1 Return sequence

Refer to [26.12 Printer status] when using LAN/wireless LAN interface.

1) Normal

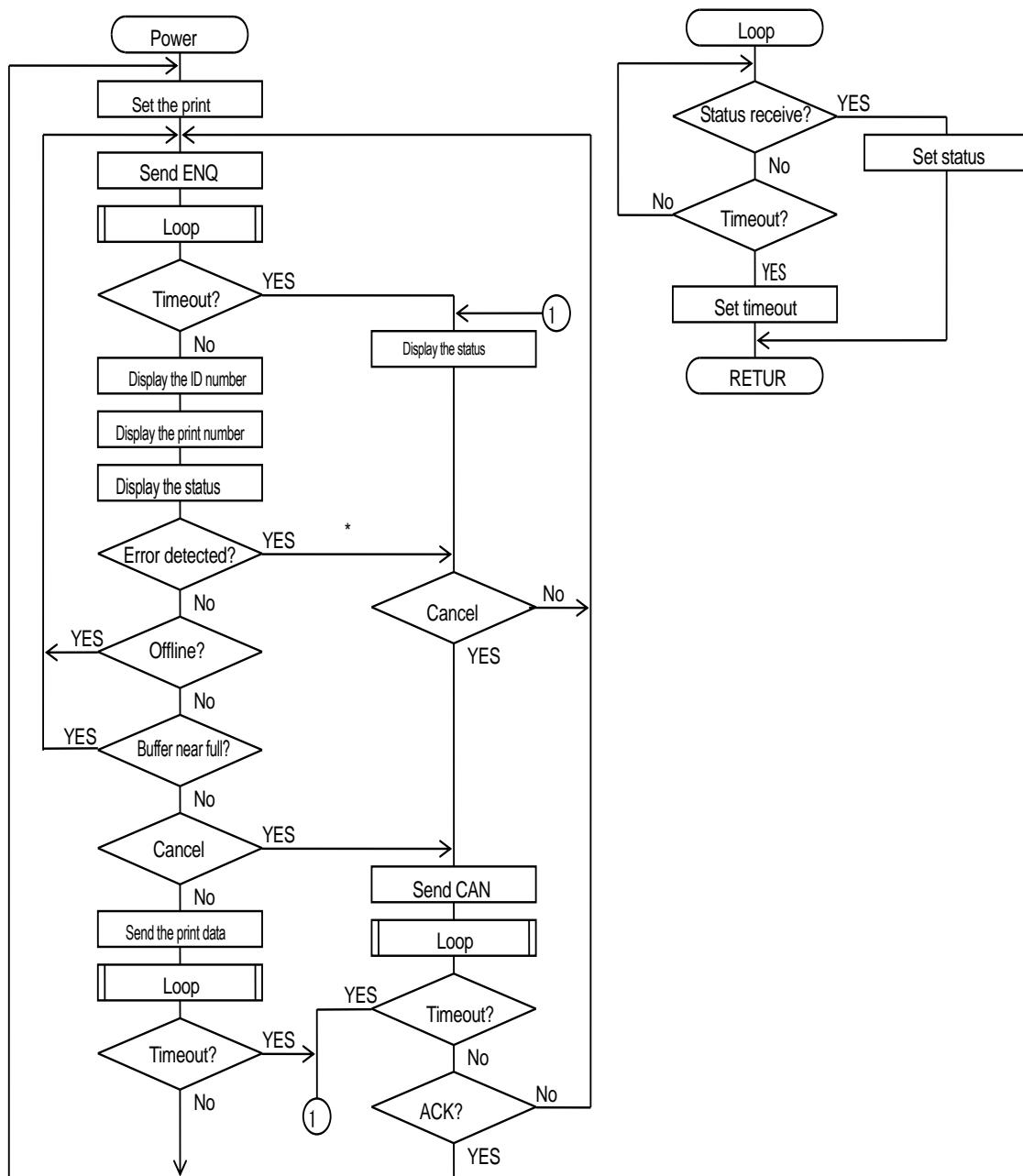


2) Cancel request command



2.5.2 Reference flowchart

See the flow chart below for programming on the host side.



*When detecting an error in the printer, make sure to send the subsequent print data after releasing the error by sending ENQ.

2.6 Status 4

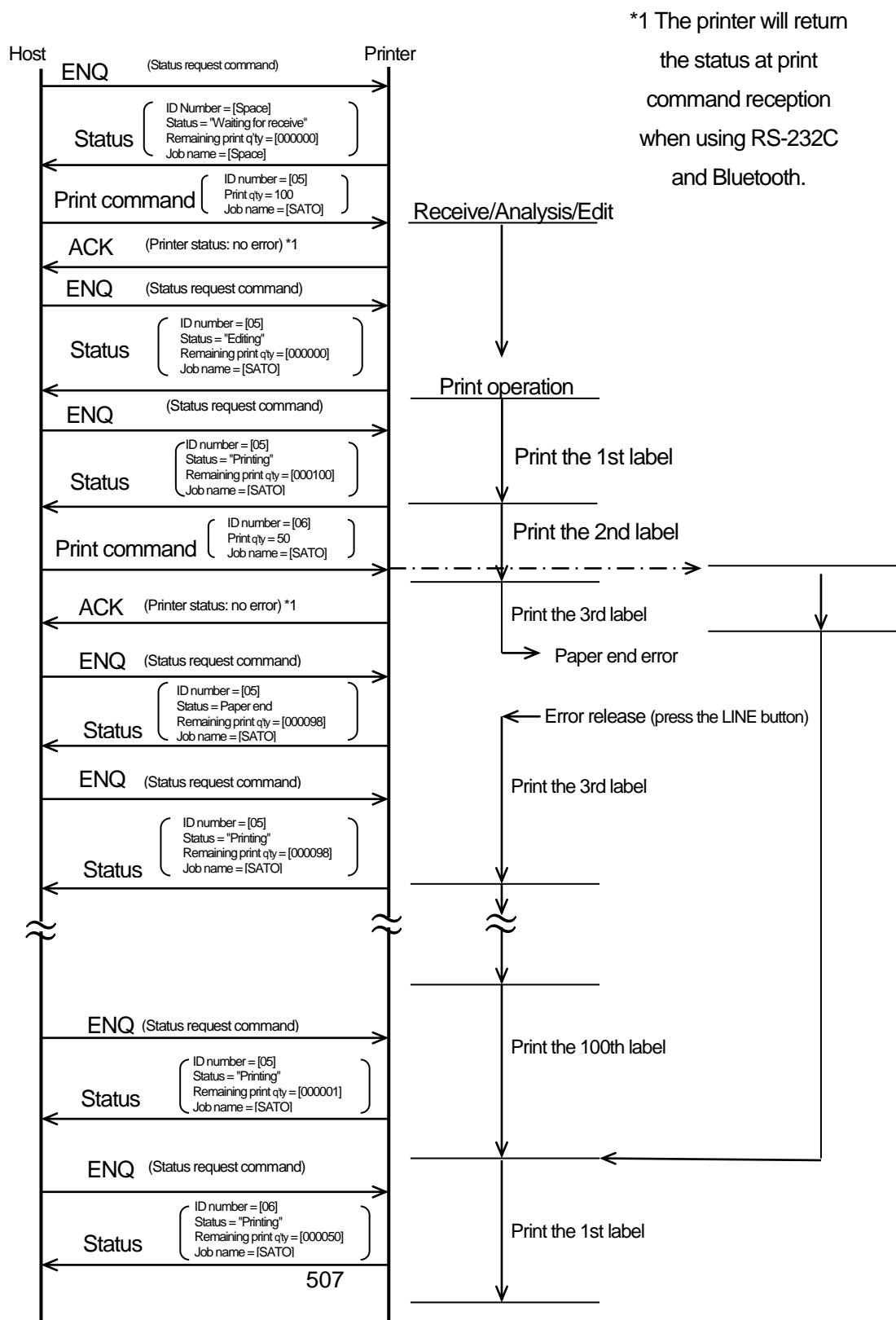
This communication protocol is designed for the purpose of controlling print status in the host, and the printer returns the status by receiving request command from the host.

Refer to [12.42.2.2 Return status of status 4] for details of the request command and the return status.

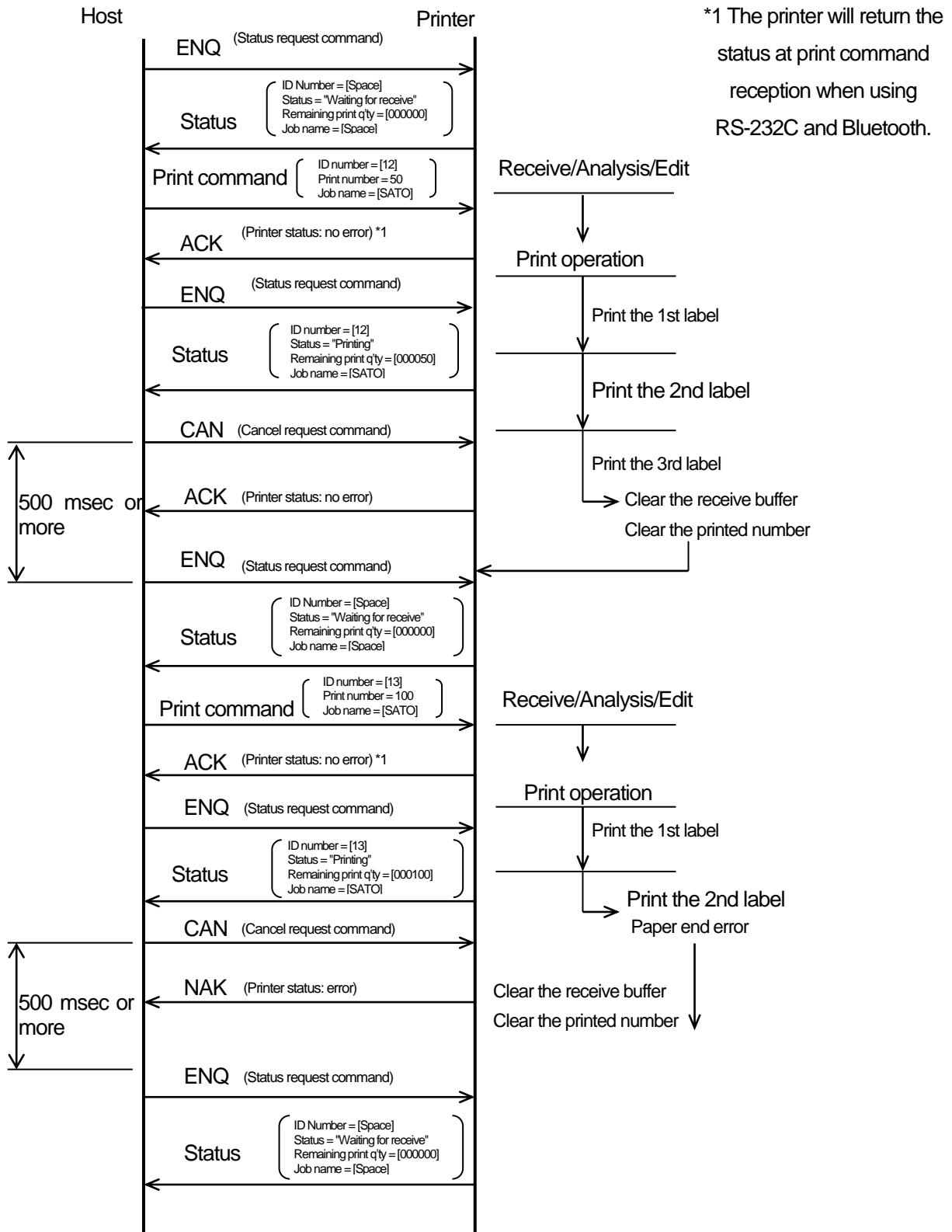
2.6.1 Return sequence

Refer to [26.12 Printer status] when using LAN/wireless LAN interface.

- 1) Normal



2) Cancel request command



2.7 Status 5

This communication protocol is designed for the purpose of controlling print status in the host, and there are several functions. This printer's receive mode in this protocol is the multiple-receive.

2.7.1 Receive buffer control

There are following two factors for detecting buffer near full due to information such as receive, print, cancel are controlled by each items.

Cause of receive buffer near full

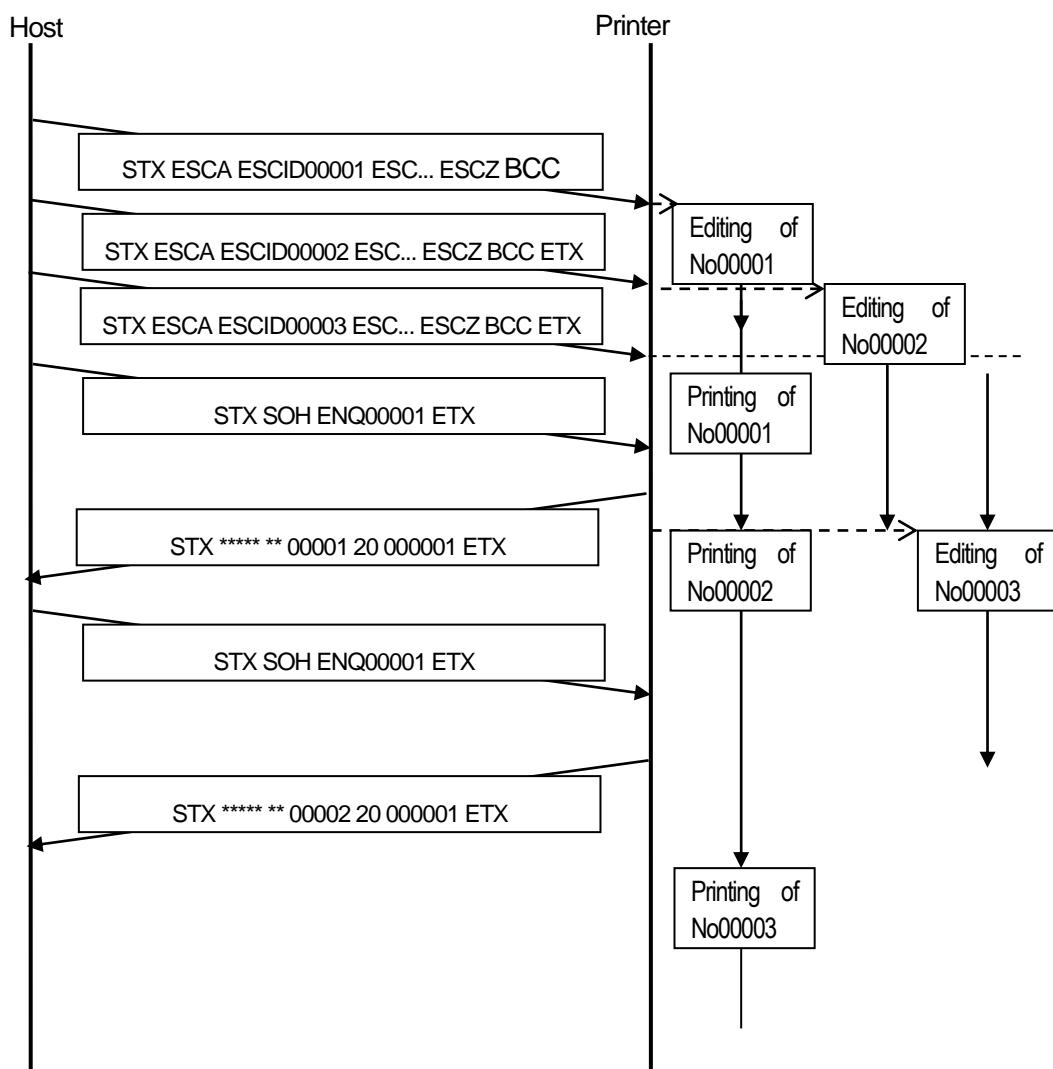
1) Buffer near full occurs when remaining capacity of receive buffer (2.95MB) becomes 0.95 MB.

Factors to release receive buffer near full

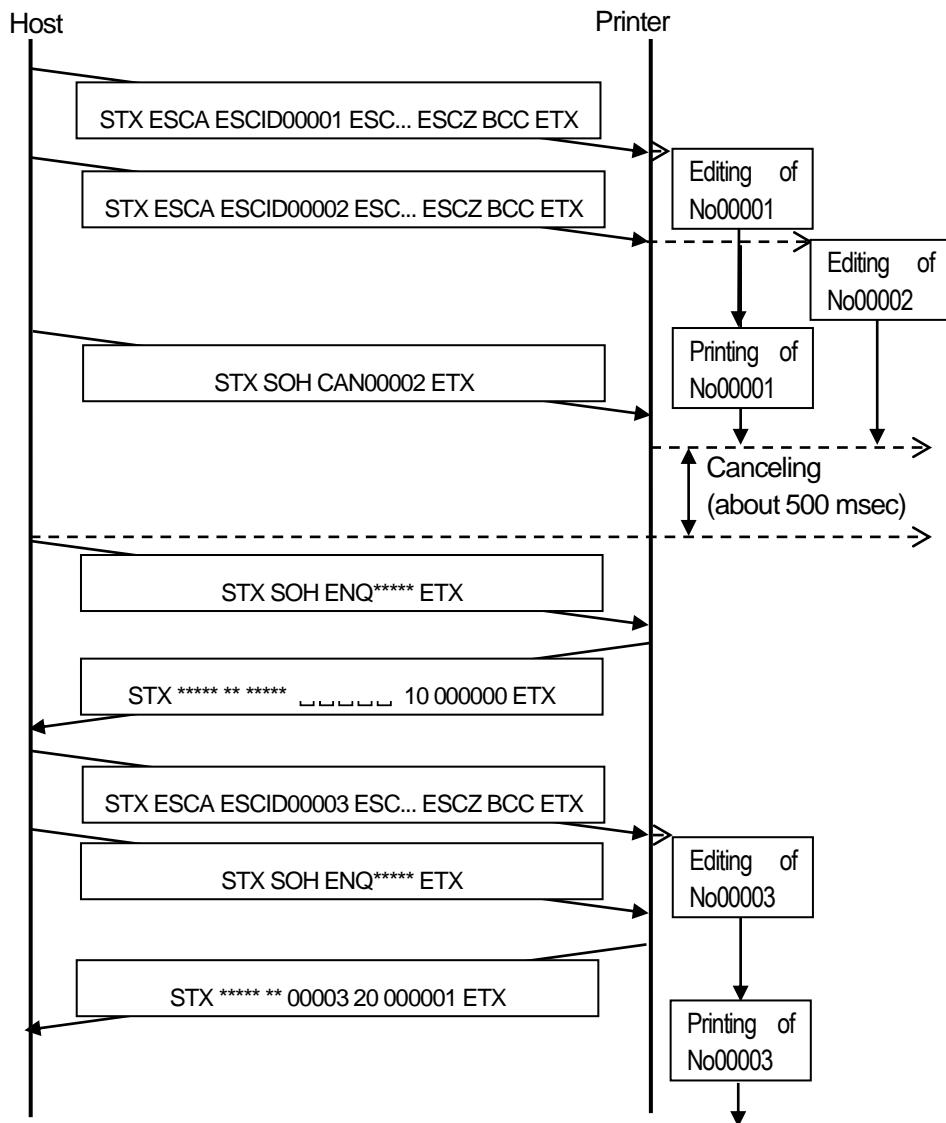
1) Receive buffer near full is released when remaining capacity of the receive buffer becomes 1.95 MB or more.

2.7.2 Return sequence

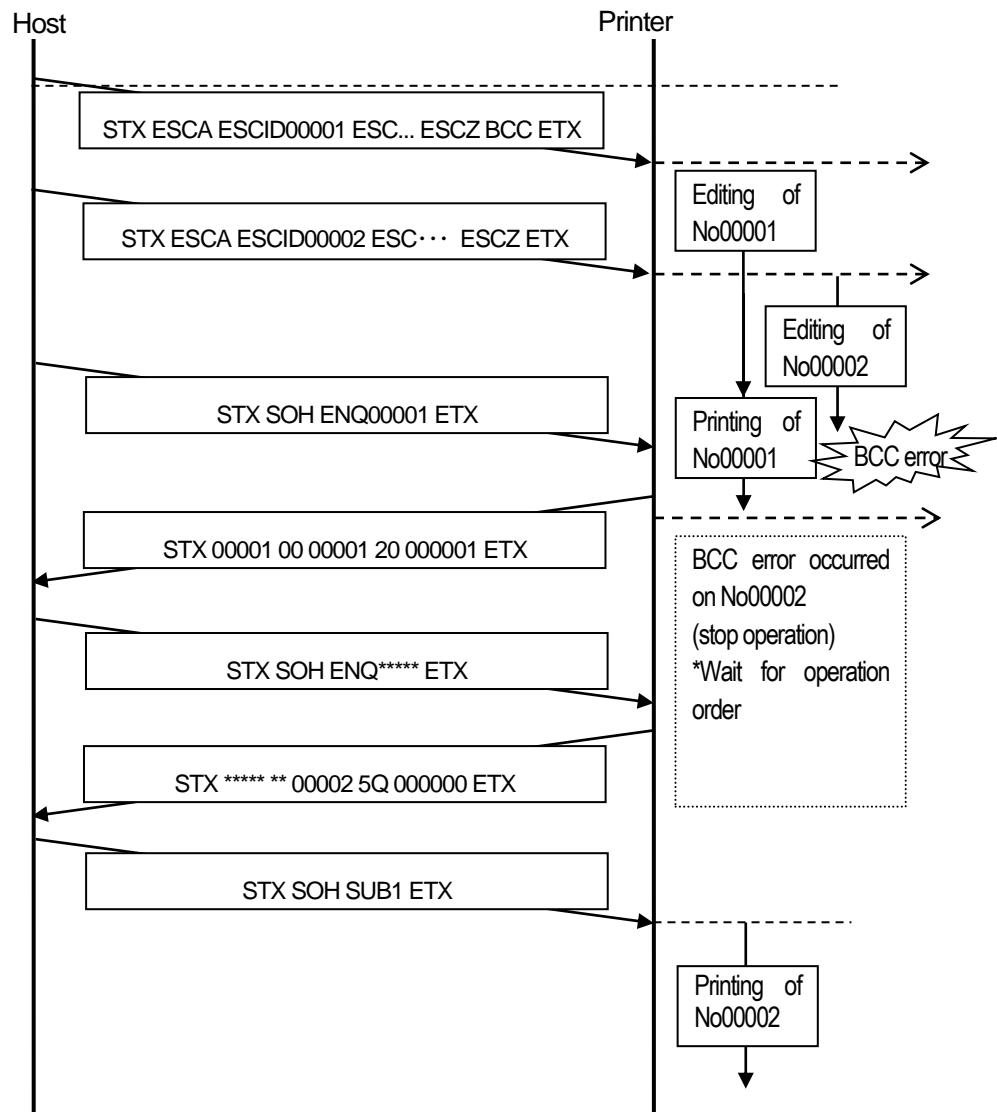
1) Normal process



2) Cancel process



3) Error process

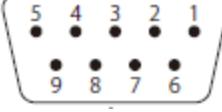
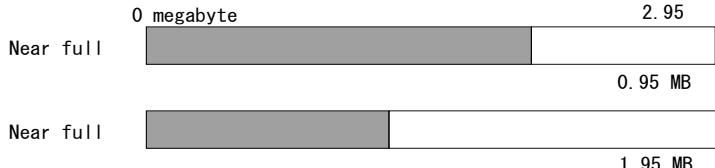


3 RS-232C

3.1 Basic Specifications

This interface complies with the RS-232C standard.

The communication settings can be made in the communication setting mode at the printer.

Interface	D-sub 9pin 																						
Communication setting	1) Setting range on the communication setting mode <table border="1" data-bbox="595 561 1333 999"> <thead> <tr> <th>Item</th><th>Setting value</th><th>Default Value</th></tr> </thead> <tbody> <tr> <td>Data bit length</td><td>7,8 (Bits)</td><td>8 Bits</td></tr> <tr> <td>Parity Bit</td><td>NONE, ODD, EVEN</td><td>NONE</td></tr> <tr> <td>Stop Bit</td><td>1, 2(Bits)</td><td>1 Bit</td></tr> <tr> <td>Baud rate</td><td>2400, 4800, 9600, 19200, 38400, 57600, 115200 (bps)</td><td>19200 bps</td></tr> <tr> <td>Protocol</td><td>READY/BUSY, XON/XOFF, Status 3, Status 4, Status 5 Refer to 2 Communication protocol for details.</td><td>Status 4</td></tr> <tr> <td>BCC check for Status 5</td><td>ENABLE/DISABLE</td><td>DISABLE</td></tr> </tbody> </table>		Item	Setting value	Default Value	Data bit length	7,8 (Bits)	8 Bits	Parity Bit	NONE, ODD, EVEN	NONE	Stop Bit	1, 2(Bits)	1 Bit	Baud rate	2400, 4800, 9600, 19200, 38400, 57600, 115200 (bps)	19200 bps	Protocol	READY/BUSY, XON/XOFF, Status 3, Status 4, Status 5 Refer to 2 Communication protocol for details.	Status 4	BCC check for Status 5	ENABLE/DISABLE	DISABLE
Item	Setting value	Default Value																					
Data bit length	7,8 (Bits)	8 Bits																					
Parity Bit	NONE, ODD, EVEN	NONE																					
Stop Bit	1, 2(Bits)	1 Bit																					
Baud rate	2400, 4800, 9600, 19200, 38400, 57600, 115200 (bps)	19200 bps																					
Protocol	READY/BUSY, XON/XOFF, Status 3, Status 4, Status 5 Refer to 2 Communication protocol for details.	Status 4																					
BCC check for Status 5	ENABLE/DISABLE	DISABLE																					
Synchronization system	Asynchronous communication method																						
Receive buffer size	2.95 MB  Near full 0 megabyte 2.95 Near full 0.95 MB 1.95 MB																						
Code	ASCII (7 Bits) Graphic (8 Bits)																						
Connector	At the printer DSUB9 pin (female terminal) At the cable DSUB9 pin (male terminal) Cable length shorter than 5 (m) Post screw specifications Inch screw thread #4-40 UNC																						
Transmission format	 <small>*In case of 7 Bits unit, b3 will be omitted.</small>																						
Signal level	High level: +5 - +12V Low level: -5 - -12V																						

3.2 REDY/BUSY

In this protocol, print data is controlled by hardware signal only without software procedures.

When the print data (STX <A> - <Z> ETX) is sent from the host under the conditions below, the received data will not be accurate.

- 1) When the printer is in offline state.
- 2) When an error has occurred in the printer.

3.2.1 Connecting diagram

1) DB-9P

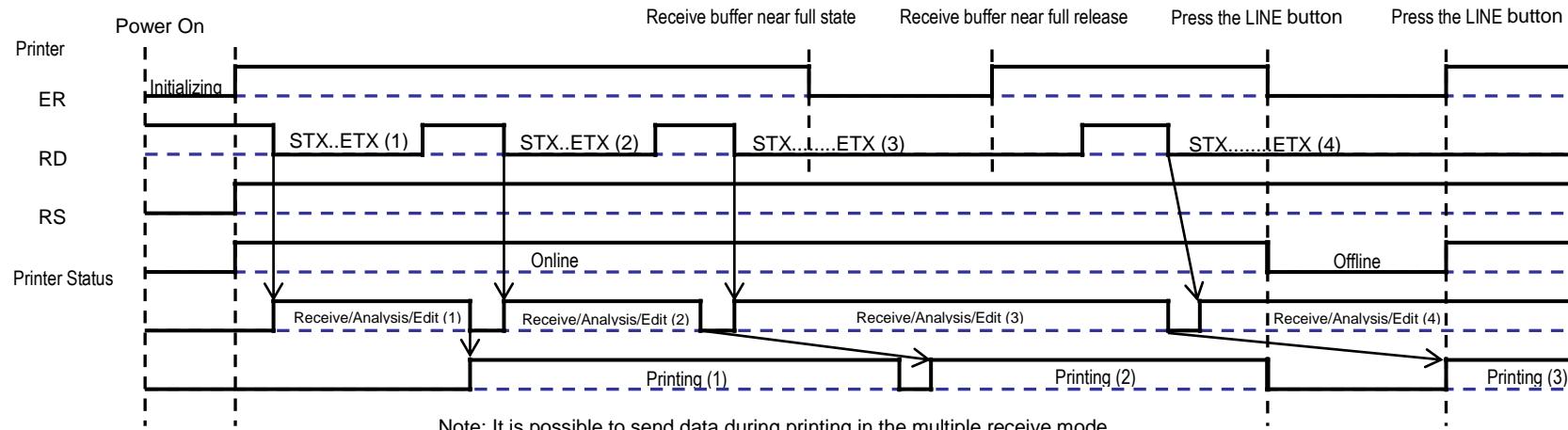
Printer		Host	
CD	1	1	CD
RD	2	3	SD
SD	3	2	RD
ER	4	6	DR
SG	5	5	SG
DR	6	4	ER
RS	7	8	CS
CS	8	7	RS

3.2.2 Explanation of input/output signal

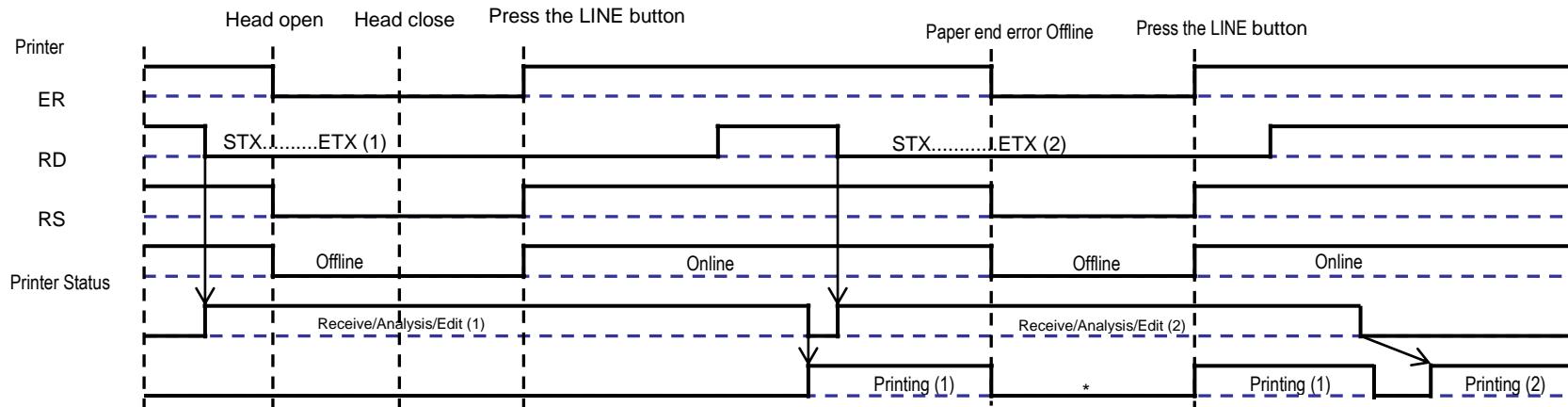
Pin number	Signal name	Direction	Description
2	RD	Input	Data from the host to the printer
3	SD	Output	Data from the printer to the host
4	ER	Output	Data terminal ready
5	SG	—	Signal ground
6	DR	Input	Data set ready
7	RS	Output	Send request
8	CS	Input	Clear to send

3.2.3 Timing chart of multiple receive

1) Normal process



2) Error process



※ When the paper end error occurs, open the head, set label, close the head and feed.

Note: (1) The paper end error will be released when the head is closed.

3.3 XON/XOFF

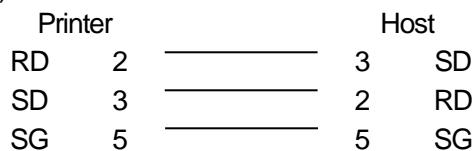
This communication protocol tells printer status if it can receive any data or not to the host by sending "XON" (HEX 11H) or "XOFF" (HEX 13H) to the SD line.

When the print data (STX <A> - <Z> ETX) is sent from the host under the conditions below, the received data will not be accurate.

- 1) When the printer is in offline state.
- 2) When an error has occurred in the printer.

3.3.1 Connecting diagram

1) DB-9P



*Depending on the model of the host, CS and RS may need to be looped (always keep "High") at the host.

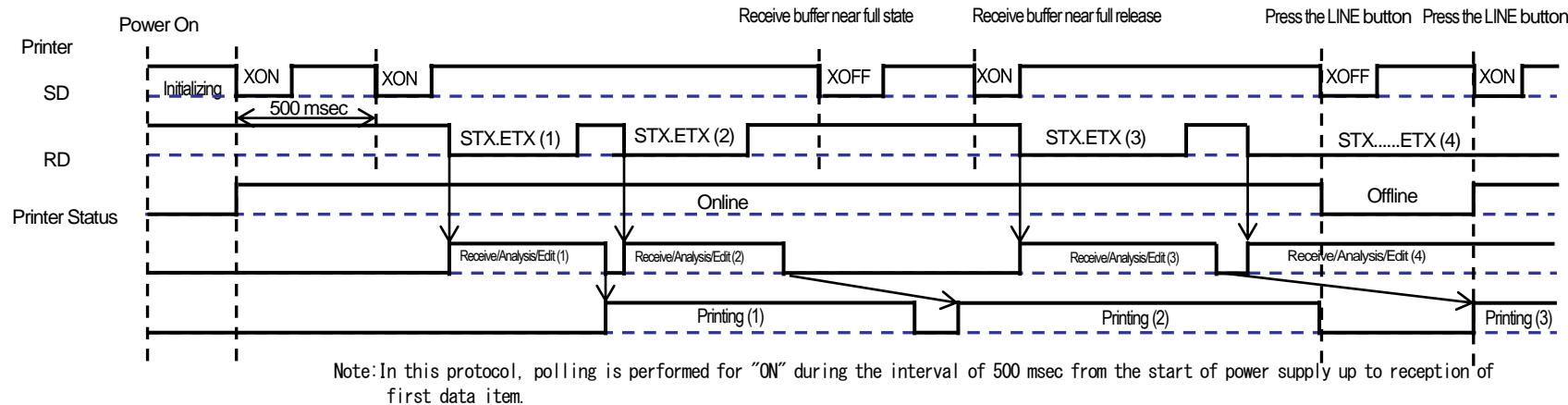
Please confirm the user's guide of the host system.

3.3.2 Explanation of input/output signal

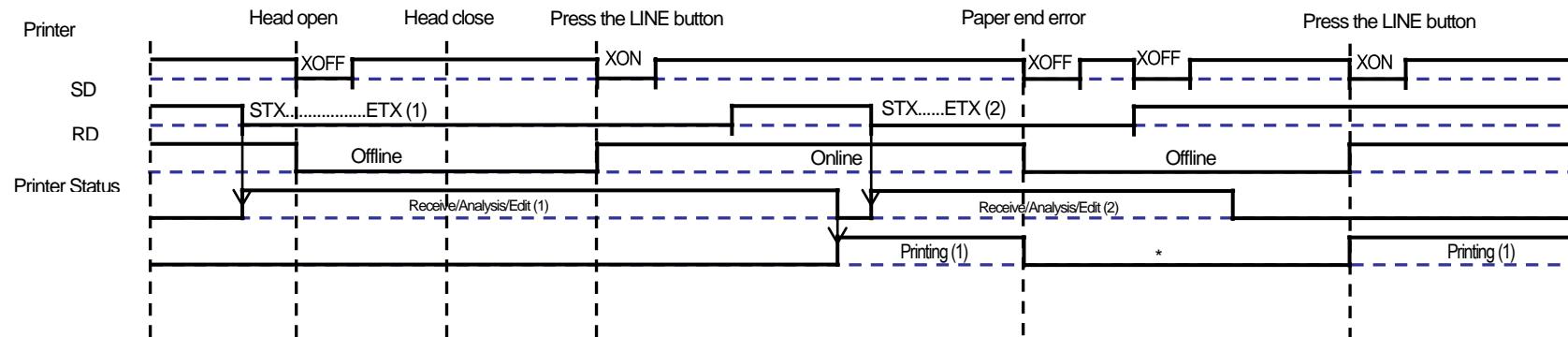
Pin number	Signal name	Direction	Description
2	RD	Input	Data from the host to the printer
3	SD	Output	Data from the printer to the host
5	SG	-	Signal ground

3.3.3 Timing chart of multiple receive

1) Normal process



2) Error process



* When the paper end error occurs, open the head, set label, close the head and feed.

Note: (1) The paper end error will be released when the head is closed.

(2) XOFF will be sent when data is received during an error.

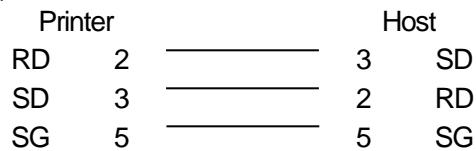
3.4 Printer Status 5 Return

This communication protocol is designed for the purpose of controlling print status in the host, and there are several functions.

This printer's receive mode in this protocol is the multiple-receive.

3.4.1 Connecting diagram

1) DB-9P



*Depending on the model of the host, CS and RS may need to be looped (always keep "High") at the host.

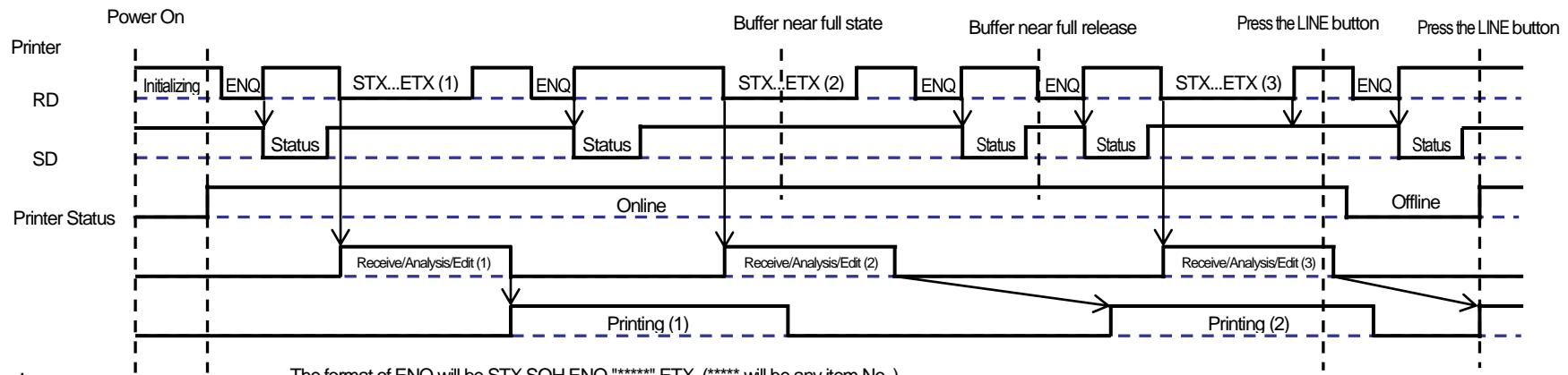
Please confirm the user's guide of the host system.

3.4.2 Explanation of input/output signal

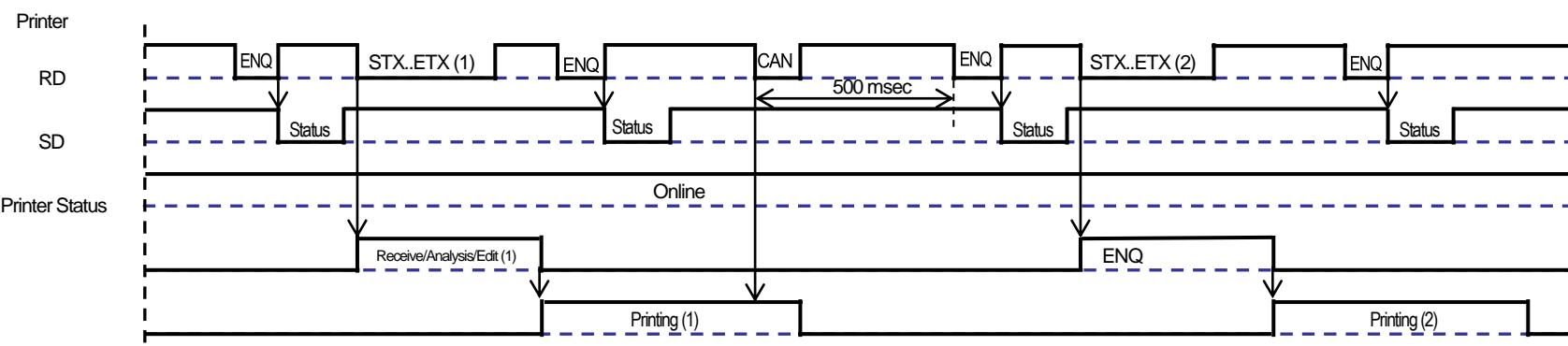
Pin number	Signal name	Direction	Description
2	RD	Input	Data from the host to the printer
3	SD	Output	Data from the printer to the host
5	SG	-	Signal ground

3.4.3 Timing chart

1) Normal process

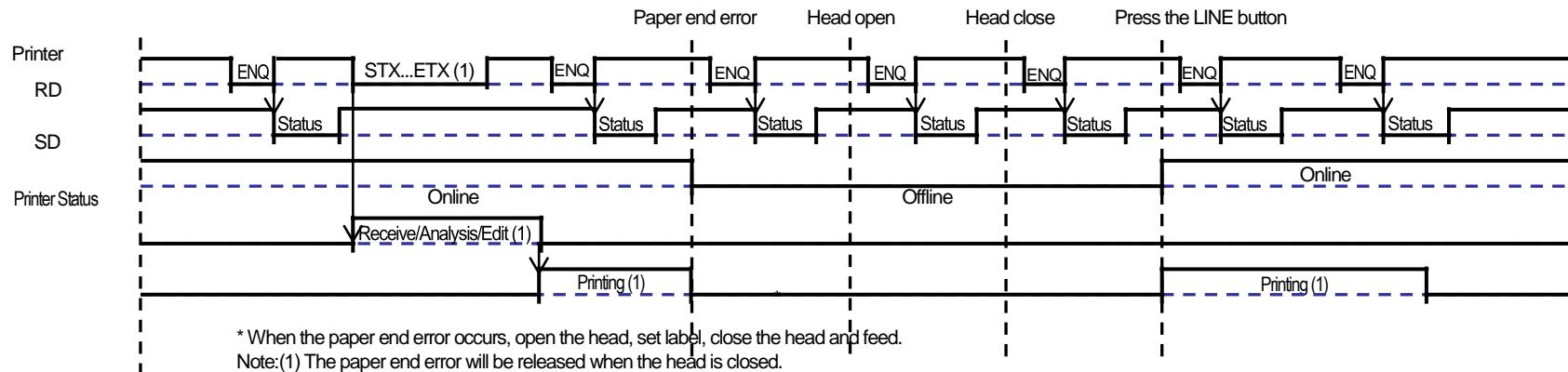


2) Cancel process

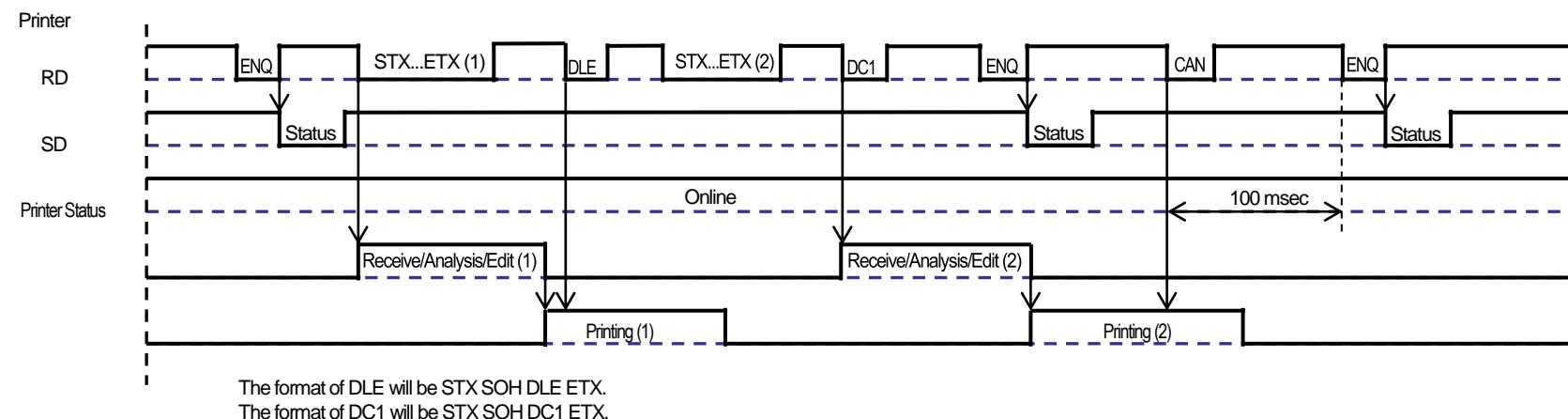


The format of ENQ will be STX SOH ENQ "*****" ETX. (***** will be any item No.)
 Avoid ENQ transmission while sending the print data (STX ESC+A - ESC+Z ETX). By sending ENQ, the status may not be returned or there may be print error.

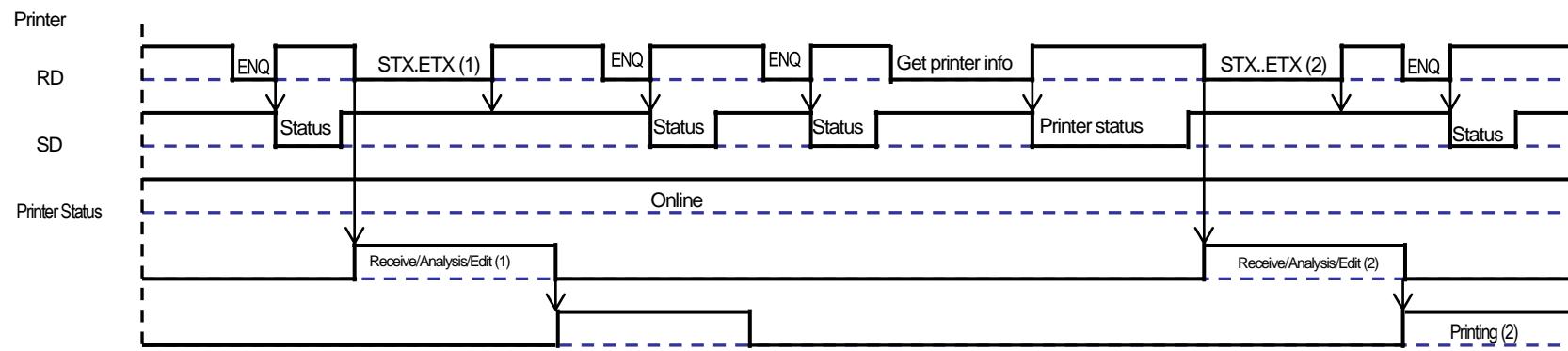
3) Error process



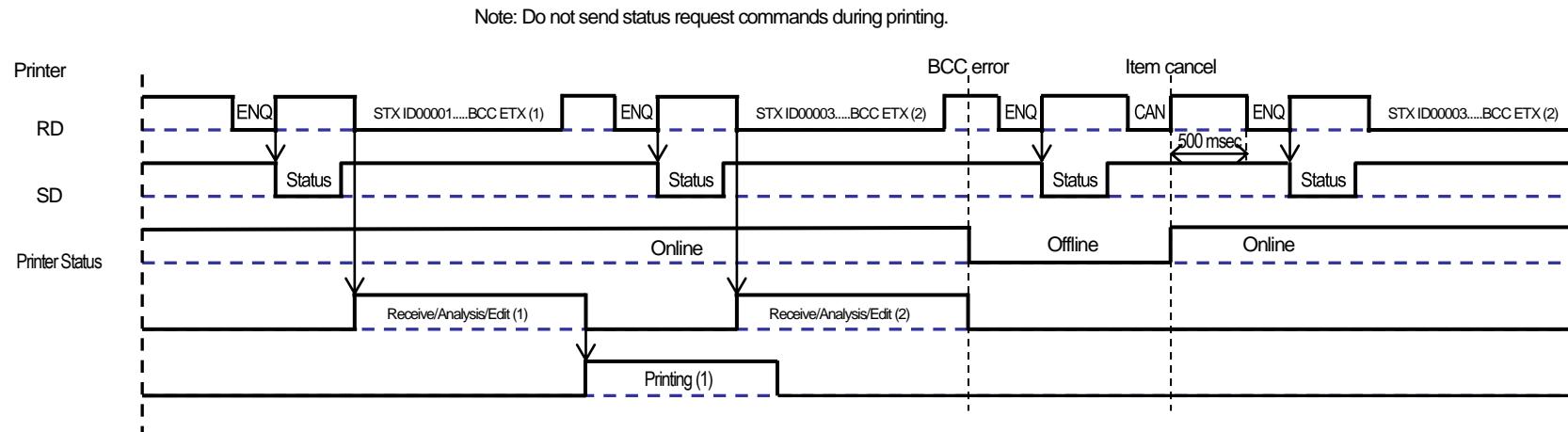
4) Print pause, print resume process



5) Information request command process



6) BCC error process



Note: Do not send status request commands during printing.

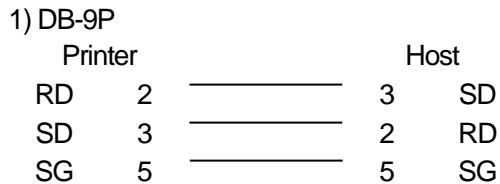
3.5 Printer Status 4 Return

This communication protocol is designed for the purpose of controlling print status in the host, and the printer returns the status by receiving request command from the host.

The printer returns the status after receiving the status request command.

This printer's receive mode in this protocol is the multiple-receive.

3.5.1 Connecting diagram



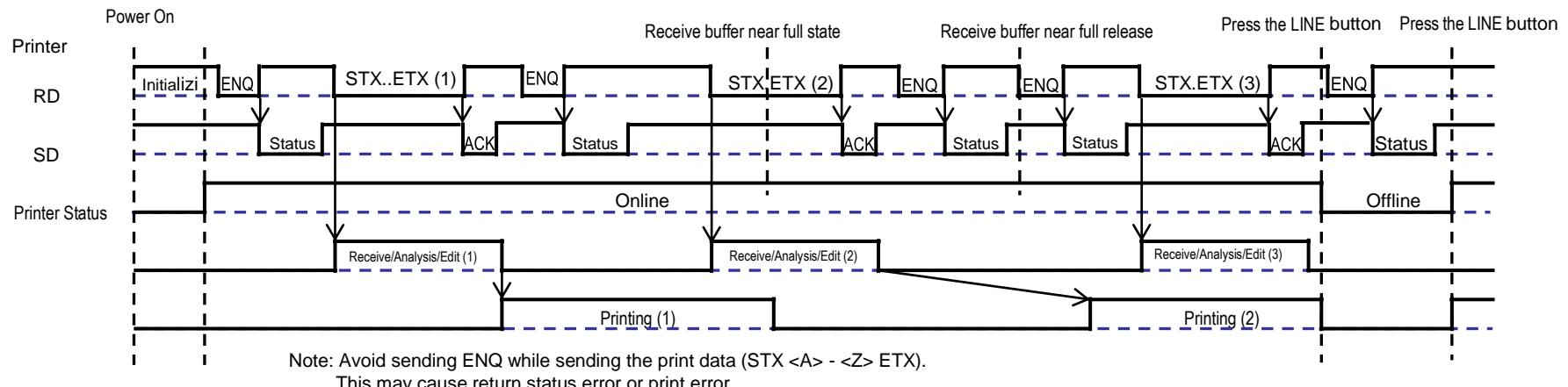
*Depending on the model of the host, CS and RS may need to be looped (always keep "High") at the host.
Please confirm the user's guide of the host system.

3.5.2 Explanation of input/output signal

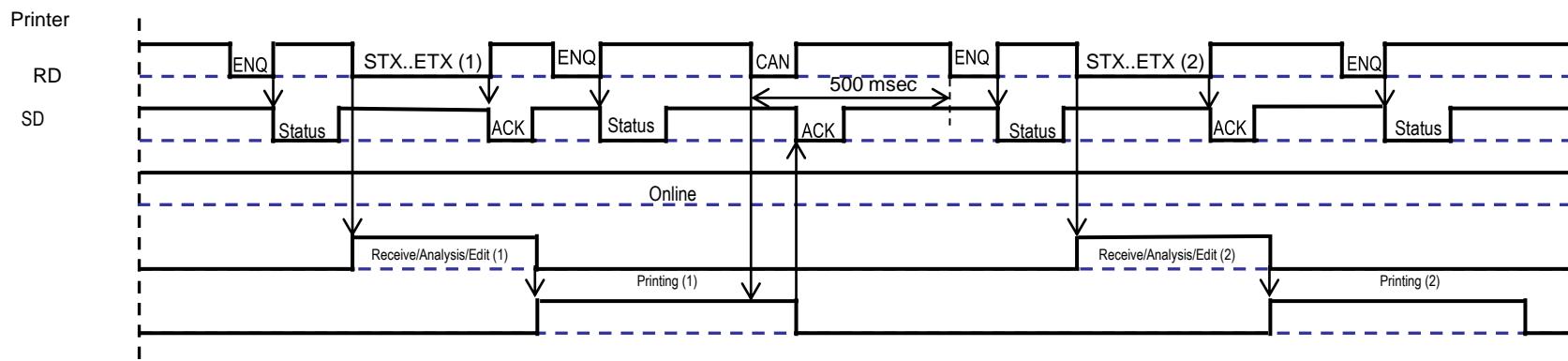
Pin number	Signal name	Direction	Description
2	RD	Input	Data from the host to the printer
3	SD	Output	Data from the printer to the host
5	SG	—	Signal ground

3.5.3 Timing chart

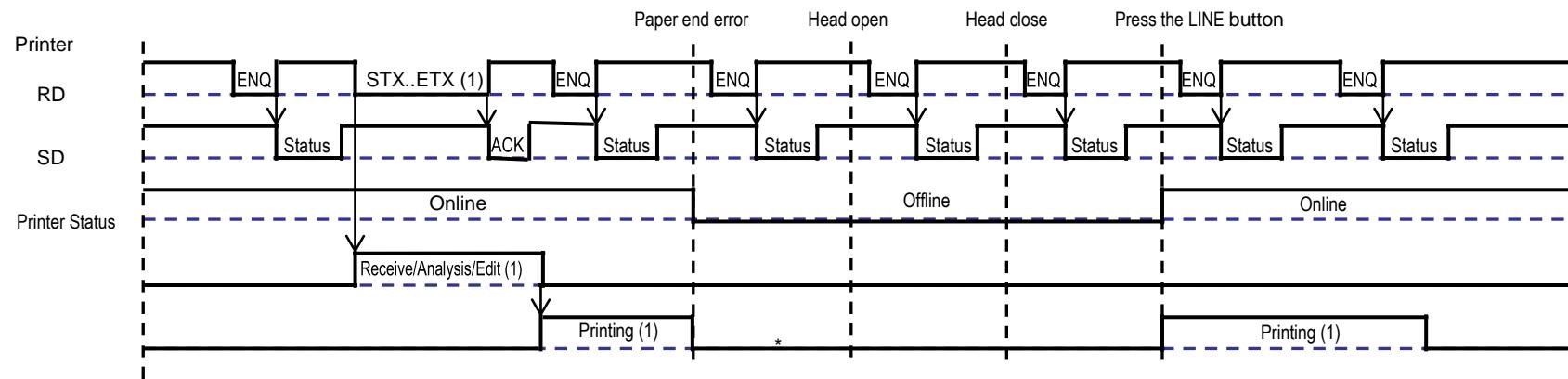
1) Normal process



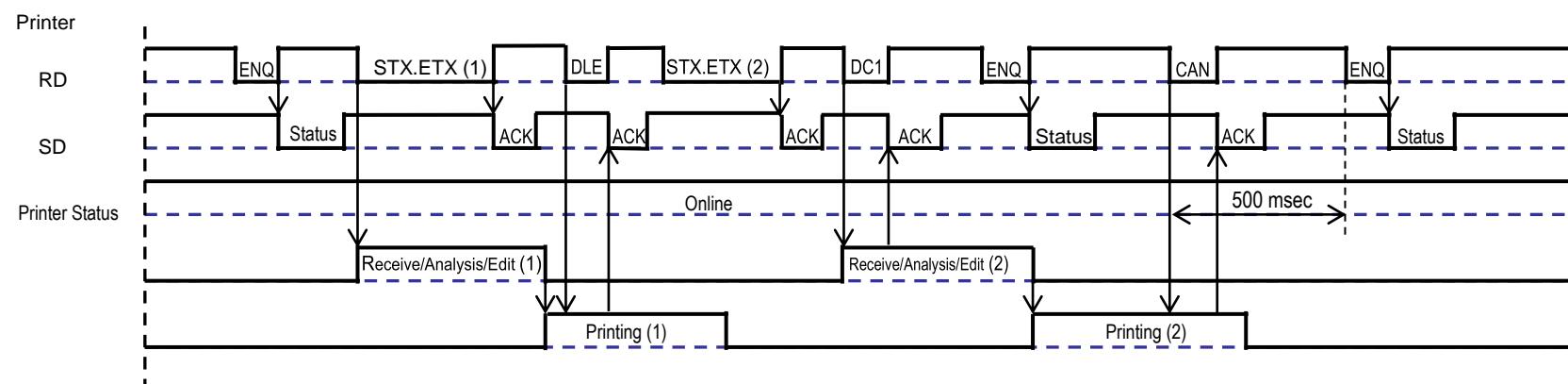
2) Cancel process



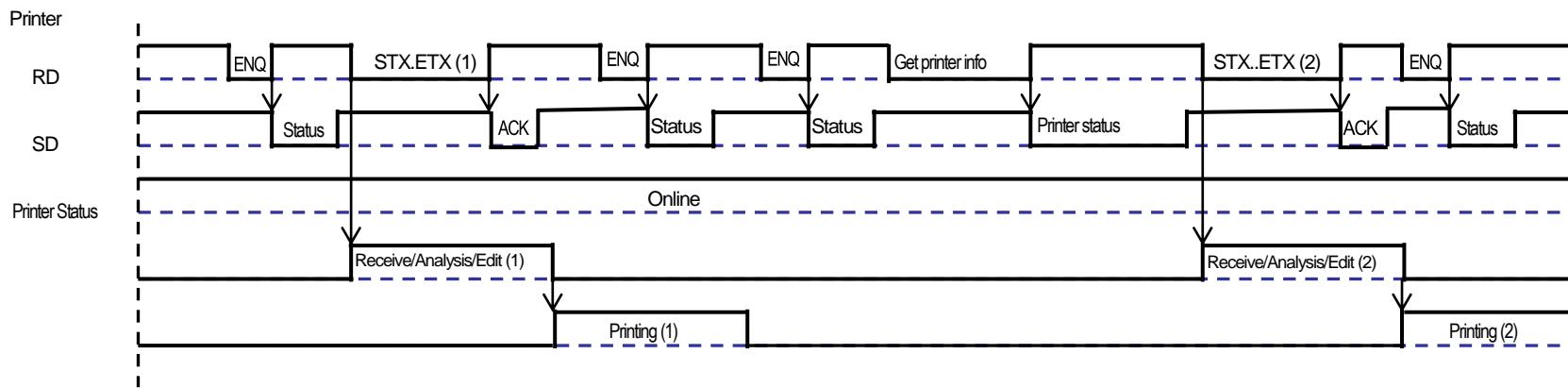
3) Error process



4) Print pause, print resume process



5) Information request command process



Note: Do not send status request commands during printing.

3.6 Printer Status 3 Return

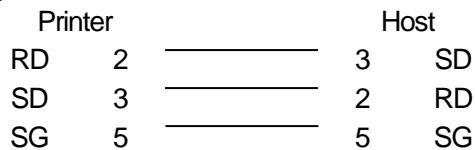
This communication protocol is designed for the purpose of controlling print status in the host, and the printer returns the status by receiving request command from the host.

The printer returns the status after receiving the status request command.

This printer's receive mode in this protocol is the multiple-receive.

3.6.1 Connecting diagram

1) DB-9P

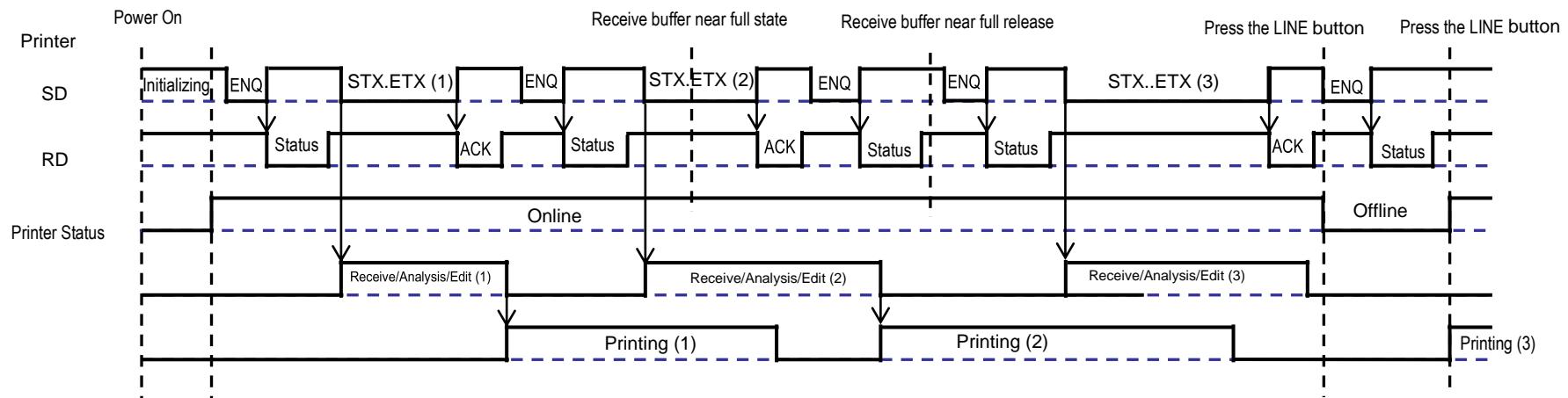


3.6.2 Explanation of input/output signal

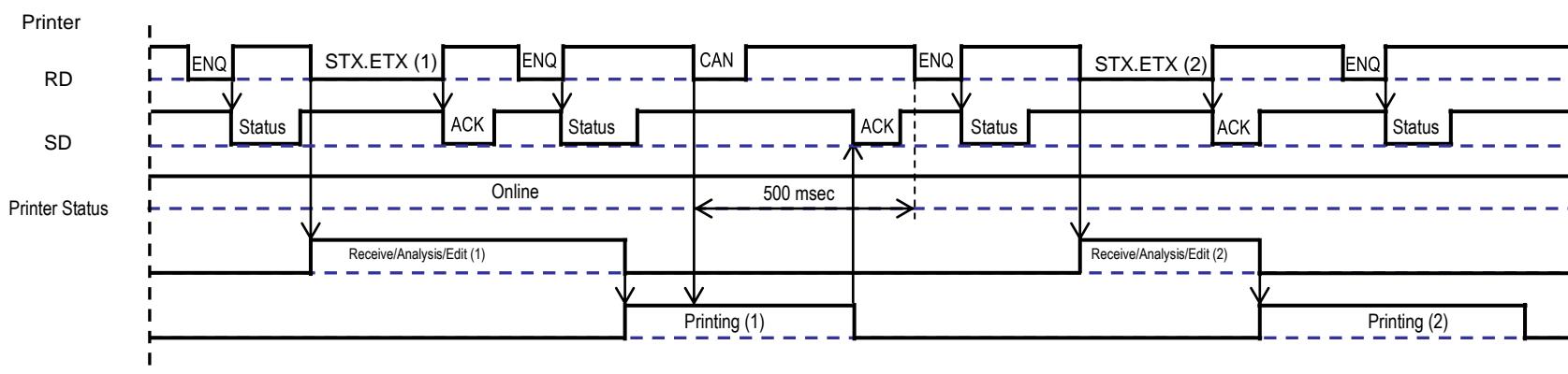
Pin number	Signal name	Direction	Description
2	RD	Input	Data from the host to the printer
3	SD	Output	Data from the printer to the host
5	SG	—	Signal ground

3.6.3 Timing chart

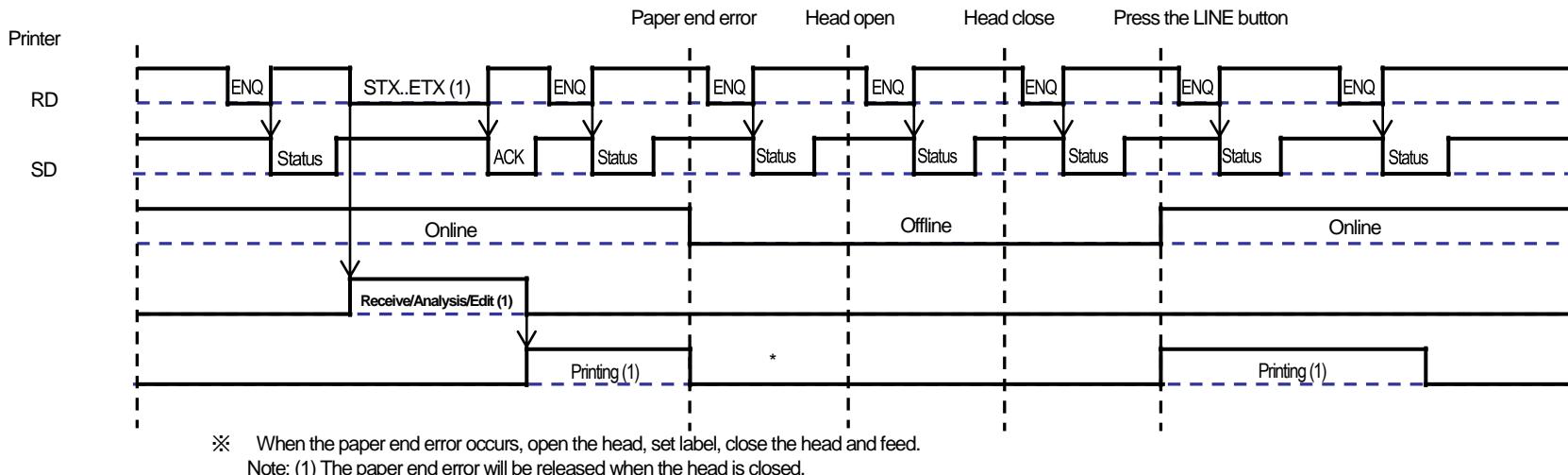
1) Normal process



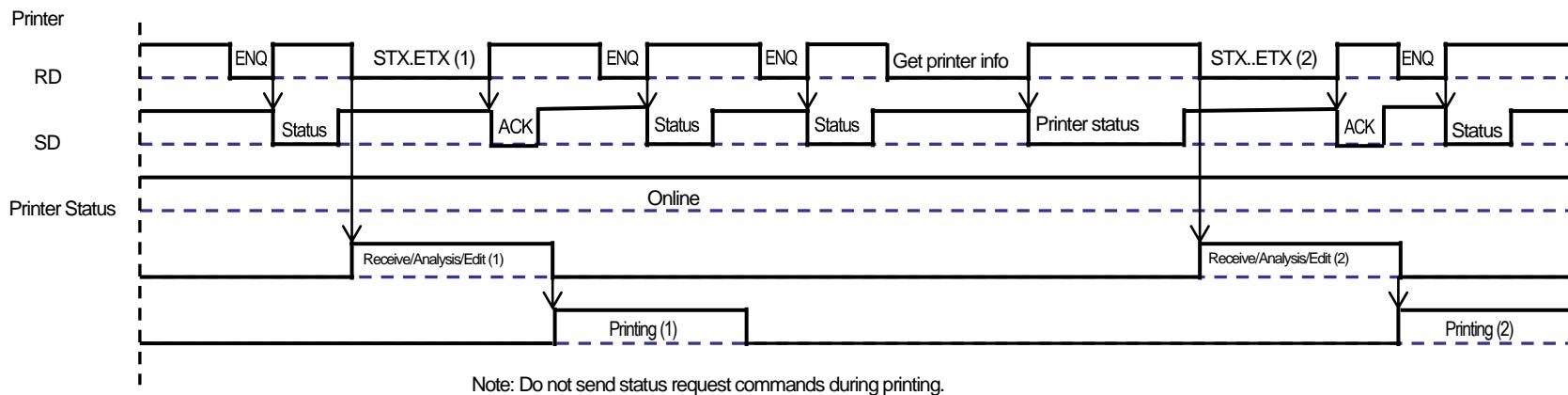
2) Cancel process



3) Error process



4) Information request command process



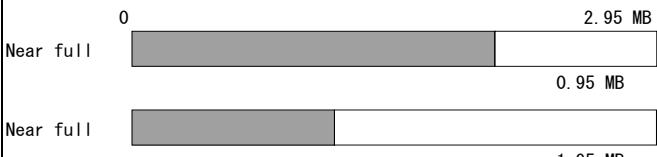
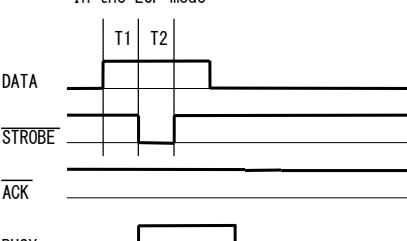
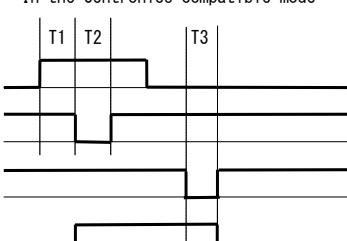
Note

- Please note the followings when using READY/BUSY.
When sending print data from the host, make sure the printer power is on before sending.
- When data that is more than the receive buffer size (2.95 MB) is sent using XON/XOFF, Status 3, Status 4, and Status 5, a receive buffer full error occurs. Therefore, send data equal to or less than 2.9 MB, and be sure to monitor the printer status while sending the data.
- Parity error will be detected when the parity error occurs after receiving ESC+A.

4 IEEE1284

4.1 Basic Specifications

This interface complies with the Centronics/IEEE1284 standard.

Interface	Amphenol 36P 									
Communication setting	<p>1) Setting range on the communication setting mode</p> <table border="1"> <thead> <tr> <th>Item</th><th>Setting value</th><th>Default Value</th></tr> </thead> <tbody> <tr> <td>Protocol</td><td>Status 4, Status 5</td><td>Status 4</td></tr> <tr> <td>BCC check for Status 5</td><td>ENABLE/DISABLE</td><td>DISABLE</td></tr> </tbody> </table>	Item	Setting value	Default Value	Protocol	Status 4, Status 5	Status 4	BCC check for Status 5	ENABLE/DISABLE	DISABLE
Item	Setting value	Default Value								
Protocol	Status 4, Status 5	Status 4								
BCC check for Status 5	ENABLE/DISABLE	DISABLE								
Connector	At printer: amphenol 36 pins (female) At cable: amphenol 36 pins (male)									
Cable length	Less than 1.5 (m)									
Signal level	High level: +2.4 - +5.0 V Low level: +0.0 - +0.4V									
Receive buffer size	2.95 MB 									
Timing chart	<p>In the ECP mode</p>  <p>In the Centronics compatible mode</p>  <p>Note 1: $0.75 \mu s \leq T1$ $0.75 \mu s \leq T2 \leq 500 \mu s$ $0.5 \mu s < T3 < 1.2 \mu s$</p>									

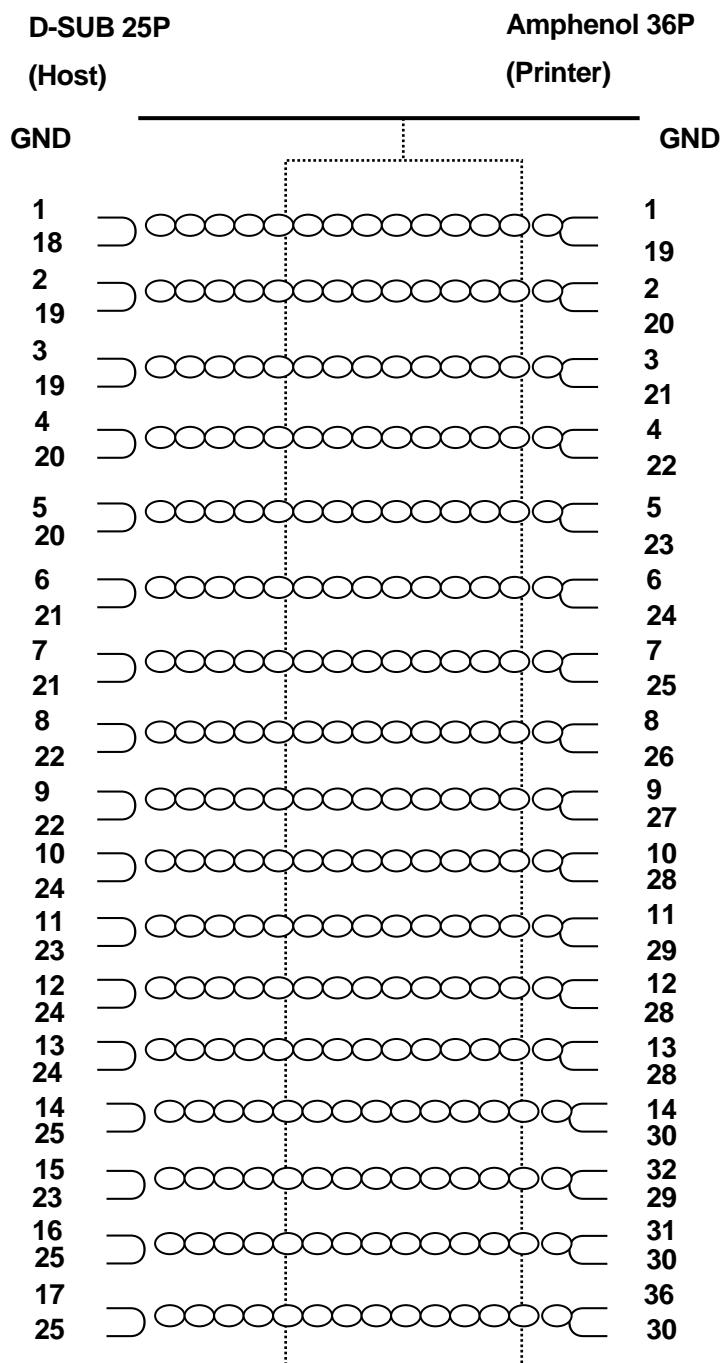
*Make sure to send print data while the printer power is on.

*Be sure to turn the printer's power off when removing the interface cable.

4.2 Connecting diagram

The connecting diagram of parallel cable is as follows.

Please use a cable that is complied with the IEEE1284 standard.



4.3 Connector Pin Assignment

The pin assignment is as follows with the centronics standard (compatible mode).

However, the wiring diagram of the IEEE1284 standard is complied with the standard of IEEE1284 Type B connector.

Pin number	Signal name	Description	Pin number	Signal name	Description
1	STROBE	Input	19	STROBE-RETURN	
2	DATA 1	Input	20	DATA 1-RETURN	
3	DATA 2	Input	21	DATA 2-RETURN	
4	DATA 3	Input	22	DATA 3-RETURN	
5	DATA 4	Input	23	DATA 4-RETURN	
6	DATA 5	Input	24	DATA 5-RETURN	
7	DATA 6	Input	25	DATA 6-RETURN	
8	DATA 7	Input	26	DATA 7-RETURN	
9	DATA 8	Input	27	DATA 8-RETURN	
10	ACK	Output	28	ACK -RETURN	
11	BUSY	Output	29	BUSY -RETURN	
12	PE	Output	30	PE -RETURN	
13	SELECT	Output	31	INIT	Input
14	AUTOFD	Input	32	FAULT	Output
15			33		
16	LOGIC GND		34		
17	CHASSIS GND		35		
18	PERIPHERAL LOGIC HIGH	Input	36	SELECTIN	Input

4.4 Explanation of input signal

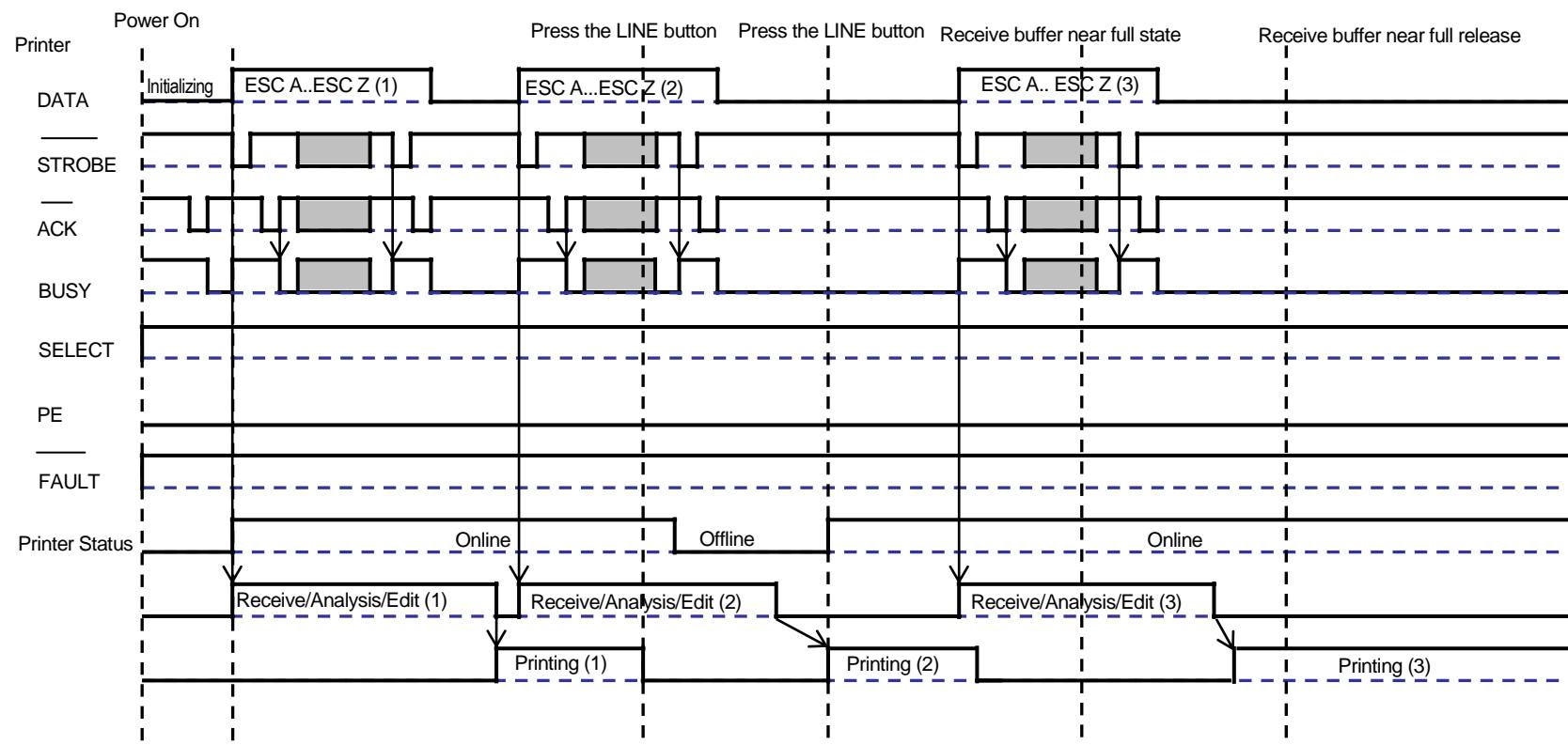
The signal lines are as follows with the centronics standard (compatible mode).

However, the signal lines of the IEEE1284 standard is complied with the IEEE1284 standard.

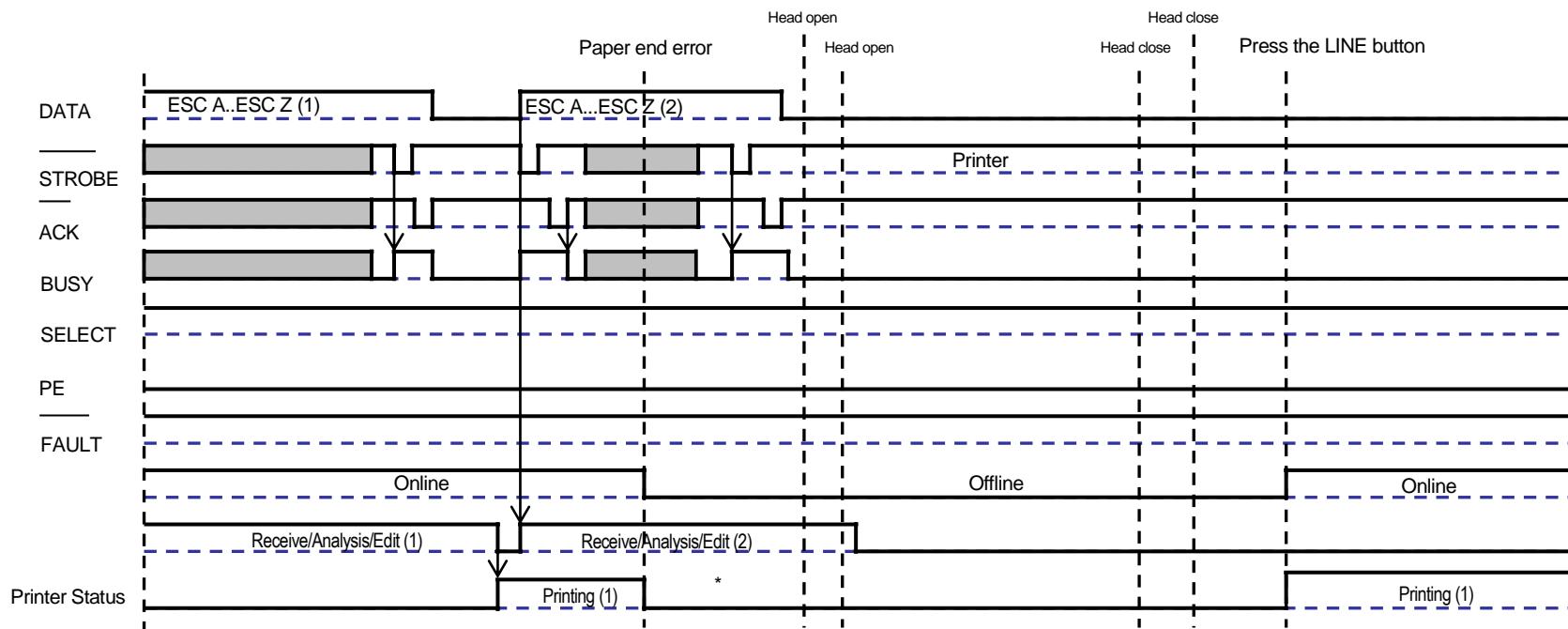
Pin number	Signal name	Direction	Description
1	STROBE	Input	A synchronized signal to read DATA 1 to DATA 8, Low active pulse is needed.
2 - 9	DATA 1 - DATA 8	Input	In the data input of 8 bits parallel, DATA 1 is LSB (least significant bit) and DATA 8 is MSB (most significant bit).
10	ACK	Output	A low active pulse signal indicating receive data intake.
11	BUSY	Output	A high active signal indicating the printer is impossible to receive any data.
12	PE	Output	A high active signal indicating there is no label.
13	SELECT	Output	A high active signal indicating the printer is possible to receive data.
14	AUTOFD	Input	A signal for IEEE1284 standard.
17	CHASSIS GND		Connected to the chassis ground.
18	PERIPHERAL LOGIC HIGH	Output	+5 V voltage at the printer.
19 - 30	SIGNAL GROUND		Connected to each signal grounds.
31	INIT	Input	A low active pulse signal requesting the printer initialization.
32	FAULT	Output	A low active pulse signal indicating an error in the printer.
36	SELECETIN	Input	A signal for IEEE1284 standard.

4.5 Timing chart of multiple receive

(1) Normal process



(2) Process at the paper end



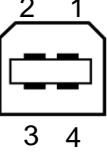
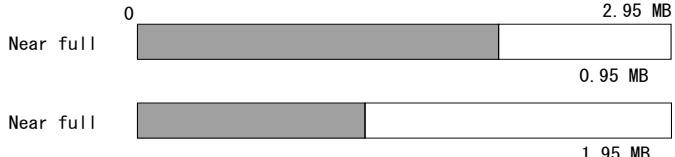
*When the paper end error occurs, open the head, set label, close the head and feed.

Note: The paper end error will be released when the head is closed.

5 USB

5.1 Basic Specifications

USB interface of the printer complies with USB2.0 standard.

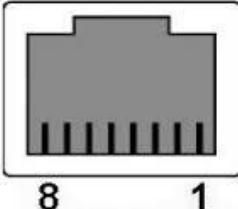
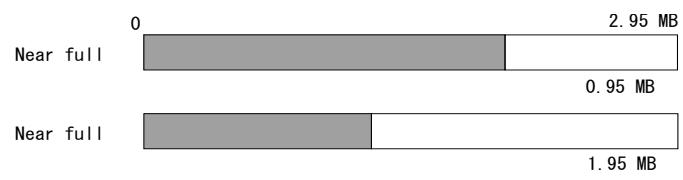
Interface	Type B female 									
Communication setting	1) Setting range on the communication setting mode <table border="1"> <thead> <tr> <th>Item</th><th>Setting value</th><th>Default Value</th></tr> </thead> <tbody> <tr> <td>Protocol</td><td>Status 4, Status 5</td><td>Status 4</td></tr> <tr> <td>BCC check for Status 5</td><td>ENABLE/DISABLE</td><td>DISABLE</td></tr> </tbody> </table>	Item	Setting value	Default Value	Protocol	Status 4, Status 5	Status 4	BCC check for Status 5	ENABLE/DISABLE	DISABLE
Item	Setting value	Default Value								
Protocol	Status 4, Status 5	Status 4								
BCC check for Status 5	ENABLE/DISABLE	DISABLE								
Connector	Type B plug Cable length shorter than 5 m (Twisted pair shielded)									
Version	USB 2.0 High speed									
Receive buffer size	2.95 MB 									

5.2 Connector Pin Assignment

Pin number	Name
1	VBus
2	-Data(D-)
3	+Data(D+)
4	GND

6 LAN, Wireless LAN

6.1 Basic Specifications (LAN)

Interface	RJ45 														
Connector	Connector type RJ45 Cable type 10BASE-T, 100BASE-TX (category 5 or upper) Cable length shorter than 100 (m)														
Link/Status LED	LED lights when LINK with the Ethernet is established or the printer received packet. <table border="1"><thead><tr><th>LED</th><th>Color</th><th>Motion Specification</th></tr></thead><tbody><tr><td>LED1</td><td>Green</td><td>LED lights for a certain time when received packets (10 msec)</td></tr><tr><td rowspan="2">LED2</td><td>Yellow</td><td>LED goes off when the printer detected the connection to 10BASE-T</td></tr><tr><td>Orange</td><td>LED lights when the printer detected the connection to 100BASE-TX</td></tr><tr><td></td><td>White</td><td>LED lights when a cable is not connected</td></tr></tbody></table>	LED	Color	Motion Specification	LED1	Green	LED lights for a certain time when received packets (10 msec)	LED2	Yellow	LED goes off when the printer detected the connection to 10BASE-T	Orange	LED lights when the printer detected the connection to 100BASE-TX		White	LED lights when a cable is not connected
LED	Color	Motion Specification													
LED1	Green	LED lights for a certain time when received packets (10 msec)													
LED2	Yellow	LED goes off when the printer detected the connection to 10BASE-T													
	Orange	LED lights when the printer detected the connection to 100BASE-TX													
	White	LED lights when a cable is not connected													
Protocol	The following communication protocol settings can be made. <table border="1"><thead><tr><th>Setting Items</th><th>Setting range</th></tr></thead><tbody><tr><td>Protocol</td><td>Printer Status 3 Return Printer Status 4 Return (cyclic response mode) Printer Status 4 Return (ENQ response mode) (default value) Printer Status 5 Return</td></tr></tbody></table>	Setting Items	Setting range	Protocol	Printer Status 3 Return Printer Status 4 Return (cyclic response mode) Printer Status 4 Return (ENQ response mode) (default value) Printer Status 5 Return										
Setting Items	Setting range														
Protocol	Printer Status 3 Return Printer Status 4 Return (cyclic response mode) Printer Status 4 Return (ENQ response mode) (default value) Printer Status 5 Return														
Receive buffer size	2.95 MB 														

6.1.1 LAN setting/display items

The list of items that can be set or referenced is shown below.

TCP/IP related setting

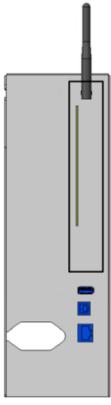
Setting Items	Setting range	Default (at shipment)
LAN/WLAN switching	Auto/LAN/Wi-Fi	Auto
DHCP v4 setting	ENABLE/DISABLE	ENABLE
IPv4 address	0.0.0.0 to 255.255.255.255	000.000.000.000
Subnet mask	0.0.0.0 to 255.255.255.255	255.255.255.000
IPv4 Default Gateway	0.0.0.0 to 255.255.255.255	000.000.000.000
IPv4 DNS primary address	0.0.0.0 to 255.255.255.255	000.000.000.000
IPv4 DNS secondary address	0.0.0.0 to 255.255.255.255	000.000.000.000
IPv6 address resolution	Manual/DCHP/AUTO/Disable	Disable
IPv6 address	AAAA:BBBB:CCCC:DDDD:EEEE: FFFF:GGGG:HHHH ASCII specification for 128 bit A to H is in the range of "0" to "9", "A" to "F". A to H can be omitted	0:0:0:0:0:0:0
IPv6 Default Router	AAAA:BBBB:CCCC:DDDD:EEEE: FFFF:GGGG:HHHH ASCII specification for 128 bit A to H is in the range of "0" to "9", "A" to "F". A to H can be omitted	0:0:0:0:0:0:0
Ipv6 Subnet Prefix	1 to 128	64
IPv6 DNS primary address	AAAA:BBBB:CCCC:DDDD:EEEE: FFFF:GGGG:HHHH ASCII specification for 128 bit A to H is in the range of "0" to "9", "A" to "F". A to H can be omitted	0:0:0:0:0:0:0
ARP Announcement	Enable Disable	Enable
ARP Periodic	"0"~"600"(seconds)	0
KEEPALIVETIME	"30" to "300"(seconds)	180
KEEPALIVECOUNT	"1" to "999" (times)	17
SOCKET_CANCEL	"0": Normal mode "1": Compatible mode	0
Communication protocol (for SBPL)	0:Status 4(periodic) 1:Status 4(ENQ) 2:Status 3 3:Status 5 4:None	1
BCC check for Status 5	ENABLE/DISABLE	DISABLE
Multiple connections	ENABLE/DISABLE	DISABLE
Port number 1	1 to 65535 *1	1024
Port number 2	1 to 65535 *1	1025
Port number 3	1 to 65535 *1	9100
SNTP function	ENABLE/DISABLE	DISABLE
SNTP server IPv4 address	0.0.0.0 to 255.255.255.255	000.000.000.000
SNTP error notification function	ENABLE/DISABLE	DISABLE
SNMP settings	DISABLE/ENABLE	DISABLE
SNMP sysContact	Character string within 0- 255 characters	
SNMP sysName	Character string within 0- 255 characters	
SNMP sysLocation	Character string within 0- 255 characters	
SNMP read-only version	1 2c 3 1 2c 3 DISABLE	1 2c 3
SNMP read-only community name	Character string of max. 32 characters Max 32 characters long string	public
SNMP read-only user name	8 to 32 characters	rouser
SNMP read-only security	none/Authentication /Privacy (encrypted)	none
SNMP read-only authentication protocol	MD5/SHA	MD5
SNMP read-only authentication password	8 to 32 characters	mypassword
SNMP read-only authentication cryptographic system	DES/AES	DES
SNMP read-only cryptography password	8 to 32 characters	mypassword

SNMP read-write version	1 2c 3 1 2c 3 DISABLE	1 2c 3
SNMP read-write community name	Character string of max. 32 characters	private
SNMP read-write user name	8 to 32 characters	rwuser
SNMP read-write security	none/Authentication /Privacy (encrypted)	none
SNMP read-write authentication protocol	MD5/SHA	MD5
SNMP read-write authentication password	8 to 32 characters	mypassword
SNMP read-write authentication cryptographic system	DES/AES	DES
SNMP read-write cryptographic password	8 to 32 characters	mypassword
SNMP trap	ENABLE/DISABLE	DISABLE
SNMP trap version	SNMPv1/SNMPv2c/SNMPv3	SNMPv1
SNMP trap Destinations	Distnation1,Distnation2,Distnation3	Distnation1
SNMP trap IP version	IPv4/IPv6	IPv4
SNMP IPv4 trap Destination1	AAA.BBB.CCC.DDD A to D represent "0" to "255" Allow "0" to "255" for A to D	0.0.0.0
SNMP IPv6 trap Destination1	AAAA:BBBB:CCCC:DDDD: FFFF:GGGG:HHHH ASCII specification for 128 bit A to H represent "0" to "FFFF" A to H can be omitted	0:0:0:0:0:0:0
SNMP IPv4 trap Destination2	AAA.BBB.CCC.DDD A to D indicates "0" to "255" Allow "0" to "255" for A to D	0.0.0.0
SNMP IPv6 trap Destination2	AAAA:BBBB:CCCC:DDDD: FFFF:GGGG:HHHH ASCII specification for 128 bit A to H represent "0" to "FFFF" A to H can be omitted	0:0:0:0:0:0:0
SNMP IPv4 trap Destination3	AAA.BBB.CCC.DDD A to D indicates "0" to "255" Allow "0" to "255" for A to D	0.0.0.0
SNMP IPv6 trap Destination3	AAAA:BBBB:CCCC:DDDD: FFFF:GGGG:HHHH ASCII specification for 128 bit A to H represent "0" to "FFFF" A to H can be omitted	0:0:0:0:0:0:0
SNMP trap community	Character string of max. 32 characters Max 32 characters long string *Encrypted data	trapcom
SNMP trap user name	Character string of max. 32 characters Max 32 characters long string *Encrypted data	trapuser
SNMP trap engine ID	Even number 10 to 64 digits	Number generated from Unique code.
SNMP trap security	"0": NONE "1": Authentication "2": Privacy (encrypted)	none
SNMP trap authentication protocol	"0":MD5 "1":SHA	0
SNMP trap authentication password	8 to 32 digit characters *Encrypted data	mypassword
SNMP trap encryption protocol	"0":DES "1":AES	DES
SNMP trap encryption password	8 to 32 digit characters *Encrypted data	mypassword
LPD	ENABLE/DISABLE	ENABLE
FTP	ENABLE/DISABLE	DISABLE
FTP Timeout	"10"~"3600"(seconds)	300

[Disclaimer]

*1.Please note that port number 1-1023 is Well-known port. Please use the port on one's own responsibility.
Our company assume no responsible for any failure arising from use.

6.2 Basic Specifications (wireless LAN)

Interface (Wireless LAN PCB)										
Protocol	<p>The following communication protocol settings can be made.</p> <table border="1"> <thead> <tr> <th>Setting Items</th><th>Setting range</th></tr> </thead> <tbody> <tr> <td>Protocol</td><td> Printer Status 3 Return Printer Status 4 Return (cyclic response mode) Printer Status 4 Return (ENQ response mode) (default value) Printer Status 5 Return </td></tr> </tbody> </table>	Setting Items	Setting range	Protocol	Printer Status 3 Return Printer Status 4 Return (cyclic response mode) Printer Status 4 Return (ENQ response mode) (default value) Printer Status 5 Return					
Setting Items	Setting range									
Protocol	Printer Status 3 Return Printer Status 4 Return (cyclic response mode) Printer Status 4 Return (ENQ response mode) (default value) Printer Status 5 Return									
Wireless display status	<p>The field intensity is displayed by an icon on the screen.</p> <table border="1"> <thead> <tr> <th>Icon</th><th>Name</th><th>Description</th></tr> </thead> <tbody> <tr> <td></td><td>Not connected</td><td>Wi-Fi is enabled but not connected</td></tr> <tr> <td></td><td>Wi-Fi field intensity</td><td>Wi-Fi connected, field intensity (4 levels)</td></tr> </tbody> </table>	Icon	Name	Description		Not connected	Wi-Fi is enabled but not connected		Wi-Fi field intensity	Wi-Fi connected, field intensity (4 levels)
Icon	Name	Description								
	Not connected	Wi-Fi is enabled but not connected								
	Wi-Fi field intensity	Wi-Fi connected, field intensity (4 levels)								
Wifi information display	<p>Display Wifi information on the Information/Wifi Status screen Update is performed every 10 seconds.</p> 									

Wireless LAN specification	<p>(1) Standard Conforms to IEEE802.11a/b/g/n</p> <table border="1" data-bbox="562 294 1171 467"> <thead> <tr> <th>Standard</th><th>Frequency band</th><th>Max. speed</th></tr> </thead> <tbody> <tr> <td>IEEE802.11b</td><td>2.4 GHz</td><td>150.0 Mbps</td></tr> <tr> <td>IEEE802.11a</td><td>5 GHz</td><td>54 Mbps</td></tr> <tr> <td>IEEE802.11g</td><td>2.4 GHz</td><td>54 Mbps</td></tr> <tr> <td>IEEE802.11n</td><td>2.4 to 5 GHz</td><td>135 Mbps</td></tr> </tbody> </table> <p>(2) IEEE802.11n connection conditions MCS value 0 to 6 supported While operation is performed at MCS value 7, performance is not guaranteed.</p> <table border="1" data-bbox="562 631 970 871"> <thead> <tr> <th>Band width</th><th>Guard interval</th><th>Baud rate</th></tr> </thead> <tbody> <tr> <td rowspan="2">20 MHz</td><td>800 nsec</td><td>58.5 Mbps</td></tr> <tr> <td>400 nsec</td><td>65.0Mbps</td></tr> <tr> <td rowspan="2">40 MHz</td><td>800 nsec</td><td>121.5 Mbps</td></tr> <tr> <td>400 nsec</td><td>135.0Mbps</td></tr> </tbody> </table> <p>(3) Wireless LAN communication mode Infrastructure mode Ad Hoc mode *In IEEE802.11n, only Infrastructure mode is available.</p> <p>(4) Used channel 1 - 13 (when connected with IEEE802.11b/g/n) *AP channel will be used in the Infrastructure mode. *A channel of the other side will be used when the other side's status is waiting for connection in the Ad Hoc mode. *Regardless of the regional setting, when the band width of the IEEE802.11n is 40MHz, the setting range will be 3 to 11 channel.</p> <p>(5) SSID Up to 32 alphanumeric characters and symbols (from 20H to 7EH) can be set.</p>	Standard	Frequency band	Max. speed	IEEE802.11b	2.4 GHz	150.0 Mbps	IEEE802.11a	5 GHz	54 Mbps	IEEE802.11g	2.4 GHz	54 Mbps	IEEE802.11n	2.4 to 5 GHz	135 Mbps	Band width	Guard interval	Baud rate	20 MHz	800 nsec	58.5 Mbps	400 nsec	65.0Mbps	40 MHz	800 nsec	121.5 Mbps	400 nsec	135.0Mbps
Standard	Frequency band	Max. speed																											
IEEE802.11b	2.4 GHz	150.0 Mbps																											
IEEE802.11a	5 GHz	54 Mbps																											
IEEE802.11g	2.4 GHz	54 Mbps																											
IEEE802.11n	2.4 to 5 GHz	135 Mbps																											
Band width	Guard interval	Baud rate																											
20 MHz	800 nsec	58.5 Mbps																											
	400 nsec	65.0Mbps																											
40 MHz	800 nsec	121.5 Mbps																											
	400 nsec	135.0Mbps																											

(6) Wireless LAN security

Wireless LAN Security	None	
	WEP	
	WPA+WPA2	
	WPA2	
	Dynamic WEP	
WEP	Open system	
	Shared Key	
WEP Key	1 ~ 4	
WEP Key Characters	64bit 5 ASCII / 10 hex 128bit 13 ASCII / 26 hex	
WPA+WPA2、 WPA2	PSK	PSK Key 8~64 ASCII 64 hex
	Enterprise(802.1x)	EAP Conf
	CCKM	
EAP	FAST	MSCHAP v 2
		GTC
		TLS
	PEAP	LEAP
		MSCHAP v 2
		GTC
		TLS
		MD5
		OTP
	TTLS	TLS
		MSCHAP v 2
		MSCHAP
		CHAP
		PAP
		EAP-GTC
		EAP-MD5
		EAP-MSCHAPv2
		EAP-OTP
		EAP-TLS

	<p>(7) Security (combination of authentication and encryption scheme)</p> <p>Ad Hoc mode</p> <table border="1"> <thead> <tr> <th>Security</th><th>Authentication</th></tr> </thead> <tbody> <tr> <td>None</td><td>-</td></tr> <tr> <td>WEP</td><td>Open System Shared Key0</td></tr> </tbody> </table> <p>*Ad Hoc mode is not supported with IEEE802.11n.</p> <p>Infrastructure mode</p> <p>Please refer to the " (6) Wireless LAN security"</p> <p>(8) WPS 2.0 (Wi-Fi Simple Configuration Technical Specification v2.0.0) is supported</p> <p>(9) In the Adhoc mode, communication can be performed with up to six terminals.</p> <p>(10) CCX authentication (Ver4.0), Wi-Fi ® authentication are acquired.</p> <p>(11) The printer supports Wi-Fi Direct.</p> <p>*Note When using this printer around medical equipments/facilities, please consult with the system administrator to confirm there is no influence to the equipments/facilities.</p>	Security	Authentication	None	-	WEP	Open System Shared Key0
Security	Authentication						
None	-						
WEP	Open System Shared Key0						
Receive buffer size	<p>2.95 MB</p> <p>Near full 0 2.95 MB</p> <p>Near full 0.95 MB</p> <p>Near full 1.95 MB</p>						

6.2.1 Wireless LAN setting/display items

Sections that can be set and referred, and variables are listed in the table below.

Variable name	Setting range	Default (at shipment)
Wireless LAN operation mode	Infrastructure/Adhoc	Adhoc
SSID	1 to 32 characters (*1)	SATO_PRINTER
Hidden SSID	ENABLE/DISABLE	ENABLE
Channel number	1 to 13The range changes with regions.	6
Infrastructure mode network security	None/WEP/WPA+WPA2/WPA2/Dynamic WEP	None
Adhoc mode network security	None/WEP	None
WEP key	Open system/Shared Key	Open System
WEP key 1	Encrypted character string of characters	NULL
WEP key 2	Encrypted character string of characters	NULL
WEP key 3	Encrypted character string of characters	NULL
WEP key 4	Encrypted character string of characters	NULL
WEP Key Index	1 to 4	1
WPA authentication	"0": Personal (PSK), "1": Enterprise (802.1x) "2": CCKM	0
PSK	8 to 63 ASCII or 64 HEX digits	NULL
EAP Mode	"0": FAST "1": LEAP "2": PEAP "3": TLS "4": TTLS	0
Inner Method if EAP Mode=FAST	"0":MSCHAPv2 "1":GTC "2":TLS	"0":MSCHAPv2
Inner Method if EAP Mode=PEAP	"0":MSCHAPv2 "1":GTC "2":MD5 "3":OTP "4":TLS	"0":MSCHAPv2
Inner Method if EAP Mode=TTLS	"0":MSCHAPv2 "1":MSCHAP "2":CHAP "3":PAP "4":EAP-GTC "5":EAP-MD5 "6":EAP-MSCHAPv2 "7":EAP-OTP "8":EAP-TLS	"0":MSCHAPv2
EAP authenticated user name	0 to 63 characters (*1)	NULL
EAP authentication password	0 to 32 encrypted characters	NULL
Anon. Outer ID If EAP Mode = FAST, PEAP, TTLS	0 to 63 characters (*1)	NULL
Verify Server Cert. Not for LEAP	ENABLE/DISABLE	ENABLE
Private Key P/W	0 to 64 encrypted characters	NULL
PAC Auto provisioning	ENABLE/DISABLE	DISABLE
PAC Password	0 to 64 encrypted characters	NULL

*1: The specification range is HEX 20 to 7Eh.

6.3 Software Specifications

Available protocol: TCP/IP

Network layer: IPv4,IPv6,ICMP

Session layer: TCP and UDP

Application layer: LPR, FTP, DHCP, HTTP/HTTPS, NMP, SNTP

1) LPR, FTP and dedicated socket protocol of TCP/IP are available for sending print data.

2) Dedicated socket protocol is available to obtain printer status.

6.4 TCP/IP

In the TCP/IP protocol environment, LPR and FTP are provided for printing. You can use DHCP for setting the address.

6.5 LPR Specifications

The protocol of LPR complies with RFC1179, and handles the list of logical printer names as a cue name.

The cue name is lp.

Order of sending of data file and control file doesn't affect print operation when sending job with LPR.

* Deleting job with LPR is not available.

* The LPR specification is available only in Status 4/ENQ response.

* When conducting large quantity printing with LPR, some data may be skipped because of the specification of Windows.

* Banner page printing is not available.

* Note that establishing multiple session at the same time is not available.

6.6 FTP

FTP protocol complies with RFC959. It handles the list of logical printer name as a transmission destination directory, and performs transmitting files to the directory as the print operation. You can specify ASCII (A) or BINARY (I) as a transmission mode, however difference of the mode depends on the client.

The directory name is lp.

* Note that establishing multiple session at the same time is not available.

* The login user is as shown below. (No password is required.)

```
root  
anonymmous  
lp  
...
```

6.7 NTP (Network Time Protocol)

Uses NTP to adjust the time in the printer. When the NTP function is enabled, it acquires the current time from the NTP server and uses it to adjust the time in the printer. If a calendar IC is installed, it also adjusts the calendar IC time. This function operates using the LAN or wireless LAN interface. If "NTP error notification" is "ENABLE" when time adjustment using NTP fails, an error screen appears.

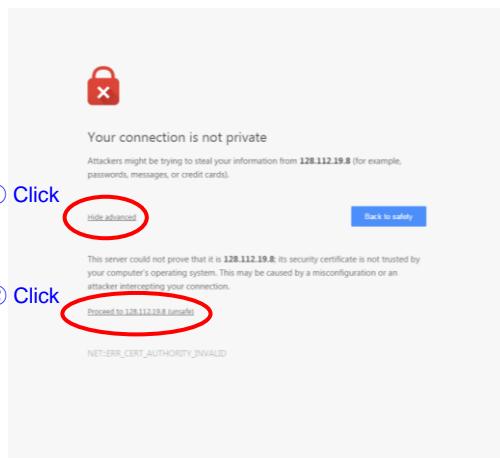
6.8 FTP/HTTP/HTTPS specification

The printer can be configured through web browser. See below for the URL.
(recommended browser: Chrome)

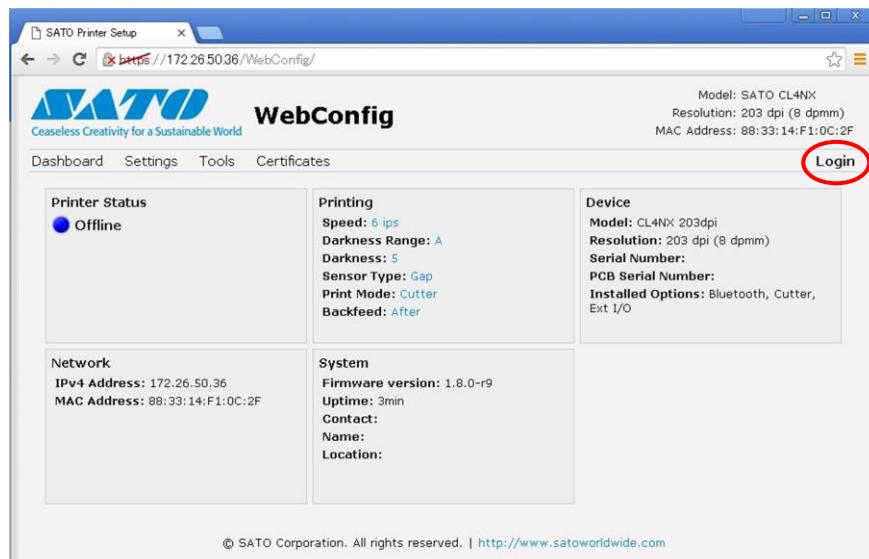
- 1) Access the printer at the following URL from the Web browser.

https://printer's IP address/

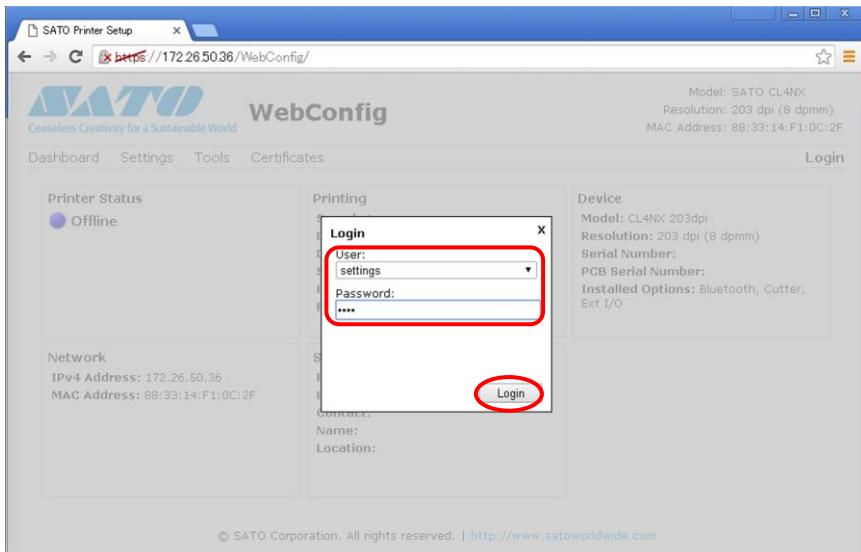
- 2) If you are sure you have entered in the correct IP address, go to the Advanced option and click Proceed to [printer's IP address] to view WebConfig screen.



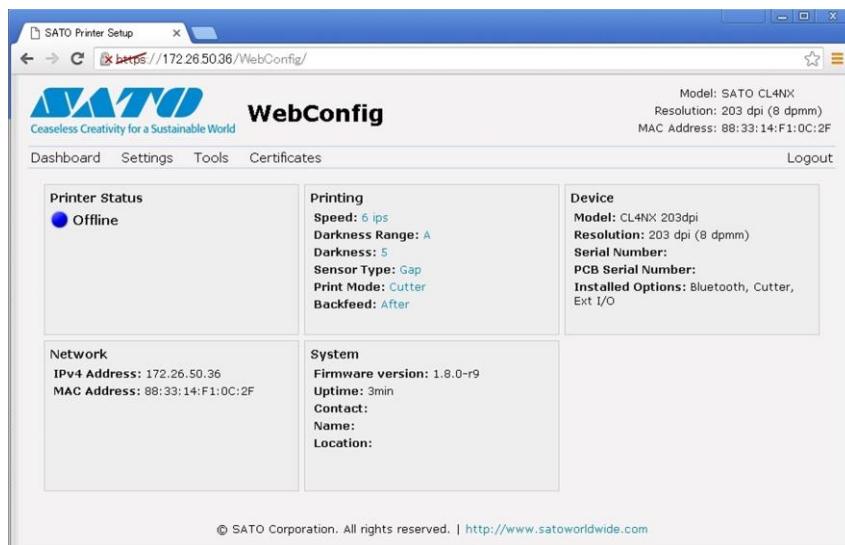
- 3) Click the "login" from WebConfig screen.



4) Log in. Username: settings, Password: It becomes 0310.



5) Login is now complete.



6.9 Wireless LAN settings

6.9.1 802.1x authentication and certification

In 802.1x authentication, certification may be required depending on the format. If certification is required, it must be imported from the WEB settings screen or from a USB memory device.

Type of certification and secret key, necessity of certification, ID, and password are explained below.

- Items need to be imported from the WEB setting screen

No	Imported item	Description
1	Route certification	File: select files of route certification
2	Client certification	Password: input the secret password for the client certification File: files of client certification
3	Secret key	Password: input password for the secret key File: select secret files
4	PAC file	Password: input password for the PAC files File: select PAC files

- Necessity of ID/password and each certification in the 802.1x authentication.

EAP format	Necessity (○:necessary, ×: not necessary, Δ: others)						
	User name	Password	Certification Password	Route certification	Client certification	Secret key	PAC file
EAP-TLS	○	×	○	○	○	○	×
EAP-PEAP	○	○	×	○	×	×	×
EAP-LEAP	○	○	×	×	×	×	×
EAP-TTLS	○	○	×	○	×	×	×
EAP-FAST	○	○	×	×	×	×	Δ(*1)

*1 Necessary when PAC file auto distribution is OFF.

6.10 Socket Communication

2 types of connection can be used in the socket server function of TCP/IP; 2 port connection that uses Port 1024 for receiving print data and

Port 1025 for printer status return, and 1 port connection that uses Port 9100 for print data receiving and printer status return.

When using Port 9100, the printer returns only status return data and the printer operation setting request data.

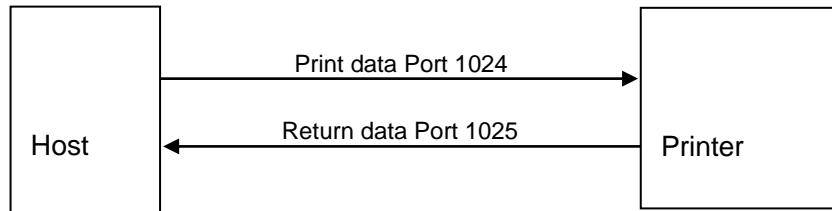
Using both 2 port connection and 1 port connection at the same time is not available.

Each socket cannot connect to multiple sessions at the same time.

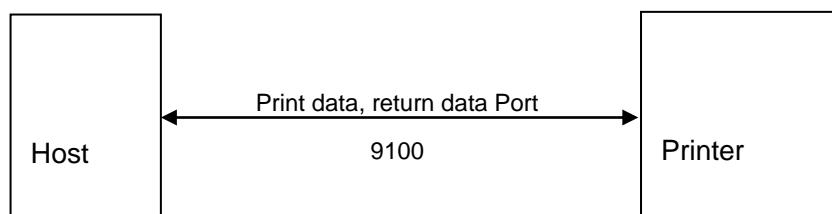
LPR and FTP are available for sending print data in addition to socket. During connecting LPR or FTP, connecting to print data port (Port 1024 or Port 9100) with socket communication is not available.

2 ports connection with Port 1025 and Port 9100 is not available.

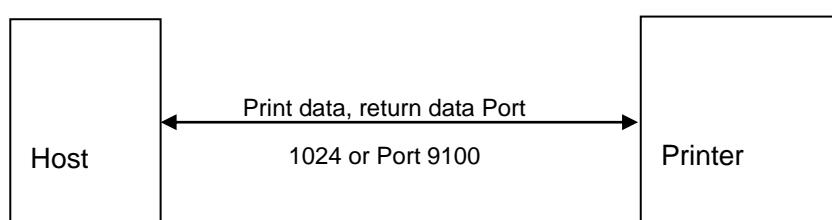
1) Printing with 2 port connection/Socket (Status 4)



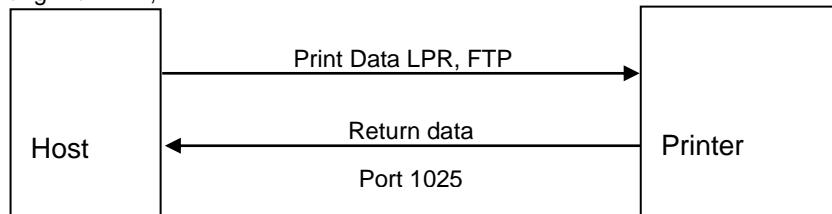
2) Printing with 1 port connection/Socket (Status 4)



3) Printing with 1 port connection/Socket (Status 3 and 5 return)



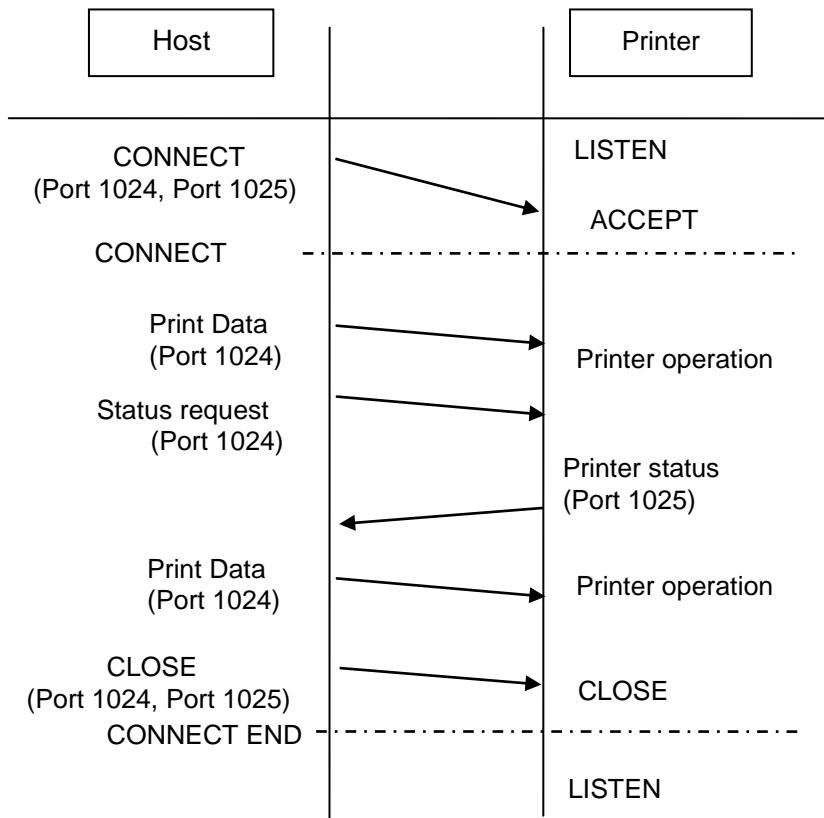
4) Printing with LPR, FTP



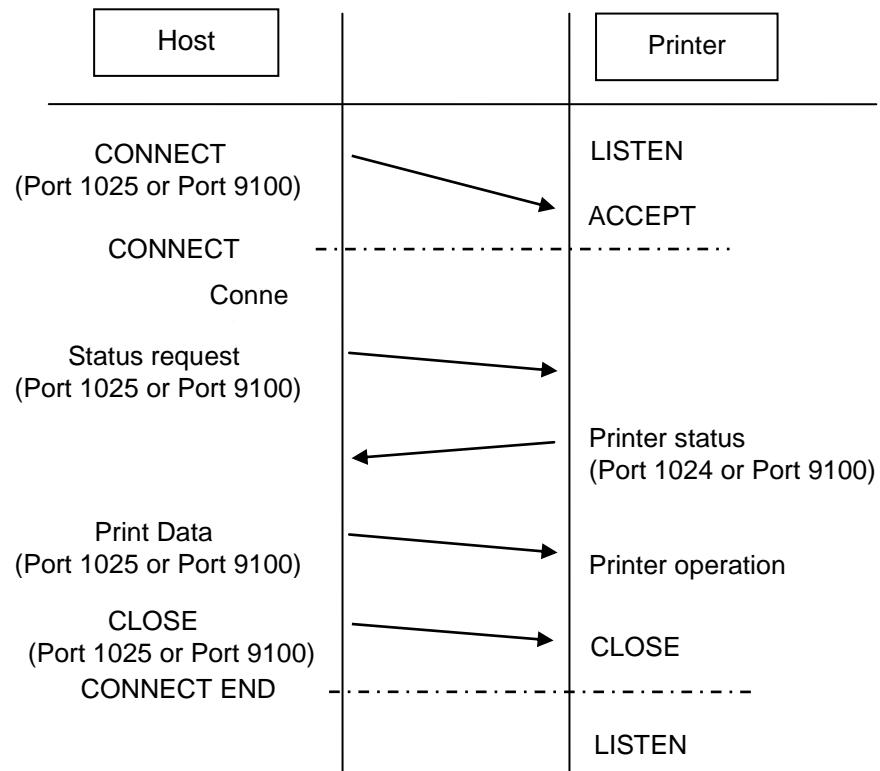
6.11 Connection and disconnection of session

The socket sever function connects and disconnects the print data port (Port 1024), the status reply port (Port 1025) and the sending and receiving port (Port 9100 or Port 1024) in the following manner.

1) Printing data port (Port 1024), status return port (Port 1025)



2) Sending and receiving port (Port 9100 or Port 1024)



6.12 Printer status

1) Status mode

There are 3 modes of status return when using LAN interface.

(1) Status 4/Cyclic response mode (2 port connection or 1 port connection)

The printer uses port 1024 for print data port, port 1025 for status return, and port 9100 for both print data port and status return.

The printer output the printer status at a constant period (500 msec to 1000 msec interval) . Also, the printer returns the latest printer status by receiving the status request command sent from the host.

(2) Status 4/ENQ response mode (2 port connection or 1 port connection)

The printer uses port 1024 for print data port, port 1025 for status return, and port 9100 for both print data port and status return.

The printer returns the printer status by receiving the status request command sent from the host.

(3) Status 3, Status 5/ENQ response mode (1 port connection)

The printer uses port 1024 for print data port and status return, or uses port 9100 for both print data port and status return.

The printer returns ACK by receiving the print request command sent from the host, and returns the printer status by receiving the status request command sent from the host.

Printer driver can not be used for label printing while using Status 3.

Switching status mode is available by changing setting of the communication protocol and the printer status reply timing in the interface mode of the printer. Type of status mode and the setting items in the interface setting mode is as follows.

Type of status mode	Setting items in the interface setting mode	
	Flow Control	
2 port connection Cyclic response mode	Status 4	
2 port connection ENQ response mode	Status 4 ENQ	
1 port connection ENQ response mode	Status 3 Status 5	

2) Status return data format

(1) 2 ports connection (Status 4 return)

Number of send bytes 4 bytes 0000001CH	ENQ 1 byte 05H	ID number 2 bytes	STX 1 byte 02H	Status 1 byte	Remaining print number 6 bytes	JOB name 16 bytes	ETX 1 bytes 03H
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(Total: 32 bytes)

Please refer to the "2.42.2.2 Return status of status 4" for the status contents.

(2) 1 port connection (Status 5 return)

STX 1 byte 02H	Specified item No. 5 bytes	Specified item Status 2 bytes	Currently processed item 5 byte	Currently processed item Status 2 bytes	Currently processed item Number of print 6 bytes	ETX 03H 1 byte
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(Total: 22 bytes)

Please refer to the "2.42.2.3 Return status of status 5" for the status contents.

(3) 1 port connection (Status 3 return)

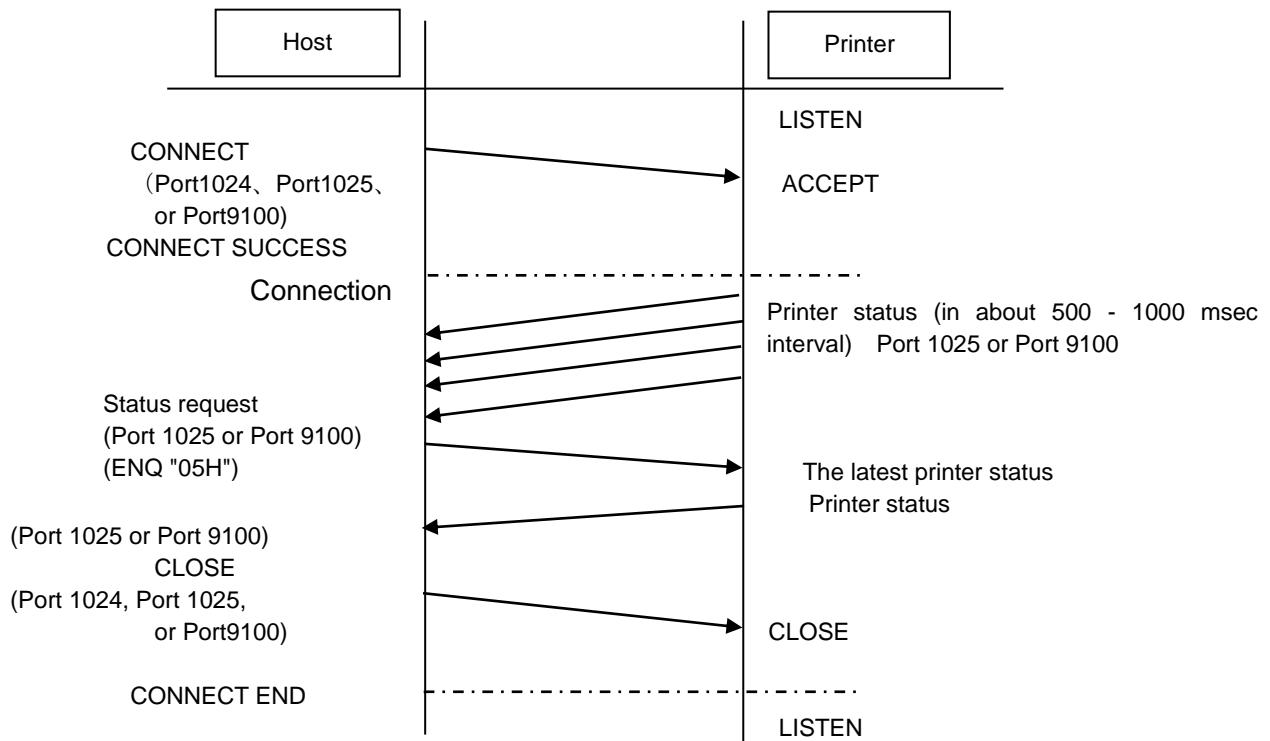
STX 1 byte 02H	ID number 2 byte	Status 1 byte	Remaining print q'ty 6 byte	ETX 1 byte 03H
(Total: 11 bytes)				

Please refer to the "2.42.2.1 Return status of status 3" for the status contents.

3) Sequence

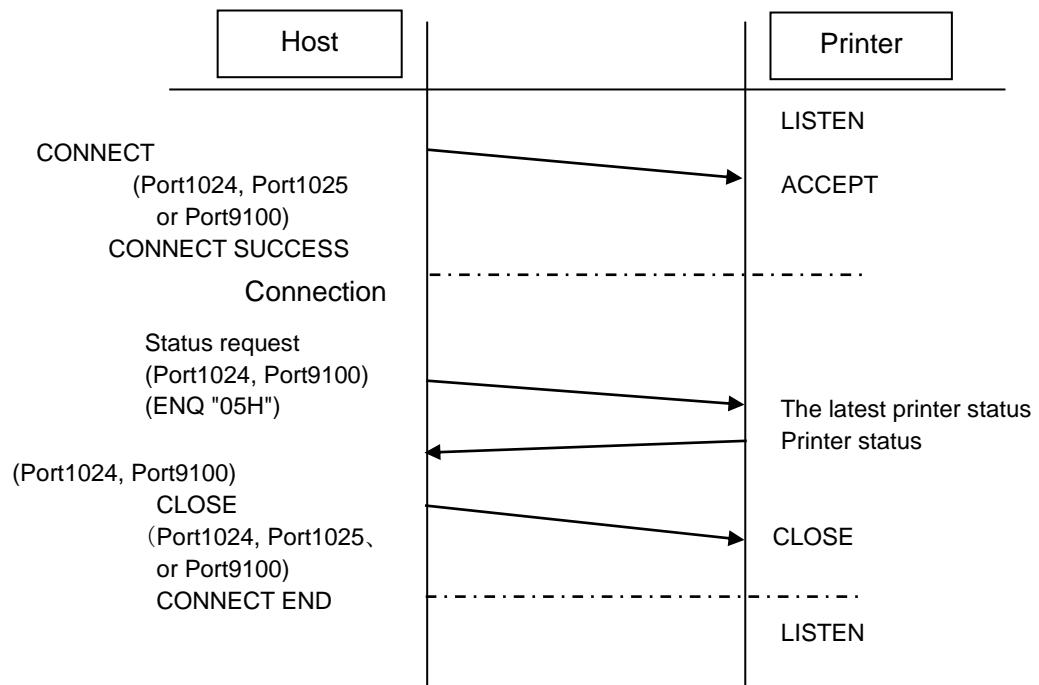
(1) Status 4/Cyclic response mode (2 ports connection or 1 port connection)

The printer will return the status in the interval of 500 to 1000 msec. When receiving a status request command (ENQ: 05H) from the host, the printer returns the latest printer status data.



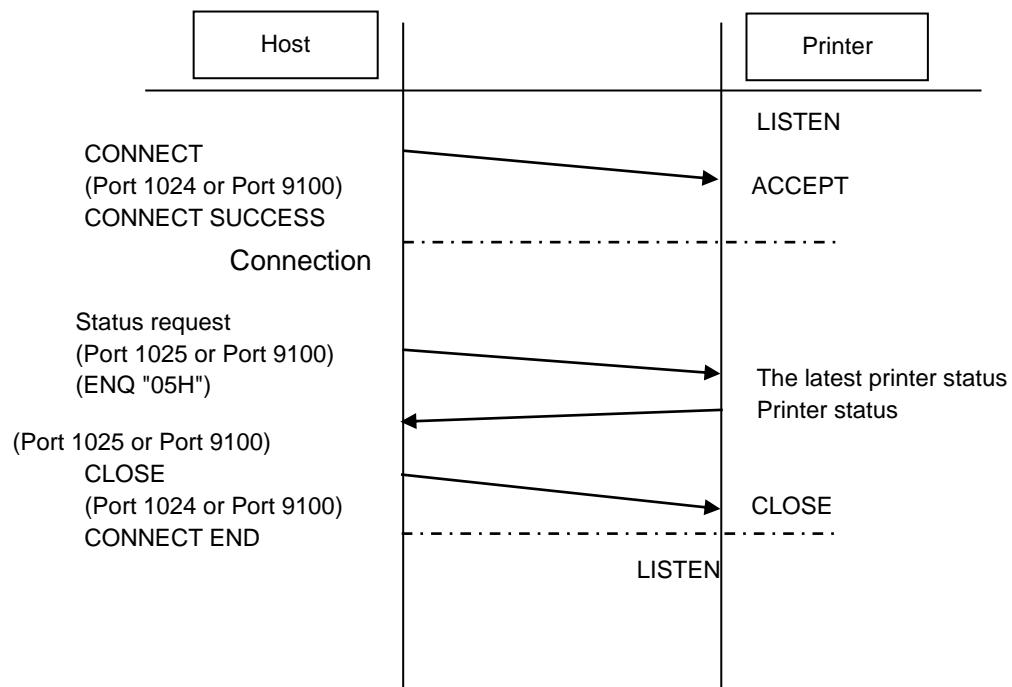
(2) Status 4/ENQ response mode (2 ports connection or 1 port connection)

After receiving a status request command (ENQ: 05H) from the host, the printer returns the latest printer status.



(3) Status 3, Status 5/ENQ response mode (1 port connection)

The printer returns ACK by receiving the print request command sent from the host, and returns the printer status by receiving the status request command (ENQ:05H)



6.13 SNMP Specifications

SNMP is a protocol to monitor/control network devices that are connected to the network. This printer supports communication via SNMPv1, SNMPv2c and SNMPv3. The following MIB-II is supported as MIB, and it is possible to get information, notify administrative information and change settings using this MIB.

- system(1)
- interface(2)
- at(3)
- ip(4)
- icmp(5)
- tcp(6)
- udp(7)
- snmp(10)
- host(25)
- printerMIB(43)

Host ResourceMIB/printerMIB is supported to show printer status. See next page for details.

6.13.1 PrinterMIB / Host Resources MIB that shows printer status

CL4NX/CL6NX			Trap	Printer MIB				Host Resources MIB		
#	Alert	Description		prtAlertSeverityLevel	prtAlertTrainingLevel	prtAlertGroup	prtAlertCode	hrPrinterDetectedErrorState	hrDeviceStatus	hrPrinterStatus
1	EBATTDEG	Battery degradation	X	critical(3)	untrained(3)	other(1)	subunitLifeOver(11)	-	Depends on the printer status (mStatus_xxx)	Depends on the printer status (mStatus_xxx)
2	EBATTCAUTION	Battery degradation	X	critical(3)	untrained(3)	other(1)	subunitLifeOver(11)	-		
3	EBATTERY	Battery error	X	critical(3)	untrained(3)	other(1)	subunitUnrecoverableFailure(30)	-		
4	EBATTLOW	Battery low	X	critical(3)	untrained(3)	other(1)	subunitAlmostEmpty(12)	-		
5	EBATTLOWCHG	Battery low (charging)	X	critical(3)	untrained(3)	other(1)	subunitAlmostEmpty(12)	-		
6	EBATTNONE	No battery	X	critical(3)	untrained(3)	other(1)	subunitMissing(9)	-		
7	EBATTTEMP	Battery temperature error	X	critical(3)	other(1)	other(1)	subunitAtLimit(17)	-		
8	EBATTWARNING	Battery degradation	X	critical(3)	other(1)	other(1)	subunitLifeOver(11)	-		
9	EBCC	Status5 BCC error	X	critical(3)	other(1)	interpreter(15)	other(1)	-		
10	EBOVER	Buffer overflow	X	critical(3)	other(1)	channel(14)	other(1)	-		
11	EBTMODULE	Bluetooth module error	X	critical(3)	fieldService(5)	channel(14)	subunitUnrecoverableFailure(30)	-		
12	EBVCOMPARE	Barcode verification error(compare)	X	critical(3)	trained(4)	other(1)	other(1)	-		
13	EBVCONNECT	Barcode reader connection error	X	critical(3)	trained(4)	other(1)	subunitMissing(9)	-		
14	EBVREAD	Barcode verification error(read)	X	critical(3)	trained(4)	other(1)	other(1)	-		
15	EBVSTART	Barcode verification error(start position)		critical(3)	trained(4)	other(1)	other(1)	-		
16	ECALENDAR	Calendar error	X	critical(3)	fieldService(5)	other(1)	other(1)	-		

CL4NX/CL6NX			Trap	Printer MIB				Host Resources MIB		
#	Alert	Description		prtAlertSeverityLevel	prtAlertTrainingLevel	prtAlertGroup	prtAlertCode	hrPrinterDectedErrorState	hrDeviceStatus	hrPrinterStatus
17	ECDBATTL	Card memory full	X	critical(3)	other(1)	other(1)	subunitMemoryExhausted(34)	-		
18	ECDRW	Card R/W error	X	critical(3)	other(1)	other(1)	other(1)	-		
19	ECEND/ENORIBBON	Ribbon end	X	critical(3)	untrained(3)	markerSupplies(11)	markerPrintRibbonEmpty(1103)	bit #3 (noToner)		
20	ECHARGEPOFF	Charging	X	critical(3)	untrained(3)	other(1)	other(1)	-		
21	ECMD/ECOMMAND	SBPL command error	X	critical(3)	other(1)	interpreter(15)	other(1)	-		
22	ECOPY_SRCISDST	Destination is source	X	critical(3)	other(1)	interpreter(15)	other(1)	-		
23	ECOVEROPEN	Cover open	X	critical(3)	untrained(3)	cover(6)	coverOpen(3)	bit #4 (doorOpen)		
24	ECRC	CRC error	X	critical(3)	other(1)	channel(14)	other(1)	-		
25	ECUTCOP	Cutter cover open	X	critical(3)	untrained(3)	finDevice(30)	separationCutterCoverOpen(31103)	bit #4 (doorOpen)		
26	ECUTNGSTATE	Eject cut not available		critical(3)	other(1)	finDevice(30)	other(1)	-		
27	ECUTTER	Cutter error	X	critical(3)	trained(4)	finDevice(30)	separationCutterJam(31108)	bit #5 (jammed)		
28	ECUTTERSTART	Cutter error	X	critical(3)	trained(4)	finDevice(30)	separationCutterJam(31108)	bit #5 (jammed)		
29	ECUTTERSTUCK	Cutter error	X	critical(3)	trained(4)	finDevice(30)	separationCutterJam(31108)	bit #5 (jammed)		
30	EDENSITY	Head density change	X	critical(3)	fieldService(5)	marker(10)	other(1)	-		
31	EDIGEST	Package verification error	X	critical(3)	other(1)	other(1)	other(1)	-		
32	EEAPAUTH	EAP authentication error	X	critical(3)	trained(4)	channel(14)	other(1)	-		
33	EEAPTIME	EAP authentication error	X	critical(3)	trained(4)	channel(14)	other(1)	-		

CL4NX/CL6NX			Trap	Printer MIB				Host Resources MIB		
#	Alert	Description		prtAlertSeverityLevel	prtAlertTrainingLevel	prtAlertGroup	prtAlertCode	hrPrinterDetectedErrorState	hrDeviceStatus	hrPrinterStatus
34	EFRAM	Framing error	X	critical(3)	other(1)	channel(14)	other(1)	-		
35	EGAPTOOLONG	Gap too long	X	critical(3)	untrained(3)	input(8)	other(1)	-		
36	EHDERR/EHEAD	Head error	X	critical(3)	fieldService(5)	marker(10)	other(1)	-		
37	EHOPEN/EHEADOPEN	Head open	X	critical(3)	untrained(3)	marker(10)	subunitOpened(18)	bit #4 (doorOpen)		
38	ELAN	LAN error	X	critical(3)	other(1)	channel(14)	other(1)	-		
39	EMACHINE	Machine error	X	critical(3)	fieldService(5)	other(1)	other(1)	-		
40	EMEDIA	Media error	X	critical(3)	trained(4)	other(1)	other(1)	-		
41	ENFCCMDERROR	NFC command error	X	critical(3)	other(1)	other(1)	other(1)	-		
42	ENFCMODULE	NFC module error	X	critical(3)	fieldService(5)	other(1)	other(1)	-		
43	EMOTERTEMP	Motor overheated	X	critical(3)	other(1)	other(1)	subunitOverTemperature(36)	-		
44	ENO_GAP	Gap not found	X	critical(3)	untrained(3)	input(8)	other(1)	-		
45	ENOIMARK	I-mark not found	X	critical(3)	untrained(3)	input(8)	other(1)	-		
46	ENONRFIDWARNING	Non-RFID Warning		critical(3)	trained(4)	other(1)	other(1)	-		
47	ENOTFOUND	Not found	X	critical(3)	other(1)	other(1)	other(1)	-		
48	ENOTHINGTOPRINT	No fields to print	X	critical(3)	untrained(3)	interpreter(15)	other(1)	-		
49	EOPTION	Option error		critical(3)	fieldService(5)	other(1)	other(1)	-		
50	EORUN	Overrun error	X	critical(3)	other(1)	channel(14)	other(1)	-		
51	EOVERHEAT	Print head overheated	X	critical(3)	other(1)	marker(10)	subunitOverTemperature(36)	-		
52	EPAPERJAM	Paper jam	X	critical(3)	trained(4)	mediaPath(13)	jam(8)	bit #5 (jammed)		
53	EPARAM	Invalid argument	X	critical(3)	other(1)	other(1)	other(1)	-		
54	EPAT	RFID tag error	X	critical(3)	untrained(3)	other(1)	other(1)	-		
55	EPEND/ENOPAPER	Out of paper	X	critical(3)	untrained(3)	input(8)	inputMediaSu	bit #1		

CL4NX/CL6NX			Trap	Printer MIB				Host Resources MIB		
#	Alert	Description		prtAlertSeverityLevel	prtAlertTrainingLevel	prtAlertGroup	prtAlertCode	hrPrinterDetectedErrorState	hrDeviceStatus	hrPrinterStatus
							pplyEmpty(808)	(noPaper)		
56	EPLATFORM	Package platform mismatch error	X	critical(3)	other(1)	other(1)	other(1)	-		
57	EPOWEROFF	Power off error	X	critical(3)	trained(4)	other(1)	other(1)	-		
58	EPRINTERTEMP	Printer overheated	X	critical(3)	fieldService(5)	generalPrinter(5)	subunitOverTemperature(36)	-		
59	EPROGRAM	Program error	X	critical(3)	fieldService(5)	other(1)	other(1)	-		
60	EPRTY	Parity error	X	critical(3)	other(1)	channel(14)	other(1)	-		
61	ERAMDISK	Ramdisk not found error	X	critical(3)	other(1)	other(1)	other(1)	-		
62	EREINDEX	Database reindex error	X	critical(3)	other(1)	interpreter(15)	other(1)	-		
63	ERFID	RFID error	X	critical(3)	fieldService(5)	other(1)	other(1)	-		
64	ESDBCOLSIZE	Too many bytes in indexed column	X	critical(3)	other(1)	interpreter(15)	other(1)	-		
65	ESDBCONN	Not connected to table	X	critical(3)	other(1)	interpreter(15)	other(1)	-		
66	ESDBCONTEXT	Edit operation no allowed	X	critical(3)	other(1)	interpreter(15)	other(1)	-		
67	ESDBNOISPC	No space in table index	X	critical(3)	other(1)	interpreter(15)	other(1)	-		
68	ESDBROWSIZE	Too many bytes in sdb row	X	critical(3)	other(1)	interpreter(15)	other(1)	-		
69	ESENSOR	Sensor error	X	critical(3)	trained(4)	mediaPath(13)	jam(8)	bit #5 (jammed)		
70	ESIGNFILE	No RSA key found	X	critical(3)	other(1)	other(1)	other(1)	-		
71	ESIGNFILEM	No matching RSA key found	X	critical(3)	other(1)	other(1)	other(1)	-		
72	ESIPLFIELDFULL	Field full	X	critical(3)	other(1)	interpreter(15)	other(1)	-		

CL4NX/CL6NX			Trap	Printer MIB				Host Resources MIB		
#	Alert	Description		prtAlertSeverityLevel	prtAlertTrainingLevel	prtAlertGroup	prtAlertCode	hrPrinterDectedErrorState	hrDeviceStatus	hrPrinterStatus
73	ESIPLFORMATFULL	Format full	X	critical(3)	other(1)	interpreter(15)	other(1)	-		
74	ESNTP	NTP error	X	critical(3)	other(1)	other(1)	other(1)	-		
75	ESOCKET	Socket error	X	critical(3)	fieldService(5)	channel(14)	other(1)	-		
76	ESTALEID	Status for job id has been recycled	X	critical(3)	other(1)	interpreter(15)	other(1)	-		
77	EVERSIONGT	Operation requires a later version	X	critical(3)	other(1)	other(1)	other(1)	-		
78	EVERSIONLT	Operation requires a previous version	X	critical(3)	other(1)	other(1)	other(1)	-		
79	EWLANMODULE	WLAN module error	X	critical(3)	fieldService(5)	channel(14)	other(1)	-		
80	EXMLSCHEMA	XML XSD error	X	critical(3)	other(1)	interpreter(15)	other(1)	-		
81	guiWarning_calendarError	Calendar error	X	warning(4)	fieldService(5)	other(1)	other(1)	-		
82	guiWarning_changeBattery1	Change battery	X	warning(4)	untrained(3)	other(1)	subunitLifeAlmostOver(10)	-		
83	guiWarning_changeBattery2	Change battery	X	warning(4)	untrained(3)	other(1)	subunitLifeAlmostOver(10)	-		
84	guiWarning_changeCutter	Change cutter	X	warning(4)	fieldService(5)	finDevice(30)	separationCutterLifeAlmostOver(31110)	-		
85	guiWarning_changePlaten	Change platen	X	warning(4)	fieldService(5)	mediaPath(13)	subunitLifeAlmostOver(10)	-		
86	guiWarning_changeTPH	Change TPH	X	warning(4)	fieldService(5)	marker(10)	subunitLifeAlmostOver(10)	-		
87	guiWarning_cleanHead	Clean head	X	warning(4)	trained(4)	marker(10)	other(1)	-		
88	guiWarning_commandError	Command error	X	warning(4)	other(1)	interpreter(15)	other(1)	-		
89	guiWarning_headError	Head error	X	warning(4)	fieldService(5)	marker(10)	other(1)	-		
90	guiWarning_paperNearEnd	Paper near end	X	warning(4)	untrained(3)	input(8)	inputMediaSupplyLow(807)	bit #0 (lowPaper)		

CL4NX/CL6NX			Trap	Printer MIB				Host Resources MIB		
#	Alert	Description		prtAlertSeverityLevel	prtAlertTrainingLevel	prtAlertGroup	prtAlertCode	hrPrinterDectedErrorState	hrDeviceStatus	hrPrinterStatus
91	guiWarning_receiveBufferNearFull	Receive buffer near full	X	warning(4)	other(1)	channel(14)	other(1)	-		
92	guiWarning_ribbonNearEnd	Ribbon near end	X	warning(4)	untrained(3)	markerSupplies(11)	markerPrintRibbonAlmostEmpty(1106)	bit #2 (lowToner)		
93	guiWarning_unknownHead	Unknown head	X	warning(4)	fieldService(5)	marker(10)	other(1)	-		
94	mStatus_error	Offline and error	X	critical(3)	untrained(3)	generalPrinter(5)	subunitOffline(22)	bit #6 (offline) bit #7 (serviceRequested)	down(5)	other(1)
95	mStatus_online mStatus_aep	Online	-	-	-	-	-	-	running(2) / warning(3) *	idle(3) / printing(4) **
96	mStatus_offline	Offline	X	critical(3)	untrained(3)	generalPrinter(5)	subunitOffline(22)	bit #6 (offline)	down(5)	other(1)
97	mStatus_powerDown	Power down	-	-	-	-	-	-	down(5)	other(1)
98	mStatus_init	Initializing	-	-	-	-	-	-	down(5)	warmup(5)
99	mStatus_upgrading	Upgrading	-	-	-	-	-	-	down(5)	other(1)
100	mStatus_powersave	Power Saving Mode	-	-	-	-	-	-	running(2) warning(3) down(5) ***	other(1)
101	mStatus_wakeup	Waking up from Power Saving Mode	-	-	-	-	-	-	running(2) warning(3) down(5) ***	warmup(5)

* warning(3) is set in case of an active warning (guiWarning_xxx), else running(2) is set.

** printing(4) is set while printing a label, else idle(3) is set.

*** running(2) or warning(3) is set (see *) if the printer will wake up to the online state (mStatus_online), else down(5) is set.

6.14 Switching between LAN and WLAN

This is a function that switches between interfaces so that you can use a LAN when a WLAN unit is connected.

Go to Interface > Network > Interface on the LCD screen and select the interface to be used.

Any of following 3 items can be selected:

Item	Explanation
AUTO	If a LAN cable is connected when the printer is started up, the LAN is enabled. If the printer cannot detect a connected LAN cable, the WLAN is enabled.
LAN	The LAN is enabled, and the WLAN is disabled.
Wi-Fi	The WLAN is enabled, and the LAN is disabled.

To enable the changed setting, restart the printer after you make the change.

Note that besides using the LCD screen, you can also change the setting with the DC2 command. (Refer to "Command Specification" for details.)

[Restrictions]

1. If the "Wi-Fi" setting is selected and you disconnect the WLAN unit before starting up the printer, the setting changes to "AUTO".
2. Other than the MAC address, the network settings for the LAN and WLAN are the same (DHCP/STATIC, IP address, subnet mask, gateway address, etc.).

6.15 Note

6.15.1 Common to LAN/wireless LAN interface

When opening or closing the print data port (Port 1024) or the status port (Port 1025) or the sending and receiving port (Port 9100), 150 msec to 200 msec interval is necessary between closing the port and opening the port again. If the time interval after closing the port is too short, it may cause double connection. Double connection means that the connection request "CONNECT" is sent to the port (Port 1024, Port 1025 or Port 9100) already connected (CONNECT (Socket OPEN)). In this case, this connection request will be rejected "Socket CLOSE". When receiving request of double connection, the printer responds to the request for disconnection (Socket CLOSE).

6.15.2 Wireless LAN interface

- 1) Communication distance and transmission speed between the host and the printer(wireless LAN board) varies depending on the wireless LAN operation at the used environment.
- 2) When using the printer in the Infrastructure mode, it is recommended to use it at a wireless LAN field intensity display of level 3 (see the numeric below) or higher.



- 3) Communication data may be lost when wireless LAN environment is not adequate due to mobile use of the printer or ambient conditions.
- 4) Please set the frequency of channels in each group are different for more than "5 channels" when multiple wireless LAN network groups are neighboring.
Example) When the channel of the group 1 is "1", set the channel of the group 2 for "6" or later.

6.15.3 LAN interface

- 1) Connecting and disconnecting LAN cable while the printer is connecting to the PC may result in communication failure. Please avoid connecting or disconnecting the cable while the printer is ON. In the case of communication failure, restart the printer.

7 Bluetooth

Bluetooth interface of the printer complies with Bluetooth Ver.3.0 standard.

7.1 Basic Specifications

Item	Description											
Standards	Bluetooth Ver. 3.0+EDR Power Class 2											
Communication distance	10m (at the standard measurement environment)											
Used profile	Serial Port Profile (SPP) *1											
Operation mode	Slave mode											
Security level	<table border="1"> <tr> <td>Level 1</td><td>No authentication</td></tr> <tr> <td>Level 2-1</td><td>No PIN code authentication, service level, encryption</td></tr> <tr> <td>Level 2-2</td><td>With PIN code authentication, service level, encryption</td></tr> <tr> <td>Level 3</td><td>No PIN code authentication, link level, encryption</td></tr> <tr> <td>Level 4</td><td>With secure simple pairing support, service level, encryption</td></tr> </table>		Level 1	No authentication	Level 2-1	No PIN code authentication, service level, encryption	Level 2-2	With PIN code authentication, service level, encryption	Level 3	No PIN code authentication, link level, encryption	Level 4	With secure simple pairing support, service level, encryption
Level 1	No authentication											
Level 2-1	No PIN code authentication, service level, encryption											
Level 2-2	With PIN code authentication, service level, encryption											
Level 3	No PIN code authentication, link level, encryption											
Level 4	With secure simple pairing support, service level, encryption											
PIN code	0 to 16 ASCII code specification (20H, 21H, 23H - 7EH) Default Value: 0000											
Device name	0 to 53 ASCII code specification (20H, 21H, 23H - 7EH) Default value: SATO PRINTER_xxxxxxxxxxxxxx (xxxxxxxxxxxx is BD address)											
Power Save Mode	sniff, park, hold (operates according to the host setting)											
CRC ENABLE/DISABLE	CRC: ENABLE DISABLE (Default)											
Disconnection timeout period (SPP layer)	0 sec. (default value)											
Disconnection timeout period (LMP layer)	60 sec. (default value)											
Parameter	<table border="1"> <thead> <tr> <th>Setting Items</th><th>Setting range</th></tr> </thead> <tbody> <tr> <td>Protocol</td><td>Status 3 Status 4 (default value) None</td></tr> </tbody> </table>		Setting Items	Setting range	Protocol	Status 3 Status 4 (default value) None						
Setting Items	Setting range											
Protocol	Status 3 Status 4 (default value) None											
Receive buffer size	<p>2.95 MB</p>											
Pairing	Save the link key for 10 devices											
CoD (Class of Device)	Major service class: Not specified Major device class: Imaging major class Minor device class: Printer											
Supervision timeout	Default = 20 seconds (configurable at the host)											

*1 A method that connects 2 Bluetooth supported devices by establishing virtual serial port is defined.

[Supplemental explanation]

- (1) The printer operates with the slave mode. Connect the printer by specifying printer's Bluetooth Device Address (BD address) from the master.
- (2) Connection may be failed when the authentication mode, packet type and PIN code of the master is different from the above settings. When the connection is failed, check the authentication level, PIN code by test print, match the setting of the master and reconnect.
- (3) Bluetooth interface and the printer is connected by RS-232C serial interface internally. The transmission speed is 115200bps.
- (4) When the link with Bluetooth is lost (out of area), disconnect from the printer after the supervision timeout period elapses.
- (5) When Bluetooth communication is disconnected while sending print data (STX-ETX), the partly received data is discarded after the disconnection timeout period elapses. Resend the print data (STX-ETX) if a timeout occurs. Timeout monitoring is not performed when the disconnection timeout period is 0.
- (6) The printer will be buffer over when the receive buffer is full. Please send print data while checking the receive buffer status by sending ENQ.
- (7) ACK/NAK is returned only when the CRC check result is normal when CRC check is enabled.

7.2 Bluetooth settings

The followings are Bluetooth setting items.

(1) Authentication level (Level 1, Level 2-1, Level 2-2, Level 3, Level 4)

(2) PIN code (alphanumeric characters and symbols (20H, 21H, 23H-7EH) 1-16 digits)

PIN code (Personal Identification Number, pass key) is an authentication password in 1-16 digits used for printer identification. The PIN code is needed when the authentication level is Level 2 to 4. Link key will be generated automatically after PIN code authentication and pairing start in the printer. Once the link key is generated, there is no need for PIN code authentication. The printer can be connected without checking the PIN code during the pairing.

The module of Bluetooth specification version 3.0 supports Fast Connect. Pairing information can be saved in the printer for 10 units. When pairing has done with more than 10 units, the printer deletes the oldest pairing information and save the new pairing information. (The pairing information is not cleared even when factory clear is performed.) The pairing information can be initialized by the [DC] DA command.

(3) Communication parameter (ISI, ISW, PSI, PSW)

ISI, ISW, PSI, and PSW are setting values of Bluetooth module. The details are as below.

Setting	Description
ISI (Inquiry Scan Interval)	Time interval of ISW (0000, 0018 - 4096) (0.625 msec unit)
ISW (Inquiry Scan Window)	Response time for a search request from the host (0000, 0017 - 4096) (0.625 msec unit)
PSI (Page Scan Interval)	Time interval of PSW (0018 - 4096) (0.625 msec unit)
PSW (Page Scan Window)	Response time for a connection request from the host (0017 - 4096) (0.625 msec unit)

Device search request from the master device can be rejected when ISI=000 and ISW=0000.

The default values after the factory clear are ISI=2048 (1.28 sec), ISW=18 (11.25 msec), PSI=2048(1.28 sec) and PSW=18 (11.25 msec).

It is impossible to set ISI<ISW or PSI<PSW.

The communication parameters are not necessary to be changed normally. However, communication parameters are needed to be adjusted when the field intensity is not strong enough.

(4) Device name (alphanumeric characters and symbols (20H, 21H, 23H-7EH) 1-20 digits)

By setting device name, the name can be displayed at the connected device and the printer can be identified.

Note) The contents that are initialized only when the printer is first turned ON after making the communication parameter settings are set up in the Bluetooth interface. Do not power off the printer when the printer is rebooted until the printer starts up normally.

7.3 CRC Transmission Data

Transfer format of send data needed to be configured as follows when CRC check mode is selected.

STX	Each command *1	ETX	CRC_High	CRC_Low
← → CRC calculation				
Item	HEX (H)	Description		
STX	02	Transmission control character to initiate text		
Each command	—	Each command + Parameter		
ETX	03	Transmission control character to terminate text		
CRC	2 byte	Calculated by the method called CRC-ANSI. Send error control value that was calculated by CRC-16 (Generating function X16+X15+X2+1*2) in order of [High] and [Low].		

- 1) Use this command in between Start of Data Transmission <A> and End of Data Transmission <Z>. Set STX and ETX for print data. The printer will not print if there is no STX or ETX in the print data.
- 2) This is shifted to the right; therefore, the value actually used for calculation is [0xA001]. Also, initial value is set to "0".

7.4 Calculation Example of CRC

A part of CRC calculation procedures when sending print speed set <CS> is shown below as an example.

The send data is STX <A><CS>2 <Z> ETX. In HEX, the above will be 02 1B 41 1B 43 53 32 1B 5A 03. The underlined part is the calculation range of CRC. Generating function is described as 1010 0000 0000 0001 in BIN. 1B is the first calculation target and it is described as 0001 1011 in BIN. Initial value of CRC is set to "0".

- (1) Take exclusive-OR of CRC and target data (1B), and assign its result to CRC.

$$\begin{array}{r} 0000\ 0000\ 0000\ 0000 \quad (\text{CRC}) \\ \underline{\text{XOR}} \quad 0000\ 0000\ 0001\ 1011 \quad (1B) \\ \text{CRC} = 0000\ 0000\ 0001\ 1011 \end{array}$$

- (1-1) Take AND of CRC and 0001, and assign its result to A. Shift CRC 1 bit to the right and assign it to CRC.

$$\begin{array}{r} \text{A} = 1 \\ \text{CRC} = 0000\ 0000\ 0000\ 1101 \end{array}$$

- (1-2) If A = 1, take exclusive-OR of CRC and generating function, and assign its result to CRC. If A = 0, no calculation is made.

$$\begin{array}{r} 0000\ 0000\ 0000\ 1101 \quad (\text{CRC}) \\ \underline{\text{XOR}} \quad 1010\ 0000\ 0000\ 0001 \quad (1B) \\ \text{CRC} = 1010\ 0000\ 0000\ 1100 \end{array}$$

- (2-1) Perform the same calculations as (1-1). And then, perform calculations of (1-1) and (1-2) for 7 times (8 bit in total).

$$\begin{array}{r} \text{A} = 0 \\ \text{CRC} = 0101\ 0000\ 0000\ 0110 \end{array}$$

- (2-2) Perform the same calculations as (1-2). A = 0; therefore, leave CRC as it is.

$$\begin{array}{r} \text{CRC} = 0101\ 0000\ 0000\ 0110 \\ \text{A} = 0 \\ \text{CRC} = 0010\ 1000\ 0000\ 0011 \end{array}$$

- (3-1) Perform the same calculations as (1-1).

$$\begin{array}{r} \text{CRC} = 0010\ 1000\ 0000\ 0011 \end{array}$$

- (3-2) Perform the same calculations as (1-2).

(4-1) Perform the same calculations as (1-1).	A = 1 CRC = 0001 0100 0000 0001
(4-2) Perform the same calculations as (1-2).	$ \begin{array}{r} 0001 0100 0000 0001 \\ \text{XOR} \quad 1010 0000 0000 0001 \\ \hline \text{CRC} = 1011 0100 0000 0000 \end{array} \begin{array}{l} (\text{CRC}) \\ (1B) \end{array} $
(5-1) Perform the same calculations as (1-1).	A = 0 CRC = 0101 1010 0000 0000
(5-2) Perform the same calculations as (1-2).	CRC = 0101 1010 0000 0000
(6-1) Perform the same calculations as (1-1).	A = 0 CRC = 0010 1101 0000 0000
(6-2) Perform the same calculations as (1-2).	CRC = 0010 1101 0000 0000
(7-1) Perform the same calculations as (1-1).	A = 0 CRC = 0001 0110 1000 0000
(7-2) Perform the same calculations as (1-2).	CRC = 0001 0110 1000 0000
(8-1) Perform the same calculations as (1-1).	A = 0 CRC = 0000 1011 0100 0000
(8-2) Perform the same calculations as (1-2).	CRC = 0000 1011 0100 0000
Calculation of CRC up to 1B has completed. In the same manner, perform calculations of the next target data 41, and continue calculating up to 03. EC 5E in this case.	Calculation result up to 03 CRC = 1110 1100 0101 1110

7.5 Transmission Data Example

The following are the example of transmission data.

(1) Print Data

```
STX
<A>
<X22>,SATO
<Q>0001
<Z>
ETX
71H 9CH
```

HEX data to be actually sent is described as follows. Underlined part is CRC.

02 1B 41 1B 58 32 32 2C 53 41 54 4F 1B 51 30 30 30 31 1B 5A 03 71 9C

(2) Print speed setting command

```
STX
<A>
<CS>2
<Z>
ETX
ECH 5EH
```

HEX data to be actually sent is described as follows. Underlined part is CRC.

02 1B 41 1B 43 53 32 1B 5A 03 EC 5E

7.6 CRC errors

The printer calculates the CRC of every items of received data and checks the validity of the received data by comparing it with the CRC in the received data. When the calculated CRC is not the same as the CRC in the received data, the printer judges the data is incorrect, arises CRC error and stops printing.

There are 2 ways to release the CRC error.

(1) Press the LINE button	: The printer will resume the printing from the print data with the CRC error.
(2) Press the CANCEL button	: The printer will cancel the print data with the error and resume the printing from the next print data..

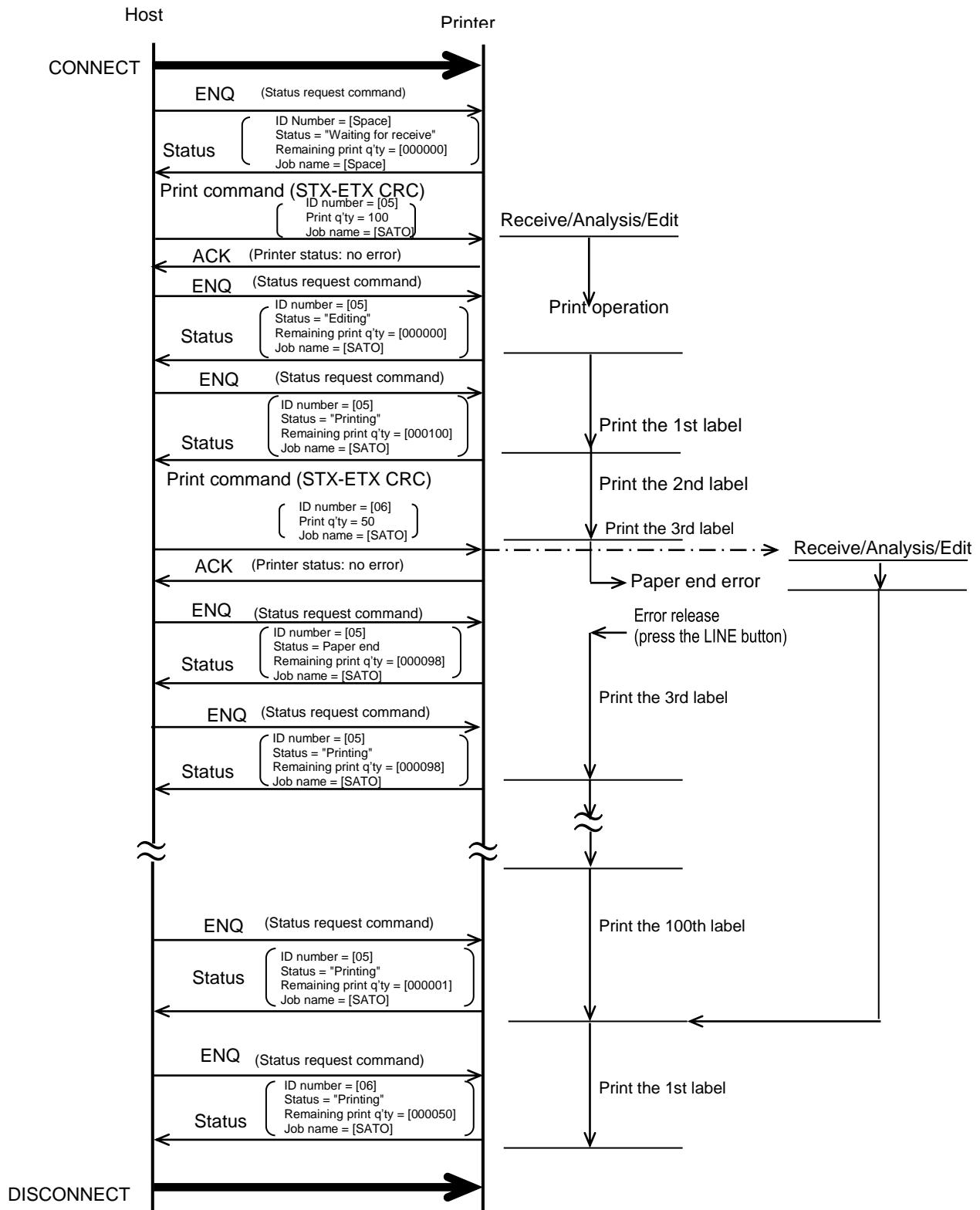
[Supplemental explanation]

1. The return status of the Status 3 and 4 at the CRC error will be "other errors".

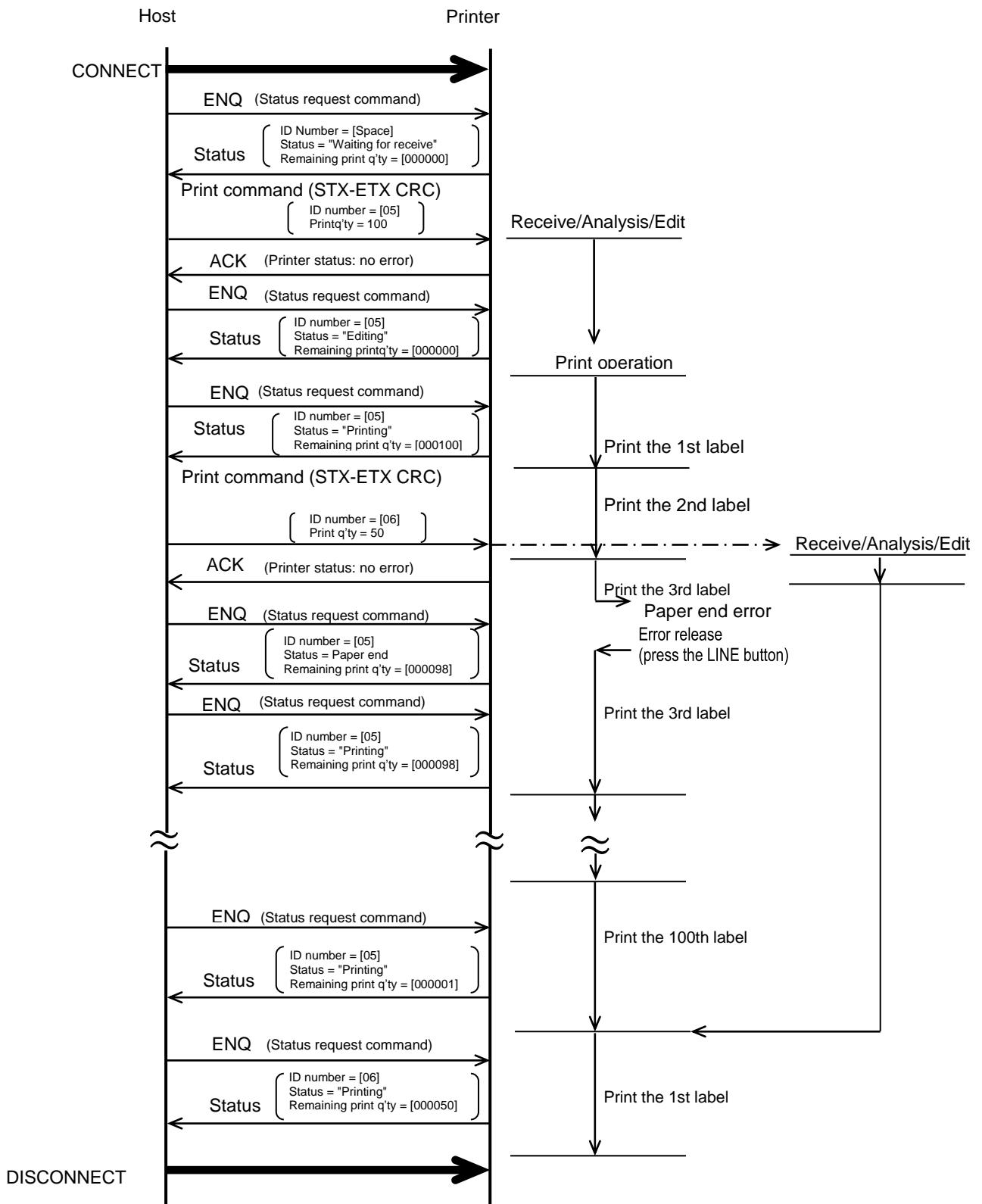
7.7 Transmission Sequence

7.7.1 Normal end

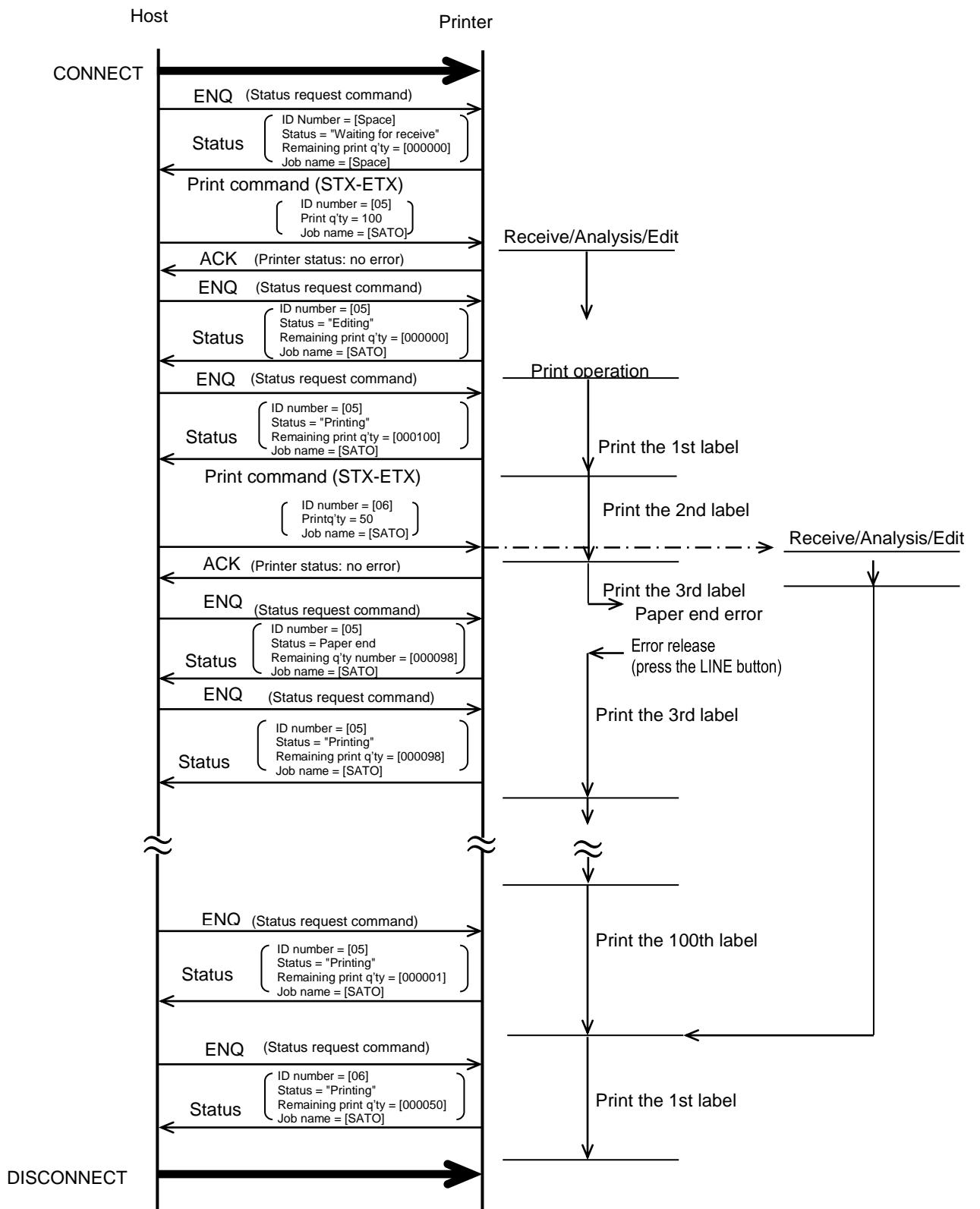
7.7.1.1 Status 4 (when CRC check is enabled)



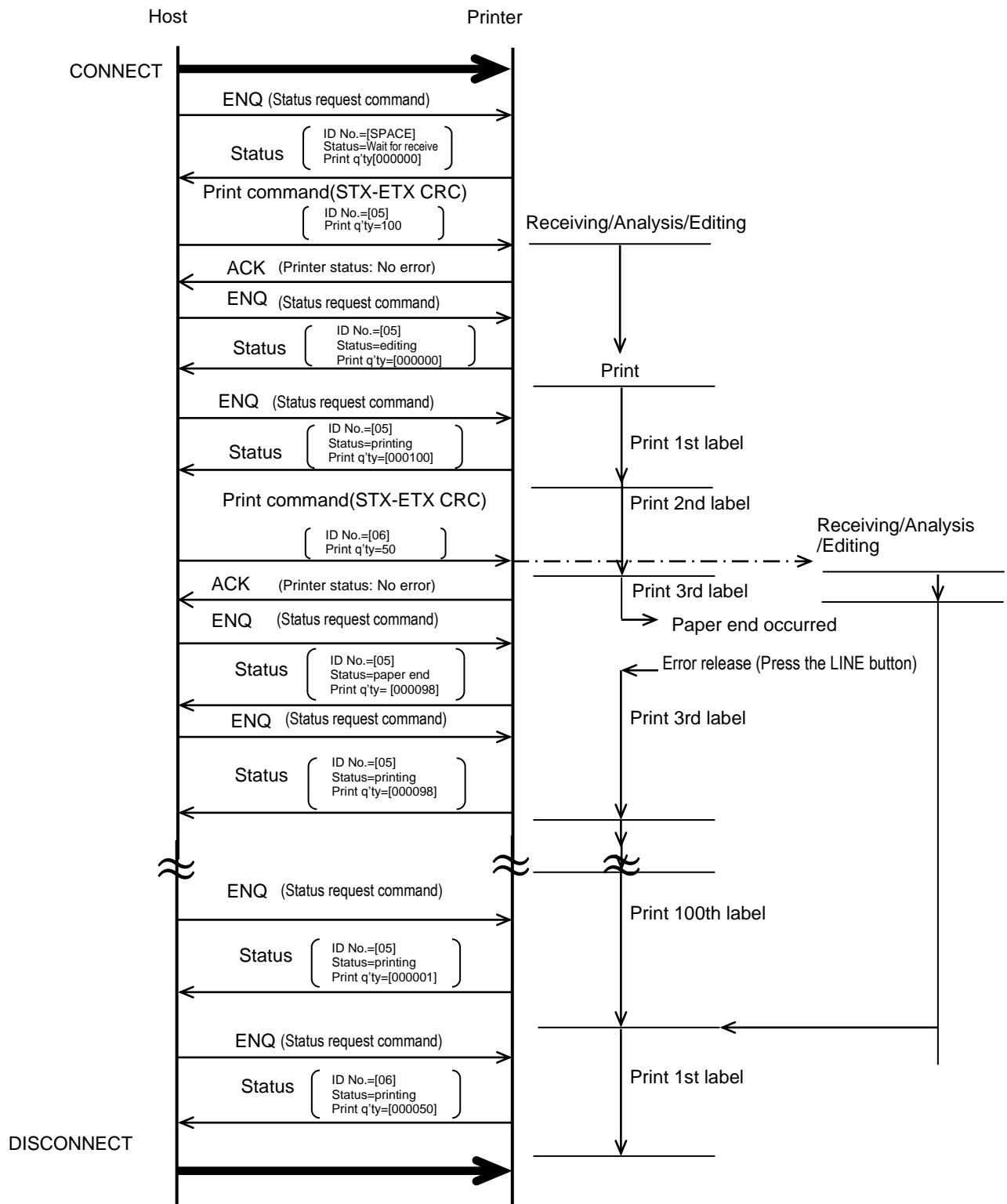
7.7.1.2 Status 3 (when CRC check is enabled)



7.7.1.3 Status 4 (when CRC check is disabled)

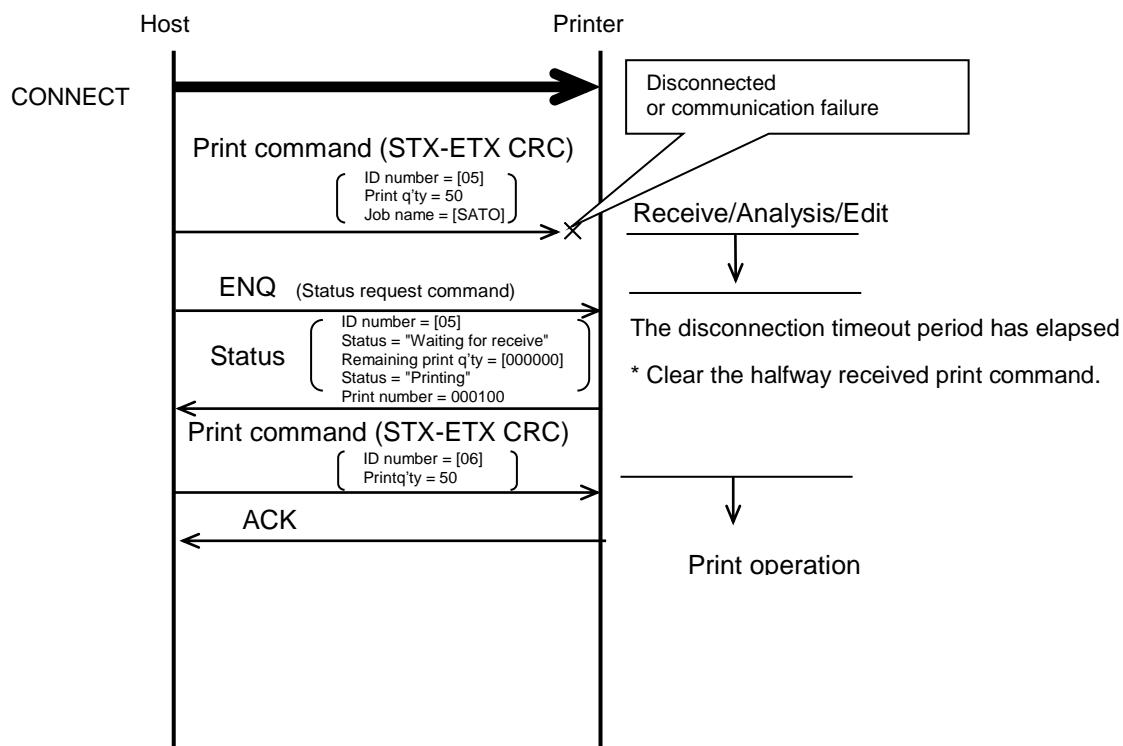


7.7.1.4 Status 3 (when CRC check is disabled)



7.7.2 Disconnection during print data sending

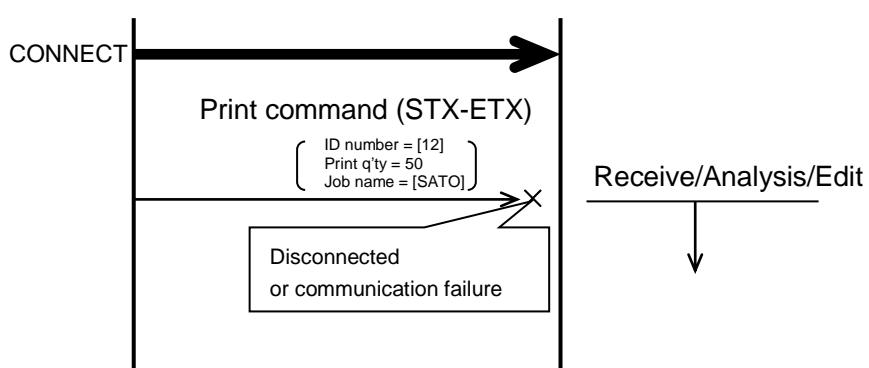
7.7.2.1 When CRC check is enabled (common to Status 3 and 4)



[Note]

When the Bluetooth communication is disconnected while sending print data, the partly received data is discarded after the disconnection timeout period elapses.

7.7.2.2 When CRC check is disabled (common to Status 3 and 4)

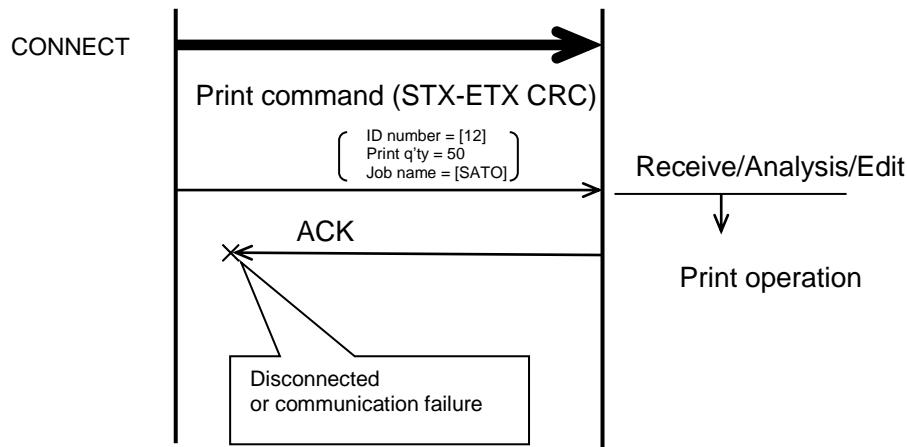


[Note]

The print data may be lost when Bluetooth communication is disconnected during sending of print data, as shown in the above numeric. Please resend the data after printer power off and on.

7.7.3 Disconnection during status sending after print data reception

7.7.3.1 When CRC check is enabled (common to Status 3 and 4)



[Note]

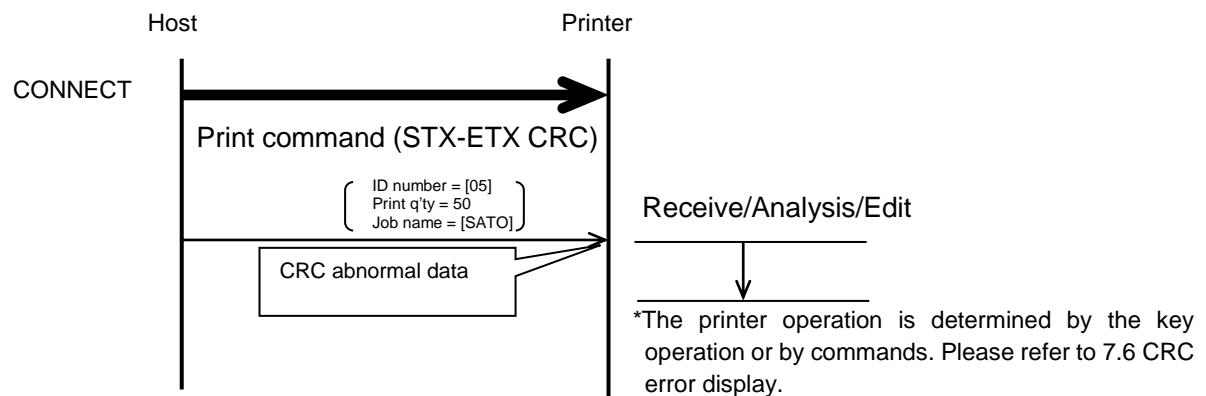
1. When there is no ACK returned, stop the transmission as it appears that some sort of communication interference is occurring.
2. ACK return may be lost when Bluetooth is disconnected before the printer returning ACK.

7.7.3.2 When CRC check is disabled (common to Status 3 and 3,4)

The printer operation is the same as 7.7.3.1 when CRC check is enabled.

7.7.4 Abnormal end when CRC check is enabled

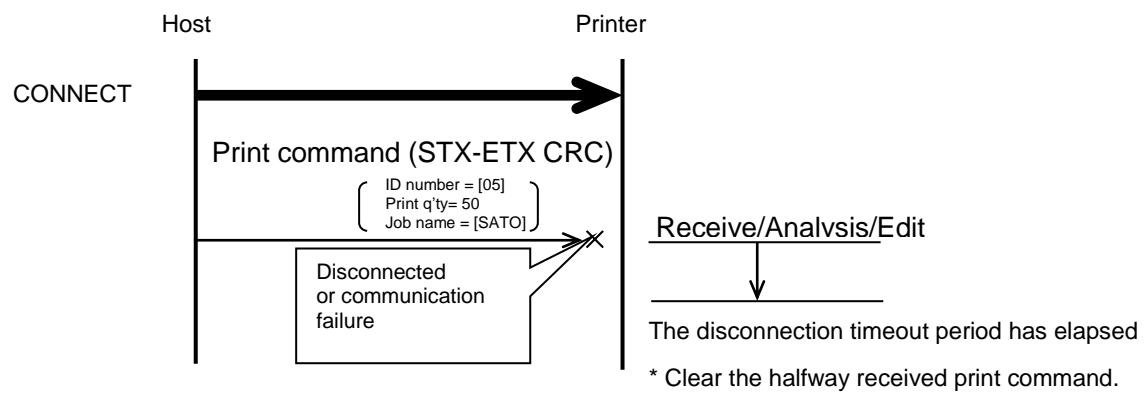
7.7.4.1 When a CRC error occurs (common to Status 3 and 4)



[Note]

The printer will clear the print data and will not return ACK/NAK when the received data has CRC error.

7.7.4.2 When a disconnection timeout occurs (common to Status 3 and 4)



[Note]

When there is no data come in to the printer during print command reception for communication time out period (10 sec), the printer will time out and clear the partly received print command.(ACK/NAK will not be returned.)

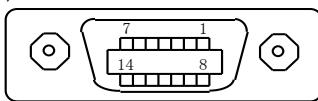
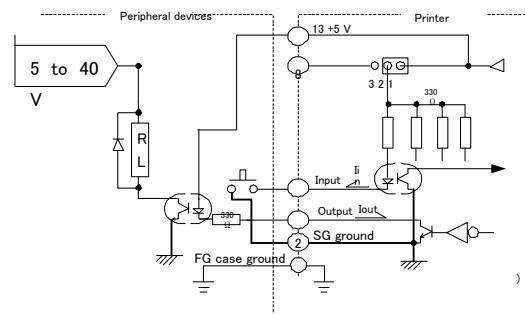
8 External signal interface

8.1 Basic Specifications

External signal interface is designed to connect the printer to external peripheral devices.

External signal interface works only in pulse input mode (print by external signal input). Error signal is output in any mode if an error occurs in the printer.

External signal setting is set in the Interface > External I/O of the printer.

Connector	Amphenol 14 pin (female)  *For connector, use DDK's 57 series 14-pin (57-30130 etc.) or the like.										
Input/Output circuit diagram	14 pin type I/O connection example 										
Signal level	High +4.2 - 5 V input terminal lin ≈ 0 mA output terminal lout ≈ 0 mA Low 0 - 0.7 V input terminal lin ≈ 10 mA output terminal lout ≈ 50 mA										
Print by external signal	Set "ENABLE/DISABLE" in the Interface > External I/O.										
Reissuing EXT signal	Following signal types are available in the Interface > External I/O > Signals > EXT Mode. <table border="1" data-bbox="603 1201 1349 1628"> <thead> <tr> <th>Type</th><th>Operation details</th></tr> </thead> <tbody> <tr> <td>TYPE I</td><td>The print complete signal (PREND) is High before label printing, and it becomes Low after print completion. The signal level becomes High after 20 msec.</td></tr> <tr> <td>TYPE II</td><td>The print complete signal (PREND) is Low before label printing, and it becomes High after print completion. The signal level becomes Low after 20 msec.</td></tr> <tr> <td>TYPE III</td><td>The print complete signal (PREND) is High before label printing, and it becomes Low from the start to the end of print, and it becomes High again after print completion.</td></tr> <tr> <td>TYPE IV</td><td>The print complete signal (PREND) is Low before label printing, and it becomes High from the start to the end of print, and it becomes Low again after print completion.</td></tr> </tbody> </table>	Type	Operation details	TYPE I	The print complete signal (PREND) is High before label printing, and it becomes Low after print completion. The signal level becomes High after 20 msec.	TYPE II	The print complete signal (PREND) is Low before label printing, and it becomes High after print completion. The signal level becomes Low after 20 msec.	TYPE III	The print complete signal (PREND) is High before label printing, and it becomes Low from the start to the end of print, and it becomes High again after print completion.	TYPE IV	The print complete signal (PREND) is Low before label printing, and it becomes High from the start to the end of print, and it becomes Low again after print completion.
Type	Operation details										
TYPE I	The print complete signal (PREND) is High before label printing, and it becomes Low after print completion. The signal level becomes High after 20 msec.										
TYPE II	The print complete signal (PREND) is Low before label printing, and it becomes High after print completion. The signal level becomes Low after 20 msec.										
TYPE III	The print complete signal (PREND) is High before label printing, and it becomes Low from the start to the end of print, and it becomes High again after print completion.										
TYPE IV	The print complete signal (PREND) is Low before label printing, and it becomes High from the start to the end of print, and it becomes Low again after print completion.										
Reissuing EXT signal	Following settings are available in the Interface > External I/O. Enable : Reprint the same content Disable : No reprint										
Dispenser completion signal	Sets pin number for dispenser completion signal in Interface > External I/O > Signals > Outputs settings. When pin no. is set: Outputs dispenser completion signal when dispenser motion is completed. (Sets signal level to Low) When set, it works with the sequence of dispenser completion signal. When pin number is not set: Dispenser completion signal state won't change while waiting for dispenser motion to complete.										
Label Near end	Sets pin number for Label near end in Interface > External I/O > Signals > Outputs settings.										

8.2 Connector Pin Assignment

14-pin external signal interface

Pin No	Signal name	Description	Input/Output	Level	Electrical conditions (Voltage, Current (MAX))
1	Paper end*6	Output at paper end detection.	Open collector output	Low	Withstand pressure 50 V Sink current 50 mA
2	GND	SIGNAL GROUND	-	-	-
3	Ribbon end*6	Output at ribbon end detection.	Open collector output	Low	Withstand pressure 50 V Sink current 50 mA
4	Machine error	Output with head open, head error, communication error and so on.	Open collector output	Low	Withstand pressure 50 V Sink current 50 mA
5	Print start signal (PRIN)	The printer issues one label by input of this signal.	Input	Low	High: high impedance Low: more than -15mA, 0V
6	Print completion signal (PREND)*1, *2	Signal is output at the operation of the printer issues one label.	Open collector output	Low	Withstand pressure 50 V Sink current 50 mA
7	Reprint signal (PRIN2)	By input of this signal, the printer reprints the same contents for one time.	Input	Low	High: high impedance Low: more than -15mA, 0V
8	EXT 5V_IN *3	For power supply from peripherals.	Input	-	5V
9	Offline *4	Output when the printer is in the online state.	Open collector output	Low	Withstand pressure 50 V Sink current 50 mA
10	Ribbon near end	Output at ribbon near end detection.	Open collector output	High	Withstand pressure 50 V Sink current 50 mA
11	-	-	-	-	-
12	+24V	-	-	-	2A
13	+5V	-	-	-	500mA
14	-	-	-	-	-
—	Dispenser completion waiting signal *5, *6	Signal is output during dispenser completion waiting	Open collector output	Low	Withstand pressure 50 V Sink current 50 mA
—	Label near end	Output when detect label near end	Open collector output	High	50V 50mA

*1 Select TYPE I-TYPE IV for No.6 pin "PREND" output signal. For details, refer to external signal type in 8.1Basic specification.

*2 No. 6 pin "PREND" output signal is not output when "0" is specified as number of cuts for cut unit number command in cutter operation.

*3 When SW14 on IF board is set to 2-3, the printer operates by power supply from EXT5V_IN(No. 8 pin). When set to 1-2 side, the printer operates by internal power supply (Set to 1-2 side as shipment settings) .

*4 When SW15 on IF board is set to 2-3, the no.9 pin operates as offline output. When set to 1-2 side, the printer operates as input (Set to 2-3 as shipment settings).

*5 Output pin no. can be set for Waiting for dispenser completion and label near end from Extio Signals from settings on GUI.Default: "Unspecified".

*6 Output timing of print end signal (PREND) is changed when Wait signal for dispenser is set to valid. Please refer to [[3]Output waiting for dispenser] of [8.3I/O signal] for details.

[Note]

- 1.The external signal may be insufficient for a period of approx. one second from the time the power is turned ON. Therefore, perform control after waiting for at least one second.
- 2.When the conditions shown in "Details" are satisfied, the signal is set to the status shown in "Level".
Example 1) When paper end occurs for pin No. 1, the level becomes Low, and at that time, the contact is set to ON, and currentstarts flowing.
Example 2) The print start signal of pin No. 5 is set to a Low level when print start is requested, and the current starts flowing.

[Supplemental explanation]

The corresponding relationship between the pin No. and signal name (details) can be changed in the Printing/Advanced/Extio Signals screen.

8.3 Explanation of input/output signal

1) Input signal

Item	Input waveform
Print Start	
Reprint (no print start signal)	
Reprint (with print start signal)	

[Supplemental explanation]

1. Keep the print start signal (PRIN) to "Low" until print completion signal (PREND) is output.* (Refer to [Maintaining the print start signal (PRIN)] below.) Also, output the reprint signal (PRIN2) for 10 msec or more. When signal is output for shorter than 10 msec, and reprint signal is not acknowledged, the printer will not reprint.
2. If NULL cut specified not output print end signal (PREND).

[Maintaining the print start signal (PRIN)]

Item	Input waveform
Print Start	TYPE1, 2
	Print Start (PRIN) → High → Single print complete ↓
	Reprint (PRIN2) → High → Single print complete ↓
	Print operation → High → Single print complete ↓
Print Start	TYPE3, 4
	Print Start (PRIN) → High → Single print complete ↓
	Reprint (PRIN2) → High → Single print complete ↓
	In the case of TYPE 3, 4, the PRIN signal may be returned to "High" during the period shown by the dotted line, without any problem.
	Print operation → High → Single print complete ↓

Item	Timing Chart
PREND SIGNAL	<p>Single print complete ↓</p> <p>$T1 < 150 \text{ ns}$</p>

*Rise or fall time of PREND signal is less than 150 ns. Please consider the time when output signal from the connected devices.

1. When the print start signal and reprint signal are output simultaneously, the print start signal is enabled and the printer does not perform reprinting.
2. The reprint signal is enabled only from the time of end of the print operation (QTY=0) until the next print data reception. Other than that, the printer does not perform reprinting.

2) Output signal

Item	Output waveform		
Basic operation	<p>Single print complete</p> <p>20 msec</p>		
	Print operation		
	Print complete (PREND)		
	3		
	4		
	Paper end		
	Ribbon end		
Paper end	<p>Paper end error</p> <p>Head open</p> <p>Head close</p> <p>Paper replacement</p>		
	Print operation		
	Print complete (PREND)		
	3		
	4		
	Paper end		
	Ribbon end		
Ribbon end	<p>Ribbon end occurs</p> <p>Head open</p> <p>Head close</p> <p>Ribbon replacement</p>		
	Print operation		
	Print complete (PREND)		
	3		
	4		
	Paper end		
	Ribbon end		

Item	Output waveform		
Machine error	Head Open		Head close
	Print operation		
	Print complete ¹ (PREND) ²		
	3		
	4		
	Paper end		
Ribbon near end	Ribbon near end occurs	Head open	Head close
	Print operation		
	Print complete ¹ (PREND) ²		
	3		
	4		
	Paper end		
Offline	Ribbon near end		
	Head open	Head close	Press the LINE key
	Print operation		
	Print complete ¹ (PREND) ²		
	3		
	4		
Paper end			
	Offline		

[Supplemental explanation]

Refer to Appendix in the operator manual for error signal output when RFID module is enabled.

2) Dispenser completion waiting output

Item	Output waveform
Operation 1 (Backfeed after printing)	<p style="text-align: center;">Single print complete Dispense complete</p> <p style="text-align: right;">20 msec</p> <p style="text-align: right;">500 ms + Backfeed period</p>
Operation 2 (Backfeed before printing)	<p style="text-align: center;">Single print complete Dispense</p> <p style="text-align: right;">20 msec</p>

1. Please note that Output timing of print end signal (PREND) is changed when Wait signal for dispenser is valid.

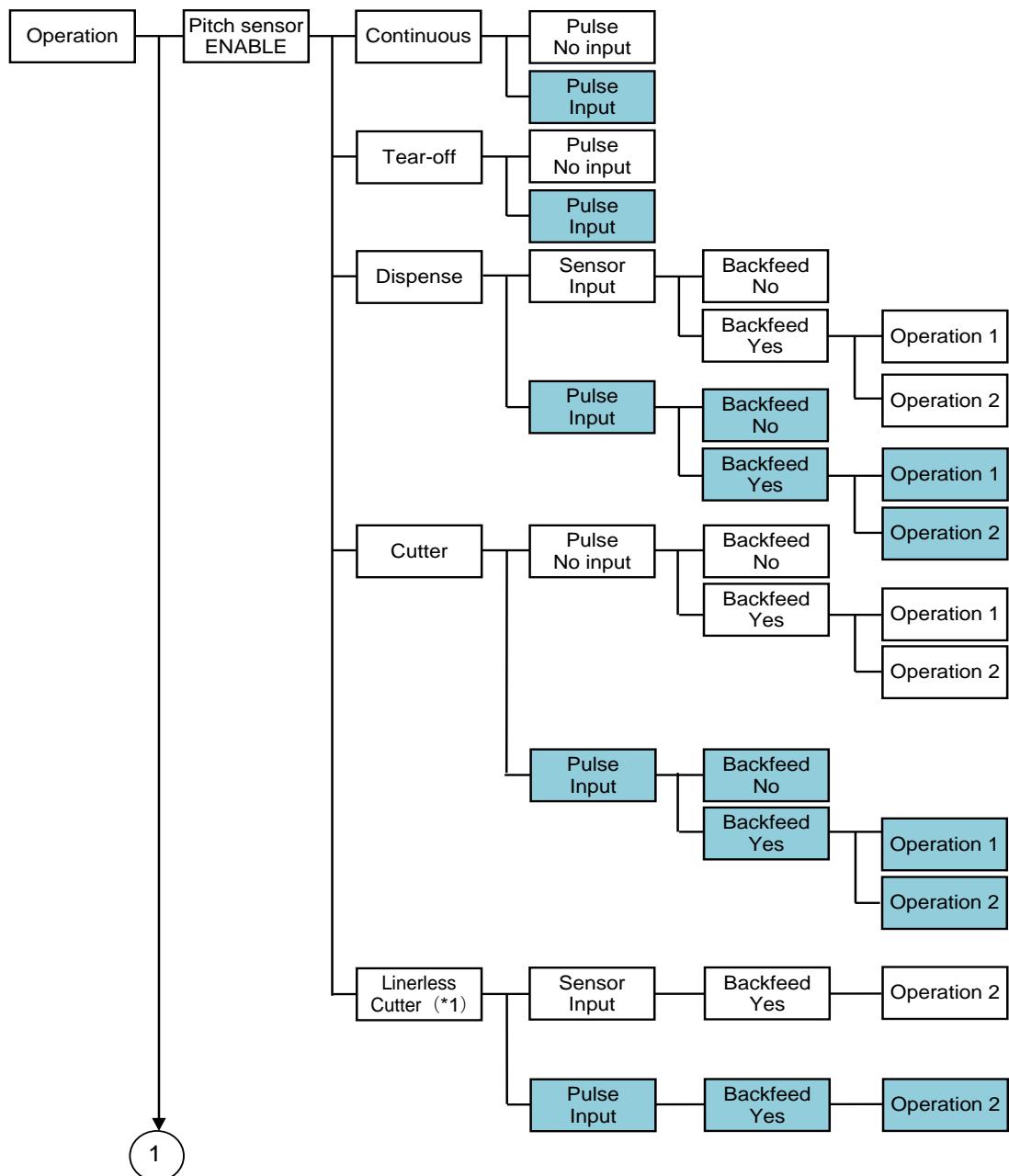
Operation 1) Output Print End Signal after Wait label for dispenser is removed and backfeeding of label is completed to print start position.

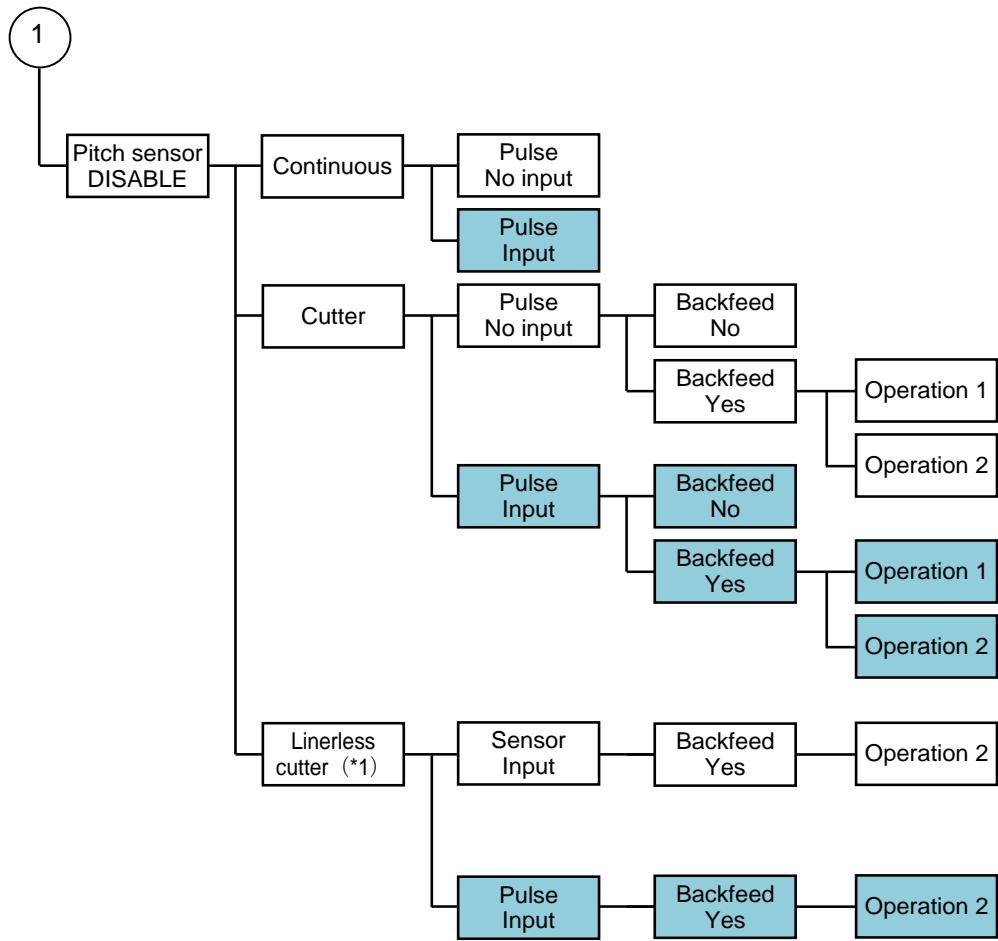
Operation 2) Output Print End Signal after feeding label to dispenser position.

8.4 Timing waveform

The external signal input operation mode is the filled-in location.

For details on the paper movement in each operation mode and the concerned waveform, see the operation specifications.





Note

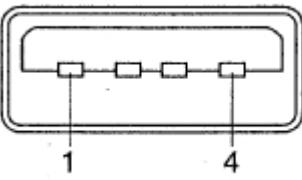
- 1) Operation 1: Backfeed after printing
- 2) Operation 2: Printing after backfeed

(*1) Linereless cutter is only for CL4NX

9 USB Host

9.1 Basic Specifications

USB interface of the printer complies with USB2.0 standard.

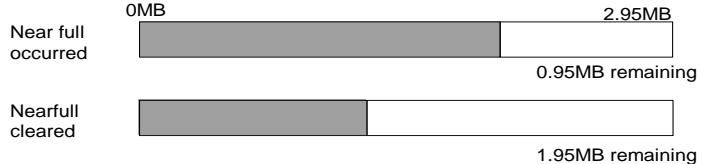
Interface	A Type female  Back × 1 ch, Front × 1 ch
Connector	Series A plug Cable length shorter than 5 m (Twisted pair shielded)
Version	USB 2.0 High speed
Device class	Mass storage class, HID class
Used for	USB memory (HEX dump, printer settings, firmware (installation))

9.2 Connector Pin Assignment

Pin number	Name
1	VBus
2	-Data(D-)
3	+Data(D+)
4	GND

10 NFC

10.1 Basic Specifications

Interface	NFC forum Type 2 Tag compliant
Communication distance	If height is 0mm from Antenna center, communicates within $\pm 5\text{mm}$ to the right and left. If height is $+10\text{mm}$, communication distance is within $\pm 10\text{mm}$ to the right and left.
Communication settings	No communication settings. Module is automatically detected after factory clear. Can be enabled/disabled in Service mode (module behavior) and Interface mode (communication behavior)
Print mode	When power is OFF: Tag mode (NDEF format write to NFC tag) by tag mode When power is ON: Passthrough mode, Bluetooth/WiFi handover connection
Communication timeout	1 second
NFC receive buffer size	Tag mode: 888 bytes(the whole NFC tag memory) Pass through mode: 51,200 bytes *Note: This is the maximum communication size with pass through mode. e.g.) Pass through mode communicates with 50 KB or less for one packet. (NG(fail) is returned if more than 50 KB. The received data is discarded in this case.)
Size of receive buffer	2.95MB 

[Additional notes]

The NFC interface of this printer uses NXP Semiconductors NT3H1101.
Does not support 1-byte command(status response).

NFC allocation on printer



Note

This feature is supported on printers from serial number 6B~ and above.

10.2 Tag mode

This mode works when printer is turned off.

It reads and writes on NFC tag memory (888 bytes).

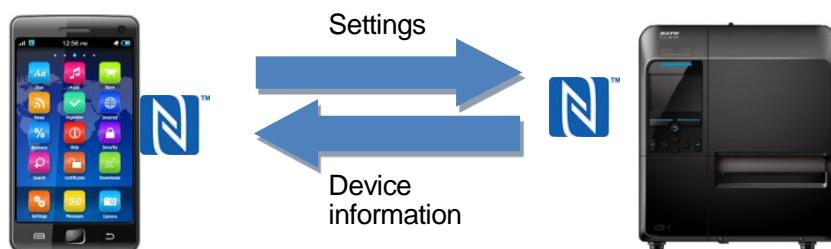
It writes printer information to the NFC tag memory when printer is switched off. This information can be obtained.

When you write, NFC tag memory information is sent to the printer when the printer is turned on.

Purpose: Printer Settings, Collect information

Note: Device information should be read before writing, since the read and write uses the same area.

800 bytes are available as the valid area for NFC tag memory.



10.2.1 Data format

1. Transmission data format

Transmission data after compression

Sets transmission data with zip compression.
The maximum size is 800 bytes after compression.

2. Receive data

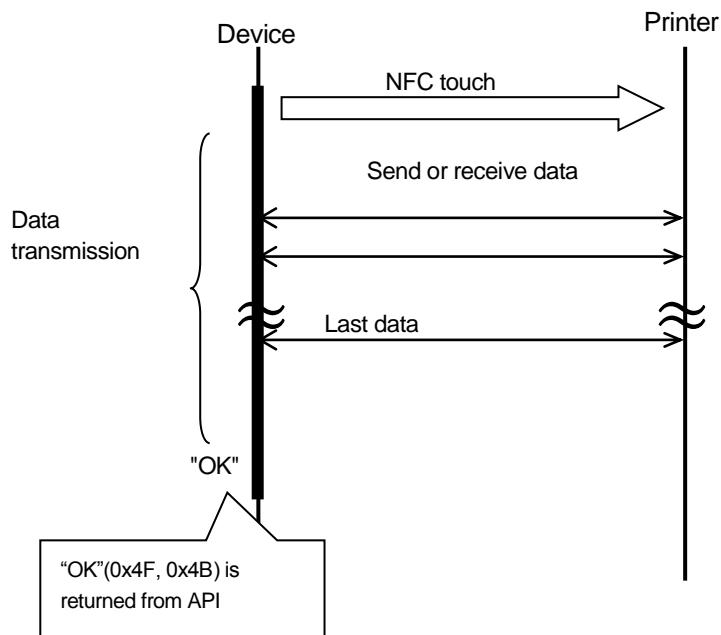
Receive data

The receive data is an uncompressed text data.

10.2.2 Data format

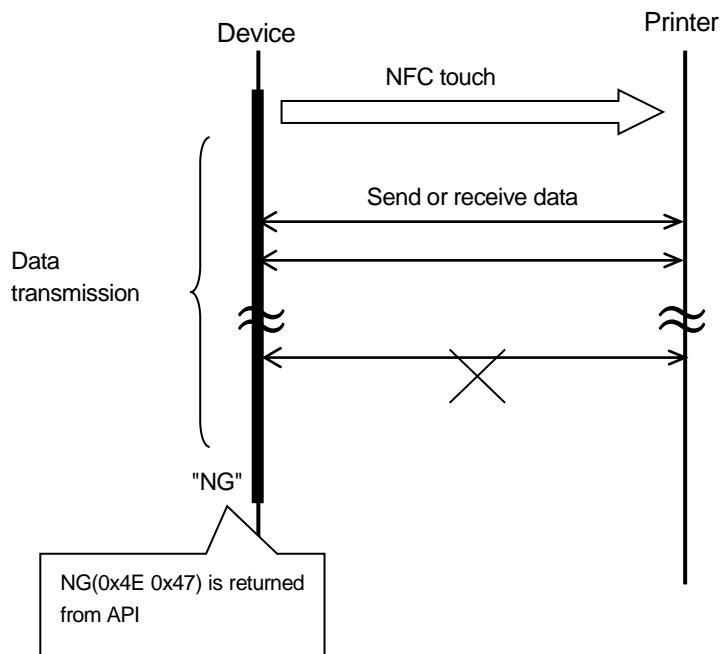
1. Successful end

See below for the sequence sample for sending/receiving data



2. Error

NG(Fail) is returned from API if there is an error in the communication or tag memory error.



10.3 Passthrough mode

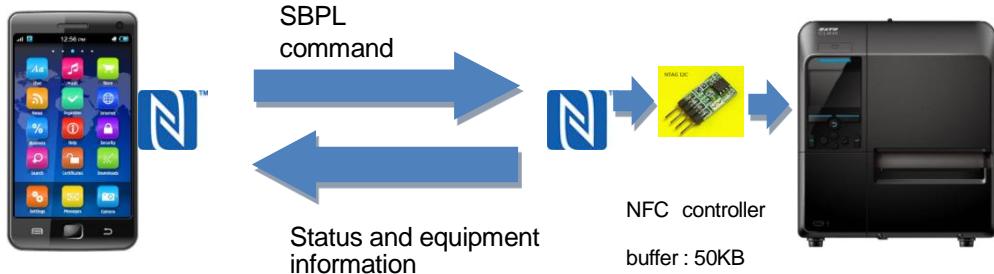
This mode works when printer's power is turned on. It communicates with printer via NFC tag.

Data is communicated between NFC device and NFC tag, and is uncompressed by NFC controller to send (pass through) data directly to the printer.

Purpose: For sending small amounts of SBPL data (to print), printer setup, collecting values and status.

The "small amount of data" here means around 1000 bytes (on assumption to scan the device within 2 seconds with speed of 8Kbps as a measured value.) It is recommended to use handover mode if data is larger than this size.

Note: Make sure to check the buffer status in the RS parameter of DC2+PG command to control the transmission (make sure not to send print data until buffer near full is cleared) if printer near full (2MB or more on printer's receive buffer) is going to happen in the operation, since this does not allow two-way communication.



10.3.1 Data format

Transmission data format

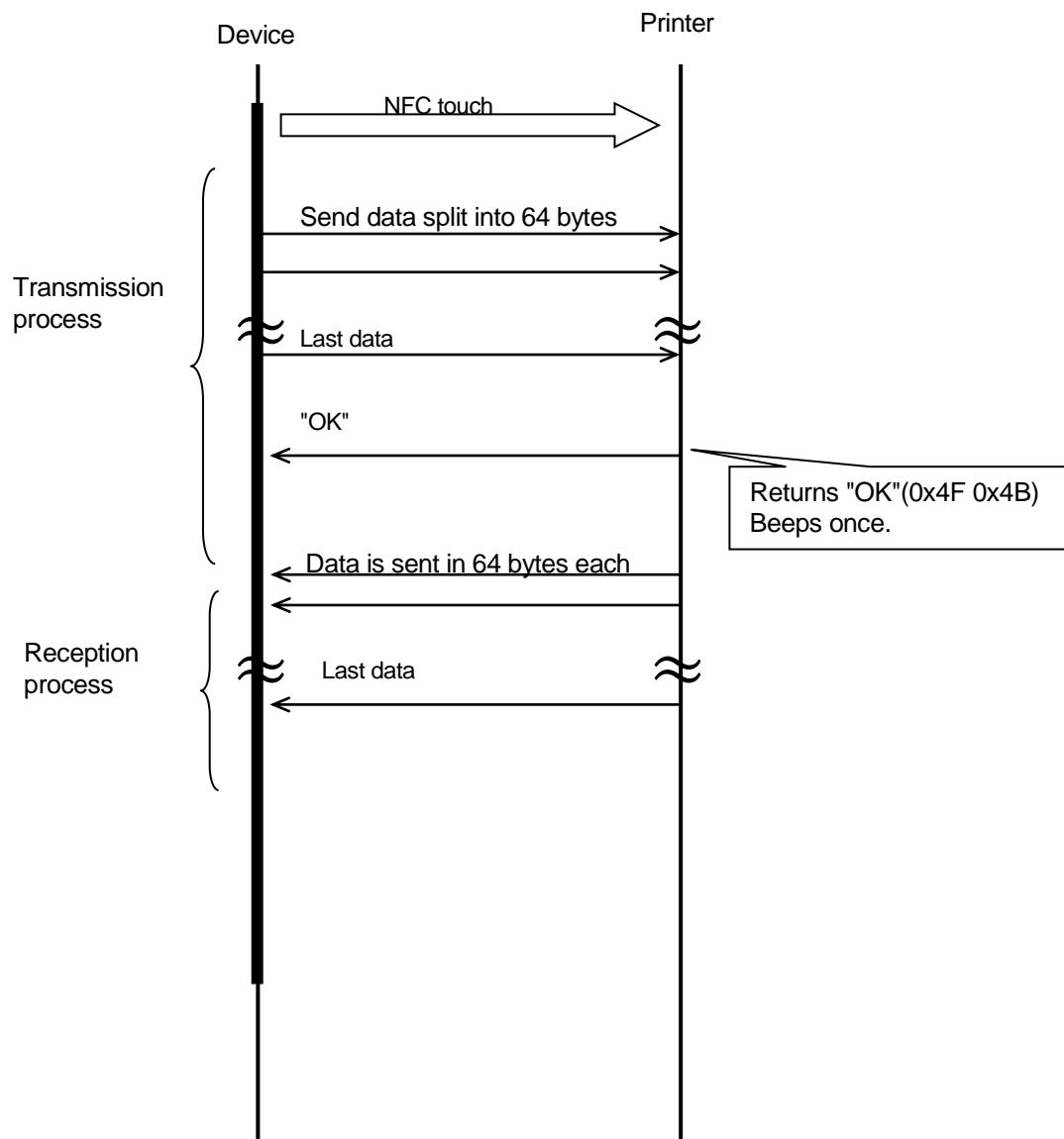
(1) Number of data in bytes (4 bytes)	(2) Transmission data after compression	(3) CRC 2 bytes
--	--	-----------------------

- (1) Number of bytes for transmission
Sets the number of transmitted bytes in big endian.
- (2) Transmission data after compression
Sets transmission data after zip compression.
The maximum size before compression is 51200 bytes.
- (3) CRC
Sets CRC of the transmitted data before compression. CRC-16-CCITT is used for CRC.
See Chapter 10.3.3 for details.

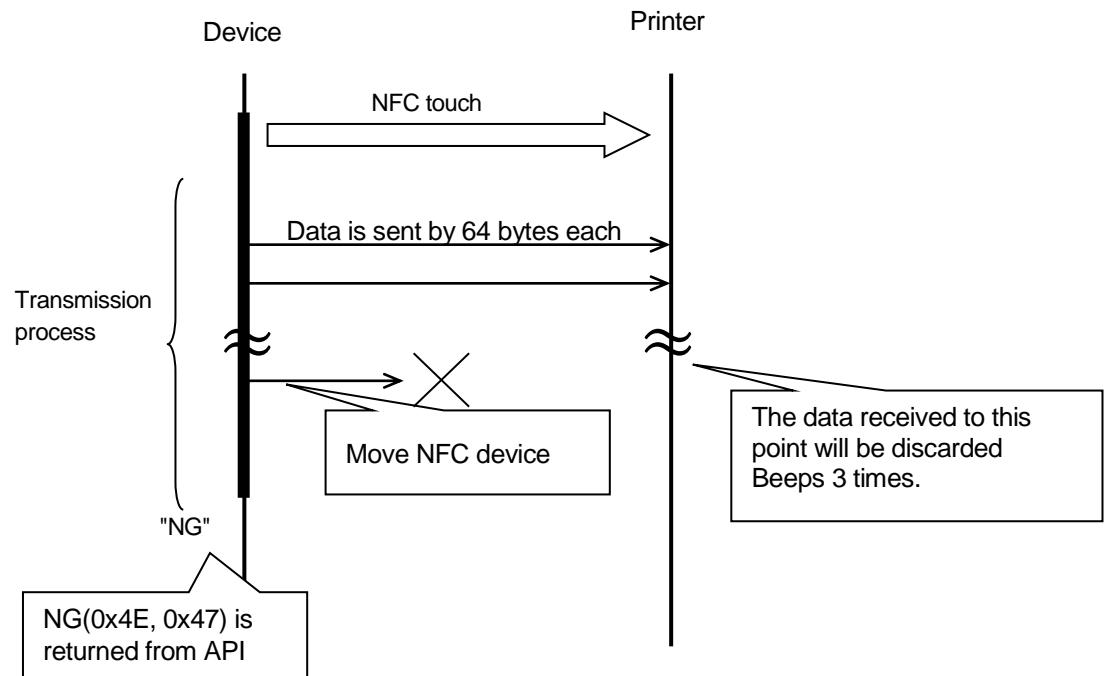
10.3.2 Sequence diagram

1. Successful end

See below for the sample sequence when transmitting data.

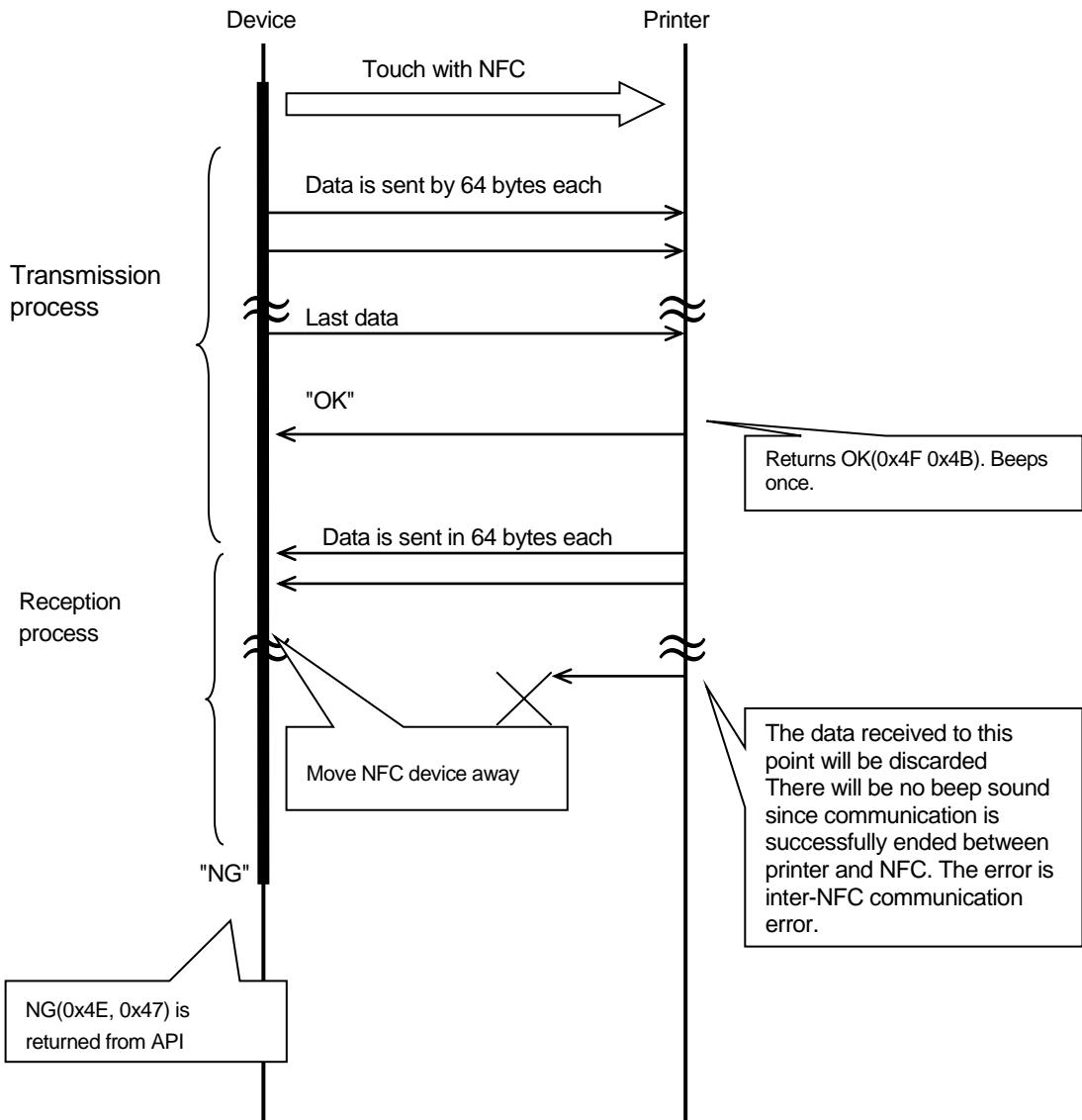


2. When device moves away from printer during transmission
Printer discards the partially received data.



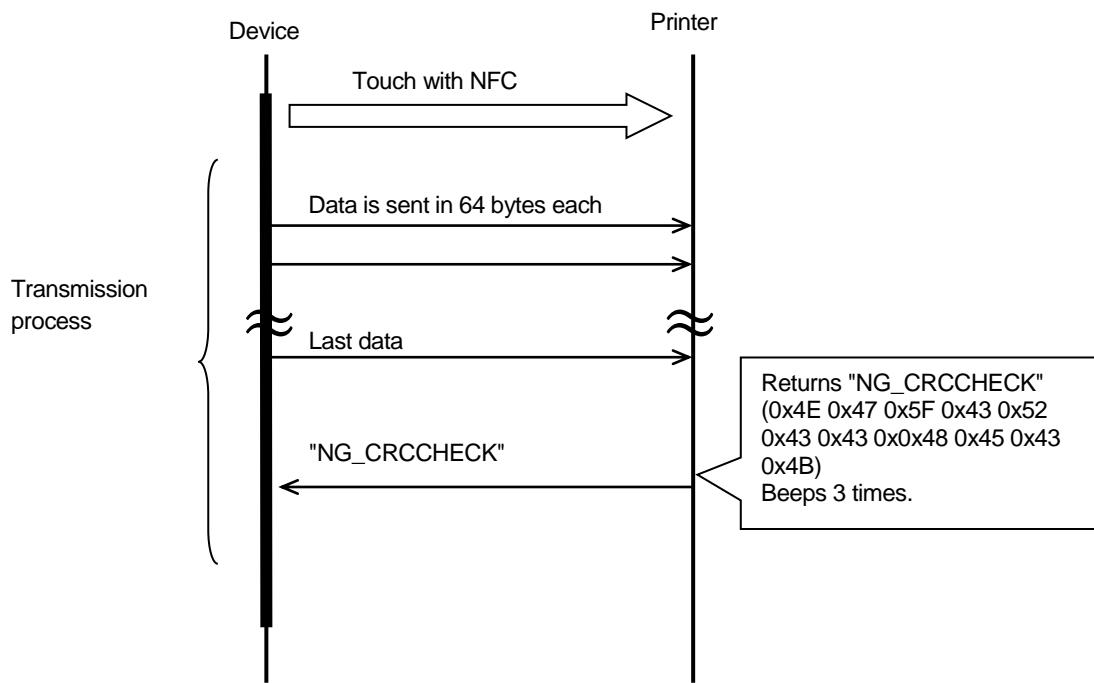
3. When device moves away from printer while receiving
The right "allow" button is highlighted.

The printer discards transmission data



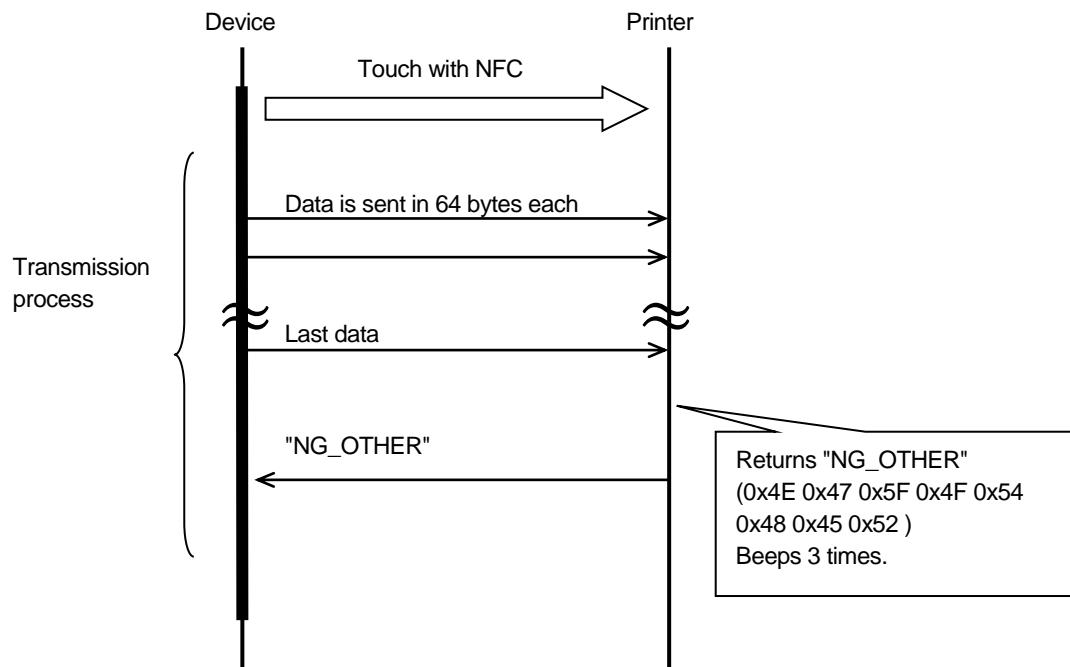
4. When CRC error occurs

The printer discards received data and returns "NG_CRCHECK".



5. When NFC communication buffer over error occurs

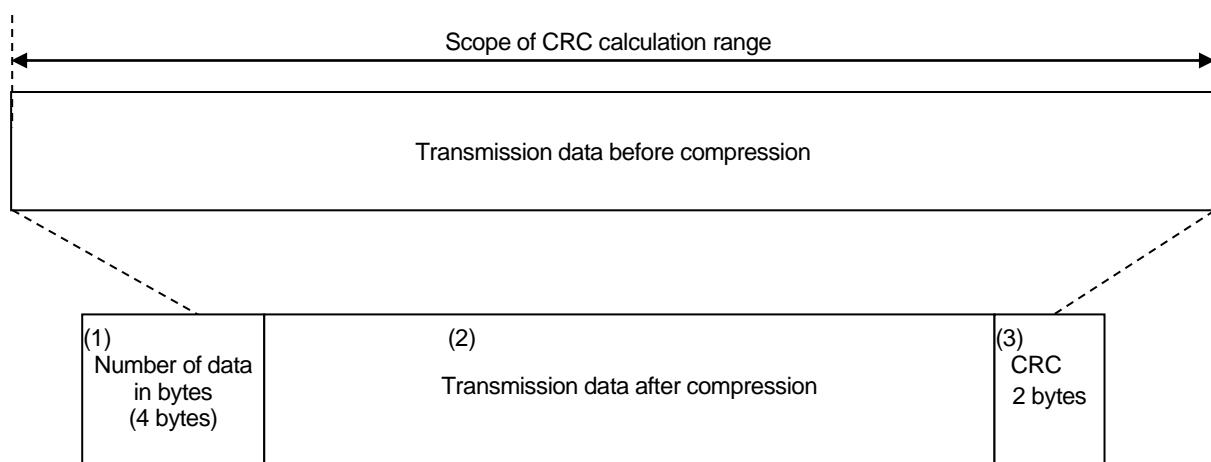
Printer discards received data and returns "NG_OTHER".



10.3.3 CRC-16 CCITT

1. Scope of CRC calculation

The transmission data before compression will be calculated.



2. CRC calculation method

CRC-16-CCITT is used to calculate CRC.

Polynomial : $X^{16}+X^{12}+X^5+X^0$

Default value : 0xFFFF

See programming sample on the next page.

```

/* CRC table*/
unsigned short CRC16Table[ 256 ] = {
    0x0000, 0x1021, 0x2042, 0x3063, 0x4084, 0x50A5, 0x60C6, 0x70E7,
    0x8108, 0x9129, 0xA14A, 0xB16B, 0xC18C, 0xD1AD, 0xE1CE, 0xF1EF,
    0x1231, 0x0210, 0x3273, 0x2252, 0x52B5, 0x4294, 0x72F7, 0x62D6,
    0x9339, 0x8318, 0xB37B, 0xA35A, 0xD3BD, 0xC39C, 0xF3FF, 0xE3DE,
    0x2462, 0x3443, 0x0420, 0x1401, 0x64E6, 0x74C7, 0x44A4, 0x5485,
    0xA56A, 0xB54B, 0x8528, 0x9509, 0xE5EE, 0xF5CF, 0xC5AC, 0xD58D,
    0x3653, 0x2672, 0x1611, 0x0630, 0x76D7, 0x66F6, 0x5695, 0x46B4,
    0xB75B, 0xA77A, 0x9719, 0x8738, 0xF7DF, 0xE7FE, 0xD79D, 0xC7BC,
    0x48C4, 0x58E5, 0x6886, 0x78A7, 0x0840, 0x1861, 0x2802, 0x3823,
    0xC9CC, 0xD9ED, 0xE98E, 0xF9AF, 0x8948, 0x9969, 0xA90A, 0xB92B,
    0x5AF5, 0x4AD4, 0x7AB7, 0x6A96, 0x1A71, 0x0A50, 0x3A33, 0x2A12,
    0xDBFD, 0xCBDC, 0xFBBF, 0xEB9E, 0x9B79, 0x8B58, 0xBB3B, 0xAB1A,
    0x6CA6, 0x7C87, 0x4CE4, 0x5CC5, 0x2C22, 0x3C03, 0x0C60, 0x1C41,
    0xEDAE, 0xFD8F, 0xDCDE, 0xDDCD, 0xAD2A, 0xBD0B, 0x8D68, 0x9D49,
    0x7E97, 0x6EB6, 0x5ED5, 0x4EF4, 0x3E13, 0x2E32, 0x1E51, 0x0E70,
    0xFF9F, 0xEFBE, 0xDFDD, 0xCFFC, 0xBF1B, 0xAF3A, 0x9F59, 0x8F78,
    0x9188, 0x81A9, 0xB1CA, 0xA1EB, 0xD10C, 0xC12D, 0xF14E, 0xE16F,
    0x1080, 0x00A1, 0x30C2, 0x20E3, 0x5004, 0x4025, 0x7046, 0x6067,
    0x83B9, 0x9398, 0xA3FB, 0xB3DA, 0xC33D, 0xD31C, 0xE37F, 0xF35E,
    0x02B1, 0x1290, 0x22F3, 0x32D2, 0x4235, 0x5214, 0x6277, 0x7256,
    0xB5EA, 0xA5CB, 0x95A8, 0x8589, 0xF56E, 0xE54F, 0xD52C, 0xC50D,
    0x34E2, 0x24C3, 0x14A0, 0x0481, 0x7466, 0x6447, 0x5424, 0x4405,
    0xA7DB, 0xB7FA, 0x8799, 0x97B8, 0xE75F, 0xF77E, 0xC71D, 0xD73C,
    0x26D3, 0x36F2, 0x0691, 0x16B0, 0x6657, 0x7676, 0x4615, 0x5634,
    0xD94C, 0xC96D, 0xF90E, 0xE92F, 0x99C8, 0x89E9, 0xB98A, 0xA9AB,
    0x5844, 0x4865, 0x7806, 0x6827, 0x18C0, 0x08E1, 0x3882, 0x28A3,
    0xCB7D, 0xDB5C, 0xEB3F, 0xFB1E, 0x8BF9, 0x9BD8, 0xABBB, 0xBB9A,
    0x4A75, 0x5A54, 0x6A37, 0x7A16, 0x0AF1, 0x1AD0, 0x2AB3, 0x3A92,
    0xFD2E, 0xED0F, 0xDD6C, 0xCD4D, 0xBDAA, 0xAD8B, 0x9DE8, 0x8DC9,
    0x7C26, 0x6C07, 0x5C64, 0x4C45, 0x3CA2, 0x2C83, 0x1CE0, 0x0CC1,
    0xEF1F, 0xFF3E, 0xCF5D, 0xDF7C, 0xAF9B, 0xBFBA, 0x8FD9, 0x9FF8,
    0x6E17, 0x7E36, 0x4E55, 0x5E74, 0x2E93, 0x3EB2, 0x0ED1, 0x1EF0,
};

}


```

```

/*Function to calculate CRC*/
unsigned short crc16(unsigned char *buffer, unsigned int size) {
    unsigned short crc = 0xFFFF;
    while(size--) {
        crc = CRC16Table[((crc>>8) ^ (*buffer++))&0xFF] ^ (crc<<8);
    }
    return crc;
}

```

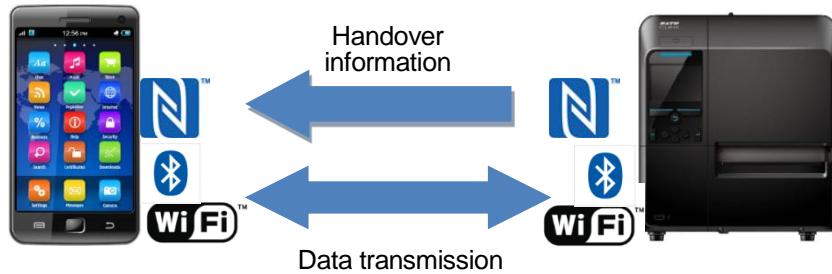
10.4 Handover mode

This mode works when printer's power is turned on. It reads the handover information (Bluetooth, WiFi connection) from NFC tag memory that is written on NFC tag memory at power off, and communicates with printer based on that information by connecting to Bluetooth or Wi-Fi.

Purpose: For sending SBPL data (printing), printer setup, collecting values and status.

Note: The communication after handover connection is done through Bluetooth or Wi-Fi.

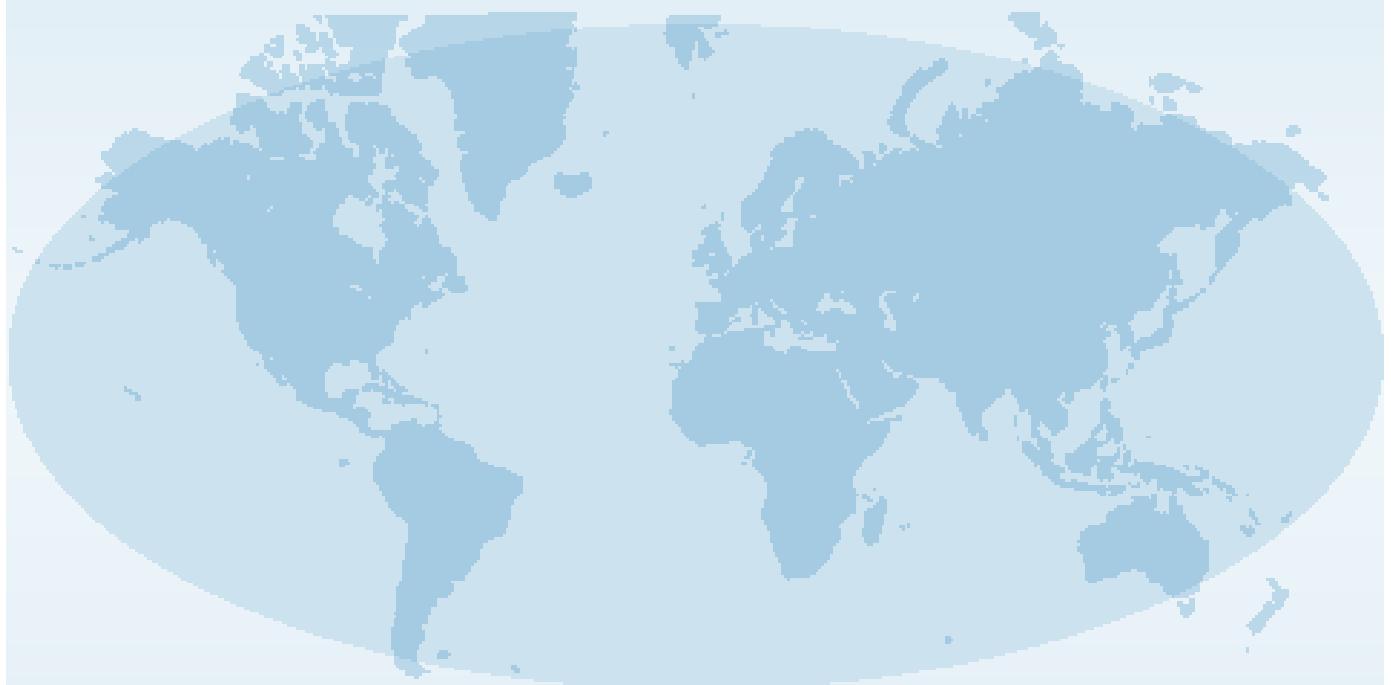
For data format and transmission sequence, see Chapter 7. Bluetooth and Chapter 6. WLAN.



11 Note

■Operation after turning the printer's power off

Please note that the data sent from the host to the printer after turning the printer's power off is not ensured.



Extensive contact information for worldwide SATO operations can be found on the Internet at
www.satoworldwide.com

