

Specifications for

Kiosk module printer

NP-215

NP-225

NP-325

NP-415W

Revision 1.00	2000.08.01	1 edition
Revision 2.00	2001.04.18	2 edition
Revision 2.10	2001.06.13	3 edition
Revision 2.20	2002.01.29	4 edition
Revision 2.30	2002.02.15	5 edition
Revision 2.40	2002.03.26	6 edition
Revision 2.50	2002.04.12	7 edition
Revision 2.60	2002.07.09	8 edition
Revision 2.70	2003.01.31	9 edition

Read carefully Before Using the Printer

Wrong handling of the printer may cause its performance declined and the product damaged. Please read the notes below before handling.

1. Static discharge prevention must be made for installation and removal of the printer to protect IC and other electrical parts. Connect it to the earth ground. It is also requested to remove the static from body of the person before handling, especially, the input terminal.
2. Avoid excessive force to the input terminal for handling.
3. When any type of paper, other than specified in this manual, is used, it may cause deterioration of the print quality and thermal head reliability.

Examples of troubles

- 1) Print quality deterioration by using low sensitivity paper.
 - 2) Thermal head wears due to roughness of paper surface.
 - 3) Sticking between heat receipt layer and thermal head, and vibration noise during printing.
 - 4) Print ink disappears on low print durability paper.
 - 5) Electrolyte corrosion on thermal head due to low quality of heat receipt layer.
4. Avoid printing with no paper loaded. It damages platen and thermal head.
 5. Do not scabble thermal head with sharp edge or something hard, or give impact. The heat element may be damaged.
 6. Set the power of printer off before connecting or removing connectors.
 7. When printing in high speed under low temperature of high humidity environment, the paper may be stained by moisture that appears from paper, or the printer may have condensation. Avoid dew from dropping down to the thermal head that may cause electrolyte corrosion. Turn the power off until any dew is removed.
 8. The printer is not protected from water or dew formed. Do not water the printer or handle it with a wet hand, which may cause damage to the printer due to short circuit, or heat or fire.
 9. The printer is not protected from dust or dirt. If it is used at dusty place, the thermal head may be damaged or paper feed is not operated properly.
 10. When cleaning the printer with a vacuum cleaner, avoid the printer's paper outlet from locating cleaner's air inlet.
 11. The printer's main structure parts use plated steel. However, rust may be caused to the cut section.
 12. Reflection type of infrared ray sensors are used at some locations in the printer. Direct sun light may cause mal-function of printer. Avoid from such a location for installation.
 13. This printer does not support any operations caused by the commands or control commands not specified in this manual.

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1. Overview

1.1 Overview

The printer is categorized as following.

NP - * * **5** * *
 1 2 3 4

1: Paper width, 2 = 2 inches, 3 = 3 inches

2: Paper setting, 1= Paper holder type, 2 = Drop-in type

3: Interface, P = Parallel, R = Serial, D = Parallel/Serial compatible

4: OEM number

* D type is parallel and serial compatible. Interface connector is not incorporated.

NP - **4 1 5** W * *
 1 2 3

1: Windows driver available

2: Interface, P = Parallel, R = Serial, D = Parallel/Serial compatible

3: OEM number

* D type is parallel and serial compatible. Interface connector is not incorporated.

1.2 Features

This module printer is designed on the basis of our long experience as a printer manufacturer. Individual unit such as printer mechanism, controller board and auto-cutter is assembled in compact with our reliable design concept.

Simple integration to the system requiring only power and data supplies, that contributes to the short development time and improvement of product reliability.

- 1) Important areas such as paper entrance and auto-cutter guide are designed professionally on the basis of our long experience as a printer manufacturer.
- 2) Small, compact and light weight. Easy to integrate into various kinds of system.
- 3) Short development time.
- 4) High speed and quality of printing
- 5) Both parallel and serial interfaces are available as a standard.
- 6) Various barcode symbols, 1-D and 2-D (QR code) are available.
- 7) Various kinds of application are available.
- 8) Possible to control paper presenter (paper transfer and present device).
- 9) User-friendly drop-in type of roll paper holder with paper end sensor. * 1
- 10) Windows drivers (Windows95/98/NT4.0/2000) are available.
- 11) Easy to write/rewrite F/W by using flash memory. Also, 3 patterns of registration are available with NV bit image.

*1 Drop-in type of paper holder is for NP-225, NP-325 and NP-415W. NP-215 is paper holder type.

1.3 Configuration

The printer consists of the following components.

Product Name				NP-215	NP-225	NP-325	NP-415W
Description	Specification	Part No.	Q'ty				
Printer	NP-215		1	X			
	NP-225		1		X		
	NP-325		1			X	
	NP-415W		1				X
Thermal paper	60xØ 48mm	24-X117	1	X	X		
	80xØ 48mm	24-X121	1			X	
	112xØ 48mm	24-X116	1				X
Paper holder	80R	35-029Q	1	X			
	80L	35-030Q	1	X			
Screws	tight	21-U196	2	X			
B501 power cable	D-P44507	30-439A	1	X	X	X	X

*B501 power cable : D type only

2. Specifications

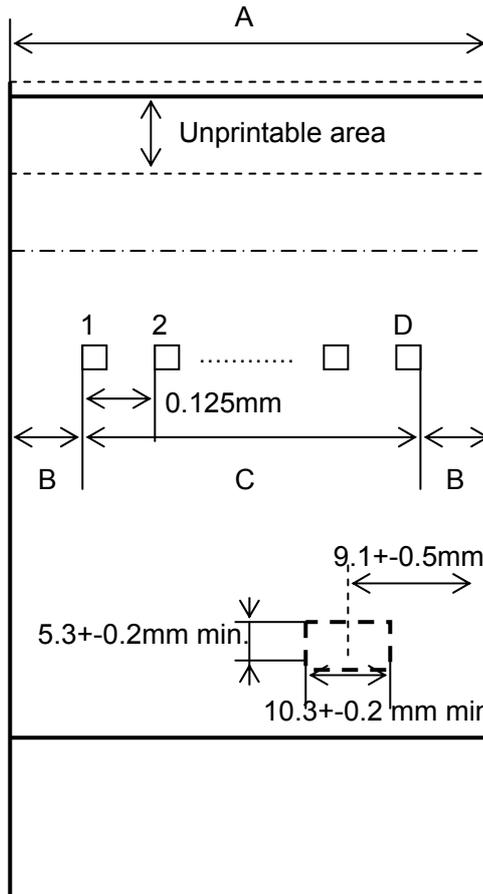
2.1 Basic specifications

No.	Specifications	NP-215/225	NP-325	NP-415W
1	Print specs. 1. Print method 2. Total dots / line 3. Dot density 4. Print width 5. Print speed (Max.) *It can be changed by the condition. 6. Print digits Font A (12 × 24) Font B (9 × 17) 7. Line feed pitch	Line thermal dot 432 dots 8 dots / mm 54 mm 85 mm / s 1 partition drive (ASCII print) 36 digits (Font A) 48 digits (Font B) 0.125 mm	← 576 dots ← 72 mm 70 mm / s 1 partition drive (ASCII print) 48 digits (Font A) 64 digits (Font B) ←	← 832 dots ← 104 mm 70 mm / s Automatic partition drive (ASCII 38 print) 69 digits (Font A) 92 digits (Font B) ←
2	Character specs. 1. Character size Font A (12 × 24) Font B (9 × 17) 2. Character types ASCII Block graphics International 3. Character modification	1.50 × 3.00 mm 1.13 × 2.13 mm 224 80 × 2 32 Double width	← ← ← ← ← ← ←	← ← ← ← ← ← ←
		Vertical double Quadruple Bold Double strike Inverted 90° clockwise rotation Black/white reverse Underline 4. Line spacing (Default)	← ← ← ← ← ← ← ←	← ← ← ← ← ← ← ←
3	Print mode	ANK mode Bit image mode Barcode mode	← ← ←	← ← ←
4	Barcode specs	1-D symbology UPC-A UPC-E EAN-13 (JAN-13) EAN-8 (JAN-8) CODE39 ITF	← ← ← ← ← ←	← ← ← ← ← ←

		2-D symology	CODABAR (NW-7) CODE128 QR code	← ← ←	← ← ←
5	Interface	Parallel Serial	Centronics RS-232C	← ←	← ←
6	Auto-cutter	1. Cut method 2. Applicable paper 3. Cut cycle 4. Cut mode (by command setting) 5. Life time	Guillotine type Thermal 65 - 125 (micro) 30 cuts / minute Total cut Partial cut (a 2mm tab left at the center) 300,000 cuts	← ← ← ← ←	← ← ← ← ←
7	Paper specs.	1. Paper width 2. Max. diameter 3. Core diameter 4. Papers recommended	60 mm Ø80 mm / Ø83 mm Inner Ø12mm Outer Ø18mm	80 mm Ø83 mm	112mm Ø83 mm
			TF50KS-E2D (Nihon Seishi) PD160R-N (Shin Oji Seishi) AFP235 (Mitsubishi Seishi) TL69KS-R2 (Nihon Seishi) TL69KS-HW74 (Nihon Seishi) TC98KS-T1 (Nihon Seishi)		
8	Receiving buffer		Approx. 10K bytes		
9	Operation SW		ALMLED OUT Line feed SW input		
10	Weight	Net weight	approx. 550g / 650g	approx. 750g	approx. 1,250g
11	Low sensor		Approx. 22.5 Ø (approx.2.5m+-1m. When inner of paper core is Ø 12 and outer is Ø 18) Reflection sensor.		Approx. 3m +- 1.5m (When inner of paper core is Ø 12 and outer is Ø 18.) Changeable reflection sensor

2.2 Printing area and cutter position

Cutter position (Cutting place)



TOP	0.0mm
Cutter position	3.0mm
Head position	17.5mm
Sensor position	28.5mm

	NP-215 NP-225	NP-325	NP-415W
A	60mm	80mm	112mm
B	3mm	4mm	4mm
C	54mm	72mm	104mm
D	432dot	576dot	832dot

Black mark printing

1. Black mark printing is used when preprint paper is formatted and used.
2. Black mark printing is printed on the backside with black ink.
3. Do not print around the black mark printing area with dark ink.

2.3 Power supply specifications

1) Power voltage : DC24V ± 5%

2) Current consumption *2, *3

	NP-215/225		NP-325		NP415W	
	1 partition	2 partition	1 partition	2 partition	1 partition	2 partition
Standby	Approx. 0.1A					
ASCII printing (Printing average of 16%)	Approx. 1.4A	Approx. 0.9A	Approx. 1.7A	Approx. 1.1A	-	Approx. 1.3A
Bit image printing (Max 100%)	Approx. 6.0A	Approx. 3.2A	Approx. 7.8A	Approx. 4.1A	-	Approx. 5.7A

*2: A sufficient volume of power supply is required to maintain print quality due to high peak current that may run according to printing.

*3: If power supply cable is excessively long, the operation may become unstable. Cable should be made as short as possible. If not available, connect cables near the printer and place an electrolysis condenser of 2200 μ between power supply and ground. Voltage resistance should be higher than 35V.

* For preventing from static electric discharge, make sure to connect FG wire.

2.4 Reliability

1) Head life : Average resistance change rate to head less than 15%, except defects caused by dust or others

Pulse : More than 100 million pulses (with recommended paper)

Wear distance : More than 50 km (with recommended paper)

2) Operation environment : Temperature 0 – 45

Print guarantee 5 - 40 , no condensation

3) Storage environment : Temperature -20 - 60

* When storing for a long time, paper must be kept loaded between head and platen.

4) Frame Ground (FG) wire

The FG wire (Green and Yellow) is coming from the printer body. Make sure to ground the wire near the body frame when installing the printer. FG grounding is effective for minimizing the noise level, preventing from SED and maintaining the FG safety for head, cutter, body frame, power supply and Data connectors.

5) Safety regulation

CE marking

UL60950

6) EMC

EMI: EN55022

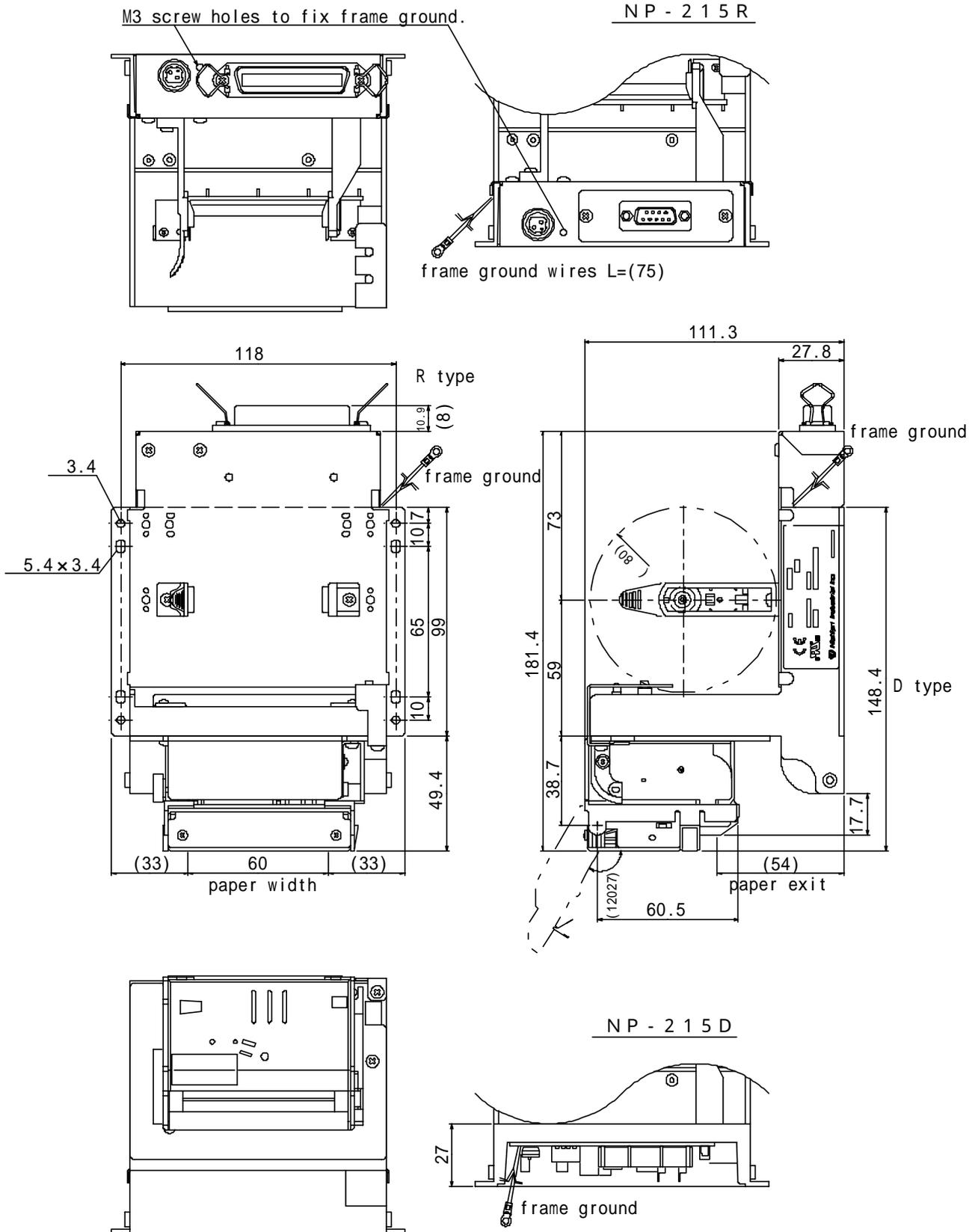
VCCI: Class A

FCC: Class A

EMS: EN55024

2.5 Dimensions

1) NP-215 dimensional drawing

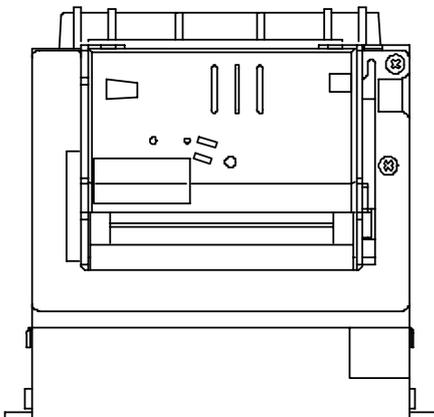
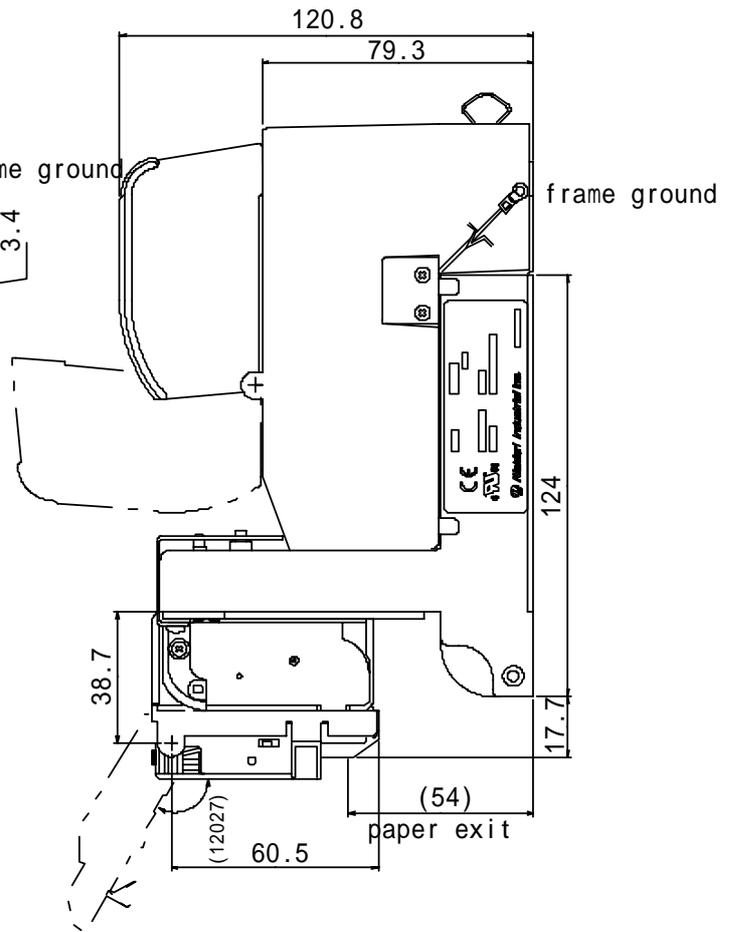
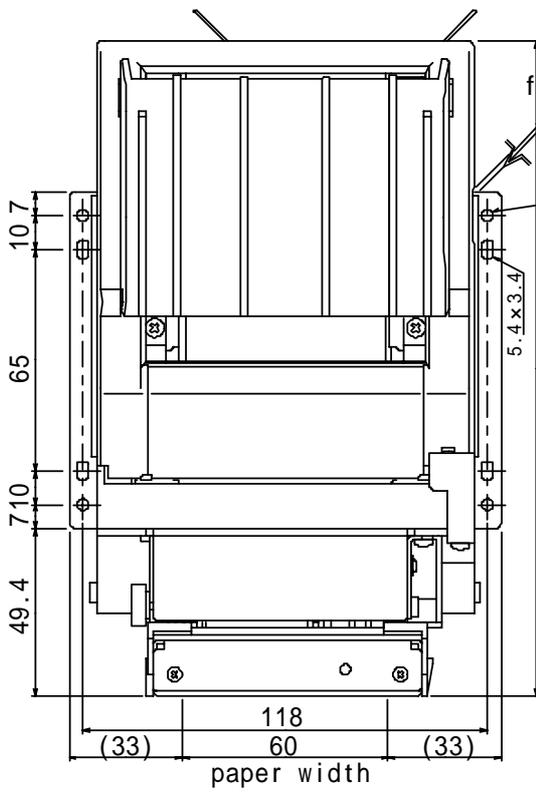
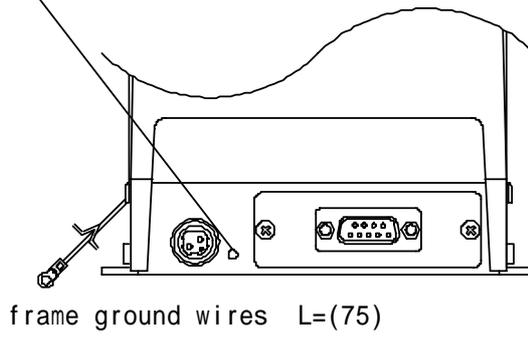
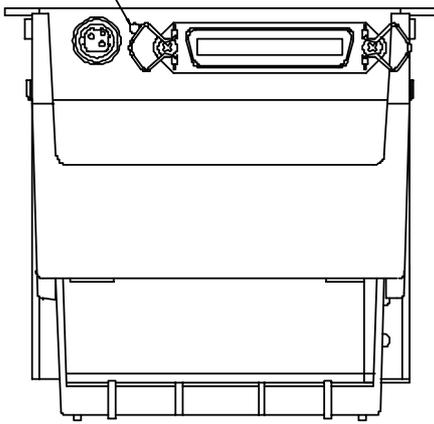


This drawing is for NP-215P.

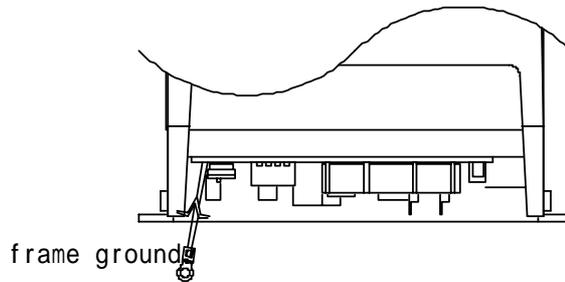
2) NP-225 dimensional drawing

M3 screw holes to fix frame ground.

NP - 2 2 5 R



NP - 2 2 5 D

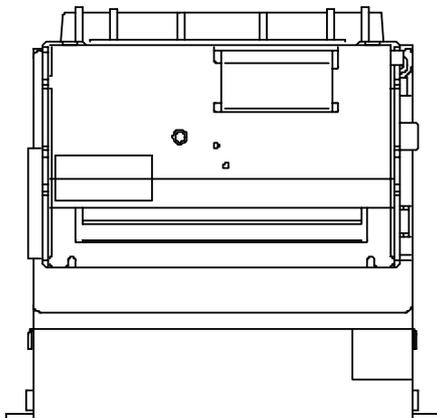
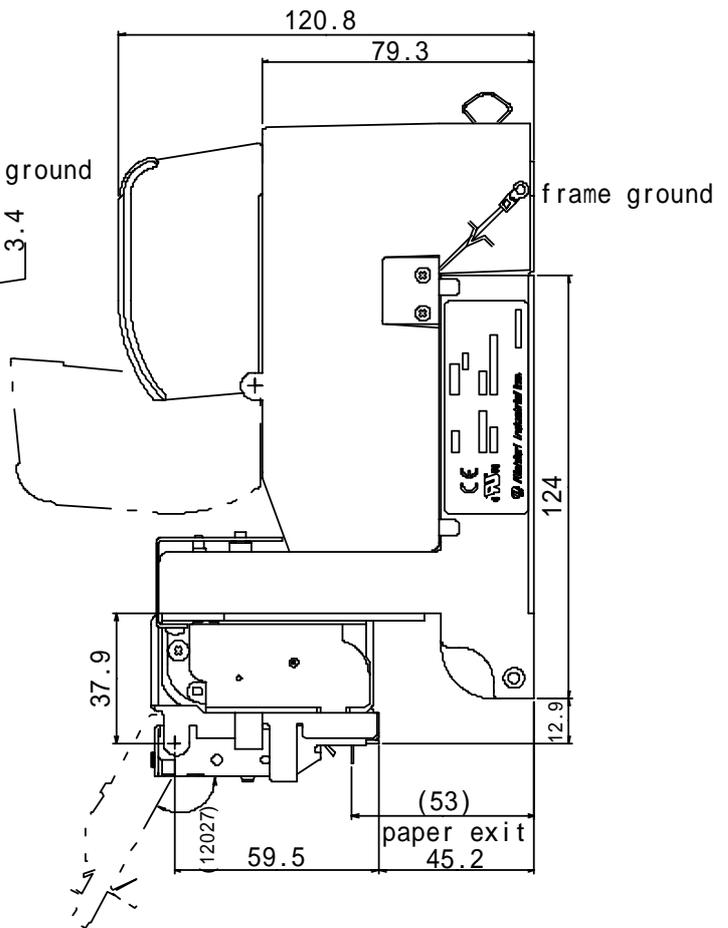
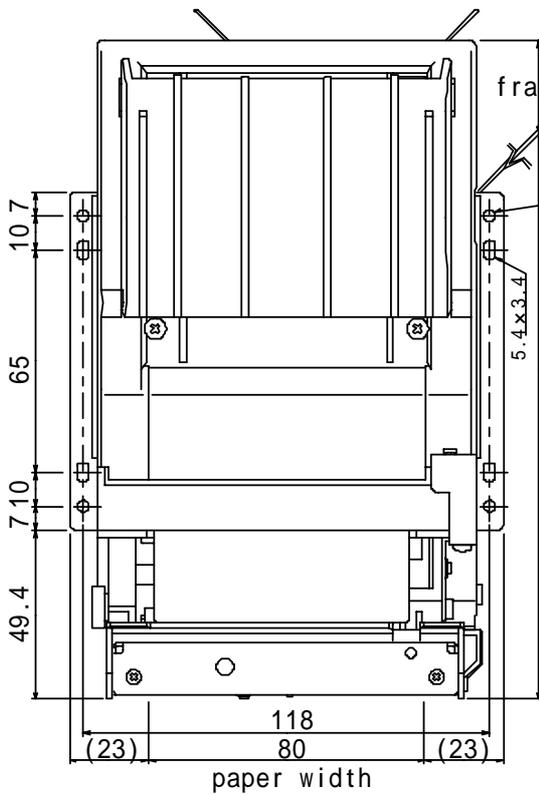
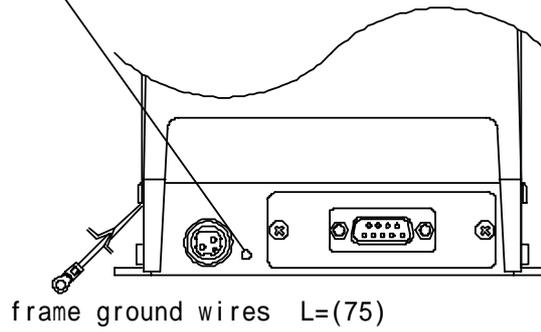
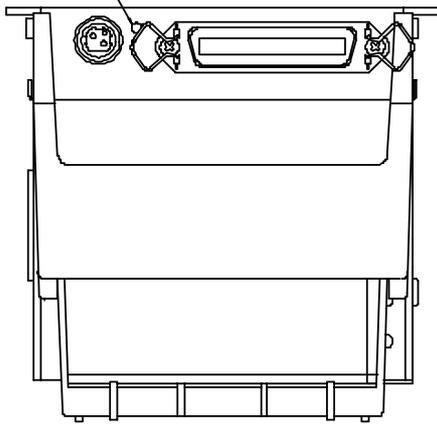


This drawing is for NP-225P.

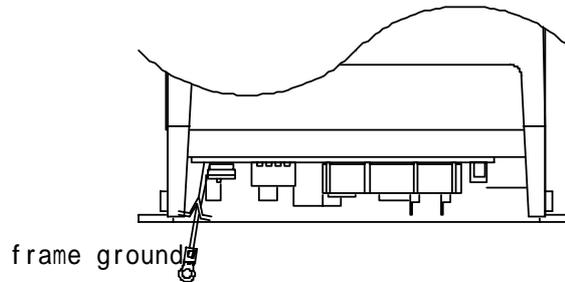
3) NP-325 dimensional drawing

M3 screw holes to fix frame ground.

NP - 3 2 5 R

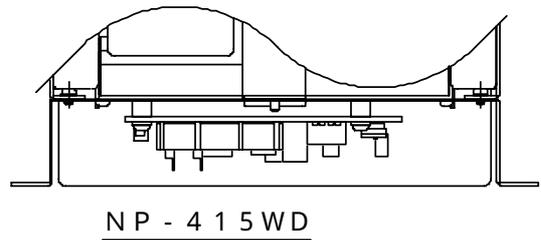
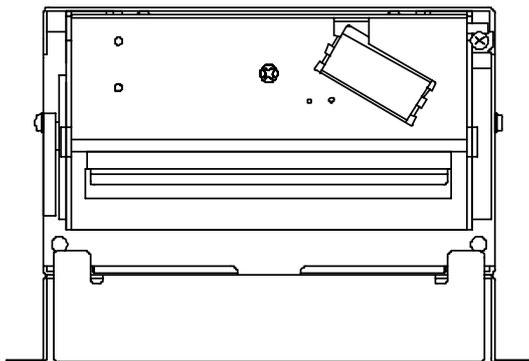
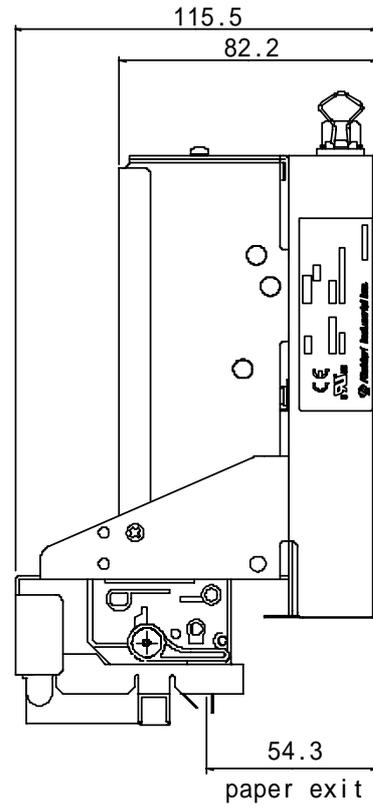
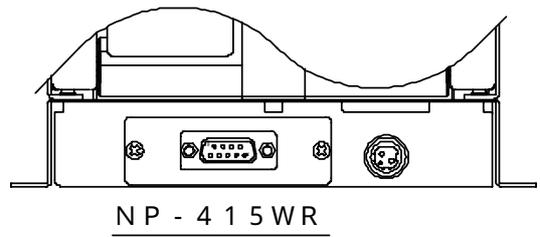
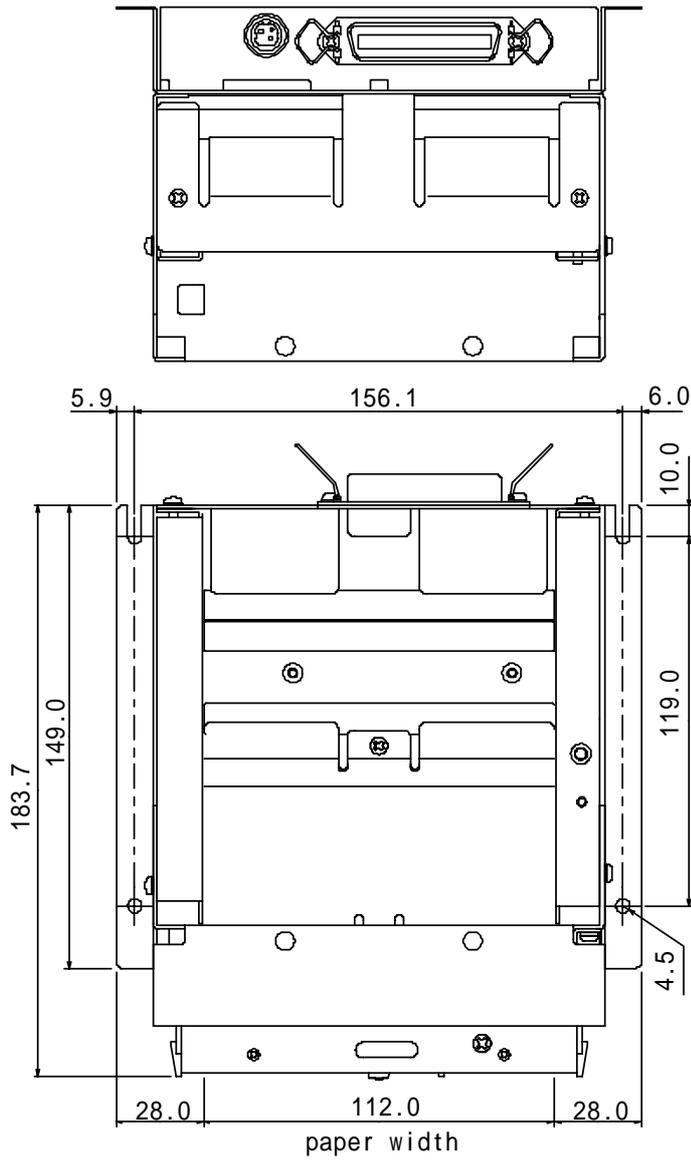


NP - 3 2 5 D



This drawing is for NP-325P.

4) NP-415W dimensional drawing



This drawing is for NP-415WP.

3. Interface specifications

3.1 Parallel interface (Centronics)

- 1) Data input : 8 bit parallel method(DATA 0 – DATA 7)
- 2) Control signals : /ACK, BUSY, /STB, /ERROR, PE, SLCT, /INIT
- 3) Input signal to a printer

- DATA 0 – 7 : 8 bit parallel signal(positive logic)
- /STB : Signal to read 8 bit data(negative logic)
- /INIT : Signal to reset an entire printer(negative logic)
- /LF : Signal to feed paper to print mechanism(negative logic)

4) Output signal from a printer

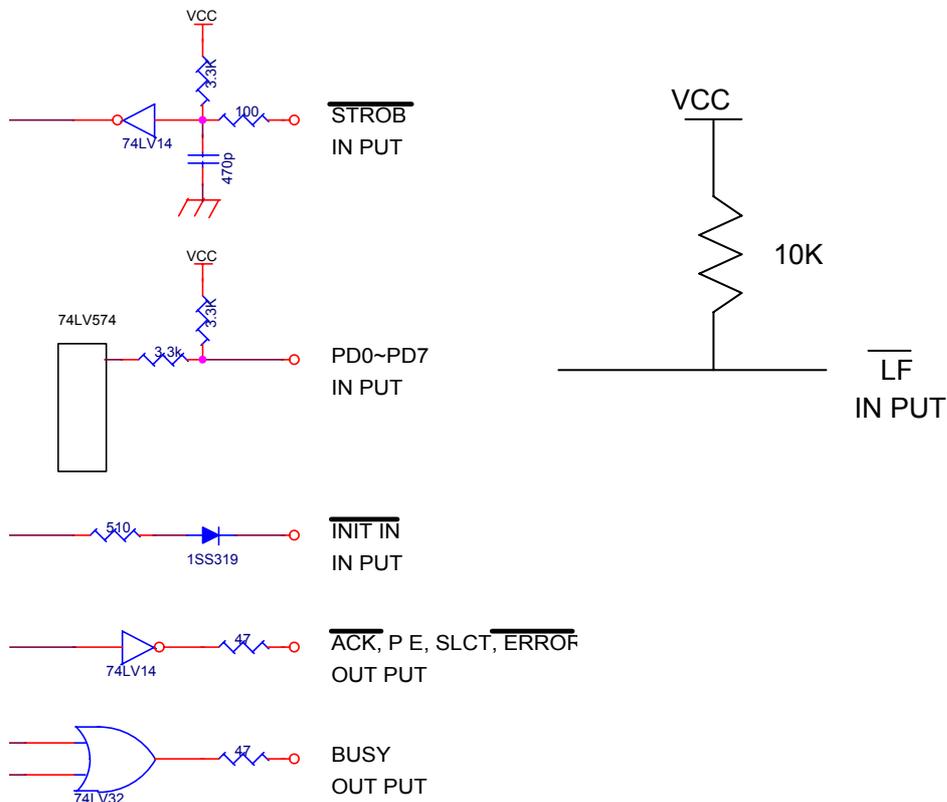
- /ACK : Enquiry signal for 8 bit data. It's also pulse signal which is output after BUSY signals (negative logic)
- BUSY : Indicate BUSY status of the printer. Inputs new data at LOW status (positive logic)
- /ERROR : This signal becomes LOW when a printer is in the alarm status. In the LOW status, all control circuits in the printer stops (negative logic)
- PE : Outputs when roll paper becomes empty (positive logic)
- SLCT : Signal to indicate on-line status (positive logic)

5) Input/Output signal level

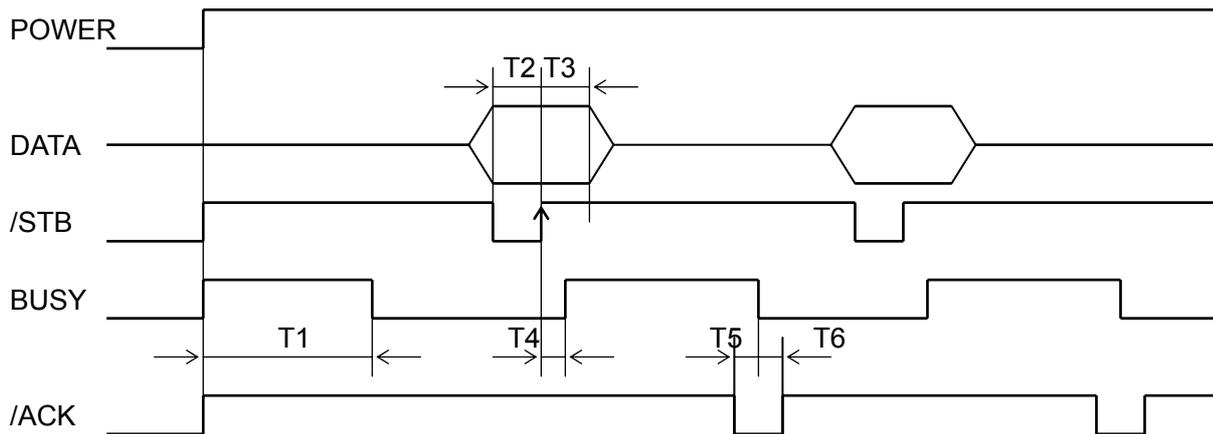
	Code	Standard value			Unit
		Min.	TYP.	Max.	
Input low level	V _{IL}	-	-	0.18V _{cc}	V
Input high level	V _{IH}	0.7V _{cc}	-	-	V
Output low level	V _{OL}	-	-	0.7V _{cc}	V
Output high level	V _{OH}	0.7V _{cc}	-	-	V

*I_{OL}4mA

6) Input/Output conditions



7) Timing chart



T1 = 3500msec (Max) T4 = 500nsec (Max)
 T2, T3 = 500nsec (Min) T5, T6 = 4microsec(TYP)

8) Receive control

When BUSY signal stays at LOW, it is feasible to receive data from host computer.
 But not feasible when BUSY signal stays at HIGH.

3.2 Serial interface (RS-232C)

- 1) Synchronization : Asynchronous
- 2) Transmission speed: 4800, 9600, 19200, 38400bps (user selectable)
- 3) A word consists of

Start bit : 1bit
 Data bit : 7 or 8 bit (user selectable)
 Parity bit : odd, even or no parity (user selectable)
 Stop bit : more than 1 bit

4) Signal polarity

RS-232C

Mark = Logic "1" (-3V -- -12V)
 Space = Logic "0" (+3V -- +12V)

5) Receive data (RD signal)

RS-232C

Mark = 1
 Space = 0

6) Reception control (DTR signal)

RS-232C

Mark = 1
 Space = 0

7) Transmission control (TD signal)

DC1, [11]h XON: Enable data receiving
 DC3, [13]h XOFF: Disable data receiving

3.3 Connector connections

- 1) J1 Power input
- 2) CN2 Connect to printer mechanism (head)
- 3) CN3 Connect to printer mechanism (motor)
- 4) CN4 Connect to printer mechanism (sensors)
- 5) CN5 Data signal input
- 6) CN6 Connect to autocutter
- 7) CN7 Connect to auxiliary sensor(paper low end)
- 8) CN8 Connect to operation panel
- 9) CN9 Connect to presenter (NPT-301 only)

3.4 Connector signal details

1.J1 power input connector (D type)

Printer side connector : B4B-XHA (JST)

Mating connector : XHP-4 (JST)

Pin #	Signal name	Input/Output	Function
1	VH	Input	Power DC +24V
2	VH	Input	Power DC +24V
3	GND	-	Power GND
4	GND	-	Power GND

* A sufficient volume of power supply is required to maintain print quality due to high peak current that may run according to printing. If power supply cable is excessively long, the operation may become unstable. Cable should be as short as possible. If not available, connect cables near the printer and place an electrolysis condenser of 2200 μ between power supply and ground. Voltage resistance should be higher than 35V. Make sure to connect FG wire to prevent from ESD problems.

2. Power input connector (P type, R type)

Printer side connector : TCS7960-532010 (Hoshiden)

Mating connector : TCP8927-53-1100, TCP8935-53-1100 (Hoshiden) Equivalent

Pin #	Signal name	Input/Output	Function
1	VH	Input	Power DC +24V
2	GND	-	Power ground
3	Not available	-	
Shell	FG	-	FG

* A sufficient volume of power supply is required to maintain print quality due to high peak current that may run according to printing. If power supply cable is excessively long, the operation may become unstable. Cable should be as short as possible. If not available, connect cables near the printer and place an electrolysis condenser of 2200 μ between power supply and ground. Voltage resistance should be higher than 35V. Make sure to connect FG wire to prevent from ESD problems.

3. Data signal input connector (Parallel)

Printer side connector: 57-40360 (DDK) equivalent

Mating connector: 57F-40360-20N (DDK) equivalent

Pin#	Signal	In/Output	Function	Remarks
1	/STB	Input	Data read assign signal	
2	PD0	Input	Parallel print data 0	
3	PD1	Input	Parallel print data 1	
4	PD2	Input	Parallel print data 2	
5	PD3	Input	Parallel print data 3	
6	PD4	Input	Parallel print data 4	
7	PD5	Input	Parallel print data 5	
8	PD6	Input	Parallel print data 6	
9	PD7	Input	Parallel print data 7	
10	/ACK	Output	Data processing end signal	
11	BUSY	Output	Receive data not ready signal	
12	PE	Output	No paper signal	
13	SLCT	Output	Connection select signal	
14	Not fixed		*	For extension
19	GND	-	Common ground	
31	/INIT	Input	Initialize signal	
32	/ERROR	Output	Control stop signal	
36	Not fixed		*	For extension
15-18 20-30 35	Not fixed			

* 14 and 36 are kept as "HIGH". Do not connect them.

4. Data signal input connector (Serial)

Printer side connector: JEC-9S (JST) equivalent

Mating connector: JEC-9P (JST) equivalent

Pin#	Signal	In/Output	Function	Remarks
2	RXD	Output	Serial receive data	
3	TXD	Input	Serial transmit data	
4	DTR	Output	Data transmit permit signal	Connect to No.7
5	GND	-	GND for signal	
6	CTS	Input	Transmit permit signal	Connect to No.8
7	DTR	Output	Data transmit permit signal	Connect to No.4
8	CTS	Input	Transmit permit signal	Connect to No.6
1, 9	N.C	-		

5. Data signal input connector (Parallel/Serial)

Printer side connector: XG4C-2631 (Omron) equivalent

Corresponding housing: XG4M-2630-T (Omron) equivalent

Pin#	Signal	In/Output	Interface	Function	Remarks
1	/STB	Input	Parallel	Data read assign signal	
2	PD0	Input	Parallel	Parallel print data 0	
3	PD1	Input	Parallel	Parallel print data 1	
4	PD2	Input	Parallel	Parallel print data 2	
5	PD3	Input	Parallel	Parallel print data 3	
6	PD4	Input	Parallel	Parallel print data 4	
7	PD5	Input	Parallel	Parallel print data 5	
8	PD6	Input	Parallel	Parallel print data 6	
9	PD7	Input	Parallel	Parallel print data 7	
10	/ACK	Output	Parallel	Data processing end signal	
11	BUSY	Output	Parallel	Receive data not ready signal	
12	PE	Output	Para/Ser.	No paper signal	
13	SLCT	Output	Parallel	Connection select signal	
14	Not fixed			*	For extension
15	/ERROR	Output	Para/Ser.	Control stop signal	
16	/INIT	Input	Para/Ser.	Initialize signal	
17	Not fixed			*	For extension
18,19	GND	-	Para/Ser.	Ground for signal	
20	/LF	Input	Para/Ser.	Paper feed signal	
21	TXD	Output	Serial	Transmit data	
22	RXD	Input	Serial	Receive data	
23	CTS	Input	Serial	Transmit permit signal	
24	DTR	Output	Serial	Data transmit permit signal	
25	GND	-	Para/Ser.	Signal ground	
26	VH	Input	Para/Ser.	DC +24V	

- Connect GND and DC+24V to stabilize circuit. Since 14 and 17 are kept as "HIGH", do not connect them.

6. CN6 Autocutter sensor (control switch), motor

Printer side connector : 5483-04AX (Molex)

Mating connector : 5480-04 (Molex)

Pin #	Signals	Input/output	Functions
1	M+	Output	Motor drive signal
2	M-	Output	Motor drive signal
3	CSW1	Input	HP detect SW output
4	CSW2	-	HP detect SW GND

7. CN7 Auxiliary sensor (paper near end sensor)

Printer side connector: 53047-0310(Molex)

Mating connector: 51021-0300(Molex)

Pin#	Signal name	In/Output	Functions	Remarks
1	LED+	Output	Anode of LED	
2	PNE	Input	Collector of phototransistor	At High Paper out
3	SG	-	Signal ground	Cathode or emitter connect
4	SG	-	Signal ground	

* Valid when DIP SW S2-7 is on.

* When PNE signal is "High", PE signal of CN5 outputs. Printing operation is not affected.

8. CN8 Connect to operation panel

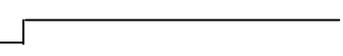
Printer side connector: 53047-0310(Molex)

Mating connector 51021-0300(Molex)

Pin#	Signal name	In/Output	Functions	Remarks
1	/LF	Input	Paper feed signal input	Active at L
2	ALM	Output	Printer error signal Output	Output in printer error
3	SG	-	Signal ground	

- 1) Paper feed is executed according to the paper feed pitch set by ESC 2, ESC 3. However, if there is no paper, line feed is not executed.
- 2) While paper feed signal is at "L", set Power on to activate self-diagnostic printing.
- 3) While paper feed signal is at "L", release INIT signal to "H" to activate diagnostic printing.
- 4) ALM signal (for operation panel) indicates printer statuses as follows:

A protective resistance is incorporated on the board, a light diode can be located between 2 and 3. 2: anode and cathode.

Display pattern	Printer status	How to solve the problem
1 0 	Normal status Print (receive) ready	
1 0 	No paper Head up status	Load the paper Set head down
1 0 	F/W write mode Presenter in cramp status	Set the power on again Pull out the clamped paper
1 0 	Head temp high (80°C) Wrong head connection	Printer returns normal at head temp of 60°C Connect head cable properly
1 0 	Auto-cutter error Presenter error	Remove jammed paper and turn power on again, or input INIT signal

9. CN9 Connect to presenter (NPT-301 only)

Printer side connector: 53047-0810

Mating connector: 51021-0800

Pin #	Signal	Input/output	Remarks
6	LED +	Output	To sensor LED1
7	Sensor 1	Input	From sensor 1
8	SG	-	Signal GND
9	LED2 +	Output	To sensor LED2
10	Sensor2	Input	From sensor2
11	SG	-	Signal GND
12	M +	Output	Motor drive output
13	M -	Output	Motor drive output

* Connect to NPT-301 only. When connect to other product, it would cause problems.

4. Functions

4.1 Function setting

4.1.1 DIP switch S1

	Function	ON	OFF	Factory setting		
				**5P	**5R	**5D
S1-1	Interface	Serial	Parallel	OFF	ON	OFF
S1-2	Select emulation	Windows	ESC/POS	OFF	OFF	OFF
S1-3	Select fixed division	2 partition	1 partition	OFF	OFF	OFF
S1-4	Baud rate	Refer to the following table		OFF	OFF	OFF
S1-5				OFF	OFF	OFF
S1-6	Parity check	Yes	No	OFF	OFF	OFF
S1-7	Parity bit	Odd	Even	OFF	OFF	OFF
S1-8	Data bit	7 bit	8 bit	OFF	OFF	OFF

Baud rate

	4,800bps	9,600bps	19,200bps	38,400bps
S1-4	OFF	OFF	ON	ON
S1-5	OFF	ON	OFF	ON

4.1.2 DIP switch S2

	Function	ON	OFF	Factory setting		
				**5P	**5R	**5D
S2-1	Auto cutter	Yes	No	ON	ON	ON
S2-2	Character set	Overseas	Japanese	OFF	OFF	OFF
S2-3	Serial control (DTR)	XON/XOFF	DTR/DSR	OFF	OFF	OFF
S2-4	Japanese settings			OFF	OFF	OFF
S2-5	Presenter	Yes	No	OFF	OFF	OFF
S2-6	Flash ROM	Rewrite	No	OFF	OFF	OFF
S2-7	Paper low end	Yes	No	ON	ON	ON
S2-8	Print density	Thick	Standard	OFF	OFF	OFF

Note:

- S2-1 OFF (autocutter OFF) will be in winder drive setting (current consumption should be less than 200mA). If autocutter is connected, the autocutter activates and paper is cut off. It may cause paper jam.
- For writing ROM, set the DIP switches as stated below and turn the power on after changing CN8 NO.1 pin LF to "L" position or while pressing the paper feed switch on the operation panel. After the operation, set the power off.
- Rewriting Flash ROM boot program: S2-6 ON and S2-2 OFF.
- Rewriting Flash ROM F/W: S2-6 ON and S2-2 OFF.
- Use S2-6 in OFF position. If set ON to use, the program may be destroyed.
- For NP-215, S2-7 (factory setting for "near end") should be set OFF.
- For NP-415W, S1-2 (factory setting for emulation) should be set ON.

4.1.3 Self diagnostic print

- By performing self-diagnostic print following items are checked.
 - Proper function of control circuitry
 - Proper function of printer mechanism
 - Print quality
 - Control F/W version
 - DIP switch setting status
 - Correct function of paper out sensor
 - Head wide and head rank (automatically detected)

2. Start and end of self diagnostic print

Set the power on while pressing the FEED switch and release the FEED switch after the printer mechanism activates to start self-printing.

The self diagnostic print automatically ends when a preset number of characters are finished printing. While printing, the printer is in Off-line mode.

4.1.4 No paper sensor

No paper sensor is mounted on the paper path in the printer mechanism.

It detects no paper status of the roll paper. When detecting no paper status, the printer sends PE signal to the host and stop printing. Pay special attention to the end of roll paper. The end should not be glued to the core of the roll. If no paper status is detected, replace the roll paper.

4.2 Processing error

1) Error detection details

Name	Status	BUSY	PE	/ERROR 232C status		PL status	Removal
Comm. error	232C Comm. error Parity Overrun Flaming Data “?” print	-	-	-	-	-	Align comm. condition
Paper near end	Paper remain sense CN7 sensor	L	H	H	Obit 1	-	Load paper
Head up	Head up	L	L	L	1bit 1	On	Head up lever down
Paper end	No paper	L	H	L	2bit 1	On	Load paper
Head temp high	Over 80°C	L	L	L	3bit 1	Flash	Return normal with 60°C
Cutter error	Cutter jam						Remove jam and POWER OFF , /INIT

When the above errors are detected except transmission error and paper low end error, printer stops all operations and outputs error signal.

In the case of parallel interface: Error signal becomes “LOW”

In the case of serial interface:

Error signal becomes “LOW” and error bit in the status information is set to “ON”.

2) Return to normal status from error statuses

Remove causes of error statuses and turn the power on again or input the /INIT signal to return to normal. When this process is activated, at the time of power switch turned off, the printer will be initialized, so that settings are required again.

If data remains in the buffer, attention should be paid

4.3 Buffer full print

If there remains data in the buffer after one line of data is received, printer automatically prints preceding data. The volume of buffer full data varies depending on ASCII characters or bit images.

4.4 Automatic paper cut

“Automatic paper cut” after paper is manually fed by pressing FEED button.

If manual line feed is conducted for more than 10 lines, the paper is automatically cut off after the paper feed is finished. This function is not available when the line feed is conducted by control command.

4.5 Winder drive

When no autocutter is mounted, autocutter drive motor functions as external rewinder drive.

CN6 Autocutter sensor (control switch), Outputs to motor pins 1 and 2

S2-1 OFF: rewinder drive

ON: autocutter drive

DC motor with DC 24V, approx. 200mA

In about 1 to 2 sec. rewinder output is turned OFF after printing and paper feed.

If overloaded with higher current than specified and the status continues, the ICs may be damaged.

4.6 Partition drive

The fixed drive (1 or 2 partition drives) or “automatic partition drive” can be selected by the DIP switch and commands. It should be selected according to the power supply and print duty.

1) Fixed partition

	Function	ON	OFF
S1-3	Fixed partition select	2 partitions	1 partition

- 1) NP-415W is assigned to 2 fixed partitions.
- 2) 2 fixed partition select may decrease print speed.
- 3) 2 fixed partition select may decrease print quality.

2) Automatic partition drive

	1 partition	2 partitions
NP-215/225	Less than 215 dots	Higher than 216 dots
NP-325	Less than 287 dots	Higher than 288 dots
NP-415W	Less than 415 dots	Higher than 416 dots

1. Automatic partition drive select will automatically change the print speed according to print ratio. Print noise may appear.
2. The default value selected by commands will be the fixed partition selected by. The DIP switch. Refer to the section 5.3.
3. Automatic partition select may decrease print quality.

5. Control commands

5.1 Control command table

	Control codes	Functions	Pages
1	HT	Horizontal tab	20
2	CR	Carriage return	20
3	LF	Print and line feed	20
4	FF	Page feed	20
5	ESC C n	Page length set for n lines	20
6	ESC SP n	Character right space set	20
7	ESC ! n	Print mode overall set	21
8	ESC % n	Down load character set/reset	21
9	ESC & s n m a Dn	Down load character definition	21
*10	ESC * m n1 n2 Dn	Bit image mode set	24
11	ESC - n	Underline set/rest	26
12	ESC 2	1/6 inches line feed set	26
13	ESC 3 n	Smallest line feed pitch set	26
14	ESC @	Initialize printer	26
15	ESC D n1 n2 --- NUL	Set horizontal tab position	26
16	ESC E n	Bold print set/reset	27
17	ESC G n	Double strike print set/reset	27
18	ESC J n	Print and smallest pitch line feed	27
19	ESC R n	Select international character	27
20	ESC c 5 n	Feed switch enable/disable	28
21	ESC d n	Print and n line feed	28
22	ESC t n	Select character code table	28
23	ESC v	Send printer status	28
24	ESC { n	Inverted character set/reset	29
25	ESC V n	Character 90° clockwise rotation set/reset	29
*26	ESC \$ n1 n2	Absolute position set	29
27	ESC \ n1 n2	Relative position set	29
28	GS k n Dn NUL	Barcode print	30
29	GS w n	Barcode width select	30
30	GS h n	Barcode height select	30
31	GS H n	HRI character print position select	30
32	GS f n	HRI character style select	30
33	GS * n1 n2 Dn	Download bit image define	31
34	GS / m	Download bit image print	31
35	GS :	Macro definition start/end	32
36	GS ^ n1 n2 n3	Macro define	32
37	ESC = n	Data input control	32
38	ESC a n	Position align	33
*39	ESC i	Full cut	33
*40	ESC m	Partial cut	33
41	ESC c 3 n1 n2	No paper signal sensor select	33
42	ESC r n	Compulsory eject	34
43	ESC q S E M	QR code print	34
44	GS T n	Register NV bit image	36
45	GS P n	Print NV bit image	36
46	GS d Dn	Download firmware	36
47	GS B n	Black/white reverse print set/reset	37
48	ESC h n	Presenter eject mode select	37
49	ESC B n	Back feed	37
50	DC1	Reset software	37
51	GS % n	Partition drive select	38
52	GS ~ n	Print density set	38

* Functions differently between printer with standard type driver and Windows type.

5.2 Printer driver

Please apply the driver stated below for using under Windows environment. Please refer to the User's Manual for a driver.

- 1) Windows 95/98: NII printer driver Windows 95/98, Version 1.00
- 2) Windows NT4.0: NII printer driver Windows NT4.0, Version 1.00
- 3) Windows 2000: NII printer driver Windows 2000, Version 1.00

5.3 Control command details

- 1) Horizontal tab : <<HT>>

Code : [09] h

Shift the print position to the next horizontal tab position

* Horizontal tab position is set by [horizontal tab set] command.

* The default of horizontal tab position is every 8th character (9th digit, 17th digit, 25th digit and 33rd digit) in font A.

* Maximum digit position for NP272 is 33rd and for NP-372 is 41st.

* If the next tab position is not set, this command is ignored.

- 2) Carriage return: <<CR>>

Code : [0D] h

This command is ignored.

- 3) Line feed : <<LF>>

Code : [0A] h

Prints data stored in the input buffer and executes line feed according to data of feed pitch.

- 4) Page feed : <<FF>>

This command is effective only in Windows mode.

Code : [0C] h

* Prints data in the print line buffer and executes page feed to the head of next page according to the page length in the setting.

* Default setting for the page length is 66 lines.

- 5) "n" line page length setting: <<ESC C n>>

Code : [1B] h + [43] h + n * [01≤n≤FF] h

Sets a page length for "n" lines with current line feed pitch.

* Position is set to the head of page

* Line pitch change after setting will not change page length.

* Default value for "n" is [42] h for 66 lines.

* If printer is initialized, the head of page is also initialized.

- 6) Setting right space of a character: <<ESC SP n>>

Code : [1B] h + [20] h + n * [00≤n≤20] h

Sets the right space of a character by unit of dot (1/203 of an inch). In the case of double width mode, the space will be doubled. The default value of "n" is [00] h.

7) Overall print mode setting: <<ESC ! n>>

Code : [1B] h + [21] h + n * [00≤n≤FF] h

Sets print mode. "n" has following meanings

Bit	Function	Values	
		0	1
0	Character font	Font A	Font B
1	Undefined	-	-
2	Undefined	-	-
3	Bold	Reset	Set
4	Double height	Reset	Set
5	Double width	Reset	Set
6	Undefined	-	-
7	Underline	Reset	Set

- * If double height and double width are set at the same time quadruple character will be formed.
- * All of the printed characters will be underlined except for the 90° rotated characters and spaces created by horizontal tab.
- * Underline width is determined by the value set in [Underline set/reset] section. The default value is "1".
- * Different sizes of character mixed such as double width and normal size can be printed.
- * The default value of "n" is [00]h.

8) Down load characters set/reset: <<ESC % n>>

Code : [1B] h + [25] h + n * [00≤n≤FF]h

Setting or resetting the characters to be downloaded.

- * Unable to use download character set & download bit image set at the same time.
- * Only LSB (b0) is valid for "n" value. LSB (b0) has the following meanings.

b0	Function
0	Resets download character
1	Sets download character

Default value is "n" = [00]h

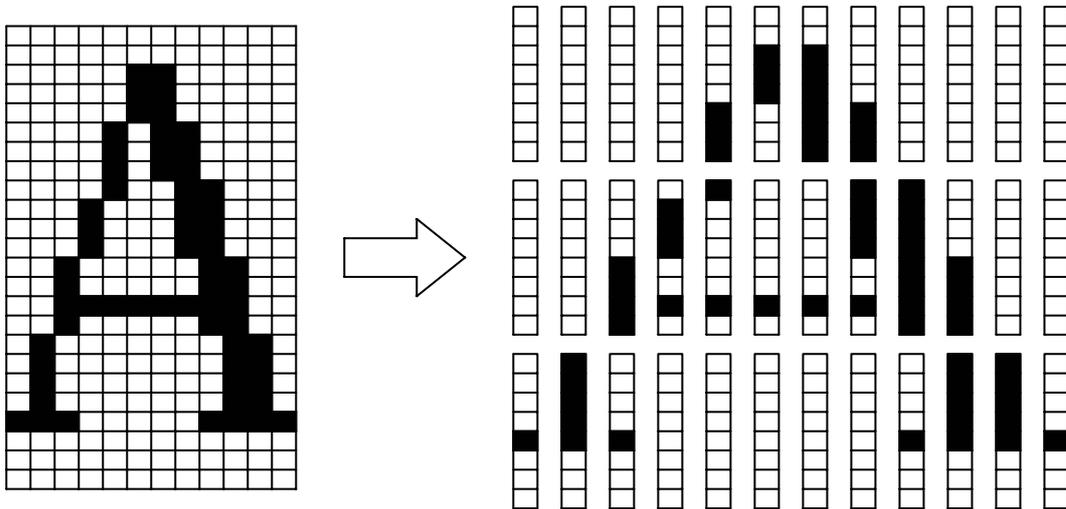
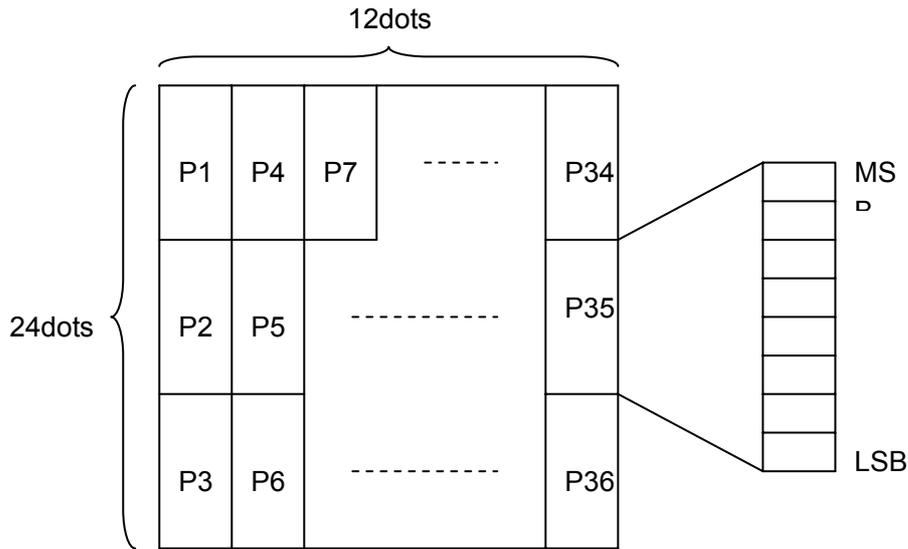
9) Definition of download character:<< ESC & s n m a Dn>>

Code : [1B] h + [26] h + s + n + m + a + Dn
 * [s = 03] h
 * [20≤n≤7E] h
 * [20≤m≤7E] h
 * font A [00≤a≤0C] h * font B [00≤a≤09] h

Definition of download character(such as alpha numeric).

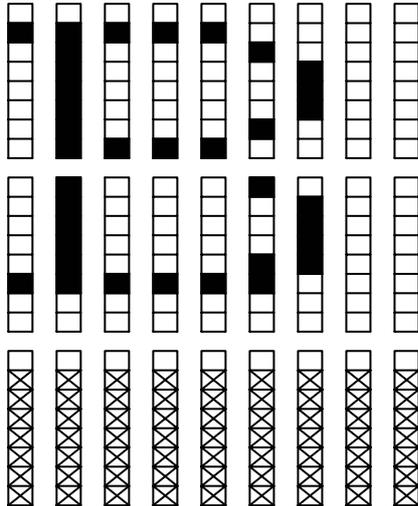
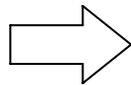
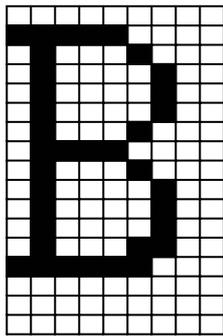
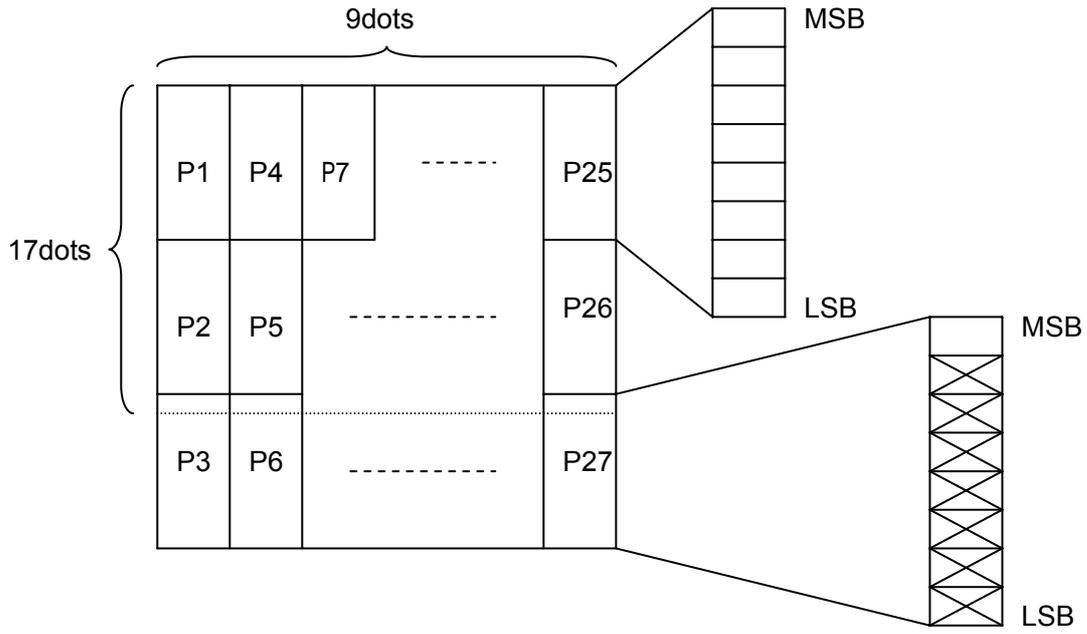
1. "s" indicates a number of bytes in a vertical direction and "a" is a number of dots in horizontal direction.
2. "n" indicates the start character code, and "m" means the end character code. If only 1 character should be defined, then n = m.
3. Definable characters are from <20>h to <7E>h in ASCII code (95 characters).
4. "Dn" indicates the data to be defined. It indicates the "a" dots pattern from the left. Remaining area on the right of a character is filled with spaces.
5. Once a download character is defined, it remains valid until the download character is redefined, printer is initialized, reset signal is input, or the power is turned off.
6. Only area specified will be reset.

< Reference >
 In the case of Font A



P1= { 00 } h,P4= { 00 } h,P7= { 00 } h,P10= { 00 } h,...
 P2= { 00 } h,P5= { 00 } h,P8= { 0F } h,P11= { 72 } h,...
 P3= { 08 } h,P6= { F8 } h,P9= { 08 } h,P12= { 00 } h,...

< Reference >
 In the case of Font B



P1= { 40 } h,P4= { 7F } h,P7= { 41 } h,P10= { 41 } h,...
 P2= { 04 } h,P5= { FC } h,P8= { 04 } h,P11= { 04 } h,...
 P3= { 00 } h,P6= { 00 } h,P9= { 00 } h,P12= { 00 } h,...

10) Bit image mode set: << ESC * m n1 n2 Dn >>

Code: [1B] h + [2A] h + m + n1 + n2 + Dn * [m = bit image mode(refer to below)] h

* [00≤n1≤FF] h

* [00≤n2≤02] h

Data is printed in bit image by following the bit image mode specified by “m”.

* Print total dots divided by 256, quotient is n2 and remainder is n1.

* Total dots in bit image mode are n1 + (256 x n2).

* If the bit image input data exceeds specified position, the exceeded data will be disregarded.

NP-215/225: 432 dots. NP-325: 576 dots. NP-415W: 832dots.

* Bit image data (Dn) interprets bit 1 as print and bit 0 as not print.

* Bit image mode is indicated below.

* If “m” is out of conditions set, the data after n1 is treated as normal data.

[Standard]

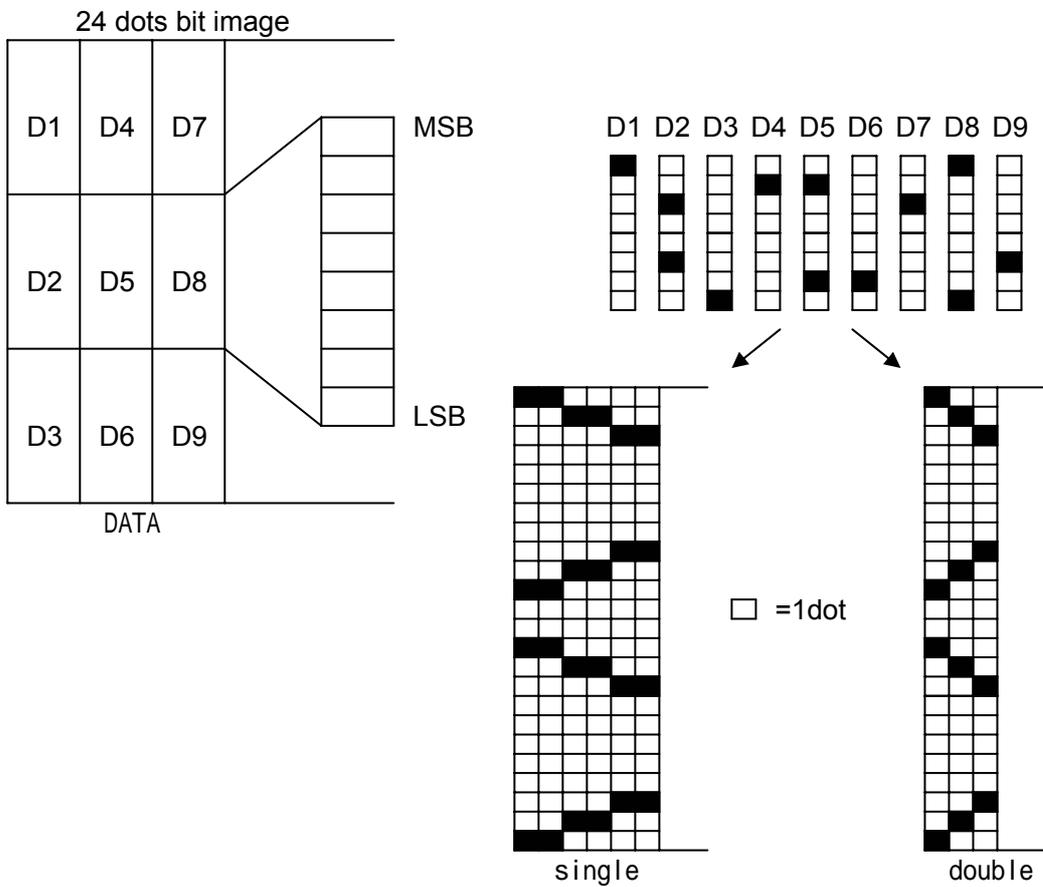
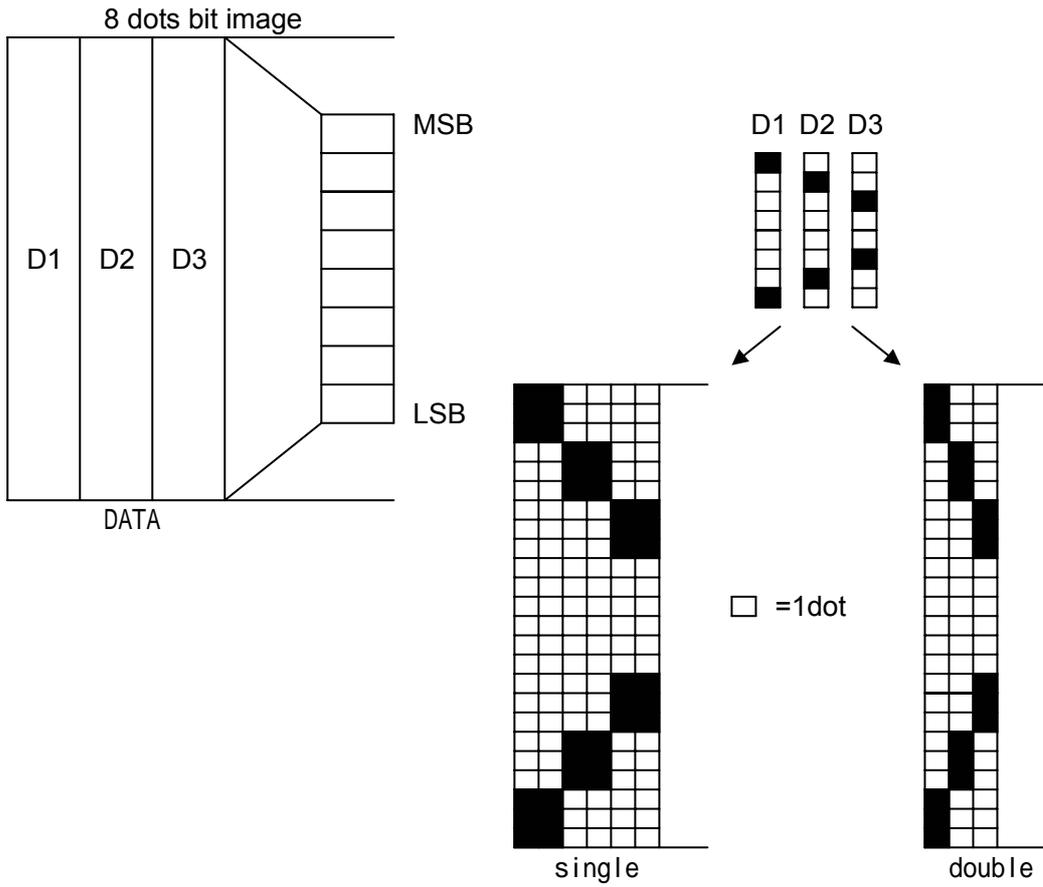
m (hex)	Bit image mode	Vertical direction		Horizontal direction			
		Dot quantiy	Dot density	Dot density	Maximum dot number		
					NP-215 NP-225	NP-325	NP-415W
00	8 dots single density	8	67DPI	101DPI	216	288	416
01	8 dots double density	8	67DPI	203DPI	432	576	832
20	24 dots single density	24	203DPI	101DPI	216	288	416
21	24 dots double density	24	203DPI	203DPI	432	576	832

[Windows]

m (hex)	Bit image mode	Vertical direction		Horizontal direction			
		Dot quantiy	Dot density	Dot density	Maximum dot number		
					NP-215 NP-225	NP-325	NP-415W
20	24 dots single density	24	203DPI	67DPI	144	192	277
21	24 dots double density	24	203DPI	101DPI	216	288	416
22	24 dots single density	24	203DPI	135DPI	288	384	554
23	24 dots double density	24	203DPI	203DPI	432	576	832
24	24 dots double density	24	203DPI	203DPI (406DPI)	432 (864)	832 (1664)	832 (1664)

* The data for [Windows] m = 24h is equivalent to m=23h due to the mechanical specification.

< Relationship between bit image data and printed dots >



11) Underline set/reset : <<ESC - n>>

Code : [1B] h + [2D] h + n * [00 ≤ n ≤ 02] h

Sets and resets the underline

* Underline is valid for all characters except for the area skipped by horizontal tab.

* Also Underline is not valid for 90° rotated character.

* Underline is verified with n value as shown bellow.

n(hex)	Type of underlines
00	Reset underline
01	Set one dot underline
02	Set two dot underline

Default value is "n" = [00]h

12) 1/6th of an inch line feed pitch : << ESC 2 >>

Code : [1B] h + [32] h

Sets one line feed to 1/6th of an inch.

13) Sets smallest pitch line feed : << ESC 3 n >>

Code : [1B] h + [33] h + n * [00 ≤ n ≤ FF] h

Sets a line feed pitch to n/203rd of an inch.

* Despite of height set by value, the same space with character height is sent by line feed.

* The default value of n is [22]h

* If n=[00]h is set, printer will not feed by pressing FEED button.

14) Printer initialization : << ESC @ >>

Code : [1B] h + [40] h

Clears the data stored in the print buffer and resets each setting to default values.

* It does not clear the data stored in the internal receive buffer.

* Rewrites the DIP switches.

* It is stored in the internal receive buffer and activated in sequential.

15) Horizontal tab position set : << ESC D n1 n2 --- NUL >>

Code : [1B] h + [44] h + n1+ n2+ --- + [00] h * [00 ≤ n ≤ FF] h

Sets the horizontal tab position

1. "n" indicates the digits number from the left. In this case, n = tab position - 1.

2. Tab position is set at the location of character width x n from the beginning of a line. The character width in this case includes character right space. When double width function is set, then the width becomes double of ordinary character.

3. Maximum number of tab positions is 32. If setting exceeds 32, then the exceeded values are neglected.

4. < ESC D NUL > clears all tab positions being set. After the tab is cleared, horizontal tab will be ignored.

5. Default value is set at every 8 characters of font A (at 9 th, 17th, 25th and 33rd digit).

16) Bold print set/reset :<< ESC E n >>

Code : [1B] h + [45] h + n * [00≤ n ≤FF] h

Sets and resets the bold print

* "n" is only valid for LSB(b0)

LSB (b0) is defined as following.

b0	Values
0	Resets bold print
1	Sets the bold print

Valid for all characters

Bold print and double strike results in the same on this printer.

The default value of "n" is [00]h.

17) Double strike set/reset :<< ESC G n >>

Code : [1B] h + [47] h + n * [00≤n≤FF] h

Sets and resets the double strike function

* "n" is only valid for LSB(b0)

* Control by "n" is explained as following.

b0	Description
0	Resets double strike
1	Sets double strike

* Double strike and bold print result in the same on this printer.

* The default value of "n" is [00]h.

18) Print and smallest pitch line feed: << ESC J n >>

Code : [1B] h + [4A] h + n * [00≤n≤FF] h

Prints the data in the print line buffer and feeds the paper by n/203rd of an inch.

* The height of character for a line is always sent by line feed. If the value of height is set by "n" below the height of character, the same space with character height is sent by line feed.

* Beginning of a line is a print start position.

19) International character select :<< ESC R n >>

Code : [1B] h + [52] h + n * [00≤n≤0A] h

Selects the international characters.

* The values of "n" have following meanings

n(Hex)	Character sets
00	U.S.A.
01	France
02	Germany
03	England
04	Denmark 1
05	Sweden
06	Italy
07	Spain
08	Japan
09	Norway
0A	Denmark 2

Default value of "n" is [08]h.

20) Panel switch enable/disable: << ESC c 5 n >>

Code : [1B] h + [63] h + [35] h + n * [00≤n≤FF] h

Changes the FEED switch valid or invalid.

* "n" is only valid for LSB(b0)

* "n" bit has a following meanings

b0	Description
0	enable FEED switch
1	disable FEED switch

Default value of "n" is [00]h.

21) Print and "n" line feed: << ESC d n >>

Code : [1B] h + [64] h + n * [00≤n≤FF] h

Prints the data in the print buffer and feeds paper by "n" lines.

* Beginning of a line is a print start position.

* If there is print data remained, line feed is activated for the same height of character.

22) Character code table select: << ESC t n >>

Code : [1B] h + [74] h + n * [00≤n≤01]h

Selects either Japan code table or non-Japan code table.

Explanation : "n" value has following meaning.

n(Hex)	character code table
00	Non-Japan character code table
01	Japan character code table

The default value of "n" is [S2-2] for DIP SW.

23) Printer status transmission : << ESC v >>

Code : [1B] h + [76] h

Sends current printer status

* Status to be transmitted consist of 1 byte and the content is explained in the chart below.

bit	Functions	Value	
		0	1
0	paper near end	paper present	near end
1	platen open	normal	head open
2	paper end	paper present	no paper
3	head temp. abnormal	normal	Temp. high
4	cutter problem	normal	cutter problem
5	presenter problem	normal	presenter problem
6	paper remove sensor information	no paper	paper present
7	not defined		

* Make sure that command is issued before transmission of print data.

(commands are stored in the input buffer and executed sequentially)

* Reception is available except in the buffer full status.

* The commands above are valid only for serial interface.

* Regarding DTR/DSR control, only one byte is transmitted after confirmation that the host is able to receive data, that is DSR signal is in SPACE status. For XON/OFF control, one byte is transmitted without confirmation of DSR signal status.

* For DTR/DSR control, if host is not in a receivable status, it waits until host can receive data.

24) Inverted character set and reset : << ESC { n >>

Code : [1B] h + [7B] h + n * [00≤n≤FF] h

Sets or resets the inverted character function

* "n2 is only valid for the LSB(b0)

* LSB (b0) has the following meaning

b0	Description
0	resets inverted character
1	sets inverted character

* The command is only valid when it is assigned at the beginning of a line.

* The default value of n is [00]h.

25) 90° clockwise rotated character set and reset :<< ESC V n >>

Code : [1B] h + [56] h + n * [00≤n≤01] h

Sets and resets 90° clockwise rotated character.

* Underline cannot be assigned to the 90° clockwise rotated character.

* "n" has the following meaning.

n(hex)	description
00	reset 90° rotated character
01	set 90° rotated character

* Default value for "n" is [00]h.

26) Absolute position set :<< ESC \$ n1 n2>>

*The function of this commands differ between Standard type and Windows type.

Code : [1B] h + [24] h + n1 + n2 * [00≤n1≤FF] h

* [00≤n2≤02] h

Print start position is assigned by dots in 1/203rd of inch from the beginning of line.

* Divide the value of dot by 256, place quotient to n2, and remainder to n1.

* The print start position is n1 + n2 x 256 from top of the line.

* Setting which exceeds end of line is ignored.

* If the command is received in the middle of line, the action will be:

Standard: the value that does not exceed the current position is ignored.

Windows: the value that does not exceed the current position is also valid.

27) Relative position set :<< ESC \ n1 n2>>

Code : [1B] h + [5C] h + n1 + n2 * [00≤n1≤FF] h

* [00≤n2≤02] h

Print start position is assigned by dots from current position in unit of 1/203rd of inch.

* Right direction is treated as plus and left as minus.

* For assigning N dots in minus direction (left), it will be: N dots = 65536 - N

* Divide dots by 256, quotient is n2 and remainder is n1.

* Assigning beyond the end of a line is neglected

28) Barcode print :<< GS k n Dn NUL >>

Code : < 1D >h + < 6B >h + n + Dn + < 00 >h * < 00≤n≤07 >h

Description : Selects barcode symbology and prints barcode.

* The next print start position is on the line head

* Select following barcode symbology with “n” value.

* Dn indicates the character code to be printed.

n (Hex)	Barcode symbology
00	UPC-A
01	UPC-E
02	EAN-13 (JAN-13)
03	EAN-8 (JAN-8)
04	CODE 39
05	ITF
06	CODABAR
07	CODE128

* When there is data in the buffer this command is neglected.

* If character code Dn is not a printable character, following data after Dn will be treated as normal data.

* If the print character numbers are fixed in the barcode symbology the input character numbers should match to the print character numbers.

* If horizontal data exceed one line, the exceeded data cannot be printed.

29) Barcode width size select :<< GS w n >>

Code : < 1D >h + < 77 >h + n * < 02≤n≤04 >h

Description : Selects width of barcode

* Default value of “n” is [03]h.

30) Barcode height select :<< GS h n >>

Code : < 1D >h + < 68 >h + n * < 00≤ n ≤FF >h

Description : Selects barcode height

* “n” shows the vertical dot number

* Default value of “n” is 162([A2]h).

31) Select of HRI character print position :<< GS H n >>

Code : < 1D >h + < 48 >h + n * < 00≤ n ≤03 >h

Description : Selects the print position of HRI characters in printing barcode.

* “n” has the following meaning.

n (Hex)	Print position
00	No printing
01	Above barcode
02	Below barcode
03	Above and below barcode

* HRI characters are the characters selected by “HRI character style select”.

* Default value of “n” is [00]h.

32) Select of HRI character style :<<GS f n>>

Code : <1D>h+<66>h+n * < 00≤ n ≤01 >h

Description : Selects HRI character style in printing barcode

* “n” has the following meanings:

n (hex)	Style
00	Font A
01	Font B

* Default value of “n” is [00]h.

35) Macro definition, start and end :<< GS :>>

Code : < 1D >h + < 3A >h

Description : Assigns Macro definition start and end. The size of data defined by Macro is up to 1,024 bytes. Exceeding to 1,024 byte cannot be defined.

* Defined Macros cannot be cleared by “Printer initialization”. Therefore “printer initialization” can be included in the Macro definition.

* During the Macro definition, printing can be proceeded.

* Once Macro is defined, the contents become effective until software is reset, power is set off, or INIT signal is input.

36) Macro execution :<< GS ^ n1 n2 n3 >>

Code : < 1D >h + < 5E >h + n1 + n2 + n3 * < 0≤n1≤FF >h

* < 00≤n2≤FF >h

* < 00≤n3≤01 >h

Description : Executes Macros being defined

* The definitions of n1, n2 and n3 are:

n1 : times of Macro execution

n2 : wait time of Macro execution

At every execution, there is a wait time of n2 x 100msec.

n3 : Macro execution mode

n3	Mode
00	Consecutive execution
01	Execution by FEED switch

- Consecutive execution: Executes “n1” times with a wait time specified at n2.
- FEED switch execute: After a time specified at n2, waits for PE LED blinks and the FEED switch depressed. After FEED switch is pressed, it executes Macro once. This action is repeated by n1 times.

* If the printer receives this command during Macro definition, it stops Macro definition. If this happened, defined Macros are cleared.

* Nothing happens if Macro is not defined or n1 = 0.

* During Macro execution with n3 = 1, line feed by FEED switch is disabled.

37) Data input control :<< ESC = n >>

Code : < 1B >h + < 3D >h + n * < 00≤n≤FF >h

Description: Selects valid device where data input is possible through host computer.

* Each bit of “n” has the following meaning.

Bit	Function	Values	
		0	1
0	Printer	Invalid	Valid
1	Not defined		
2	Not defined		
3	Not defined		
4	Not defined		
5	Not defined		
6	Not defined		
7	Not defined		

* If printer is not in “no selection” status, printer will discard all received data until it is in the selection status by this command.

* Even if printer is in no selection status, the status may become BUSY by printer operation.

* The default value of “n” is [01]h.

38) Print position alignment :<< ESC a n >>

Code : < 1B >h + < 61 >h + n * < 00≤n≤02 >h
 Description : Aligns all data to be printed on the assigned position in a line.

* “n” values are assigned to:

n (Hex)	Position
00	Left
01	Center
02	Right

* This command is valid only when it is input at the head of a line.

* The default value of “n” is [00]h.

39) Total cut (Full cut) : << ESC i >>

* The command functions differently between Standard and Windows models.

Code : < 1B >h + < 69 >h

[Standard]

* Full-cut the paper.

* Effective at the head of a line

* Feeds paper by 3mm after paper cut to prevent from paper jam.

[Windows]

* Full-cut the paper after feeding by 21.25mm

* Effective at the head of a line

* Feeds paper by 3mm after paper cut to prevent from paper jam

40) Partial cut : << ESC m >>

* The command functions differently between Standard and Windows models.

Code : < 1B >h + < 6D >h

[Standard]

* Partially cut paper (with one point left uncut at the center position)

* Effective at the head of a line

* Feeds paper by 3mm after paper cut to prevent from paper jam.

[Windows]

* Partially cut paper (with one point left uncut at the center) after feeding paper by 21.25mm.

* Effective at the head of a line.

* Feeds paper by 3mm after paper cut to prevent paper jam.

41) No paper sensor select : <<ESC c 3 n1 n2>>

Black mark sensor command

Code : <1B>h + <63>h + <33>h + n1 + n2 * < 00≤n1≤01 >h
 * < 00≤n2≤FF >h

* n1 = 0, no paper sensor (thermal paper)

* n1 = 1, black mark sensor (label paper)

* Value “n2” is available only at label selection in “n1”.

Feeds paper by dots assigned after label position is confirmed.

Minimum amount of paper feed: 0.125mm

Feeds 0.125mm x “n2” amount of paper

Default value selects the thermal paper.

Auto loading function is not available at label selection.

42) Compulsory eject :<<ESC r n>>

Code: <1B>h + <72>h + n * < 0≤n≤1 >h

* When a ticket or receipt is cramped and it is left untaken for a certain period of time, this command is used to execute compulsory eject.

* This command rotates a motor either clockwise or counter-clockwise until ticket or receipt is ejected totally.

n(Hex)	Mode
0	Clockwise
1	Counter clockwise

43) QR code print :<<ESC q S E M>>

ESC + "q" + S + E + M + DATA [+ "," + M + DATA +.....] + NUL

HEX CODE <1B>h + <71>h + S + E + M + DATA [+ <2C>h + M + DATA +....] + <00>h

About parameter

1. S: module size

* Assign 1 module size of QR code by printer's dot numbers.

* There are 5 sizes which can be assigned, 1, 2, 3, 4, 8 dots

* If invalid size is assigned, the printer assigns it as 4 dots

2. E: Correction level

* Selects error correction level to be used for restoring QR symbol.

* Following values can be assigned.

* If invalid value is assigned, the printer determines it to be L.

E	Correction level	Restore. capability
0	L	7%
1	M	15%
2	Q	25%
3	M	30%

3. M: Input data mode

* Assign input data mode

* Following modes can be assigned

* If invalid mode is assigned, data is ignored until valid Mode is assigned.

M	Input data mode
"N"	Numeric mode
"A"	Alpha numeric mode
"B"	8 bit byte mode
"K"	Kanji mode

* If multiple modes should be input, each mode data (M + data) needs to be separated by " , ".

* If you want to input " , " and NULL in the data of 8 bit byte mode, input " ! " <21>h+," and " ! " <21> h + NULL.

* " ! " itself is input as " ! " + " ! "

* Kanji data should be input by Shift JIS code.

Restrictions

Available QR codes are from version 1 to version 14 of model 1 symbols.

If input data exceeds the area to be printed, QR code is not printed.

Following table shows the number of characters and input data capacity for the model 1 in version 1 to 14.

Version	Correction level	Data code Word	Data bit	Numeric	Alpha numeric	Byte	Kanji
1	L	19	148	40	24	17	10
	M	16	124	33	20	14	8
	Q	13	100	25	15	11	6
	H	9	68	16	10	7	4
2	L	36	284	81	49	34	20
	M	30	236	66	40	28	17
	Q	24	188	52	31	22	13
	H	16	122	33	20	14	8
3	L	57	452	131	79	55	33
	M	44	348	100	60	42	25
	Q	36	284	81	49	34	20
	H	24	188	52	31	22	13
4	L	80	636	186	113	78	48
	M	60	476	138	84	58	35
	Q	50	396	114	69	48	29
	H	34	268	76	46	32	19
5	L	108	860	253	154	106	65
	M	82	652	191	116	80	49
	Q	68	540	157	95	66	40
	H	46	364	105	63	44	27
6	L	136	1084	321	194	134	82
	M	106	844	249	151	104	64
	Q	86	684	201	122	84	51
	H	58	460	133	81	56	34
7	L	170	1356	402	244	168	103
	M	132	1052	311	188	130	80
	Q	108	860	253	154	106	65
	H	72	572	167	101	70	43
8	L	208	1660	493	299	206	126
	M	160	1276	378	229	158	97
	Q	128	1020	301	183	126	77
	H	87	692	203	123	85	52
9	L	246	1964	585	354	244	150
	M	186	1484	441	267	184	113
	Q	156	1244	369	223	154	94
	H	102	812	239	145	100	61
10	L	290	2316	690	418	287	177
	M	222	1772	526	319	219	135
	Q	183	1460	433	262	180	111
	H	124	988	291	176	121	74
11	L	336	2684	800	485	333	205
	M	256	2044	608	368	253	156
	Q	208	1660	493	299	205	126
	H	145	1156	342	207	142	87
12	L	384	3068	915	555	381	234
	M	292	2332	694	421	289	178
	Q	244	1948	576	351	241	148
	H	165	1316	390	236	162	100
13	L	432	3452	1030	624	429	264
	M	332	2652	790	479	329	202
	Q	276	2204	656	398	273	168
	H	192	1532	454	275	189	116

14	L	489	3908	1167	707	486	299
	M	368	2940	877	531	365	225
	Q	310	2476	738	447	307	189
	H	210	1676	498	302	207	127

1. The first code word is 4 bit length, and following all code words consist of 8 bit length.
2. Data bit numbers include “mode indicator” and “character number indicators”.

44) NV bit image registration :<<GS T n>>

Code : <1D>h + <54>h + n

Description : Register the predetermined bit image print data.

* It is possible to register from 0 to 2 different kinds of patterns (3 patterns).

* In each pattern, up to the maximum of 15cm length (for 2” model) of bit image print data can be registered; up to the maximum of 11cm for 3” model and up to 7cm for 4” model can also be registered. The bit image print data exceeding the maximum length is neglected.

* The registered data is not erased when the power is set on or off or the printer is initialized.

* “n” has a following meanings.

n (hex)	Function
00	Start of pattern 0 registration
01	Start of pattern 1 registration
02	Start of pattern 2 registration
FF	End of registration

* When registrations started in the middle of a line, whole line is registered.

* When registration ended in the middle of a line, whole line is not registered.

* Following is a command sequence of pattern 0 registration.

GS T 0h + (bit image data assigned by ESC *) x n lines + GS T FFh

45) NV bit image print :<< GS P n >>

Code : <1D>h + <50>h + n * < 00≤n≤02 >h

Description : Prints the bit image print data registered.

* Selects one of the print pattern among three registered patterns by assigning 0 to 2 value to “n”.

46) Firmware download :<<GS d Dn>>

Code : <1D>h + <64>h + Dn

Description : Download printer firmware in hexadecimal code and rewrite firmware according to the outcome.

* Dn is firmware’s hex code which complies with INTELLEX Hex format.

47) Reverse print set and reset :<< GS B n >>

Code : < 1D > h + < 42 > h + n * < 00≤n≤FF >h

Function : Sets and resets reverse print.

* "n" is available only for the least significant bit.

* The characters incorporated and downloaded can be reverse printed.

* The right side space of character set by [Set right space of a character] is also included for reverse print. However, it does not cover the skipped space made by bit image, download bit image, NV bit image, barcode, HRI characters, horizontal tab, specify absolute position, specify relative position.

* It does not include the space between the lines.

* Reverse print has a priority over "underline specified". If a character is reversed, the character is not underlined. However, the underline setting remains effective.

* If "highlight" or "double strike" is set on the reverse print, the print may result in damages.

48) Presenter eject mode selection :<< ESC h n >>

Code : < 1B > h + < 68 > h + n * < 00≤n≤01 >h

Description : Selects either "cramp eject" or "total eject" for the presenter paper eject mode.

"n" indicates the following:

n (HEX)	Function
00	Cramp eject
01	Total eject

Default value is "n" = [00]h

49) Back feed :<< ESC B n >>

Code : < 1B > h + < 42 > h + n * < 00≤n≤FF >h

Description : Feed the paper backward.

* Paper feed amount is specified by n dot line.

* Paper is not fed backward when 0 is set.

* If this command is used for many times, paper may be jammed. To avoid this problem, enter only once and feed paper in the forward direction.

* Double strike print is available by using this command.

* Considering the backlash, there may be a gap of printing.

* When data remains in the print line buffer, it first prints data, then back feeds.

* Paper might get jammed while a presenter is in use. In this regard, please do not use the command once paper is set in the presenter.

50) Software reset :<< DC1 >>

Code : < 11 > h

Description : Restart the firmware as the same procedure as power on.

* This command is stored in the receive input buffer and activated in sequence.

* When the cutter is in a movement, soft reset is executed after finishing cutting.

51) Partition drive select : << GS % n >>

Code : < 1D > h + < 25 > h + n * < 01 ≤ n ≤ 03 > h

Description : Selects partition drive.

* "n" indicates the following:

n(HEX)	Divide
01	1 fixed partition
02	2 fixed partitions
03	automatic partition

* Default value is selected by the DIP switch (1 or 2 partitions).

* If assigned beyond the specified area, the data is neglected and the select will not change.

* Automatic partition is as follows:

	1 partition	2 partitions
NP-215/225	Less than 215 dots	More than 216 dots
NP-325	Less than 287 dots	More than 288 dots
NP-415W	Less than 415 dots	More than 416 dots

52) Print density set : << GS ~ n >>

Code : < 1D > h + < 7E > h + n * < 00 ≤ n ≤ FF > h

Description : Sets print density in the range between 65% ~ 135% of the standard value, S2-8 Off.

* "n" ranges from 41h(65%) to 87h(135%). However, set it for actual use in the range 41h(65%) ≤ n ≤ 82h(130%).

* At the initial status, 100% or 125% can be selected by the DIP switch, S2-8.

* This command has priority over the setting by DIP switch.

6. Character code table

6.1 Domestic code table (International character set: Japan)

HEX	BIN	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F	
0	0000	MUL		SP	0	@	P	`	p	▀	⊥	SP	一	夕	ミ	=	×	
1	0001			!	1	A	Q	a	q	▀	⊥	。	ア	チ	ム	ト	円	
2	0010			"	2	B	R	b	r	▀	⊥	「	イ	ツ	メ	≠	年	
3	0011			#	3	C	S	c	s	▀	⊥	」	ウ	テ	モ	≠	月	
4	0100			\$	4	D	T	d	t	▀	⊥	、	エ	ト	ヤ	▲	日	
5	0101			%	5	E	U	e	u	▀	⊥	・	オ	ナ	ユ	▲	時	
6	0110			&	6	F	V	f	v	▀	⊥	ヲ	カ	ニ	ヨ	▼	分	
7	0111			'	7	G	W	g	w	▀	⊥	ヲ	キ	ヌ	ラ	▼	秒	
8	1000			(8	H	X	h	x	▀	⊥	「	イ	ク	ネ	リ	♠	〒
9	1001	HT)	9	I	Y	i	y	▀	⊥	「	ウ	ケ	ノ	ル	♥	市
A	1010	LF		*	:	J	Z	j	z	▀	⊥	「	エ	コ	ハ	レ	♦	区
B	1011		ESC	+	;	K	[k	{	▀	⊥	「	オ	サ	ヒ	ロ	♣	町
C	1100	FF	FS	.	<	L	¥	l	l	▀	⊥	「	ヤ	シ	フ	ワ	●	村
D	1101	CR	GS	-	=	M]	m	}	▀	⊥	「	ユ	ス	ヘ	ン	○	人
E	1110			.	>	N	^	n	~	▀	⊥	「	ヨ	セ	ホ	”	/	||||
F	1111			/	?	O	_	o	SP	+	”	「	ツ	ソ	マ	°	\	SP

*[SP] indicates "space".

*Printer operation cannot be guaranteed if the blank control code (codes below [1F]h) is transmitted to printer.

6.2 Overseas code table (International character set: U.S.A)

HEX	BIN	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0	0000	NUL		SP	0	@	P	`	p	€	É	À	☼	⊥	⊥	α	≡
1	0001		DC1	!	1	A	Q	a	q	ü	æ	í	☼	⊥	⊥	β	±
2	0010			"	2	B	R	b	r	é	Æ	ó	☼	⊥	⊥	Γ	≤
3	0011		DC3	#	3	C	S	c	s	à	ô	ú	|	⊥	⊥	π	≥
4	0100			\$	4	D	T	d	t	ä	ö	ñ	⊥	⊥	⊥	Σ	Γ
5	0101			%	5	E	U	e	u	à	Ò	Ñ	⊥	⊥	⊥	σ	J
6	0110			&	6	F	V	f	v	á	û	â	⊥	⊥	⊥	μ	÷
7	0111			'	7	G	W	g	w	ç	ù	º	⊥	⊥	⊥	τ	≈
8	1000			(	8	H	X	h	x	ê	ÿ	¿	⊥	⊥	⊥	Φ	°
9	1001	HT		)	9	I	Y	i	y	ë	ö	⊥	⊥	⊥	⊥	θ	.
A	1010	LF		*	:	J	Z	j	z	è	ü	⊥	⊥	⊥	⊥	Ω	.
B	1011		ESC	+	:	K	[	k	[	ï	¢	½	⊥	⊥	■	δ	√
C	1100	FF	FS	,	<	L	\	l	|	ï	£	¼	⊥	⊥	■	∞	∞
D	1101	CR	GS	-	=	M	]	m	]	î	¥	í	⊥	⊥	■	φ	²
E	1110			.	>	N	^	n	~	Ä	℞	«	⊥	⊥	■	€	■
F	1111			/	?	O	_	o	SP	À	f	»	⊥	⊥	■	∩	SP

*[SP] indicates "space".

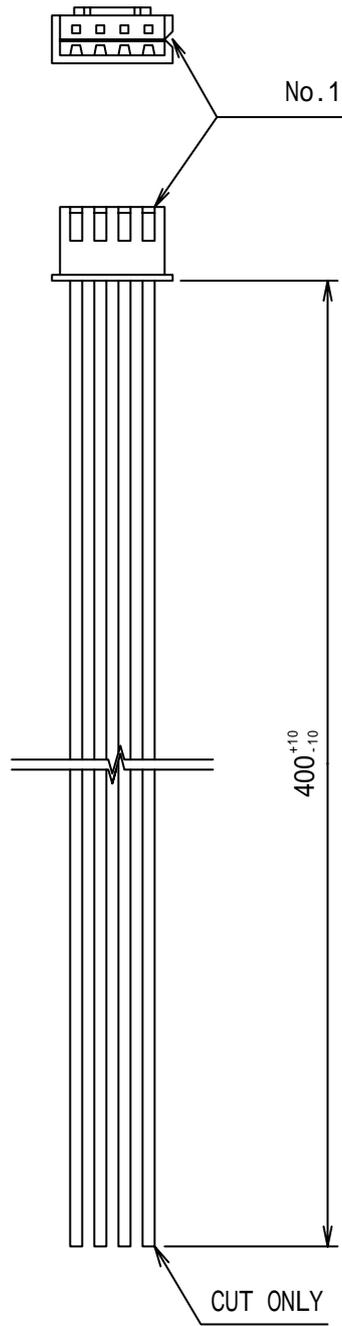
*Printer operation cannot be guaranteed if the blank control code (codes below [1F]h) is transmitted to printer.

6.3 International character code table

n	Character set	23	24	40	5B	5C	5D	5E	60	7B	7C	7D	7E
0	U. S. A	#	\$	@	[	\	\]	^	`	{	|	}	~
1	France	#	\$	à	°	ç	§	^	`	é	ù	è	¨
2	Germany	#	\$	§	À	Ö	Ü	^	`	ä	ö	ü	ß
3	U. K.	£	\$	@	[	\	\]	^	`	{	|	}	~
4	Denmark1	#	\$	@	Æ	Ø	À	^	`	æ	ø	à	~
5	Sweden	#	☉	É	À	Ö	À	Û	é	ä	ö	ä	ü
6	Italy	#	\$	@	°	\	é	^	ù	à	Ò	è	ì
7	Spain	₠	\$	@	í	Ñ	¿	^	`	¨	ñ	}	~
8	Japan	#	\$	@	[	¥	]	^	`	{	|	}	~
9	Norway	#	☉	É	Æ	Ø	À	Û	é	æ	ø	à	ü
10	Denmark2	#	\$	É	Æ	Ø	À	Û	é	æ	ø	à	ü

7 Cable

7.1 B501 power cable



No.	PARTS NAME	Q'TY	MATERIAL	TREATMENT
1	Mating connector	1	XHP-4	JST
2	Terminal	4	SXH-001T-P0.6	JST
3	High temp Vinyl cable (Red)	2	UL1007-AWG#22	No 1.2
4	High temp Vinyl cable (Black)	2	UL1007-AWG#22	No 3.4