

USER'S MANUAL

PA-3110

**Mini POS Terminal Powered by
NVIDIA® Tegra®3 Platform**

PA-3110 M3

PA-3110 POS System

With LCD/Touchscreen

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DISCLAIMER

This user's manual is meant to assist users in installing and setting up the system. The information contained in this document is subject to change without any notice.

CE NOTICE

This is a class A product. In a domestic environment this product may cause radio interference in which case the user may be required to take adequate measures.

FCC NOTICE

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

You are cautioned that any change or modifications to the equipment not expressly approve by the party responsible for compliance could void your authority to operate such equipment.

CAUTION! Danger of explosion if battery is incorrectly replaced. Replace only with the same or equivalent type recommended by the manufacturer. Dispose of used batteries according to the manufacturer's instructions.

WARNING! Some internal parts of the system may have high electrical voltage. And therefore we strongly recommend that qualified engineers can open and disassemble the system. The LCD and Touchscreen are easily breakable, please handle them with extra care.

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INTRODUCTION

CHAPTER

1

This chapter gives you the information for the PA-3110. It also outlines the system specifications.

Sections included:

- About This Manual
- POS System Illustration
- System Specifications
- Safety precautions

Experienced users can jump to chapter 2 on page 2-1 for a quick start.

1-1. ABOUT THIS MANUAL

Thank you for purchasing our PA-3110 Series System. The PA-3110 is an updated system designed to be comparable with the highest performance of IBM AT personal computers. The PA-3110 provides faster processing speed, greater expandability and can handle more tasks than before. This manual is designed to assist you how to install and set up the whole system. It contains four chapters and two appendixes. Users can configure the system according to their own needs.

Chapter 1 Introduction

This chapter introduces you to the background of this manual. It also includes illustrations and specifications for the whole system. The final section of this chapter indicates some safety reminders on how to take care of your system.

Chapter 2 System Configuration

This chapter outlines the location of main board components and their function. You will learn how to set the jumpers and configure the system to meet your own needs. In addition to the main board, there are also printer board, VFD board, MSR board and Inverter board.

Chapter 3 Software Utilities

This chapter contains information of software version list, firmware control command and utility update.

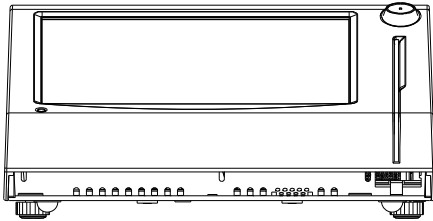
Appendix A System Diagrams

This chapter shows the exploded diagrams and part numbers of PA-3110 components.

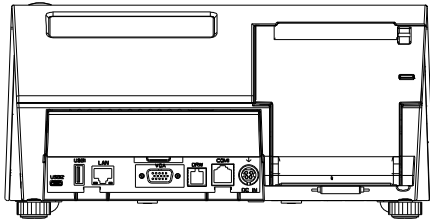
1-2. POS SYSTEM ILLUSTRATION

i-Button Type

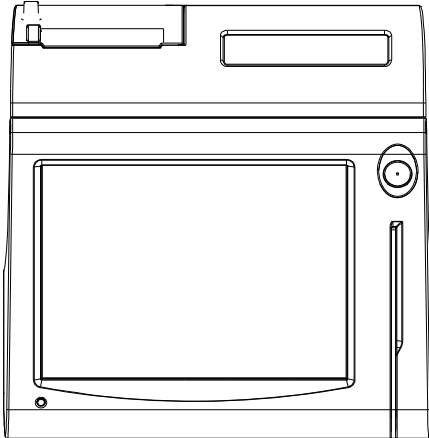
Front View



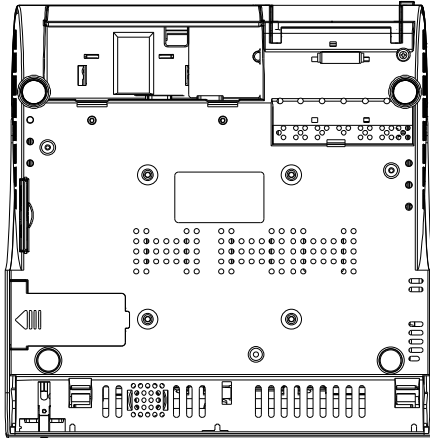
Rear View



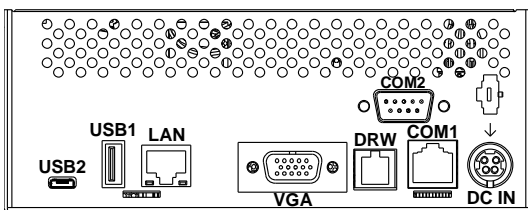
Top View



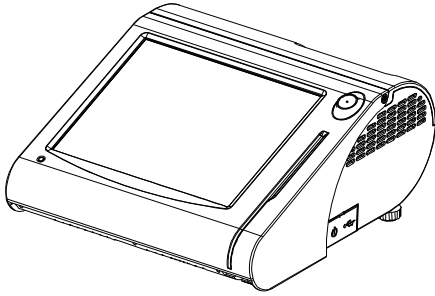
Bottom View



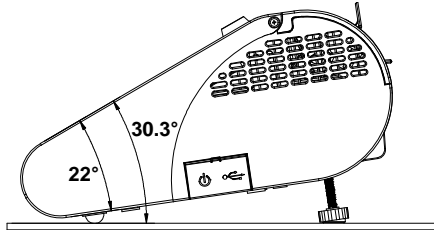
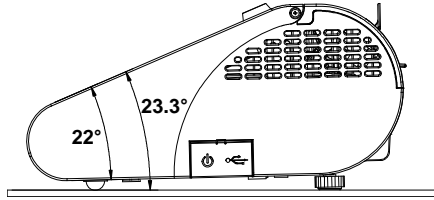
I/O View



Quarter View

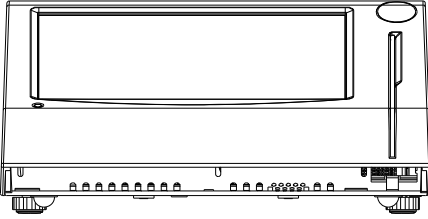


Side View

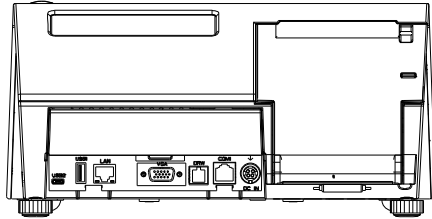


Empty Type

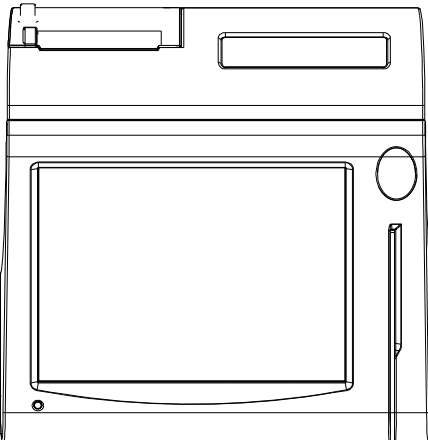
Front View



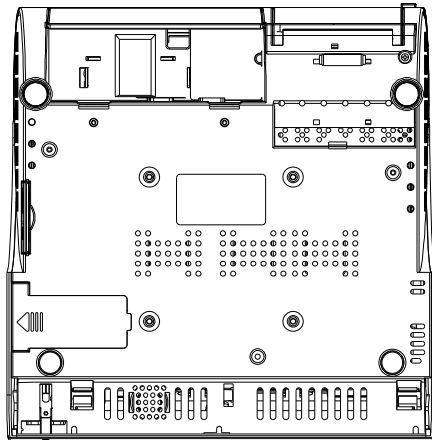
Rear View



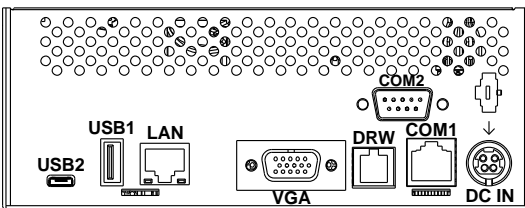
Top View



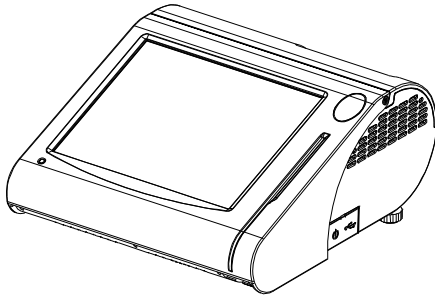
Bottom View



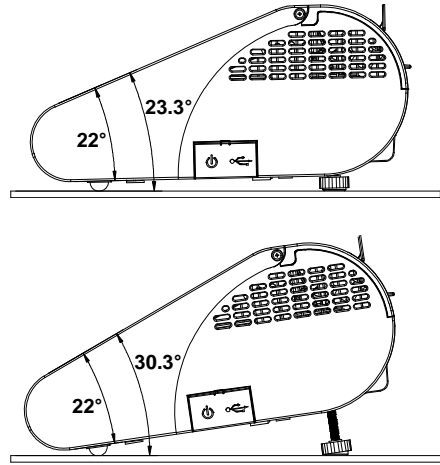
I/O View



Quarter View



Side View



1-3. SYSTEM SPECIFICATIONS

MAINBOARD (PB-6810)

System

CPU	NVIDIA® Tegra®3
Memory	DDR3 1GB
OS Support	Android 4.2
Power Supply	30~72 Watt power adapter
Flash	eMMC 8GB
SD	Standard SDHC (up to 32GB)
Wireless LAN Signal	Mini PCIe module (802.11b/g/n)
MSR/i-Button (Optional)	<ul style="list-style-type: none"> ▪ MSR: JIS I & II; ISO Tracker 1+2+3 (RS-232 interface) ▪ i-Button: Read only, output through RS-232 interface
Printer (Optional)	2”/3” easy-loading thermal printer with auto-cutter. Note: The diameter of paper roll cannot exceed 8 cm.
Color	Top: white/deep grey Bottom: deep grey
System Weight	4.5 kg
Dimension (W x H x D)	300mm x 299mm x 135mm
Certificate	FCC/CE

I/O Ports

Serial Port	<ul style="list-style-type: none"> ▪ 1 x DB-9 (COM2) ▪ 1 x RJ45 (COM1) ▪ 3 x Wafer on board (including a co-lay COM2) ▪ 5/12V Selectable (COM1/2/3/5)
USB	<ul style="list-style-type: none"> ▪ 2 x USB2.0 (1 x USB Type A; 1 x Micro USB) ▪ 1 x USB2.0 on side bezel (USB Type A)
LAN	1 x 10/100 Mbps
VGA	1 x DB-15 VGA Interface

Audio	1 x 2W Speaker
Cash Drawer	1 x RJ11 (12V/24V selectable)

Display

LCD	10.4" TFT XGA/SVGA
Max. Resolution	<ul style="list-style-type: none">▪ 1024 x 768▪ 800 x 600
Brightness	<ul style="list-style-type: none">▪ 300 cd/m²▪ 230 cd/m²
Pixel Pitch	<ul style="list-style-type: none">▪ 0.206 (W) x 0.206 (H)▪ 0.088 (W) x 0.264 (H)
Signal Interface	TTL (18-bit)
Tilt Angel	24~30°
Touch Panel	10.4" 5wire analog resistive
VFD (Optional)	20 columns & 2 lines Each column allows 5x7 dots.

Environment

Temperature	<ul style="list-style-type: none">▪ Operation: 0~35°C (32~95°F)▪ Storage: -20~60°C (-4~140°F)
Humidity	20~90%

1-4. SAFETY PRECAUTIONS

The following messages are safety reminders on how to protect your systems from damages, and extending the life cycle of the system.

1. Check the Line Voltage

- a. The operating voltage for the power supply should be within the range of 100V to 240V AC; otherwise the system may be damaged.

2. Environmental Conditions

- a. Place your PA-3110 on a sturdy, level surface. Be sure to allow enough space around the system to have easy access needs.
- b. Avoid installing your PA-3110 Series POS system in extremely hot or cold places.
- c. Avoid exposure to sunlight for a long period of time (for example, in a closed car in summer time. Also avoid the system from any heating device.). Or do not use the PA-3110 when it has been left outdoors in a cold winter day.
- d. Bear in mind that the operating ambient temperature is between 0°C and 35°C (32°F and 95°F).
- e. Avoid moving the system rapidly from a hot place to a cold place, and vice versa, because condensation may occur inside the system.
- f. Protect your PA-3110 against strong vibrations, which may cause hard disk failure.
- g. Do not place the system too close to any radio-active device. Radio-active device may cause signal interference.
- h. Always shutdown the operation system before turning off the power.

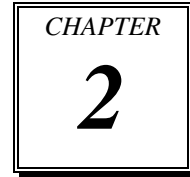
3. Handling

- a. Avoid placing heavy objects on the top of the system.
- b. Do not turn the system upside down. This may cause the hard drive to malfunction.
- c. Do not allow any objects to fall into this product.
- d. If water or other liquid spills into the product, unplug the power cord immediately.

4. Good Care

- a. When the outside case gets stained, remove the stains using neutral washing agent with a dry cloth.
- b. Never use strong agents such as benzene and thinner to clean the surface of the case.
- c. If heavy stains are present, moisten a cloth with diluted neutral washing agent or alcohol and then wipe thoroughly with a dry cloth.
- d. If dust is accumulated on the case surface, remove it by using a special vacuum cleaner for computers.

SYSTEM CONFIGURATION



Helpful information that describes the jumper and connector settings, component locations, and pin assignment.

Sections included:

- Jumper & Connector Quick Reference Table
- How to Set Jumpers
- Component Locations & Jumper Settings
 - Main Board (External I/O ports & other components)
 - Printer Board
 - VFD Board
 - MSR Board
 - Inverter Board

2-1. JUMPER & CONNECTOR QUICK REFERENCE TABLE

Main Board

JUMPER/CONNECTOR	NAME	PAGE
Power Button	SW1-2	2-7
DC In Port	DC_IN1	2-7
Cash Drawer Port	DRW1	2-8
COM Port	COM1, COM2	2-8
VGA Port	VGA1	2-9
USB Port	USB1, USB2, USB3	2-10
LAN Port	CN_LAN1	2-11
COM Connector	COM2-2, COM4, COM5, DEBUG-COM3	2-12
COM Port RI and Voltage Selection	JP_COM1, JP_COM2, JP_COM5, JP_DEBUG1	2-13
USB Connector	USB1-2, USB2-2, USB3-2	2-14
Cash Drawer Power Selection	JP5	2-15
SPI EEPROM Selection	JP8	2-15
Backlight Type Selection	JP1	2-16
Touch Function & USB Channel Selection	JP9, JP10	2-16
HSIC USB-CLK Selection	JP2, JP3	2-17
LED Connector	PWR_LED1-1	2-17
Power for Thermal Printer Connector	PRT_PWR1	2-18
External Speaker Connector	SPK1-1	2-18
Inverter Connector	INV1-1	2-18
LVDS Connector	LVDS1	2-19
Touch Panel Connector	TOUCH1-1	2-19
LAN EEPROM I/F Connector	EEPROM_CN1	2-20
Speaker Connector	DC12V_PWR1	2-20
Reset Button	RST_SW1	2-20
Volume Adjustor	VOL_N_SW1, VOL_P_SW1	2-21

JUMPER/CONNECTOR	NAME	PAGE
Recovery Button	SW4	2-21
Antenna Connector	JA1	2-22
SD Card Slot	SD_CARD1	2-22

Printer Board

JUMPER/CONNECTOR	NAME	PAGE
Power Supply Connector	24V_CN1	2-24
Thermal Head/Motor/Sensor Connector	PRINT_CN1	2-24
RS-232 Interface Connector	COM1	2-26
Auto-cutter Connector	CUT_CN1	2-27

VFD Board

JUMPER/CONNECTOR	NAME	PAGE
Power Switch Selection	JP12V_SEL1	2-29
Power Switch	CN2	2-29
RS-232 Serial Interface	CN1	2-30

MSR Board

JUMPER/CONNECTOR	NAME	PAGE
Decoder Connector	MAG_CN1	2-32
Debug Port	DEG1	2-32
Key Connector	I_BUTTON1	2-32
Output Connector	IO1	2-33

Inverter Board

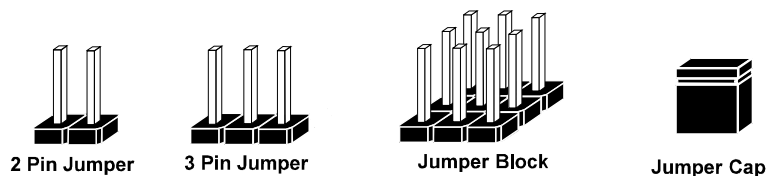
JUMPER/CONNECTOR	NAME	PAGE
Input Connector	CN1	2-35
Output Connector	CN2	2-35

2-2. HOW TO SET JUMPERS

You can configure your board by setting the jumpers. A jumper consists of two or three metal pins with a plastic base mounted on the card, and by using a small plastic "cap", also known as the jumper cap (with a metal contact inside), you are able to connect the pins. So you can set-up your hardware configuration by "opening" or "closing" pins.

Jumpers can be combined into sets that called jumper blocks. When jumpers are all in the block, you have to put them together to set up the hardware configuration. The figure below shows what this looks like.

JUMPERS AND CAPS

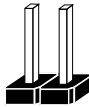


If a jumper has three pins for example, labelled PIN1, PIN2, and PIN3. You can connect PIN1 & PIN2 to create one setting and shorting. You can either connect PIN2 & PIN3 to create another setting. The same jumper diagrams are applied all through this manual. The figure below shows what the manual diagrams look and what they represent.

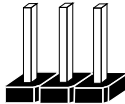
JUMPER DIAGRAMS



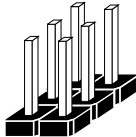
Jumper Cap looks like this



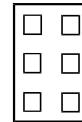
2 pin Jumper looks like this



3 pin Jumper looks like this



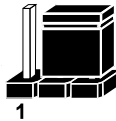
Jumper Block looks like this



JUMPER SETTINGS



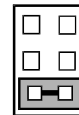
2 pin Jumper closed(enabled)
looks like this



3 pin Jumper
2-3 pin closed(enabled)
looks like this

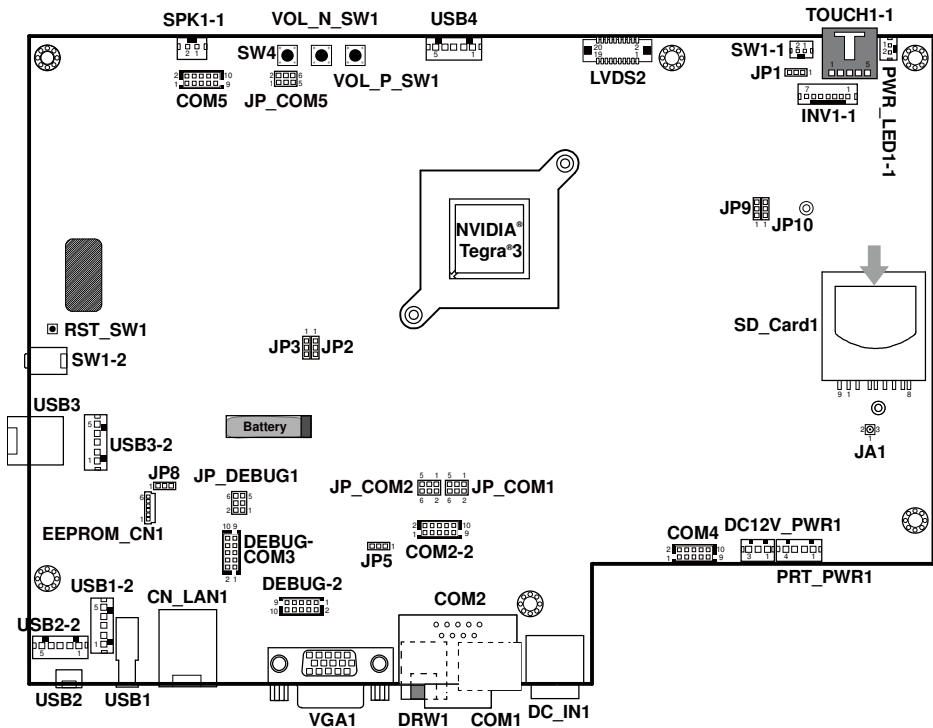


Jumper Block
1-2 pin closed(enabled)
looks like this



2-3. MAIN BOARD COMPONENT LOCATIONS & JUMPER SETTINGS

M/B: PB-6810



PA-3110 Main Board Component Locations

2-3-1. External I/O Ports

2-3-1-1. Power Button

Follow the instruction below to use the power button.



SW1-2

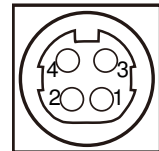
- To turn on the system, press the power button briefly.
- During normal operation, you can press the power button briefly to turn off the panel backlight. When you next briefly press the power button, the LCD backlight will turn on again.
- To turn off the system, press and hold the power button for 2 seconds. Then the system will ask for your confirmation by prompting a message of power-off.

2-3-1-2. DC IN Port

DC_IN1: DC Power-In Port

The pin assignments are as follows:

PIN	ASSIGNMENT
1	GND
2	GND
3	+24V
4	+24V



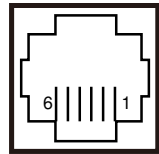
DC_IN1

2-3-1-3. Cash Drawer Port

DRW1: Cash Drawer Port

The pin assignments are as follows:

PIN	ASSIGNMENT	PIN	ASSIGNMENT
1	GND	4	+12V/+24V (Max. current: 1A)
2	Drawer Open	5	NC
3	Drawer Sense	6	GND



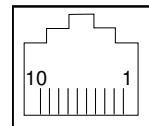
DRW1

2-3-1-4. COM Port

COM1: RJ45 Serial Port, supporting VFD

The pin assignments are as follows:

PIN	ASSIGNMENT	PIN	ASSIGNMENT
1	NC	6	NC
2	RXD	7	RTS
3	TXD	8	CTS
4	NC	9	RI/+5V/+12V selectable (Max. current: 1A)
5	GND	10	NC

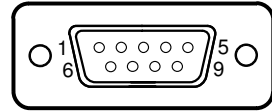


COM1

COM2: D-Sub9 Serial Port, co-lay with COM2-2

The pin assignments are as follows:

PIN	ASSIGNMENT	PIN	ASSIGNMENT
1	DCD	6	DSR
2	RXD	7	RTS
3	TXD	8	CTS
4	DTR	9	RI/+5V/+12V selectable (Max. current: 1A)
5	GND		



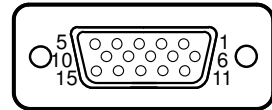
COM2

2-3-1-5. VGA Port

VGA1: VGA Port

The pin assignments are as follows:

PIN	ASSIGNMENT	PIN	ASSIGNMENT
1	RED	9	+5V
2	GREEN	10	GND
3	BLUE	11	NC
4	NC	12	SDA
5	GND	13	HSYNC
6	GND	14	VSYNC
7	GND	15	SCL
8	GND		



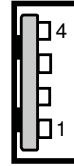
VGA1

2-3-1-6. USB Port

USB1, USB3: USB Type A Ports

The pin assignments are as follows:

PIN	ASSIGNMENT
1	+5V (Max. current: 0.5A)
2	DM
3	DP
4	GND



USB1



USB3

USB2: Micro-USB Port

The pin assignments are as follows:

PIN	ASSIGNMENT
1	+5V (Max. current: 0.5A)
2	DM
3	DP
4	ID
5	GND



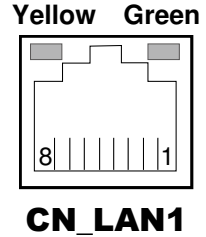
USB2

2-3-1-7. LAN Port

CN_LAN1: RJ45 LAN Port

The pin assignments are as follows:

PIN	ASSIGNMENT	PIN	ASSIGNMENT
1	TXD+	5	NC
2	TXD-	6	RXD-
3	RXD+	7	NC
4	NC	8	NC



LAN LED Indicator:

Left Side LED

Yellow Color Blinking	LAN Message Active
Off	No LAN Message Active

Right Side LED

Green Color On	10/100Mbps LAN Speed Indicator
Orange Color on	Giga LAN Speed Indicator
Off	No LAN switch/ hub connected.

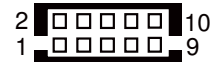
2-3-2. Other Components on Main Board

2-3-2-1. COM Connector

COM2-2: Serial Port Wafer

The pin assignments are as follows:

PIN	ASSIGNMENT	PIN	ASSIGNMENT
1	DCD	6	DSR
2	RXD	7	RTS
3	TXD	8	CTS
4	DTR	9	RI/+5V/+12V selectable (Max. current: 1A)
5	GND	10	NC

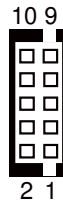


**COM2-2/
COM4/
COM5**

DEBUG-COM3, COM5: Serial Port Wafers

The pin assignments are as follows:

PIN	ASSIGNMENT	PIN	ASSIGNMENT
1	NC	6	NC
2	RXD	7	RTS
3	TXD	8	CTS
4	NC	9	RI/+5V/+12 selectable (Max. current: 1A)
5	GND	10	NC



DEBUG-COM3

COM4: Serial Port Wafer

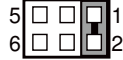
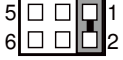
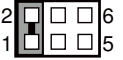

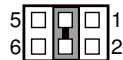
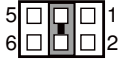

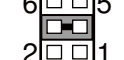

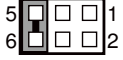
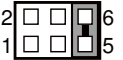
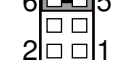
The pin assignments are as follows:

PIN	ASSIGNMENT	PIN	ASSIGNMENT
1	NC	6	NC
2	RXD	7	RTS
3	TXD	8	CTS
4	NC	9	NC
5	GND	10	NC

2-3-2-2. COM Port RI & Voltage Selection

JP_COM1, JP_COM2, JP_COM5, JP_DEBUG1: COM RI & Voltage Selection

The jumper settings are as follows:

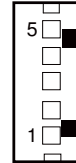
SELECTION	JUMPER SETTING	JUMPER ILLUSTRATION			
RI	1-2	 <p>JP_COM1 (Default)</p>	 <p>JP_COM2 (Default)</p>	 <p>JP_COM5 (Default)</p>	 <p>JP_DEBUG1 (Default)</p>
12V	3-4	 <p>JP_COM1</p>	 <p>JP_COM2</p>	 <p>JP_COM5</p>	 <p>JP_DEBUG1</p>
5V	5-6	 <p>JP_COM1</p>	 <p>JP_COM2</p>	 <p>JP_COM5</p>	 <p>JP_DEBUG1</p>

2-3-2-3. USB Connector

USB1-2, USB3-2: USB Wafers

The pin assignments are as follows:

PIN	ASSIGNMENT
1	DM
2	DP
3	GND
4	+5V (Max. current: 0.5A)
5	GND

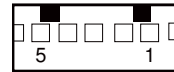


**USB1-2/
USB3-2**

USB2-2: USB Wafer

The pin assignments are as follows:

PIN	ASSIGNMENT
1	DM
2	DP
3	ID
4	+5V (Max. current: 0.5A)
5	GND





USB2-2

2-3-2-4. Cash Drawer Power Selection

JP5: Cash Drawer Power Selection

The jumper settings are as follows:



SELECTION	JUMPER SETTING	JUMPER ILLUSTRATION
+24V	1-2	 <p>JP5</p>
+12V	2-3	 <p>JP5</p>

Note: Manufacturing Default is +12V.

2-3-2-5. SPI EEPROM Selection

JP8: Pin Header for SPI EEPROM Selection

The jumper settings are as follows:

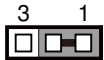
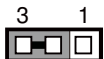
SELECTION	JUMPER SETTING	JUMPER ILLUSTRATION
Programming EEPROM	1-2	 <p>JP8</p>
Normal	2-3	 <p>JP8</p>

Note: Manufacturing Default is Normal.

2-3-2-6. Backlight Type Selection

JP1: Pin Header for Backlight Type Selection

The jumper settings are as follows:

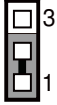
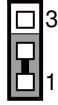
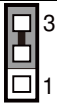
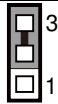
SELECTION	JUMPER SETTING	JUMPER ILLUSTRATION
LED	1-2	 <p>JP1</p>
CCFL	2-3	 <p>JP1</p>

Note: Manufacturing Default is CCFL.

2-3-2-7. Touch Function & USB Channel Selection

JP9, JP10: Pin Header for Touch Function & USB Channel Selection

The jumper settings are as follows:









SELECTION	JUMPER SETTING	JUMPER ILLUSTRATION	
To USB4	JP9: 1-2 JP10: 1-2	 <p>JP9</p>	 <p>JP10</p>
To R-Touch Controller	JP9: 2-3 JP10: 2-3	 <p>JP9</p>	 <p>JP10</p>

Note: Manufacturing Default is To R-Touch Controller.

2-3-2-8. HSIC USB-CLK Selection

JP2, JP3: Pin Header for HSIC USB-CLK Selection

The jumper settings are as follows:

SELECTION	JUMPER SETTING	JUMPER ILLUSTRATION	
38.4 MHz	JP2: 1-2 JP3: 1-2	 JP2	 JP3
26.0 MHz	JP2: 1-2 JP3: 2-3	 JP2	 JP3
19.2 MHz	JP2: 2-3 JP3: 1-2	 JP2	 JP3
12.0 MHz	JP2: 2-3 JP3: 2-3	 JP2	 JP3

Note: Manufacturing Default is 26.0 MHz.

2-3-2-9. LED Connector

PWR_LED1-1: Power Indication LED Wafer

The pin assignments are as follows:

PIN	ASSIGNMENT
1	GND
2	+5V



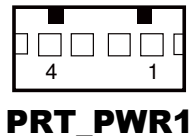
PWR_LED1-1

2-3-2-10. Power For Thermal Printer Connector

PRT_PWR1: Power for Thermal Printer Wafer

The pin assignments are as follows:

PIN	ASSIGNMENT
1	+24V
2	+24V
3	GND
4	GND

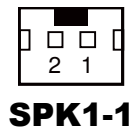


2-3-2-11. External Speaker Connector

SPK1-1: External Speaker Wafer

The pin assignments are as follows:

PIN	ASSIGNMENT
1	SPO+
2	SPO-

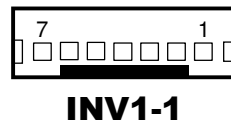


2-3-2-12. Inverter Connector

INV1-1: Inverter Wafer

The pin assignments are as follows:

PIN	ASSIGNMENT	PIN	ASSIGNMENT
1	+12V	5	LVDS_BKLTEN
2	+12V	6	BRCTR
3	GND	7	GND
4	GND		



2-3-2-13. LVDS Connector

LVDS2: LVDS Wafer

The pin assignments are as follows:

PIN	ASSIGNMENT	PIN	ASSIGNMENT
1	GND	11	RINO1-
2	+3.3V	12	CLKO-
3	RINO2+	13	GND
4	+3.3V	14	GND
5	RINO2-	15	RINO0+
6	GND	16	GND
7	GND	17	RINO0-
8	GND	18	+3.3V
9	RINO1+	19	GND
10	CLKO+	20	+3.3V



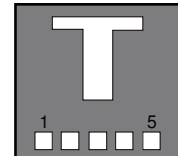
LVDS2

2-3-2-14. Touch Panel Connector

TOUCH1-1: Touch Panel Wafer

The pin assignments are as follows:

PIN	ASSIGNMENT
1	LR (Low Right)
2	LL (Low Left)
3	Probe
4	UR (Up Right)
5	UL (Up Left)



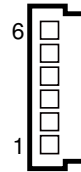
TOUCH1-1

2-3-2-15. LAN EEPROM I/F Connector

EEPROM_CN1: LAN EEPROM I/F Wafer

The pin assignments are as follows:

PIN	ASSIGNMENT	PIN	ASSIGNMENT
1	GND	4	EEDI
2	EECS	5	NC
3	EECK	6	+3.3V



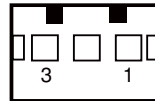
EEPROM_CN1

2-3-2-16. Speaker Connector

DC12V_PWR1: Speaker wafer

The pin assignments are as follows:

PIN	ASSIGNMENT
1	+12V
2	GND
3	+12V



DC12V_PWR1

2-3-2-17. Reset Button

RST_SW1: Reset Button

The pin assignments are as follows:

ACTION	ASSIGNMENT
Click	0V
Release	+3.3V



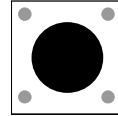
RST_SW1

2-3-2-18. Volume Adjustor

VOL_N_SW1: Volume Down Adjustor

The pin assignments are as follows:

ACTION	ASSIGNMENT
Click	Volume down
Release	N/A



**VOL_N_SW1/
VOL_P_SW1**

VOL_P_SW1: Volume Up Adjustor

The pin assignments are as follows:

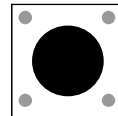
ACTION	ASSIGNMENT
Click	Volume up
Release	N/A

2-3-2-19. Recovery Button

SW4: Recovery Button

The pin assignments are as follows:

ACTION	ASSIGNMENT
Click	0V
Release	+3.3V



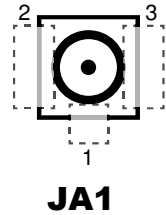
SW4

2-3-2-20. Antenna Connector

JA1: Antenna Connector

The pin assignments are as follows:

PIN	ASSIGNMENT
1	Signal
2	GND
3	GND

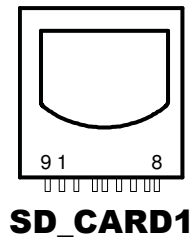


2-3-2-21. SD Card Slot

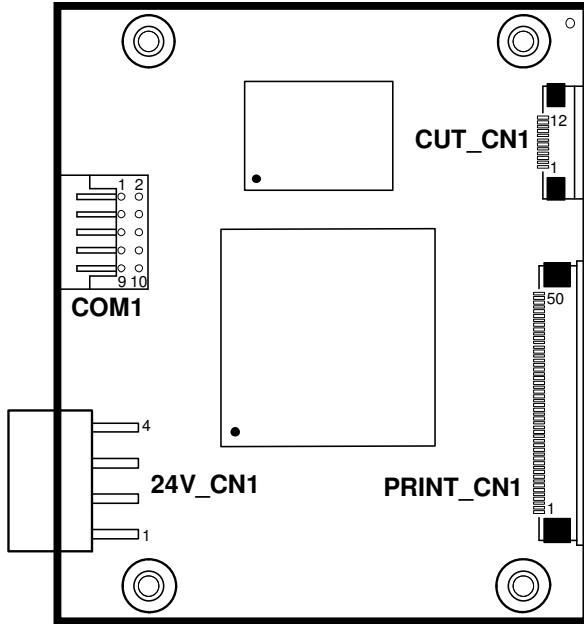
SD_CARD1: SD Card Slot

The pin assignments are as follows:

PIN	ASSIGNMENT	PIN	ASSIGNMENT
1	Data3	7	Data0
2	CMD	8	Data1
3	GND	9	Data2
4	3.3V	10	CD_SW1
5	CLK	11	SW3_COM
6	GND	12	WP_SW2



2-4. PRINTER BOARD COMPONENT LOCATIONS & JUMPER SETTINGS



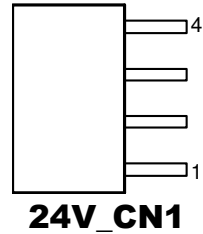
PA-3110 Printer Board Component Locations

2-4-1. Power Supply Connector

24V_CN1: Power Supply Wafer

The pin assignments are as follows:

PIN	ASSIGNMENT	I/O	FUNCTION
1	GND	-	GND
2	GND	-	GND
3	24V	I	24V
4	24V	I	24V

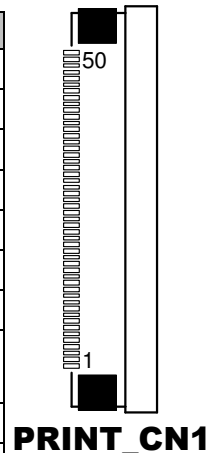


2-4-2. Thermal Head/Motor/Sensor Connector

PRINT_CN1: Thermal Head/Motor/Sensor Wafer

The pin assignments are as follows:

PIN	ASSIGNMENT	I/O	FUNCTION
1	24V	O	Head drive power
2	24V	O	Head drive power
3	24V	O	Head drive power
4	24V	O	Head drive power
5	24V	O	Head drive power
6	24V	O	Head drive power
7	DAT	O	Print data output
8	CLK	O	Synchronizing signal for print data transfer
9	GND	-	Head GND
10	GND	-	Head GND
11	GND	-	Head GND
12	GND	-	Head GND
13	GND	-	Head GND



PIN	ASSIGNMENT	I/O	FUNCTION
14	GND	-	Head GND
15	NC	-	Unused
16	DST4	O	Head strobe signal
17	DST3	O	Head strobe signal
18	3.3V	-	Logic Power
19	GND	-	Thermistor GND
20	GND	-	Thermistor GND
21	TH	I	Thermistor signal
22	NC	-	Unused
23	DST2	O	Head strobe signal
24	DST1	O	Head strobe signal
25	GND	-	Head GND
26	GND	-	Head GND
27	GND	-	Head GND
28	GND	-	Head GND
29	GND	-	Head GND
30	GND	-	Head GND
31	!LATCH	O	Print data latch
32	24V	O	Head drive power
33	24V	O	Head drive power
34	24V	O	Head drive power
35	24V	O	Head drive power
36	24V	O	Head drive power
37	24V	O	Head drive power
38	NC	-	Unused
39	PS	I	Signal of the out-of-paper sensor
40	Vps	O	Power supply of the out-of-paper sensor

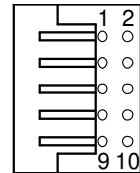
PIN	ASSIGNMENT	I/O	FUNCTION
41	GND	-	GND of the platen position/ out-of-paper sensor
42	HS	I	Signal of the platen position sensor
43	NC	-	Unused
44	FG	-	Frame GND
45	FG	-	Frame GND
46	NC	-	Unused
47	2A	O	Motor drive signal
48	1B	O	Motor drive signal
49	1A	O	Motor drive signal
50	2B	O	Motor drive signal

2-4-3. RS-232 Interface Connector

COM1: RS-232 Interface Connector

The pin assignments are as follows:

PIN	ASSIGNMENT	PIN	ASSIGNMENT
1	NC	6	DSR/CTS
2	RXD	7	RTS
3	TXD	8	CTS
4	DTR/RTS	9	NC
5	GND	10	NC



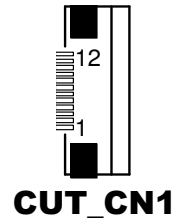
COM1

2-4-4. Auto-Cutter Connector

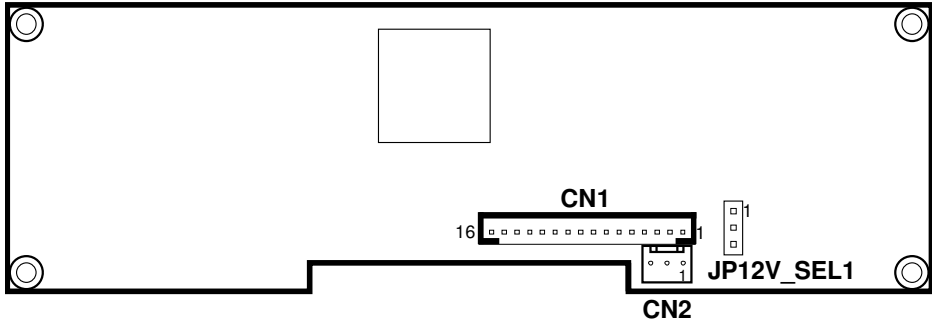
CUT_CN1: Auto-cutter Wafer

The pin assignments are as follows:

PIN	ASSIGNMENT	I/O	FUNCTION
1	NC	-	Unused
2	Vcs	O	Power supply of the home position sensor
3	GND	-	GND of the home position sensor
4	CUTS	I	Signal of the hom position sensor
5	2B-1	O	Auto-cutter motor drive signal
6	2B-2	O	Auto-cutter motor drive signal
7	2A-1	O	Auto-cutter motor drive signal
8	2A-2	O	Auto-cutter motor drive signal
9	1B-1	O	Auto-cutter motor drive signal
10	1B-2	O	Auto-cutter motor drive signal
11	1A-1	O	Auto-cutter motor drive signal
12	1A-2	O	Auto-cutter motor drive signal



2-5. VFD BOARD COMPONENT LOCATIONS & JUMPER SETTINGS

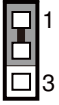
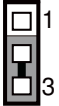


PA-3110 VFD Board Component Locations

2-5-1. Power Switch Selection

JP12V_SEL1: Power Switch Selection

The jumper settings are as follows:

SELECTION	JUMPER SETTING	JUMPER ILLUSTRATION
OFF	1-2	 <p>JP12V_SEL1</p>
ON	2-3	 <p>JP12V_SEL1</p>

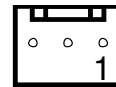
Note: Manufacturing Default is ON.

2-5-2. Power Switch

CN2: Power Switch

The pin assignments are as follows:

PIN	ASSIGNMENT
1	High Level
2	NC
3	Low Level



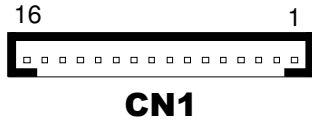
CN2

2-5-3. RS-232 Serial Interface

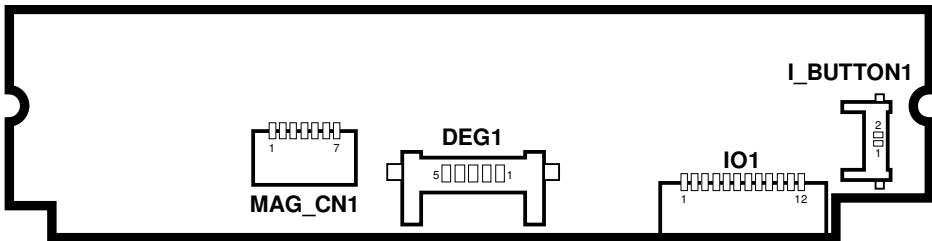
CN1: RS-232 Serial Interface wafer

The pin assignments are as follows:

PIN	ASSIGNMENT	PIN	ASSIGNMENT
1	GND	11	NC
2	TXD	12	NC
3	RXD	13	NC
4	DTR	14	NC
5	DSR	15	NC
6	RTS	16	NC
7	CTS	17	NC
8	+12V/+5V	18	NC



2-6. MSR BOARD COMPONENT LOCATIONS & JUMPER SETTINGS



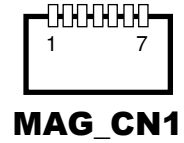
PA-3110 MSR Board Component Locations

2-6-1. Decoder Connector

MAG_CN1: Decoder Wafer

The pin assignments are as follows:

PIN	ASSIGNMENT	PIN	ASSIGNMENT
1	HDC2	5	GND
2	HDC1	6	HDA2
3	HDB2	7	HDA1
4	HDB1		

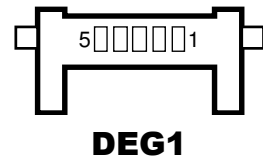


2-6-2. Debug Connector

DEG1: Debug Port Wafer

The pin assignments are as follows:

PIN	ASSIGNMENT
1	TX
2	RX
3	NC
4	GND
5	+5V

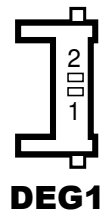


2-6-3. Key Connector

I_BUTTON1: Key Wafer

The pin assignments are as follows:

PIN	ASSIGNMENT
1	I_B1
2	GND

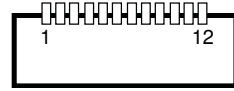


2-6-4. Output Connector

IO1: Output wafer

The pin assignments are as follows:

PIN	ASSIGNMENT	PIN	ASSIGNMENT
1	CLK_KB	7	RX_MSR
2	CLK_PC	8	TX_MSR
3	DATA_KB	9	GND
4	DATA_PC	10	USB_D+_R
5	+5V	11	USB_D-_R
6	CHASSIS GND	12	GND



IO1

2-7. INVERTER BOARD COMPONENT LOCATIONS & JUMPER SETTINGS



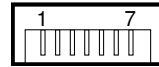
PA-3110 Inverter Board Component Locations

2-7-1. Input Connector

CN1: Input Connector

The pin assignments are as follows:

PIN	ASSIGNMENT	DESCRIPTION
1	Vin	Input Voltage
2	Vin	Input Voltage
3	GND	Power System Return
4	GND	Power System Return
5	Brt ON/OFF	ON/OFF Control
6	Brt ADJ	Lamp Control
7	GND	Power System Return



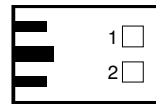
CN1

2-7-2. Output Connector

CN2: Output Connector

The pin assignments are as follows:

PIN	ASSIGNMENT	DESCRIPTION
1	Lamp High	High Voltage Output for High Side CCFL
2	Lamp Low	Low Voltage Output for Low Side CCFL



CN2

SOFTWARE UTILITIES

CHAPTER

3

This chapter provides the detailed information for you to operate the system applications.

Sections included:

- Version List
- OS API
- Firmware Control Command
 - Printer Board
 - VFD Board
 - MSR Board
- Utility Update
 - OS
 - Printer Board
 - VFD Board
 - MSR Board

3-1.OS API

3-1-1. Programming Guide

1. Create a new project in Eclipse.
2. Copy provided JAR file (CashDrawer.jar, SAPI.jar, VFD.jar) into the path below:
Libs
 - CashDrawer.jar
 - VFD.jar
 - SAPI.jar
 - Msr.jar
 - ThermalPrinter.jar
3. In Libraries tab of the target project's properties, confirm that the JAR file you added (CashDrawer.jar SAPI.jar VFD.jar) is registered in [Java Build Path]. If it has not been added, add the JAR file into build path using [Add Jars...].
4. Copy the library file (libeposprint.so) into following path:
Libs
 - armeabi
 - |_ libgpio_control.so
 - |_ libserial_port.so

Import Function Declare:

```
import android.VFD.VFD;  
import android.VFD.Msr;  
import android.CashDrawer.CashDrawer;  
import android.ThermalPrinter.ThermalPrinter;
```

3-1-2. API Reference

3-1-2-1. Cash Drawer API

OpenCashDrawer

```
Public Boolean OpenCashDrawer();
```

Purpose Open the cash drawer API.
Return True (1) on success, False (0) on failure

Example

```
boolean ControlResult = false;
ControlResult = CDrawer.OpenCashDrawer();
if(ControlResult)
    //"Cash Drawer Control Success!"
else
    //"Cash Drawer Control Failure!"
```

GetCashDrawerStatus

```
Public Boolean GetCashDrawerStatus ();
```

Purpose Get the cash drawer status.
Value Put value to Function, than get CashdrawerStatus back.
Return True (1) on success, False (0) on failure False (0)

Example

```
boolean ControlResult = false;
CashDrawer CDrawer =newCashDrawer();
ControlResult = CDrawer.GetCashDrawerStatus();
if(ControlResult)
    //"Cash Drawer Status Open !"
else
    //"Cash Drawer Status Close !"
```


3-1-2-2. VFD API

OpenVFD

Public Boolean OpenVFD(int BuadRate)

Purpose Open the VFD Port.
Value Set VFD Baud Rate; MB-4103 default baud rate is 9600;
Return True (1) on success, False (0) on failure

CloseVFD

Public Boolean CloseVFD();

Purpose Close the VFD Port.
Return True (1) on success, False (0) on failure False (0)

SendCommand

Public Boolean SendCommand(byte[] data);

Purpose Send Command to VFD.
Value VFD Command Code. ESC/POS Command.
Return True (1) on success, False (0) on failure False (0)
Example VFD – Clear VFD Command (EPSON Command)
//Initialize a VFD class instance
VFD VFD_Control = new VFD();
VFD_Control.OpenVFD(9600);
byte[] data = newbyte[1];
data[0] = 0x0C;
VFD_Control.SendCommand(data);
VFD_Control.CloseVFD();

3-1-2-3. MSR API

OpenMSR

Public Boolean OpenMSR (int BaudRate)

Purpose	Open theMSR Port.
Value	Set Msr BaudRate; MJR243R baud rate default is 19200;
Return	True (1) on success, False (0) on failure

CloseMSR

Public Boolean CloseMSR();

Purpose	Close the MSR Port.
Return	True (1) on success, False (0) on failure False (0)

SendCommand

Public Boolean SendCommand (byte[] data);

Purpose	Send Command to MSR.
Value	Msr Command Code.
Return	True (1) on success, False (0) on failure False (0)
Example	Msr – Send Command to Msr <i>//Initialize a VFD class instance</i> Msr Msrcontrol = new Msr (); Msrcontrol .OpenMSR(19200); byte[] data = newbyte [1]; data[0] = 0x0C; Msrcontrol .SendCommand(data);

Receiver Data - Attach

Public Boolean Attach();

Purpose Receive Msr Data
Return True (1) on success, False (0) on failure False (0)
Example Receive Data from MSR.
Before use this function need to implements
ObserverInterface.
Observer = Current class.

```
public class MsrActivity extends Activity implements
    android.Msr.Observer {
    EditText mReception;
    Msr Msrcontrol ;
    @Override
    protected void onCreate(Bundle savedInstanceState) {
        super.onCreate(savedInstanceState);
        setContentView(R.layout.activity_msr);

        mReception = (EditText)
            findViewById(R.id.EditTextReception);
        Msrcontrol = new Msr();
        Msrcontrol.OpenMSR(115200);Msrcontrol.Attach(this);
    }
    @Override
    public void Update(final byte[] buffer, final int size)
    {runOnUiThread(new Runnable() {
    public void run() {
    if (mReception != null) {
    mReception.append(new String(buffer, 0, size));
    }
    }
    });
    }
}
```

```

    }
    When Close:
    Msrcontrol.CloseMSR();Msrcontrol.Detach(this);

```

Receiver Data - Detach

Public Boolean Detach();

Purpose Cancel Obsver from Msr Data
Return True (1) on success, False (0) on failure False (0)

Update Event

Public Void Update(final byte[] buffer, final int size);

Purpose Get Msr Data String
Return byte[] buffer = Msr data
 int size = buffer count.
 Before using this function, implements Observer Interface.
 Observer = Current class.

Example:

```

@Override
publicvoid Update(finalbyte[] buffer, finalint size)
{runOnUiThread(new Runnable() {
publicvoid run() {
if (mReception != null) {
String MsrString =new String(buffer, 0, size);
}
}
}
}

```

3-1-2-4. Thermal Printer API

OpenPrinter

Public Boolean OpenPrinter (int Baudrate)

Purpose Open the Thermal Printer Port.
Value Set Printer Baud Rate; MB-1030 baud rate default is 115200;
Return True (1) on success, False (0) on failure

ClosePrinter

Public Boolean ClosePrinter();

Purpose Close the Thermal Printer Port.
Return True (1) on success, False (0) on failure False (0)

CutPaper

Public Boolean CutPaper(int type);

Purpose Cut paper function.
Value Type = 1 (Full cut) 2(Partial cut)
Return True (1) on success, False (0) on failure False (0)

Text

Public Boolean Text(String data);

Purpose Print string data to print.
Value Data = String data.
Return True (1) on success, False (0) on failure False (0)
Example ThermalPrinterPrinter_Control = new ThermalPrinter();
Printer_Control.OpenPrinter(115200);
Printer_Control.Text("123456789");
Printer_Control.Text("\n");
Printer_Control.ClosePrinter();
//P.S If application want to line break. Please use "\n" to change line.

BarcodePrint

Public BooleanBarcodePrint(String Data,int Type,int Hri,int Width,int Height);

Purpose Print Barcode.

Value Data = Send barcode string data to printer.

Type = 1 UPC-A(1)

Type = 2 UPC-E(1)

Type = 3 EAN-13(1)

Type = 4 EAN-8(1)

Type = 5 CODE39(1)

Type = 6 ITF(1)

Type = 7 CODEBAR(1)

Type = 8 UPC-A(2)

Type = 9 UPC-E(2)

Type = 10 EAN-13(2)

Type = 11 EAN-8(2)

Type = 12 CODE39(2)

Type = 13 ITF(2)

Type = 14 CODABAR(2)

Type = 15 CODE93(2)

Type = 16 Code128(2)

Hri =

hri	Printing Position
0	No print
1	Above bar code
2	Below bar code
3,	Above and below bar code(both)

Width = $1 \leq n \leq 6$

Height = $1 \leq n \leq 255$

Return True (1) on success, False (0) on failure False (0)

LoadPicPrinter

Public Bitmap LoadPicPrinter (Bitmap data, boolean Halftone);

- Purpose** Prepare to load pic sent to printer.
Value Bitmap data (picture data)
Halftone = true or false (Enable or Disable)
Return Return Threshold Pic.

ImagePrinter

Public BooleanImagePrint(Bitmap data);

- Purpose** Sent bitmap to printer.
Value Bitmap data (Threshold data)
Return True (1) on success, False (0) on failure False (0)

SendCommand

Public Boolean SendCommand (byte[] data);

- Purpose** Send command byte to printer.
Value Command Code. Please refer [MP-1030 Command Manual](#)
Return True (1) on success, False (0) on failure False (0)
Example

```
ThermalPrinterPrinter_Control = new ThermalPrinter();  
Printer_Control.OpenPrinter(115200);  
byte[] data = new byte[2];  
data[0] = 0x1B;  
data[1] = 0x6d; //Partial cut  
Printer_Control.SendCommand(data);  
Printer_Control.ClosePrinter();
```

GetRealTimeStatus

```
Public intGetRealTimeStatus(int n );
```

Purpose Get Real Time Status.
Value Command Code. Please refer [MP-1030 Command Manual](#)
Return Real Time Status Byte.
Example

n = 2 : Off-line status.

Bit	On / Off	Hex	Decimal	Function
0	Off	00	0	Not used. Fixed to Off.
1	On	02	2	Not used. Fixed to On.
2	Off	00	0	Cover is closed.
	On	04	4	Cover is open.
3	Off	00	0	Not used. Fixed to Off.
4	On	10	16	Not used. Fixed to On.
5	Off	00	0	No paper-end stop.
	On	20	32	Printing stops due to paper end.
6	Off	00	0	No error.
	On	40	64	Error occurs.
7	Off	00	0	Not used. Fixed to Off.

```
Int RealTimeStatus = 0 ;
ThermalPrinterPrinter_Control = new ThermalPrinter();
Printer_Control.OpenPrinter(115200);
RealTimeStatus = Printer_Control.GetRealTimeStatus(2);
// TODO Detect Status
Printer_Control.ClosePrinter();
```

GetPaperEndEvent

```
Public intGetPaperEndEvent();
```

Purpose Get Paper End Status.
Return 0x00 = Response Error 0x01 = Paper End, 0x02 = Paper Normal
Int PaperEndStatus= 0 ;
ThermalPrinterPrinter_Control = new ThermalPrinter();
Printer_Control.OpenPrinter(115200);


```
PaperEndStatus = Printer_Control.GetCoverEvent ();  
// TODO Detect Status  
if (PaperEndStatus== 1)  
{  
    Toast.makeText(PrinterActivity.this,  
    "Paper End!", Toast.LENGTH_SHORT).show();  
}  
else  
{  
    Toast.makeText(PrinterActivity.this,  
    "Paper Normal", Toast.LENGTH_SHORT).show();  
}  
Printer_Control.ClosePrinter();
```

GetCoverEvent

Public intGetCoverEvent();

Purpose

Get Cover Status.

Return

0x00 = Response Error 0x01 = Cover Open , 0x02 = Over Close

```
Int CoverStatus = 0 ;  
ThermalPrinterPrinter_Control = newThermalPrinter();  
Printer_Control.OpenPrinter(115200);  
CoverStatus = Printer_Control.GetCoverEvent ();  
// TODO Detect Status  
if (CoverStatus == 1)  
{  
    Toast.makeText(PrinterActivity.this,  
    "Cover Open!", Toast.LENGTH_SHORT).show();  
}  
else  
{  
    Toast.makeText(PrinterActivity.this,  
    "Cover Close!", Toast.LENGTH_SHORT).show();  
}  
Printer_Control.ClosePrinter();
```

Receiver Data - Attach

Public Boolean Attach();

Purpose	Receive Printer Data
Return	True (1) on success, False (0) on failure False (0)
Example	Receive Data fromPrinter. Before use this function need to implements Observer Interface. Observer = Current class.

```

publicclass PrinterActivity extends Activity implements
android.ThermalPrinter.Observer {
    ThermalPrinter Printer_Control;
    @Override
    protectedvoid onCreate(Bundle savedInstanceState) {
        super.onCreate(savedInstanceState);
        setContentView(R.layout.activity_msr);

        Printer_Control= newThermalPrinter();
        Printer_Control.Attach(this);
        If( !Printer_Control.OpenPrinter(115200))
        {
            //Port already open.
        }
        @Override
        publicvoid Update(finalint Device, finalintvalue)
        {runOnUiThread(new Runnable() {
            publicvoid run() {
                //Cover
                if(Device == 0x01)
                {
                    if(Value==0x01)
                    {

```


Update Event

Public Void Update(final int Device, final int Value);

Purpose Get Cover & Paper event

Return

Device	0x01(Cover)	0x02 (Paper)
Value	0x01(CoverOpen)	0x01(No Paper Present)
	0x02(CoverClose)	0x02(Paper Present)

GetFWVersion

Public String GetFWVSION();

Purpose Get FW Version

Return FW Version String.

GetCodePageVersion

Public String GetCodePageVersion();

Purpose Get CodePage Version

Return Code Page Version String.

3-2. FIRMWARE CONTROL COMMAND

3-2-1. Printer Board

1. COMMAND LIST

Standard commands

Control codes	Hexadecimal codes	Function
<LF>	0A	Line feed
<DLE EOT>	10 04	Real-time status transmission
<DLE DC4>	10 14	Real-time output of specified pulse
<ESC SP>	1B 20	Set character right space amount
<ESC !>	1B 21	Batch specify print mode
<ESC \$>	1B 24	Specify absolute position
<ESC ->	1B 2D	Specify/cancels underline mode
<ESC 2>	1B 32	Set default line spacing
<ESC 3>	1B 33	Set line feed amount
<ESC =>	1B 3D	Select peripheral device
<ESC @>	1B 40	Initialize printer
<ESC E>	1B 45	Specify/cancel emphasized printing
<ESC J>	1B 4A	Print and Paper Feed
<ESC m>	1B 4D	Select character font
<ESC R>	1B 52	Select international characters
<ESC \>	1B 5C	Specify relative position
<ESC a>	1B 61	Position alignment
<ESC c 3>	1B 63 33	Select paper out sensor to enable at paper out signal output
<ESC d>	1B 64	Print and feed paper n lines
<ESC i>	1B 69	Full cut
<ESC l>	1B 6D	Partial cut
<ESC p>	1B 70	Specify pulse
<ESC t>	1B 74	Select character code table
<ESC {>	1B 7B	Specify/cancel upside-down characters
<FS p>	1C 70	Print NV bit image
<FS q>	1C 71	Define NV bit image
<GS l>	1D 21	Select character size
<GS ^>	1D 2A	Define download bit images
<GS >>	1D 28	Test print
<GS />	1D 2F	Print download bit images
<GS B>	1D 42	Specify/cancel white/black inverted printing
<GS H>	1D 48	Select HRI character print position
<GS l>	1D 49	Send Printer ID
<GS L>	1D 4C	Set left margin
<GS P>	1D 50	Set basic calculated pitch
<GS V>	1D 56	Cut paper
<GS a>	1D 61	Enable/disable transmission of automatic status
<GS f>	1D 66	Select HRI character font
<GS h>	1D 68	Set bar code height
<GS k>	1D 6B	Print bar code
<GS r>	1D 72	Transmission of status
<GS v 0>	1D 76 30	Print raster bit images
<GS w>	1D 77	Set bar code horizontal size

Kanji Control Commands

Control codes	Hexadecimal codes	Function
<FS !>	1C 21	Batch specify Kanji character print mode
<FS &>	1C 26	Specify Kanji character mode
<FS .>	1C 2E	Cancel Kanji character mode

2. COMMAND NOTATION

[Name]	The name of the command.
[Format]	The code sequence. ASCII indicates the ASCII equivalents. Hex indicates the hexadecimal equivalents. Decimal indicates the decimal equivalents. [] k indicates the contents of the [] should be repeated k times.
[Range]	Gives the allowable ranges for the arguments.
[Description]	Describes the function of the command.

3. STANDARD COMMAND DETAILS

LF

[Name]	Print and line feed.
[Format]	ASCII LF Hex. 0A Decimal 10
[Range]	N/A
[Description]	This command prints the data in the print buffer and feeds one line based on the current set line spacing in standard mode.

DLE EOT n

[Name]	Real-time status transmission.
[Format]	ASCII OLE EOT n Hex. 10 04 n Decimal 16 4 n
[Range]	$1 \leq n \leq 4$

[Description]	Transmits the selected printer status specified by n in real time, according to the following parameters: n = 1 : Transmit printer status. n = 2 : Transmit off-line status. n = 3 : Transmit error status. n = 4 : Transmit paper roll sensor status.			
	n = 1 : Printer status.			
Bit	On / Off	Hex	Decimal	Function
0	Off	00	0	Not used. Fixed to Off.
1	On	02	2	Not used. Fixed to On.
2	Off	00	0	Drawer open/close signal is LOW.
	On	04	4	Drawer open/close signal is HIGH.
3	Off	00	0	On-line.
	On	08	8	Off-line.
4	On	10	16	Not used. Fixed to On.
5	Off	00	0	Not used. Fixed to Off.
6	Off	00	0	Not used. Fixed to Off.
7	Off	00	0	Not used. Fixed to Off.
	n = 2 : Off-line status.			
Bit	On / Off	Hex	Decimal	Function
0	Off	00	0	Not used. Fixed to Off.
1	On	02	2	Not used. Fixed to On.
2	Off	00	0	Cover is closed.
	On	04	4	Cover is open.
3	Off	00	0	Not used. Fixed to Off.
4	On	10	16	Not used. Fixed to On.
5	Off	00	0	No paper-end stop.
	On	20	32	Printing stops due to paper end.
6	Off	00	0	No error.
	On	40	64	Error occurs.
7	Off	00	0	Not used. Fixed to Off.
	n = 3 : Error status			
Bit	On / Off	Hex	Decimal	Function
0	Off	00	0	Not used. Fixed to Off.
1	On	02	2	Not used. Fixed to On.
2	Off	00	0	Not used. Fixed to Off.
3	Off	00	0	Not used. Fixed to Off.
4	On	10	16	Not used. Fixed to On.
5	Off	00	0	Not used. Fixed to Off.
6	Off	00	0	Not used. Fixed to Off.
7	Off	00	0	Not used. Fixed to Off.
	n = 4 : Continuous paper sensor status.			
Bit	On / Off	Hex	Decimal	Function
0	Off	00	0	Not used. Fixed to Off.
1	Off	02	2	Not used. Fixed to On.
2	Off	00	0	No paper-near-end stop.
	On	04	4	Printing stops due to paper near end.
3	Off	00	0	No paper-near-end stop.
	On	08	8	Printing stops due to paper near end.
4	On	10	16	Not used. Fixed to On.
5	Off	00	0	No paper-end stop.
	On	20	32	Printing stops due to paper end.
6	Off	00	0	No paper-end stop.
	On	40	64	Printing stops due to paper end.
7	Off	00	0	Not used. Fixed to Off.

DLE DC4 n m t

[Name]	Real-time output of specified pulse.
[Format]	ASCII DLE DC4 n m t Hex. 10 14 n m t Decimal 16 20 n m t
[Range]	n = 1 m = 0,1 1 ≤ t ≤ 8
[Description]	This outputs a signal specified by t to the connector pin specified by m. m = 0: #2 Pin of the drawer kick connector m = 1: #5 Pin of the drawer kick connector On time is set to t x 100 msec; Off time is set to t x 100 msec.

ESC SP n

[Name]	Set the character right space.
[Format]	ASCII ESC SP n Hex. 1B 20 n Decimal 27 32 n
[Range]	0 ≤ n ≤ 255 Initial Value n = 0
[Description]	This command sets the size of space to right of character. Right space = n x [horizontal motion units].

ESC ! n

[Name]	Set print mode.																																																																													
[Format]	ASCII ESC ! n Hex. 1B 21 n Decimal 27 33 n																																																																													
[Range]	0 ≤ n ≤ 255 Initial Value n = 0																																																																													
[Description]	This command selects print mode(s) with bits having following meanings. This command affects the Chinese characters.(Only Double-height, Double-width, Underline) <table border="1" style="margin-left: 20px;"> <thead> <tr> <th>Bit</th> <th>On / Off</th> <th>Hex</th> <th>Decimal</th> <th>Function</th> </tr> </thead> <tbody> <tr> <td rowspan="2">0</td> <td>Off</td> <td>00</td> <td>0</td> <td>Character font A selected.</td> </tr> <tr> <td>On</td> <td>01</td> <td>1</td> <td>Character font B selected.</td> </tr> <tr> <td rowspan="2">1</td> <td>Off</td> <td>00</td> <td>0</td> <td>Not used. Fixed to Off.</td> </tr> <tr> <td>On</td> <td>00</td> <td>0</td> <td>Not used. Fixed to Off.</td> </tr> <tr> <td rowspan="2">2</td> <td>Off</td> <td>00</td> <td>0</td> <td>Not used. Fixed to Off.</td> </tr> <tr> <td>On</td> <td>00</td> <td>0</td> <td>Not used. Fixed to Off.</td> </tr> <tr> <td rowspan="2">3</td> <td>Off</td> <td>00</td> <td>0</td> <td>Emphasized mode not selected.</td> </tr> <tr> <td>On</td> <td>08</td> <td>8</td> <td>Emphasized mode selected.</td> </tr> <tr> <td rowspan="2">4</td> <td>Off</td> <td>00</td> <td>0</td> <td>Double-height mode not selected</td> </tr> <tr> <td>On</td> <td>10</td> <td>16</td> <td>Double-height mode selected</td> </tr> <tr> <td rowspan="2">5</td> <td>Off</td> <td>00</td> <td>0</td> <td>Double-width mode not selected.</td> </tr> <tr> <td>On</td> <td>20</td> <td>32</td> <td>Double-width mode selected.</td> </tr> <tr> <td rowspan="2">6</td> <td>Off</td> <td>00</td> <td>0</td> <td>Not used. Fixed to Off.</td> </tr> <tr> <td>On</td> <td>00</td> <td>0</td> <td>Not used. Fixed to Off.</td> </tr> <tr> <td rowspan="2">7</td> <td>Off</td> <td>00</td> <td>0</td> <td>Underline mode not selected.</td> </tr> <tr> <td>On</td> <td>80</td> <td>128</td> <td>Underline mode selected.</td> </tr> </tbody> </table>	Bit	On / Off	Hex	Decimal	Function	0	Off	00	0	Character font A selected.	On	01	1	Character font B selected.	1	Off	00	0	Not used. Fixed to Off.	On	00	0	Not used. Fixed to Off.	2	Off	00	0	Not used. Fixed to Off.	On	00	0	Not used. Fixed to Off.	3	Off	00	0	Emphasized mode not selected.	On	08	8	Emphasized mode selected.	4	Off	00	0	Double-height mode not selected	On	10	16	Double-height mode selected	5	Off	00	0	Double-width mode not selected.	On	20	32	Double-width mode selected.	6	Off	00	0	Not used. Fixed to Off.	On	00	0	Not used. Fixed to Off.	7	Off	00	0	Underline mode not selected.	On	80	128	Underline mode selected.
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7	Off	00	0	Underline mode not selected.																																																																										
	On	80	128	Underline mode selected.																																																																										

ESC \$ n

[Name]	Set absolute print position.
[Format]	ASCII ESC \$ nL nH Hex. 1B 24 nL nH Decimal 27 36 nL nH
[Range]	$0 \leq (nL + nH \times 256) \leq 65535$ ($0 \leq nH \leq 255, 0 \leq nL \leq 255$)
[Description]	This command specifies the next print starting position in reference to the left edge of the print area. The printing start position is calculated using $(nL + nH \times 256) \times$ (vertical or horizontal motion units).

ESC - n

[Name]	Turn underline mode on/off.						
[Format]	ASCII ESC - n Hex. 1B 2D n Decimal 27 45 n						
[Range]	$0 \leq n \leq 1$ Initial Value n = 0						
[Description]	This command enables the print data following it to be printer out underlined. This command affects the Chinese characters. The underline mode varied depending on the following values of n: <table border="1" style="margin-left: 40px;"> <tr> <th>n</th> <th>Function</th> </tr> <tr> <td>0</td> <td>Turns off underline mode</td> </tr> <tr> <td>1</td> <td>Turns on underline mode, set at 1-dot thick</td> </tr> </table>	n	Function	0	Turns off underline mode	1	Turns on underline mode, set at 1-dot thick
n	Function						
0	Turns off underline mode						
1	Turns on underline mode, set at 1-dot thick						

ESC 2

[Name]	Select default line spacing.
[Format]	ASCII ESC 2 Hex. 1B 32 Decimal 27 50
[Range]	N/A
[Description]	This command sets the default line spacing The default line spacing is approximately 4.25 mm, which is equivalent to 34 dots.

ESC 3 n

[Name]	Set line spacing.
[Format]	ASCII ESC 3 n Hex. 1B 33 n Decimal 27 51 n
[Range]	$0 \leq n \leq 255$ Initial Value n = 34
[Description]	This command sets the line spacing using a following rule. Line spacing = n x (vertical or horizontal motion units)

ESC = n

[Name]	Select peripheral device.
[Format]	ASCII ESC = n Hex. 1B 3D n Decimal 27 61 n
[Range]	$0 \leq n \leq 255$ Initial Value n = 1

[Description]	Selects the peripheral device for which the data is effective from the host computer.			
	Bit	Function	"0"	"1"
	7	Undefined		
	6	Undefined		
	5	Undefined		
	4	Undefined		
	3	Undefined		
	2	Undefined		
	1	Undefined		
	0	Printer	Invalid	Valid

ESC @

[Name]	Initialize printer.
[Format]	ASCII ESC @ Hex. 1B 40 Decimal 27 64
[Range]	N/A
[Description]	Clears data from the print buffer and sets the printer to its default settings.

ESC E n

[Name]	Turn emphasized mode on / off.
[Format]	ASCII ESC E n Hex. 1B 45 n Decimal 27 69 n
[Range]	0 ≤ n ≤ 255 Initial Value n = 0
[Description]	This command turns emphasized mode on or off by toggling the least significant bit of n like following. When the LSB of n is 0, emphasized mode is turned off. When the LSB of n is 1, emphasized mode is turned on.

ESC J n

[Name]	Print and feed paper.
[Format]	ASCII ESC J n Hex. 1B 4A n Decimal 27 74 n
[Range]	0 ≤ n ≤ 255
[Description]	This command prints the data in the print buffer and feeds the paper [n X vertical motion unit].

ESC M n

[Name]	Select character font.						
[Format]	ASCII ESC M n Hex. 1B 4D n Decimal 27 77 n						
[Range]	n = 0, 1 Initial Value n = 0						
[Description]	This command selects only-byte character fonts using n as following. <table border="1" data-bbox="326 1206 659 1267"> <tr> <td>n</td> <td>Function</td> </tr> <tr> <td>0</td> <td>Character font A selected</td> </tr> <tr> <td>1</td> <td>Character font B selected</td> </tr> </table>	n	Function	0	Character font A selected	1	Character font B selected
n	Function						
0	Character font A selected						
1	Character font B selected						

ESC R n

[Name]	Specify international character set.																																				
[Format]	ASCII ESC R n Hex. 1B 52 n Decimal 27 82 n																																				
[Range]	$0 \leq n \leq 16$ Initial Value n = 0																																				
[Description]	This command specifies international characters according to n values. <table border="1" style="margin-left: 40px;"> <tr><th>n</th><th>Character set</th></tr> <tr><td>0</td><td>USA</td></tr> <tr><td>1</td><td>France</td></tr> <tr><td>2</td><td>Germany</td></tr> <tr><td>3</td><td>UK</td></tr> <tr><td>4</td><td>Denmark I</td></tr> <tr><td>5</td><td>Sweden</td></tr> <tr><td>6</td><td>Italy</td></tr> <tr><td>7</td><td>Spain</td></tr> <tr><td>8</td><td>Japan</td></tr> <tr><td>9</td><td>Norway</td></tr> <tr><td>10</td><td>Denmark II</td></tr> <tr><td>11</td><td>Spain II</td></tr> <tr><td>12</td><td>Latin America</td></tr> <tr><td>13</td><td>Korea</td></tr> <tr><td>14</td><td>Russia</td></tr> <tr><td>15</td><td>Slavonic</td></tr> <tr><td>16</td><td>User Define</td></tr> </table>	n	Character set	0	USA	1	France	2	Germany	3	UK	4	Denmark I	5	Sweden	6	Italy	7	Spain	8	Japan	9	Norway	10	Denmark II	11	Spain II	12	Latin America	13	Korea	14	Russia	15	Slavonic	16	User Define
n	Character set																																				
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2	Germany																																				
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4	Denmark I																																				
5	Sweden																																				
6	Italy																																				
7	Spain																																				
8	Japan																																				
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14	Russia																																				
15	Slavonic																																				
16	User Define																																				

ESC \ n

[Name]	Set relative print position.
[Format]	ASCII ESC \ n Hex. 1B 5C n Decimal 27 92 n
[Range]	$0 \leq (nL + nH \times 256) \leq 65535$ ($0 \leq nL \leq 255, 0 \leq nH \leq 255$)
[Description]	This command sets the print starting position based on the current position to $[(nL + nH \times 256) \times \text{horizontal or vertical motion unit}]$. The print starting position is moved to $(nL + nH \times 256)$ in the right direction based on the current position.

ESC a n

[Name]	Position alignment.								
[Format]	ASCII ESC a n Hex. 1B 61 n Decimal 27 97 n								
[Range]	$0 \leq n \leq 2$ Initial Value n = 0								
[Description]	This command specifies position alignment for all data in one line in standard mode, using n as follows: <table border="1" style="margin-left: 40px;"> <tr><th>n</th><th>Alignment</th></tr> <tr><td>0</td><td>Left alignment</td></tr> <tr><td>1</td><td>Center alignment</td></tr> <tr><td>2</td><td>Right alignment</td></tr> </table>	n	Alignment	0	Left alignment	1	Center alignment	2	Right alignment
n	Alignment								
0	Left alignment								
1	Center alignment								
2	Right alignment								

ESC c 3 n

[Name]	Select paper out sensor to enable at paper out signal output.																																				
[Format]	ASCII ESC c 3 n Hex. 1B 63 33 n Decimal 27 99 51 n																																				
[Range]	Specification: $0 \leq n \leq 3$ Initial Value n = 0																																				
[Description]	Selects paper out detector that outputs a paper out signal when paper has run out. <table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th>Bit</th> <th>Function</th> <th>"0"</th> <th>"1"</th> </tr> </thead> <tbody> <tr> <td>7</td> <td>Undefined</td> <td></td> <td></td> </tr> <tr> <td>6</td> <td>Undefined</td> <td></td> <td></td> </tr> <tr> <td>5</td> <td>Undefined</td> <td></td> <td></td> </tr> <tr> <td>4</td> <td>Undefined</td> <td></td> <td></td> </tr> <tr> <td>3</td> <td>Undefined</td> <td></td> <td></td> </tr> <tr> <td>2</td> <td>Undefined</td> <td></td> <td></td> </tr> <tr> <td>1</td> <td>Paper roll near end detector</td> <td>Invalid</td> <td>Valid</td> </tr> <tr> <td>0</td> <td>Paper roll near end detector</td> <td>Invalid</td> <td>Valid</td> </tr> </tbody> </table>	Bit	Function	"0"	"1"	7	Undefined			6	Undefined			5	Undefined			4	Undefined			3	Undefined			2	Undefined			1	Paper roll near end detector	Invalid	Valid	0	Paper roll near end detector	Invalid	Valid
Bit	Function	"0"	"1"																																		
7	Undefined																																				
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0	Paper roll near end detector	Invalid	Valid																																		

ESC d n

[Name]	Print and feed n lines
[Format]	ASCII ESC d n Hex. 1B 64 n Decimal 27 100 n
[Range]	$0 \leq n \leq 255$
[Description]	This command feeds the paper by n lines after printing the data in the print buffer.

ESC i


[Name]	Full cut.
[Format]	ASCII ESC i Hex. 1B 69 Decimal 27 105
[Range]	N/A
[Description]	This command executes a partial cut of the paper with one point left uncut.

ESC m

[Name]	Partial cut.
[Format]	ASCII ESC m Hex. 1B 6D Decimal 27 109
[Range]	N/A
[Description]	This command executes a partial cut of the paper with one point left uncut.

ESC p m t1 t2

[Name]	Specify pulse.
[Format]	ASCII ESC p m t1 t2 Hex. 1B 70 m t1 t2 Decimal 27 112 m t1 t2
[Range]	$0 \leq m \leq 1, 48 \leq m \leq 49$ $0 \leq t1 \leq 255$ $0 \leq t2 \leq 255$

[Description]	<p>This outputs a signal specified by t1 and t2 to the connector pin specified by m.</p> <p>Drawer kick on time is set to t1 x 2 ms; off time is set to t2 x 2 ms.</p> <table border="1" style="margin-left: auto; margin-right: auto;"> <tr> <th>m</th> <th>Connector Pin</th> </tr> <tr> <td>0, 48</td> <td>Drawer kick connector pin #2</td> </tr> <tr> <td>1, 49</td> <td>Drawer kick connector pin #5</td> </tr> </table> 	m	Connector Pin	0, 48	Drawer kick connector pin #2	1, 49	Drawer kick connector pin #5
m	Connector Pin						
0, 48	Drawer kick connector pin #2						
1, 49	Drawer kick connector pin #5						

ESC t n

[Name]	Select character code table.																				
[Format]	ASCII ESC t n Hex. 1B 74 n Decimal 27 116 n																				
[Range]	0 ≤ n ≤ 8 Initial Value n = 0																				
[Description]	This command specifies code page according to the value of n as follows: This command affects the Chinese character mode. <table border="1" style="margin-left: auto; margin-right: auto;"> <tr> <th>n</th> <th>Character set</th> </tr> <tr> <td>0</td> <td>CP-437</td> </tr> <tr> <td>1</td> <td>Katakana</td> </tr> <tr> <td>2</td> <td>CP-850</td> </tr> <tr> <td>3</td> <td>CP-852</td> </tr> <tr> <td>4</td> <td>CP-860</td> </tr> <tr> <td>5</td> <td>CP-863</td> </tr> <tr> <td>6</td> <td>CP-865</td> </tr> <tr> <td>7</td> <td>CP-1252</td> </tr> <tr> <td>8</td> <td>User Define</td> </tr> </table>	n	Character set	0	CP-437	1	Katakana	2	CP-850	3	CP-852	4	CP-860	5	CP-863	6	CP-865	7	CP-1252	8	User Define
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7	CP-1252																				
8	User Define																				

ESC { n

[Name]	Turns upside-down printing mode on/off.						
[Format]	ASCII ESC { n Hex. 1B 7B n Decimal 27 123 n						
[Range]	0 ≤ n ≤ 255 Initial Value n = 0						
[Description]	This command selects/deselects upside-down printing mode according to the least significant bit as follows. <table border="1" style="margin-left: auto; margin-right: auto;"> <tr> <th>n</th> <th>Upside-down mode</th> </tr> <tr> <td>0</td> <td>Turned off</td> </tr> <tr> <td>1</td> <td>Turned on</td> </tr> </table>	n	Upside-down mode	0	Turned off	1	Turned on
n	Upside-down mode						
0	Turned off						
1	Turned on						

FS p n m

[Name]	Print NV bit image.
[Format]	ASCII FS p n m Hex. 1C 70 n m Decimal 28 112 n m
[Range]	1 ≤ n ≤ 255 0 ≤ m ≤ 3, 48 ≤ m ≤ 51

[Description]	This command prints NV bit image n using the mode specified by m as follows:	
	m	Mode
	0, 48	Normal
	1, 49	Double-width
	2, 50	Double-height
	3, 51	Quadruple

FS q n [xL xH yL d1...dk]1...[xL xH yL d1...dk]n

[Name]	Define NV bit image.
[Format]	ASCII FS q n [xL xH yL d1...dk]1...[xL xH yL d1...dk]n Hex. 1C 71 n [xL xH yL d1...dk]1...[xL xH yL d1...dk]n Decimal 28 113 n [xL xH yL d1...dk]1...[xL xH yL d1...dk]n
[Range]	$1 \leq n \leq 255$ $1 \leq (xL + xH \times 256) \leq 54$ ($0 \leq xL \leq 54, xH=0$) for 2 inch $1 \leq (xL + xH \times 256) \leq 72$ ($0 \leq xL \leq 72, xH=0$) for 3 inch $1 \leq (yL + yH \times 256) \leq 128$ ($0 \leq yL \leq 128, yH=0$) $0 \leq d \leq 255$ $k = (xL + xH \times 256) \times (yL + yH \times 256) \times 8$
[Description]	<p>This command defines the NV bit image in the NV memory.</p> <p>n denotes the number of the NV being defined.</p> <p>(xL, xH) and (yL, yH) set the number of dots in the horizontal and vertical directions to $[(xL + xH \times 256) \times 8]$ and $[(yL + yH \times 256) \times 8]$ respectively for the NV bit image.</p> <p>[Ex.:] When $xL + xH \times 256 = 64$</p>

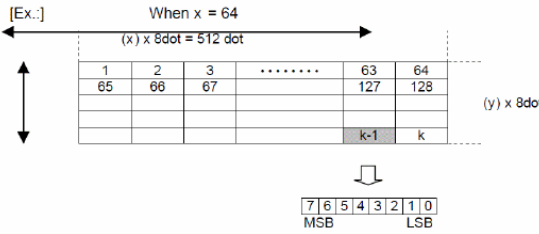
GS ! n

[Name]	Select character size.
[Format]	ASCII GS ! n Hex. 1D 21 n Decimal 29 33 n
[Range]	$0 \leq n \leq 255$ $(1 \leq \text{Vertical enlargement} \leq 8, 1 \leq \text{Horizontal enlargement} \leq 8)$ Initial Value n = 0

[Description]	<p>This command selects the character height and width using bits 0 to 3, and bits 4 to 7 respectively as follows:</p> <table border="1"> <thead> <tr> <th>Bit</th> <th>Function</th> <th>Setting</th> </tr> </thead> <tbody> <tr> <td>0</td> <td rowspan="4">Specifies the number of times normal font size in the vertical direction</td> <td rowspan="4">Refer to Table 2 [Enlarged in vertical direction]</td> </tr> <tr> <td>1</td> </tr> <tr> <td>2</td> </tr> <tr> <td>3</td> </tr> <tr> <td>4</td> <td rowspan="4">Specifies the number of times normal font size in the horizontal direction</td> <td rowspan="4">Refer to Table 1 [Enlarged in horizontal direction]</td> </tr> <tr> <td>5</td> </tr> <tr> <td>6</td> </tr> <tr> <td>7</td> </tr> </tbody> </table> <p>This command affects the Chinese characters.</p> <p>Table 1 [Enlarged in horizontal direction]</p> <table border="1"> <thead> <tr> <th>Hex</th> <th>Decimal</th> <th>Enlargement</th> </tr> </thead> <tbody> <tr> <td>00</td> <td>0</td> <td>1 time(standard)</td> </tr> <tr> <td>10</td> <td>16</td> <td>2 times</td> </tr> <tr> <td>20</td> <td>32</td> <td>3 times</td> </tr> <tr> <td>30</td> <td>48</td> <td>4 times</td> </tr> <tr> <td>40</td> <td>64</td> <td>5 times</td> </tr> <tr> <td>50</td> <td>80</td> <td>6 times</td> </tr> <tr> <td>60</td> <td>96</td> <td>7 times</td> </tr> <tr> <td>7</td> <td>112</td> <td>8 times</td> </tr> </tbody> </table> <p>Table 2 [Enlarged in vertical direction]</p> <table border="1"> <thead> <tr> <th>Hex</th> <th>Decimal</th> <th>Enlargement</th> </tr> </thead> <tbody> <tr> <td>00</td> <td>0</td> <td>1 time(standard)</td> </tr> <tr> <td>01</td> <td>1</td> <td>2 times</td> </tr> <tr> <td>02</td> <td>2</td> <td>3 times</td> </tr> <tr> <td>03</td> <td>3</td> <td>4 times</td> </tr> <tr> <td>04</td> <td>4</td> <td>5 times</td> </tr> <tr> <td>05</td> <td>5</td> <td>6 times</td> </tr> <tr> <td>06</td> <td>6</td> <td>7 times</td> </tr> <tr> <td>07</td> <td>7</td> <td>8 times</td> </tr> </tbody> </table>	Bit	Function	Setting	0	Specifies the number of times normal font size in the vertical direction	Refer to Table 2 [Enlarged in vertical direction]	1	2	3	4	Specifies the number of times normal font size in the horizontal direction	Refer to Table 1 [Enlarged in horizontal direction]	5	6	7	Hex	Decimal	Enlargement	00	0	1 time(standard)	10	16	2 times	20	32	3 times	30	48	4 times	40	64	5 times	50	80	6 times	60	96	7 times	7	112	8 times	Hex	Decimal	Enlargement	00	0	1 time(standard)	01	1	2 times	02	2	3 times	03	3	4 times	04	4	5 times	05	5	6 times	06	6	7 times	07	7	8 times
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GS * x y [d1...d(x x y x 8)]

[Name]	Define downloaded bit image.
[Format]	ASCII GS * x y [d1...d(x x y x 8)] Hex. 1D 2A x y [d1...d(x x y x 8)] Decimal 29 42 x y [d1...d(x x y x 8)]
[Range]	$1 \leq x \leq 54$ (for 2 inch) $1 \leq x \leq 72$ (for 3 inch) $1 \leq y \leq 128$ $0 \leq d \leq 255$

[Description]	<p>This command defines the downloaded bit image using the number of dots specified by x and y. x and y specify the number of dots in the horizontal and vertical directions respectively. D defines the bit image data. K denotes the number of the definition data.</p> <p>[Ex.:] </p>
---------------	---

GS (A pL pH n m

[Name]	Test print.														
[Format]	<p>ASCII GS (A pL pH n m Hex. 1D 28 41 pL pH n m Decimal 29 40 65 pL pH n m</p>														
[Range]	<p>$(pL + (pH \times 256)) = 2$ ($pL = 2, pH = 0$) $0 \leq n \leq 2$ $2 \leq m \leq 3$</p>														
[Description]	<p>Executes the specified test print.</p> <p>Specifies the parameter count following pL and pH in $(pL + (pH \times 256))$ bytes.</p> <table border="1" data-bbox="416 885 847 972"> <tr> <td>n</td> <td>Paper Type</td> </tr> <tr> <td>0</td> <td>Basic sheet (paper roll)</td> </tr> <tr> <td>1</td> <td>Paper Roll</td> </tr> <tr> <td>2</td> <td></td> </tr> </table> <p>· n specifies the paper to use in the test print shown in the tables below.</p> <table border="1" data-bbox="416 1015 847 1078"> <tr> <td>m</td> <td>Type of Test Print</td> </tr> <tr> <td>2</td> <td>Printer Status (Self Print)</td> </tr> <tr> <td>3</td> <td>Rolling Pattern Print</td> </tr> </table>	n	Paper Type	0	Basic sheet (paper roll)	1	Paper Roll	2		m	Type of Test Print	2	Printer Status (Self Print)	3	Rolling Pattern Print
n	Paper Type														
0	Basic sheet (paper roll)														
1	Paper Roll														
2															
m	Type of Test Print														
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3	Rolling Pattern Print														

GS / m

[Name]	Print downloaded bit image.
[Format]	<p>ASCII GS / m Hex. 1D 2F m Decimal 29 47 m</p>
[Range]	$0 \leq m \leq 3, 48 \leq m \leq 51$

Chapter 3 Basic Applications

[Description]	This command prints the downloaded bit image defined by GS * according to the mode denoted by m.		
	m	Mode	Vertical dot density(DPI)
	0, 48	Normal	203
	1, 49	Double-width	203
	2, 50	Double-height	101
	3, 51	Quadruple	101

GS B n

[Name]	Turns white/black reverse printing mode on / off.
[Format]	ASCII GS B n Hex. 1D 42 n Decimal 29 66 n
[Range]	0 ≤ n ≤ 255 Initial Value n = 0
[Description]	This command selects white/black reverse printing mode by setting the least significant bit of n. When the LSB of n is 0, white/black reverse mode is turned off. When the LSB of n is 1, white/black reverse mode is turned on.

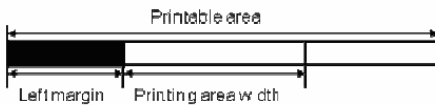
GS H n

[Name]	Select HRI character print position.										
[Format]	ASCII GS H n Hex. 1D 48 n Decimal 29 72 n										
[Range]	0 ≤ n ≤ 3, 48 ≤ n ≤ 51 Initial Value n = 0										
[Description]	Selects the printing position of HRI characters when printing bar codes.										
	<table border="1"> <thead> <tr> <th>m</th> <th>Printing Position</th> </tr> </thead> <tbody> <tr> <td>0, 48</td> <td>No print</td> </tr> <tr> <td>1, 49</td> <td>Above bar code</td> </tr> <tr> <td>2, 50</td> <td>Below bar code</td> </tr> <tr> <td>3, 51</td> <td>Above and below bar code(both)</td> </tr> </tbody> </table>	m	Printing Position	0, 48	No print	1, 49	Above bar code	2, 50	Below bar code	3, 51	Above and below bar code(both)
m	Printing Position										
0, 48	No print										
1, 49	Above bar code										
2, 50	Below bar code										
3, 51	Above and below bar code(both)										

GS I n

[Name]	Transmission of Printer ID.																											
[Format]	ASCII GS I n Hex. 1D 49 n Decimal 29 73 n																											
[Range]	1 ≤ n ≤ 3, 49 ≤ n ≤ 51, 65 ≤ n ≤ 69																											
[Description]	Selects the printing position of HRI characters when printing bar codes.																											
	<table border="1"> <thead> <tr> <th>n</th> <th>Printer ID Type</th> <th>Specifications</th> </tr> </thead> <tbody> <tr> <td>1, 49</td> <td>Model ID</td> <td>MB-1030</td> </tr> <tr> <td>2, 50</td> <td>Type ID</td> <td>1030-XX</td> </tr> <tr> <td>3, 51</td> <td>ROM Version ID</td> <td>Depends on the ROM version</td> </tr> <tr> <td>65</td> <td>Firmware Version</td> <td>Depends on the firmware version</td> </tr> <tr> <td>66</td> <td>Manufacturer Name</td> <td>MB-1030 System</td> </tr> <tr> <td>67</td> <td>Model Name</td> <td>MB-1030</td> </tr> <tr> <td>68</td> <td>Serial Number</td> <td>Depends on the serial number</td> </tr> <tr> <td>69</td> <td>Chinese Character Types</td> <td>Taiwan Language Characters: TW_BIG5 Japanese Language Characters: JP_SJIS</td> </tr> </tbody> </table>	n	Printer ID Type	Specifications	1, 49	Model ID	MB-1030	2, 50	Type ID	1030-XX	3, 51	ROM Version ID	Depends on the ROM version	65	Firmware Version	Depends on the firmware version	66	Manufacturer Name	MB-1030 System	67	Model Name	MB-1030	68	Serial Number	Depends on the serial number	69	Chinese Character Types	Taiwan Language Characters: TW_BIG5 Japanese Language Characters: JP_SJIS
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GS L nL nH

[Name]	Set left margin.
[Format]	ASCII GS L nL nH Hex. 1D 4C nL nH Decimal 29 76 nL nH
[Range]	$0 \leq nL \leq 255$, $0 \leq nH \leq 255$ ($nL + nH \times 256 = 0$ ($nL=0$, $nH=0$))
[Description]	This command sets the left margin specified to $[(nL + nH \times 256) \times (\text{horizontal motion units})]$. 

GS P x y

[Name]	Set basic calculated pitch.
[Format]	ASCII GS P x y Hex. 1D 50 x y Decimal 29 80 x y
[Range]	$0 \leq x \leq 255$ $0 \leq y \leq 255$ Initial Value $x = 203$, $y = 203$: EPSON targeted model print head 203 DPI
[Description]	Sets the horizontal basic calculated pitch to approximately 25.4/xmm [(1/x) inch], and the vertical basic calculated pitch to approximately 25.4/ymm [(1/y) inch]. $x = 0$: Returns the horizontal basic calculated pitch to its default value. $y = 0$: Returns the vertical basic calculated pitch to its default value.

GS V m

[Name]	Cut paper.										
[Format]	ASCII GS V m (n) Hex. 1D 56 m (n) Decimal 29 86 m (n)										
[Range]	$m = 0, 1, 65, 66$										
[Description]	Executes specified paper cut. <table border="1" data-bbox="412 980 1016 1145"> <thead> <tr> <th>m</th> <th>Function</th> </tr> </thead> <tbody> <tr> <td>0</td> <td>Full cut</td> </tr> <tr> <td>1</td> <td>Partial cut (one point uncut)</td> </tr> <tr> <td>65</td> <td>Feeds paper to (cutting position + [n x basic calculated pitch]) and performs a full cut</td> </tr> <tr> <td>66</td> <td>Feeds paper to (cutting position + [n x basic calculated pitch]) and performs a partial cut (one point uncut)</td> </tr> </tbody> </table>	m	Function	0	Full cut	1	Partial cut (one point uncut)	65	Feeds paper to (cutting position + [n x basic calculated pitch]) and performs a full cut	66	Feeds paper to (cutting position + [n x basic calculated pitch]) and performs a partial cut (one point uncut)
m	Function										
0	Full cut										
1	Partial cut (one point uncut)										
65	Feeds paper to (cutting position + [n x basic calculated pitch]) and performs a full cut										
66	Feeds paper to (cutting position + [n x basic calculated pitch]) and performs a partial cut (one point uncut)										

GS a n

[Name]	Enable/disable transmission of automatic status.
[Format]	ASCII GS a n Hex. 1D 61 n Decimal 29 97 n
[Range]	$0 \leq n \leq 255$

[Description]	Selects the statuses that are targeted for transmission with the automatic status function (ASB: Automatic Status Back).				
	Bit	Statuses Targeted for ASB	"0"	"1"	
	7	Black Mark Detector	Invalid	Valid	
	6	Undefined			
	5	Undefined			
	4	Undefined			
	3	Continuous Paper Detector	Invalid	Valid	
	2	Error	Invalid	Valid	
	1	ONLINE/OFFLINE Status	Invalid	Valid	
	0	Drawer kick connector pin #3	Invalid	Valid	
	The printer information transmitted is comprised of 4 bytes as follows:				
	First byte (printer information)				
	Bit	Off/On	Hex	Decimal	Function
	7	Off	00	0	Not used. Fixed to Off
	6	Off	00	0	Paper is not being fed by the paper feed button
		On	40	64	Paper is being fed by the paper feed button
	5	Off	00	0	Cover is close
		On	20	32	Cover is open
	4	On	10	16	Not used. Fixed to On
	3	Off	00	0	On-line
		On	08	8	Off-line
	2	Off	00	0	Drawer kick-out connector pin 3 is LOW
		On	04	4	Drawer kick-out connector pin 3 is HIGH
	1	Off	00	0	Not used. Fixed to Off
	0	Off	00	0	Not used. Fixed to Off
Second byte (printer information)					
Bit	Off/On	Hex	Decimal	Function	
7	Off	00	0	Not used. Fixed to Off	
6	Off	00	0	Not used. Fixed to Off	
5	Off	00	0	Not used. Fixed to Off	
4	Off	00	0	Not used. Fixed to Off	
3	On	08	8	Not used. Fixed to Off	
2	On	04	4	Not used. Fixed to Off	
1	On	02	2	Not used. Fixed to Off	
0	On	01	1	Not used. Fixed to Off	
Third byte (paper sensor information)					
Bit	Off/On	Hex	Decimal	Function	
7	Off	00	0	Not used. Fixed to Off	
6	Off	00	0	Not used. Fixed to Off	
5	Off	00	0	Not used. Fixed to Off	
4	On	00	0	Not used. Fixed to Off	
2,3	Off	00	0	Paper end sensor: paper present	
	On	0C	12	Paper end sensor: no paper present	
0,1	Off	00	0	Paper near end sensor: paper adequate	
	On	03	3	Paper near end sensor: paper near end	
Fourth byte (paper sensor information)					
Bit	Off/On	Hex	Decimal	Function	
7	Off	00	0	Not used. Fixed to Off	
6	Off	00	0	Black mark sensor status	
5	Off	00	0	Not used. Fixed to Off	
4	Off	00	0	Not used. Fixed to Off	
3	On	08	8	Not used. Fixed to On	
2	On	04	4	Not used. Fixed to On	
1	On	02	2	Not used. Fixed to On	
0	On	01	1	Not used. Fixed to On	

GS f n

[Name]	Select HRI character font.						
[Format]	ASCII GS f n Hex. 1D 66 n Decimal 29 102 n						
[Range]	n = 0,1,48,49 Initial Value n = 0						
[Description]	Selects the printing position of HRI character font when printing bar codes. <table border="1" data-bbox="416 369 731 435"> <tr> <th>n</th> <th>Font</th> </tr> <tr> <td>0, 48</td> <td>Selects Font A (12 x 24).</td> </tr> <tr> <td>1, 49</td> <td>Selects Font B (9 x 17).</td> </tr> </table>	n	Font	0, 48	Selects Font A (12 x 24).	1, 49	Selects Font B (9 x 17).
n	Font						
0, 48	Selects Font A (12 x 24).						
1, 49	Selects Font B (9 x 17).						

GS h n

[Name]	Set bar code height.
[Format]	ASCII GS h n Hex. 1D 68 n Decimal 29 104 n
[Range]	1 ≤ n ≤ 255 Initial Value n = 162
[Description]	Sets bar code height to n dots.

GS k m d1 ... dk NUL.2.gs k m n d1 ... dk

[Name]	Print bar code.
[Format]	1. ASCII GS k m d1...dk NUL Hex. 1D 6B m d1...dk NUL Decimal 29 107 m d1...dk NUL 2. ASCII GS k m n d1...dk NUL Hex. 1D 6B m n d1...dk NUL Decimal 29 107 m n d1...dk NUL
[Range]	1. 0 ≤ m ≤ 6 The definition region of k and d differ according to the bar code type. 2. 65 ≤ m ≤ 73 The definition region of n and d differ according to the bar code type.

Chapter 3 Basic Applications

[Description]	Selects bar code type and prints bar codes.		
	1:		
	m	Bar Code Type	Defined region of k
	0	UPC-A	$11 \leq k \leq 12$
	1	UPC-E	$11 \leq k \leq 12$
	2	JAN13 (EAN13)	$12 \leq k \leq 13$
	3	JAN8 (EAN8)	$7 \leq k \leq 8$
	4	CODE39	$1 \leq k \leq 255$
	5	ITF	$2 \leq k \leq 254$ (However, this is an even number.)
	6	CODABAR	$1 \leq k \leq 255$
			Defined region of d
			$48 \leq d \leq 57$
			$48 \leq d \leq 57$
			$48 \leq d \leq 57$
			$48 \leq d \leq 57$
			$48 \leq d \leq 57, 65 \leq d \leq 90$ 32, 36, 37, 43, 45, 46, 47
			$48 \leq d \leq 57$
			$48 \leq d \leq 57, 65 \leq d \leq 68$ 36, 43, 45, 46, 47, 58
	2:		
	m	Bar Code Type	Defined region of n
	65	UPC-A	$11 \leq n \leq 12$
	66	UPC-E	$11 \leq n \leq 12$
	67	JAN13 (EAN13)	$12 \leq n \leq 13$
	68	JAN8 (EAN8)	$7 \leq n \leq 8$
	69	CODE39	$1 \leq n \leq 255$
	70	ITF	$2 \leq n \leq 254$ (However, this is an even number.)
	71	CODABAR	$1 \leq n \leq 255$
			Defined region of d
			$48 \leq d \leq 57$
			$48 \leq d \leq 57$
			$48 \leq d \leq 57$
			$48 \leq d \leq 57, 65 \leq d \leq 90$ 32, 36, 37, 43, 45, 46, 47
			$48 \leq d \leq 57$
			$48 \leq d \leq 57, 65 \leq d \leq 68$ 36, 43, 45, 46, 47, 58
	72	CODE93	$1 \leq n \leq 255$
			$0 \leq d \leq 127$
	73	CODE128	$2 \leq n \leq 255$
			$0 \leq d \leq 127$

GS r n

[Name]	Transmission of status.
[Format]	ASCII GS r n Hex. 1D 72 n Decimal 29 114 n
[Range]	n = 1, 2

GS w n

[Name]	Set bar code horizontal size.		
[Format]	ASCII GS w n Hex. 1D 77 n Decimal 29 119 n		
[Range]	1 ≤ n ≤ 6 Initial Value n = 2		
[Description]	Sets the bar code horizontal size.		
	n	Multi-level Bar Code Module Width [mm]	Binary Level Bar Code Fine Element Width[mm] Thick Element Width[mm]
	1	0.141	0.141 0.423
	2	0.282	0.282 0.706
	3	0.423	0.423 1.129
	4	0.564	0.564 1.411
	5	0.706	0.706 1.834
	6	0.847	0.847 2.258

4. KANJI CONTROL COMMAND DETAILS

FS ! n

[Name]	Batch specify Chinese character print mode.		
[Format]	ASCII GS ! n Hex. 1C 21 n Decimal 28 33 n		
[Range]	0 ≤ n ≤ 255 Initial Value n = 0		
[Description]	Batch specifies the Chinese character print mode. This command affects all characters.		
	Bit	Function	"0" "1"
	7	Underline	Off On
	6	Undefined	
	5	Undefined	
	4	Undefined	
	3	Double tall expanded	Off On
	2	Expanded wide	Off On
	1	Undefined	
	0	Undefined	

FS &

[Name]	Specify Chinese character mode.		
[Format]	ASCII GS & Hex. 1C 26 Decimal 28 38		
[Range]	N/A		
[Description]	Specifies Chinese characters mode. This command affects the character code table.		

FS .

[Name]	Cancel Chinese character mode.		
[Format]	ASCII GS . Hex. 1C 2E Decimal 28 46		
[Range]	N/A		
[Description]	Cancels Chinese characters mode. This command affects the character code table, it is set to the initial value (CP-437).		

3-2-1-1. Character Code Table

ESC/POS Standard Codes

Katakana

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
	0123456789ABCDEF															
0																
1																
2	!"#\$%&'()*+,-./															
3	0123456789:;<=>?															
4	@ABCDEFGHIJKLMNO															
5	PQRSTUVWXYZ[\]^_															
6	`abcdefghijklmnopq															
7	rstuvwxyz{ }~															
8	▀ ▁ ▂ ▃ ▄ ▅ ▆ ▇ █ ▉															
9	␣ ␣ ␣ ␣ ␣ ␣ ␣ ␣ ␣															
A	。 「 」 、 ・ フ アイ ウ エ オ ヤ ヲ ヱ ツ															
B	ー ア イ ウ エ オ カ キ ク ケ コ サ シ ス セ ツ															
C	タ チ ツ テ ト ナ ニ ヌ ネ ノ ハ ヒ フ ヘ ホ マ															
D	ミ ム メ モ ヤ ヲ ヱ ヲ ヱ ヲ ヱ ヲ ヱ															
E	≡ 田 ▲ ▼ ♠ ♣ ♠ ♣ ○ ○ ^															
F	X 年 月 日 時 分 秒 市 区 町 村 人															

Notes: The character code tables show only character configurations. They do not show actual print pattern.

CP437

```

0123456789ABCDEF
0
1
2 !"#$%&'()*+,-./
3 0123456789:;<=>?
4 @ABCDEFGHIJKLMNO
5 PQRSTUVWXYZ[\]^_
6 `abcdefghijklmno
7 pqrstuvwxyz{|}~
8 ÇüéääåçêëèìíîËÄ
9 ÈæÆóöüÿöÜø£¥µ¶f
A áíóúñÑáò¿¬½¾¿i«»
B
C
D
E αβΓπσµτφθΩδωφεη
F ≡±><|j÷≈°·√n²■
    
```

CP737

```

0123456789ABCDEF
0
1
2 !"#$%&'()*+,-./
3 0123456789:;<=>?
4 @ABCDEFGHIJKLMNO
5 PQRSTUVWXYZ[\]^_
6 `abcdefghijklmno
7 pqrstuvwxyz{|}~
8 ΑΒΓΔΕΖΗΘΙΚΛΜΝΞΟΠ
9 ΡΣΤΥΦΧΨΩαβγδεζηθ
A ικλμνξοπρστυφχψ
B
C
D
E ωάέήϊίϊούύώΆΈΗΊΌΥ
F Ω±><ϊÿ÷≈°·√n²■
    
```

CP850

```

0 123456789ABCDEF
1
2  !"#$%&'()*+,-./
3  0123456789:;<=>?
4  @ABCDEFGHIJKLMNO
5  PQRSTUVWXYZ[\]^_
6  `abcdefghijklmno
7  pqrstuvwxyz{|}~
8  ÇüéääåçèëîïïÄÅ
9  ÈæŒôöüÿÛÜøŁØ×ƒ
A  áíóúñÑãø¿®-½¼½i«»
B  ▒|ÁÂÃÄÅ| | | | | | | | | |
C  | | | | | | | | | | | | | | |
D  ðÐÉÊËÌÍÎÏ | | | | | | | |
E  ÔÕÖØðöµþÞÚÛÜÝŸ
F  -±=¼½§÷, °´´´.132 ■
    
```

CP852

```

0 123456789ABCDEF
1
2  !"#$%&'()*+,-./
3  0123456789:;<=>?
4  @ABCDEFGHIJKLMNO
5  PQRSTUVWXYZ[\]^_
6  `abcdefghijklmno
7  pqrstuvwxyz{|}~
8  ÇüéääüççłëöôižĀĆ
9  ĘŁÍôöLİŚśŮŮŤł×č
A  áíóúĄążŻĘę žĆš«»
B  ▒|ÁÂĘŚ| | | | | | | | | |
C  | | | | | | | | | | | | | | |
D  ðÐĘđNĪĪė | | | | | | | |
E  ŌŌŃńŃśŖŮŮŸŸŧ
F  -´´´´´š÷, °´´´´ ŮŖř ■
    
```

CP857

0123456789ABCDEF
0
1
2 !"#\$%&'()*+,-./
3 0123456789:;<=>?
4 @ABCDEFGHIJKLMNO
5 PQRSTUVWXYZ[\]^_
6 `abcdefghijklmno
7 pqrstuvwxyz{|}~
8 ÇüéáãäåçêëèíîïËÄ
9 ÈÆŒôöøùüÏÖÜøƒØŞş
A áíóúñÑĠġĴ@-½¼ı«»
B
C
D
E
F

CP860

0123456789ABCDEF
0
1
2 !"#\$%&'()*+,-./
3 0123456789:;<=>?
4 @ABCDEFGHIJKLMNO
5 PQRSTUVWXYZ[\]^_
6 `abcdefghijklmno
7 pqrstuvwxyz{|}~
8 ÇüéáãäåĀçēĒēİŌİĀĀ
9 ĒĀĒôôöŪŪİŌŪƒĒŪŌ
A áíóúñÑāāōōō-½¼ı«»
B
C
D
E
F

CP865

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
			!"#\$%&'()*+,-./													
			0123456789:;<=>?													
			@ABCDEFGHIJKLMNO													
			PQRSTUVWXYZ[\]^_													
			`abcdefghijklmno													
			pqrstuvwxyz{ }~													
			ÇüéääåçêëèìíîËÄ													
			ÈæŒöøùúÿÜÖøŁØƒ													
			áíóúñÑαζι-¼½¾i«»													
			▀ ▁ ▂ ▃ ▄ ▅ ▆ ▇ █ ▉ ▊ ▋ ▌ ▍ ▎ ▏ ▐ ░ ▒ ▓ ▔ ▕ ▖ ▗ ▘ ▙ ▚ ▛ ▜ ▝ ▞ ▟ ■ □ ▢ ▣ ▤ ▥ ▦ ▧ ▨ ▩													
			αβγπσμτφθΩδωφεη													
			≡ ± ≤ ≥ ∫ ∓ ∘ ∙ √ n² ■													

CP866

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
			!"#\$%&'()*+,-./													
			0123456789:;<=>?													
			@ABCDEFGHIJKLMNO													
			PQRSTUVWXYZ[\]^_													
			`abcdefghijklmno													
			pqrstuvwxyz{ }~													
			АБВГДЕЖЗИЙКЛМНОП													
			РСТУФХЦЧШЩЬЫЬЭЮЯ													
			абвгдежзийклмноп													
			▀ ▁ ▂ ▃ ▄ ▅ ▆ ▇ █ ▉ ▊ ▋ ▌ ▍ ▎ ▏ ▐ ░ ▒ ▓ ▔ ▕ ▖ ▗ ▘ ▙ ▚ ▛ ▜ ▝ ▞ ▟ ■ □ ▢ ▣ ▤ ▥ ▦ ▧ ▨ ▩													
			рстуфхцчшщьюьэя													
			ЁёЕе ЇїУу ° ∙ √ № ■													

CP1252

	0123456789ABCDEF
0	
1	
2	!"#\$%&'()*+,-./
3	0123456789:;<=>?
4	@ABCDEFGHIJKLMNO
5	PQRSTUVWXYZ[\]^_
6	`abcdefghijklmno
7	pqrstuvwxyz{ }~
8	€ ‚ƒ „… † ‡ § ‹ ¤ Ž
9	• -- ~ ™ š › ® ž Ÿ
A	ı Œ œ ¥ ¦ § ¨ © ª « ¬ ® ¯
B	° ± ² ³ ´ µ ¶ · ¸ ¹ º » ¼ ½ ¾
C	À Á Â Ã Ä Å Æ Ç È É Ê Ë Ì Í Î
D	Ï Ñ Ò Ó Ô Õ Ö × Ø Ù Ú Û Ü Ý Þ
E	à á â ã ä å æ ç è é ê ë ì í î
F	ñ ò ó ô õ ö ÷ ø ù ú û ý þ ÿ

CP1253

	0123456789ABCDEF
0	
1	
2	!"#\$%&'()*+,-./
3	0123456789:;<=>?
4	@ABCDEFGHIJKLMNO
5	PQRSTUVWXYZ[\]^_
6	`abcdefghijklmno
7	pqrstuvwxyz{ }~
8	€ ‚ƒ „… † ‡ § ‹
9	• -- ™ š ›
A	ı Œ œ ¥ ¦ § ¨ © « ¬ ® ¯
B	° ± ² ³ ´ µ ¶ · ¸ ¹ º » ¼ ½ ¾
C	Α Β Γ Δ Ε Ζ Η Θ Ι Κ Λ Μ Ν Ξ Ο
D	Π Ρ Σ Τ Υ Φ Ψ Ω Ϊ Ϋ ἀ β γ δ ε ζ η θ ι κ λ μ ν ξ ο
E	ϐ ϑ ϒ ϓ ϔ ϕ ϗ Ϙ ϙ Ϡ ϡ Ϣ ϣ Ϥ ϥ Ϧ ϧ Ϩ ϩ Ϫ ϫ Ϭ ϭ Ϯ ϯ ϰ ϱ ϲ ϳ ϴ ϵ ϶ Ϸ ϸ Ϲ Ϻ ϻ ϼ Ͻ Ͼ Ͽ Ͽ
F	π ρ σ τ υ φ χ ψ ω ι υ ο ω

International Characters

	23	24	40	5B	5C	5D	5E	60	7B	7C	7D	7E
U.S.A	#	\$	@	[\]	^	`	{		}	~
France	#	\$	à	°	ç	ù	^	`	é	ü	è	~
Germany	#	\$	ä	Ä	ö	ü	^	`	ä	ö	ü	~
UK	£	\$	@	[\]	^	`	{		}	~
Denmark I	#	\$	@	Æ	Ø	Å	^	`	æ	ø	å	~
Swden	#	¤	É	Ä	Ö	Å	Ü	é	ä	ö	å	ü
Italy	#	\$	È	°	\	é	è	ù	ä	ö	è	ì
Spain	Pt	\$	@	i	Ñ	¿	^	`	ä	ö	ñ	~
Japan	#	\$	@	[¥]	^	`	{		}	~
Norway	#	¤	È	Æ	Ø	Å	Ü	é	æ	ø	å	ü
Denmark II	#	\$	È	Æ	Ø	Å	Ü	é	æ	ø	å	ü
Spain II	#	\$	à	i	Ñ	¿	é	è	í	ñ	ó	ú
Latin America	#	\$	à	i	Ñ	¿	é	è	í	ñ	ó	ú
Korea	#	\$	@	[\]	^	`	{		}	~
Russia	#	\$	@	[\]	^	`	{		}	~
Slavonic	#	\$	@	[\]	^	`	{		}	~

3-2-1-2. Japanese Language Codes (Shift-JIS Codes)

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
8140		、	。	、	、	、	、	、	、	、	、	、	、	、	、	、
8150	一	、	、	、	、	、	、	、	、	、	、	、	、	、	、	、
8160	~			...	"	"	"	"	"	"	"	"	"	"	"	"
8170	}	◇	《	》	「	」	『	』	【	】	+	-	±	x		
8180	+	=	≠	<	>	≤	≥	∞	.	:	∞	.	:	∞	.	:
8190	\$	¢	£	%	#	&	*	@	§	☆	★	○	●	◎	◇	◆
81A0	□	■	△	▲	▽	▼	※	〒	→	←	↑	↓	＝			
81B0									ε	≡	ε	≡	ε	≡	ε	≡
81C0									Λ	∇	↗	⇒	⇔	∨	∃	
81D0									∠	⊥	∧	∅	∇	≡		
81E0									≡	≡	≡	≡	≡	≡	≡	≡
81F0	Å	%	#	♭	♯	†	‡	¶								○

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
8240																0
8250	1	2	3	4	5	6	7	8	9							
8260	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P
8270	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					あ
82A0	あ	い	う	え	お	か	が	き	く	け	こ	さ	し	じ	す	ず
82B0	げ	こ	ご	さ	ざ	し	じ	ず	ぜ	そ	ぞ	た	だ	ち		
82C0	ぢ	っ	つ	づ	て	で	と	ど	な	に	ぬ	ね	の	は	ば	ば
82D0	ひ	び	ふ	ぶ	へ	べ	ほ	ぼ	ま	み	む	め				
82E0	も	や	ゆ	ゆ	よ	ら	り	る	れ	ろ	わ	わ	ゑ			
82F0	を	ん														

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
8340	ア	アイ	ウ	エ	エ	オ	カ	ガ	キ	ク	ク					
8350	ケ	ゲ	コ	ゴ	サ	ザ	シ	ジ	ス	ズ	セ	ゼ	ソ	タ		
8360	チ	ツ	ツ	テ	ド	ド	ナ	ニ	ヌ	ノ	ハ	バ				
8370	パ	ヒ	ビ	フ	ブ	フ	ヘ	ベ	ホ	ボ	ポ	ミ				
8380	ム	メ	モ	ヤ	ユ	ユ	ヨ	ラ	リ	ル	ロ	ワ				
8390	キ	ア	ラ	ン	ヴ	カ										A
83A0	Β	Γ	Δ	Ε	Ζ	Η	Θ	Ι	Κ	Λ	Μ	Ν	Ξ	Ο	Π	Ρ
83B0	Σ	Τ	Υ	Φ	Χ	Ψ	Ω									α
83C0	β	γ	δ	ε	ζ	η	θ	ι	κ	λ	μ	ν	ξ	ο	π	ρ
83D0	σ	τ	υ	φ	χ	ψ	ω									
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8440	А	Б	В	Г	Д	Е	Е	Ж	З	И	Й	К	Л	М	Н	О
8450	П	Р	С	Т	У	Ф	Х	Ц	Ч	Ш	Щ	Ъ	Ы	Ь	Э	Ю
8460	Я															
8470	а	б	в	г	д	е	ё	ж	з	и	й	к	л	м	н	
8480	о	п	р	с	т	у	ф	х	ц	ч	ш	щ	ъ	ы	ь	э
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8940 院陰隱韻吋右宇烏羽迂雨卯鶉窺丑確
8950 白濁噓唄蔚蔚縵姥麻浦瓜閩嘜云運雲
8960 荏解飲宮嬰影映曳榮永泳洩瑛盈穎穎
8970 英術詠銳液疫益厭悅謁越閩榎厭凹
8980 園壘奪宴延怨掩援沿濱炎焰煙燕猿緣
8990 艷苑園遠鉛篇塩於汚甥凹央奧往庀押
89A0 旺橫歐毆王翁揆鶯鷗黃岡冲荻儻屋憶
89B0 臆桶壯乙掩卸恩溫穩音下化復何伽伽
89C0 佳加可嘉夏嫁家寡科暇果架歌河火珂
89D0 禍禾稼箇花苟茄荷華菓蝦課嘩貨迦過
89E0 霞蚊俄峨我牙画臥芽蟻賀雅鐵駕介会
89F0 解回塊壞迴快怪悔恢懷戒拐改

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8B40 機掃殺氣汽畿祈季稀紀徽規記貴起軌
8B50 輝飢騎鬼龜雋儀妓宜戲技擬欺犧疑祇
8B60 義蟻誼議掬菊鞠吉吃喫桔橘詰砧杵黍
8B70 却客脚虐逆斤久仇休及吸宮弓急救
8B80 朽求汲泣灸球究窮筴級糾給旧牛去居
8B90 巨拒拋拳渠虛許距鋸漁鰈魚亨亨京供
8BA0 俠僑兇競共凶協匡卿叫喬境峽強疆怯
8BB0 恐恭挾教橋況狂狹矯胸膏興齋鄉鎔鑿
8BC0 饜驚仰凝堯曉業局曲極玉桐杆僅勤均
8BD0 巾錦斤欣欽琴禁禽筋緊芹菌衿襟謹近
8BE0 金吟銀九俱句区狗玖矩苦驅駁駟駒具
8BF0 愚虞喰空偶寓遇隅串擲釧屑屈

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啞娃阿哀愛挨始逢葵茜穉惹握渥旭草
芦鱗梓庄幹扱宛姐虻鮪綯黏貼或粟裕
安庵按暗案闇鞍杏以伊位依偉囿夷委
威尉惟意慰易椅為畏異移維緯肯萎衣
謂違逡医井亥域育郁磯一壹溢溢稻茨
芋鱗允印咽員因姻引飲淫胤蔭

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魁晦械海灰界皆繪芥蟹開階貝凱劬外
咳害崖慨概涯碼藝街該鎧骸運馨蛙垣
柿斲鈎劃嚇各廡拈攪格核殼獲穫穫覽
角赫較郭閣隔革学岳染額顎掛笠檉
樞捩繳瀉割喝恰括活滑滑葛褐轄且鯉
叶花樺鮑株兜冕蒲釜鏽啣鴨栢茅莖粥
刈刈瓦乾侃冠寒刊勸勸卷喚堪姦完官
寬干幹患感憤憾換敢柑柜棺款款汗漢
澗灌環甘監看竿管簡緩任翰肝艦莞觀
諫賞鑑鑑間閑閑陷韓館館丸含岸巖玩
癩巖岩既儼雁頑頑願企伎危噐器基奇
嬉寄岐希幾忌揮机旗既期楨棗

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掘窟沓靴營窪熊隈桑粟綠桑鏃歎君薰
訓群軍郡卦袂祁係傾兄啓圭珪型契
形徑患慶慧懸揭携敬景桂浞哇稽系經
繼繫繫莖荊蚩計詣警輕頸鷄芸迎鯨
劇戟擊激隙桁傑欠決潔穴結血訣月件
俟倦健兼券劍喧圈堅嫌建憲懸拳捲檢
權牽犬獻研硯絹臬肩見謙翼軒遣鍵險
頭驗驗元原殿幻弦滅源玄現絃絃言諺
限乎個古呼回姑孤己庫弧戶故枯湖狐
糊袴股胡孤虎誇跨鈔履顧鼓五互伍午
吳吾娛後御悟梧橋瑚甚語謨護餒乞鯉
交佼侯候倂光公功效勾厚口向

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8D40 后喉坑垢好孔孝宏工巧巷幸庚庾康弘
8D50 恒慌抗拘控攻昂晃更航校稷構江洪浩
8D60 港溝甲皇硬稿糠紅紘絞網拼考肖肱腔
8D70 膏航荒行衡講真購郊餅鈇硃鋼閤降
8D80 項香高鴻剛劫苟合壕拷濠豪轟趨克刻
8D90 告國穀酷鵠黑獄漁腰靛忽惚苟狃込此
8DA0 頃今困坤壘婚恨懇昏昆根梱混痕紺良
8DB0 魂些佐又峻嵯左差查沙瑳砂詐鎖裝坐
8DC0 座挫債催再最哉賽婁宰彰才採栽歲濟
8DD0 災采犀碎砦祭齋細菜栽載際劑在材罪
8DE0 財呀坂阪堺裨肴咲崎崎崎驚作削咋搾
8DF0 昨朔柵窄策索錯襞絳邑匙冊刷

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8E40 察撈撮擦札殺薩雜阜臍捌鑄絞皿晒三
8E50 傘參山慘撒散棧燦珊產算纂蚕讚贊酸
8E60 齏斬舊殘仕仔伺使刺司史嗣四士始姉
8E70 姿子屍市師志思指支攴攵斯施旨枝止
8E80 死氏獅祉私系紙紫肢脂至視詞詩試誌
8E90 諮資賜雌飼齒事似侍兒字寺慈持時次
8EA0 滋治爾靈痔礫示而耳目時辟夕鹿式識
8EB0 鳴竺軸穴零七叱執失嫉室悉湿漆疾質
8EC0 突葩篠偃柴芝屢蕊縞舍写射捨赦斜煮
8ED0 杜紗老謝車遮蛇邪借勺尺杓灼爵酌積
8EE0 錫若寂弱焘主取守手朱殊狩殊種腫趣
8EF0 酒首儒受呢壽授樹綬囹囚収周

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8F40 宗就州修愁拾洲秀秋終繡習吳舟蕘衆
8F50 襲讐蹴輯迺迺酉酬集醜什住充十從戎柔
8F60 汁泐獸縱重銜叔夙宿淑祝縮肅塾熟出
8F70 術述俊峻春暎竣舜駿准循苟桶殉淳
8F80 準潤盾純巡逦醇順処初所暑囑渚庶緒
8F90 署書署諸助叙女序徐恕鋤除傷償勝
8FA0 匠升召哨商唱譽娶妾媾宵將少尚庄
8FB0 床廠彰承抄招掌捷昇昌昭晶松梢樟樵
8FC0 沼消涉湘燒焦照症省硝礁祥称草笑粧
8FD0 紹肖莠蔣蘅蕪裳訟証詔詳象賞醬鉦鍾
8FE0 鐘障鞘上丈丞乘冗刺城場壤嬢常情擾
8FF0 彙杖淨狀壹穰蒸讓讓錠囑堊飾

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9040 拭植殖燭織職色蝕食蝕辱尻伸信侵唇
9050 娠寢審心慎振新晉森森浸深申疹真神
9060 秦紳臣苾薪親診身辛進計震人仁刃塵
9070 壬尋甚昆胃訊訊陣鞫鞫鞫須許凶厨
9080 逗吹垂帥推水炊匪粹粹衰遂餅餅鍾隨
9090 瑞髓崇嵩數枢趨難据杉梏營頗雀澄澄
90A0 摺寸世濼啟是凄制勢牲征牲成政整星
90B0 晴棲栖正清牲生盛精聖聲製西誠誓請
90C0 逝醒青靜齊稅脆隻席憎咸斥昔析石積
90D0 籍籍青貢赤跡蹟碩切拙接撰折設劬劬
90E0 說雪絕舌蟬仙先千占宣專尖川戰扇撰
90F0 栓柗泉淺洗染染煎煎旋旋穿箭線

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9140 織羨腺舛船薦詮踐踐選選錢錢閃鮮前
9150 善漸然全禪繼膳輝增塑咀措會曾楚狙
9160 疏疎礎祖租租素組蘇訴阻遡鼠僧創双
9170 叢倉喪壯奏爽宋屠匠惣想搜掃掃搔
9180 操早曹巢檣槽漕燥争瘻相窓糈綜綜聰
9190 草苳荳藻裝走送遺鎗霜騷像增憎憎臟
91A0 蕘膾造促側則即息捉束測足速俗厲賊
91B0 族統卒袖具掬存孫尊損村遜他多太太
91C0 佗唾墮妥惰打柁舵椅陀駝駝堆堆对耐
91D0 佻帶待怠態戴替泰滯胎腿苔袋貸退逮
91E0 隊黛鯛代台大第醒題鷹淹瀧卓啄宅托
91F0 扞拓沃濯琢託譚濁諾苴夙峭只

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9240 叩但達辰奪脫筭豎迥棚谷狸糈樽誰丹
9250 卑喚坦坦坦探旦款淡濃炭短端單純耽
9260 蛋誕鍛团壇彈斷暖檀段男談偵知地弛
9270 恥智池痴稚置致蚩遲馳樂畜竹筑蓄
9280 逐秩壘茶嬌着中仲宙虫抽屛柱注虫衷
9290 註討鑄駐樽豬猪芋著貯丁兆凋蝶龍帖
92A0 帳巾韦張彰徵徽挑暢朝潮暎叨眺聽脹
92B0 腸蝶調調超跳跳長頂勳勒抄直朕沈珍
92C0 賃鎮陳津墜樵槌追鎗痛通塚樽榭榭佃
92D0 漬柘辻鷺綴鐳椿潰坪壺孀袖爪吊釣鶴
92E0 亭低停偵刺貞貞堤定帝底庭廷弟悌抵
92F0 挺提梯汀碇禛禛締緹訂諦蹄遁

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9340 邱鄧釘鼎泥搗擢敵滴的笛適瀉溺哲徹
 9350 撤撤迭鉄與填天展店添纏甜貼軫顛点
 9360 佗殿滅田電兔吐堵塗妬屠徒斗杜渡登
 9370 菟賭途都鍍砥砥努度士奴怒倒党冬
 9380 凍刀唐塔塘套宕島嶋悼投搭東桃拷棟
 9390 盜淘湯燙灯燈当痘禱等答筒禱統到董
 93A0 蕩藤討膳豆踏逃透鐘陶頭騰鬪働動同
 93B0 堂導幢撞洞瞳童胴筍道銅峠嶋匿得德
 93C0 沛特誓禿鶯鴛獨誅柝樛凸突楸屈蒿芒
 93D0 寅西潯噸屯敦敦沌豚遁頓吞曇鈍奈那
 93E0 內乍夙薜謎灘捺鍋樞劇緯驟南楠軟難
 93F0 汝二尼忒迺勾脈肉缸廿日乳入

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9540 鼻佟痺匹疋髯彥膝裝肘弼必畢筆逼桧
 9550 姪媛紐百謬儀彪樵水漁瓢粟表評豹廟
 9560 描病秒苗鏹鈺蒜蝱轄品彬斌瀕貧寶
 9570 頻敏瓶不付埠夫婦當富布府怖扶敷
 9580 斧普浮父符腐膚芙諧負賦赴阜附侮撫
 9590 武舞葡無部封楓風營蓍伏副復幅服福
 95A0 腹復覆淵弗弘沸仏物緡分吻噴噴憤份
 95B0 焚奮粉糞紛秀文聞丙併兵摒幣平弊柄
 95C0 並蔽閉陞米頁僻壁癖碧別營蔑篋偏菱
 95D0 片篇編辺返運便勉婉弁鞭保鋪鋪圍捕
 95E0 步甫輔輔穗募蔓慕戎暮母簿菩做俸包
 95F0 呆報奉宝峰峯崩抱抱捧放方朋

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9740 諭諭唯佑優勇友宥幽悠憂揖有袖湧涌
 9750 猶猷由祐裕誘遊邑郵雄融夕予余与譽
 9760 與預備幼妖容庸揚擺擺曜楊樣洋溶溶
 9770 與窠羊耀孽蓉要謠躡暹陽養慾抑欲
 9780 沃浴翌翼淀羅蝶裸來萊賴雷洛洛酪酪
 9790 乱夙嵐欄濫藍蘭覽利吏履李梨理璃璃
 97A0 裏裡里離陸律率立律掠略劉流溜琉留
 97B0 硫拉陸韋龍侶慮旅虜了亮僚兩凌寮寮
 97C0 梁涼嶺療瞭稜稷良涼涼量陵領力綠倫
 97D0 厘淋淋琳臨臨隣麟麟璿璿璽滌霖類令
 97E0 伶伶冷勵嶺伶伶禮鈴鈴隸隸零靈麗齡曆
 97F0 歷列劣烈裂廉廉戀憐憐漣漣簾練練

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9440 如尿管妊妊忍認濡襦祢寧窳猫熬年念
 9450 捻燃燃粘乃迺之焚囊惱濃納能腦膿農
 9460 颯蚤巴把播霸把波派豈破婆芭芭馬俳
 9470 糜拜排敗杯盃牌背肺輩配倍培煤梅
 9480 模煤猥買壳陪陪這蠅秤矧萩伯剝博拍
 9490 柏泊白箔柏泊薄迫曝曝爆縛莫駭麥函
 94A0 箱俗箸箸箸檣檣肌烟扇八鉢澆瓮醜髮
 94B0 伐罰拔筏筏閱鳩鳩鳩給隼伴判半反叛帆
 94C0 搬斑斑汜汎汎犯班畔畔繁般蕃版範米煩
 94D0 煩飯飯晚晚番盤盤蕃蠻匪卒否妃此彼悲
 94E0 扉批披斐斐比泌疲皮秘秘緋罷肥被誹費
 94F0 避非飛飛簸簸備尾微批毘毘眉美

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9640 法泡烹飽飽胞芳萌蓬蠶褒訪豐邦鋒飽
 9650 鳳鵬之亡傍劊坊妨帽忘忙房暴望某棒
 9660 冒紡紡紡諷謀貌貿錚防吠頰北僕卜墨撲
 9670 朴牧穆穆鉤勃勃勃殆崛崛奔本翻凡盆
 9680 摩磨磨麻埋妹妹枚每哩禎幕羨枕鮪枉
 9690 縛縛亦僕亦抹沫沫迄促爾爾万慢滿漫
 96A0 蔓味未魅已其岬密蜜蜜湊蔓稔脈妙耗民
 96B0 眠務夢無牟矛霧鴉掠掠娘冥名命明盟
 96C0 迷銘鳴姪牝滅減免棉綿緬面麵麵摸茂妄
 96D0 孟毛猛盲網耗蒙儲木黠目奎勿餅尤戾
 96E0 初崑崑悶悶紋門鬥也治夜爺耶野弥矢厄
 96F0 役約藥詛詛驪驪柳數鐘愉愈油瘡

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

9840 蓮連練呂魯櫛炉路路露勞雲廊弄朗樓
 9850 榔浪瀟牢狼籠老贅蠟郎六鑪祿肋錄論
 9860 倭和話歪賄賄惑杵驚瓦巨髒詫藁薇薇
 9870 灣碗碗
 9880
 9890 式
 98A0 丐丕个丩、并、丿又乖乘亂丿豫爭舒式
 98B0 于亞亞一亢京臺豐从仍仄仆仗仗仗仍
 98C0 仟价伉仗估佛向佗佗佗佗佗佗佗佗佗
 98D0 佻佻佻佻佻佻佻佻佻佻佻佻佻佻佻佻
 98E0 偈偈偈偈偈偈偈偈偈偈偈偈偈偈偈
 98F0 會偈偈偈偈偈偈偈偈偈偈偈偈偈偈

3-2-1-3. Traditional Chinese Language Codes

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
A140		ˆ	˘	˙	˚	˛	˜	˝	˞	˟	ˠ	ˡ	ˢ	ˣ	ˤ	˥
A150		ˆ	˘	˙	˚	˛	˜	˝	˞	˟	ˠ	ˡ	ˢ	ˣ	ˤ	˥
A160		ˆ	˘	˙	˚	˛	˜	˝	˞	˟	ˠ	ˡ	ˢ	ˣ	ˤ	˥
A170		ˆ	˘	˙	˚	˛	˜	˝	˞	˟	ˠ	ˡ	ˢ	ˣ	ˤ	˥
A180		ˆ	˘	˙	˚	˛	˜	˝	˞	˟	ˠ	ˡ	ˢ	ˣ	ˤ	˥
A190		ˆ	˘	˙	˚	˛	˜	˝	˞	˟	ˠ	ˡ	ˢ	ˣ	ˤ	˥
A1A0		ˆ	˘	˙	˚	˛	˜	˝	˞	˟	ˠ	ˡ	ˢ	ˣ	ˤ	˥
A1B0		ˆ	˘	˙	˚	˛	˜	˝	˞	˟	ˠ	ˡ	ˢ	ˣ	ˤ	˥
A1C0		ˆ	˘	˙	˚	˛	˜	˝	˞	˟	ˠ	ˡ	ˢ	ˣ	ˤ	˥
A1D0		ˆ	˘	˙	˚	˛	˜	˝	˞	˟	ˠ	ˡ	ˢ	ˣ	ˤ	˥
A1E0		ˆ	˘	˙	˚	˛	˜	˝	˞	˟	ˠ	ˡ	ˢ	ˣ	ˤ	˥
A1F0		ˆ	˘	˙	˚	˛	˜	˝	˞	˟	ˠ	ˡ	ˢ	ˣ	ˤ	˥

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
A240		ˆ	˘	˙	˚	˛	˜	˝	˞	˟	ˠ	ˡ	ˢ	ˣ	ˤ	˥
A250		ˆ	˘	˙	˚	˛	˜	˝	˞	˟	ˠ	ˡ	ˢ	ˣ	ˤ	˥
A260		ˆ	˘	˙	˚	˛	˜	˝	˞	˟	ˠ	ˡ	ˢ	ˣ	ˤ	˥
A270		ˆ	˘	˙	˚	˛	˜	˝	˞	˟	ˠ	ˡ	ˢ	ˣ	ˤ	˥
A280		ˆ	˘	˙	˚	˛	˜	˝	˞	˟	ˠ	ˡ	ˢ	ˣ	ˤ	˥
A290		ˆ	˘	˙	˚	˛	˜	˝	˞	˟	ˠ	ˡ	ˢ	ˣ	ˤ	˥
A2A0		ˆ	˘	˙	˚	˛	˜	˝	˞	˟	ˠ	ˡ	ˢ	ˣ	ˤ	˥
A2B0		ˆ	˘	˙	˚	˛	˜	˝	˞	˟	ˠ	ˡ	ˢ	ˣ	ˤ	˥
A2C0		ˆ	˘	˙	˚	˛	˜	˝	˞	˟	ˠ	ˡ	ˢ	ˣ	ˤ	˥
A2D0		ˆ	˘	˙	˚	˛	˜	˝	˞	˟	ˠ	ˡ	ˢ	ˣ	ˤ	˥
A2E0		ˆ	˘	˙	˚	˛	˜	˝	˞	˟	ˠ	ˡ	ˢ	ˣ	ˤ	˥
A2F0		ˆ	˘	˙	˚	˛	˜	˝	˞	˟	ˠ	ˡ	ˢ	ˣ	ˤ	˥

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
A340		ˆ	˘	˙	˚	˛	˜	˝	˞	˟	ˠ	ˡ	ˢ	ˣ	ˤ	˥
A350		ˆ	˘	˙	˚	˛	˜	˝	˞	˟	ˠ	ˡ	ˢ	ˣ	ˤ	˥
A360		ˆ	˘	˙	˚	˛	˜	˝	˞	˟	ˠ	ˡ	ˢ	ˣ	ˤ	˥
A370		ˆ	˘	˙	˚	˛	˜	˝	˞	˟	ˠ	ˡ	ˢ	ˣ	ˤ	˥
A380		ˆ	˘	˙	˚	˛	˜	˝	˞	˟	ˠ	ˡ	ˢ	ˣ	ˤ	˥
A390		ˆ	˘	˙	˚	˛	˜	˝	˞	˟	ˠ	ˡ	ˢ	ˣ	ˤ	˥
A3A0		ˆ	˘	˙	˚	˛	˜	˝	˞	˟	ˠ	ˡ	ˢ	ˣ	ˤ	˥
A3B0		ˆ	˘	˙	˚	˛	˜	˝	˞	˟	ˠ	ˡ	ˢ	ˣ	ˤ	˥
A3C0		ˆ	˘	˙	˚	˛	˜	˝	˞	˟	ˠ	ˡ	ˢ	ˣ	ˤ	˥
A3D0		ˆ	˘	˙	˚	˛	˜	˝	˞	˟	ˠ	ˡ	ˢ	ˣ	ˤ	˥
A3E0		ˆ	˘	˙	˚	˛	˜	˝	˞	˟	ˠ	ˡ	ˢ	ˣ	ˤ	˥
A3F0		ˆ	˘	˙	˚	˛	˜	˝	˞	˟	ˠ	ˡ	ˢ	ˣ	ˤ	˥

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
A440		ˆ	˘	˙	˚	˛	˜	˝	˞	˟	ˠ	ˡ	ˢ	ˣ	ˤ	˥
A450		ˆ	˘	˙	˚	˛	˜	˝	˞	˟	ˠ	ˡ	ˢ	ˣ	ˤ	˥
A460		ˆ	˘	˙	˚	˛	˜	˝	˞	˟	ˠ	ˡ	ˢ	ˣ	ˤ	˥
A470		ˆ	˘	˙	˚	˛	˜	˝	˞	˟	ˠ	ˡ	ˢ	ˣ	ˤ	˥
A480		ˆ	˘	˙	˚	˛	˜	˝	˞	˟	ˠ	ˡ	ˢ	ˣ	ˤ	˥
A490		ˆ	˘	˙	˚	˛	˜	˝	˞	˟	ˠ	ˡ	ˢ	ˣ	ˤ	˥
A4A0		ˆ	˘	˙	˚	˛	˜	˝	˞	˟	ˠ	ˡ	ˢ	ˣ	ˤ	˥
A4B0		ˆ	˘	˙	˚	˛	˜	˝	˞	˟	ˠ	ˡ	ˢ	ˣ	ˤ	˥
A4C0		ˆ	˘	˙	˚	˛	˜	˝	˞	˟	ˠ	ˡ	ˢ	ˣ	ˤ	˥
A4D0		ˆ	˘	˙	˚	˛	˜	˝	˞	˟	ˠ	ˡ	ˢ	ˣ	ˤ	˥
A4E0		ˆ	˘	˙	˚	˛	˜	˝	˞	˟	ˠ	ˡ	ˢ	ˣ	ˤ	˥
A4F0		ˆ	˘	˙	˚	˛	˜	˝	˞	˟	ˠ	ˡ	ˢ	ˣ	ˤ	˥

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
A540		ˆ	˘	˙	˚	˛	˜	˝	˞	˟	ˠ	ˡ	ˢ	ˣ	ˤ	˥
A550		ˆ	˘	˙	˚	˛	˜	˝	˞	˟	ˠ	ˡ	ˢ	ˣ	ˤ	˥
A560		ˆ	˘	˙	˚	˛	˜	˝	˞	˟	ˠ	ˡ	ˢ	ˣ	ˤ	˥
A570		ˆ	˘	˙	˚	˛	˜	˝	˞	˟	ˠ	ˡ	ˢ	ˣ	ˤ	˥
A580		ˆ	˘	˙	˚	˛	˜	˝	˞	˟	ˠ	ˡ	ˢ	ˣ	ˤ	˥
A590		ˆ	˘	˙	˚	˛	˜	˝	˞	˟	ˠ	ˡ	ˢ	ˣ	ˤ	˥
A5A0		ˆ	˘	˙	˚	˛	˜	˝	˞	˟	ˠ	ˡ	ˢ	ˣ	ˤ	˥
A5B0		ˆ	˘	˙	˚	˛	˜	˝	˞	˟	ˠ	ˡ	ˢ	ˣ	ˤ	˥
A5C0		ˆ	˘	˙	˚	˛	˜	˝	˞	˟	ˠ	ˡ	ˢ	ˣ	ˤ	˥
A5D0		ˆ	˘	˙	˚	˛	˜	˝	˞	˟	ˠ	ˡ	ˢ	ˣ	ˤ	˥
A5E0		ˆ	˘	˙	˚	˛	˜	˝	˞	˟	ˠ	ˡ	ˢ	ˣ	ˤ	˥
A5F0		ˆ	˘	˙	˚	˛	˜	˝	˞	˟	ˠ	ˡ	ˢ	ˣ	ˤ	˥

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AC40 揉括拾拈拊拈政故旣旣春昭映味是
 AC50 星昨曠吟曷曷栒栒柱柔柔東架栒栒栒柯
 AC60 柄柑枏枏杓杓杓杓杓杓杓杓杓杓杓杓
 AC70 殆殆毒毗毗氣氣洋洲洪流津洌耳洞洗
 AC80
 AC90
 ACA0 活洽派洵洛泉涸洸洸洸洸洸洸洸洸
 ACB0 為炳烜烜炭炸炮炮爇爇爇爇爇爇爇爇爇
 ACC0 珊坡玲珍珀玳基甬畏界吠吠疫疫疤疥痰
 ACD0 痲癩皆皇飯盈益盃盃省咄咄相眉看盾盼
 ACE0 眇矜矜研砌砍砍秩秩祈祇禹禹科科秋穿
 ACF0 突竿竿籽籽紅紅紀紀紉紉紉紉紉紉紉紉

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AE40 嘍嘍嘍嘍嘍嘍嘍嘍嘍嘍嘍嘍嘍嘍嘍嘍嘍嘍
 AE50 娑娑媵媵媵媵媵媵媵媵媵媵媵媵媵媵媵媵媵
 AE60 害家宴宮灣容宸射屈展展嶼嶼嶼嶼嶼嶼嶼嶼
 AE70 峰島峴峴峴峴峴峴峴峴峴峴峴峴峴峴峴峴峴峴
 AE80
 AE90
 AEA0 恣恥恐怨恭恩息憐憐憐憐憐憐憐憐憐憐憐
 AEB0 扇拳擊拿携挾振捕悟閤閤閤閤閤閤閤閤閤閤
 AEC0 挫接捍捌效枚料旁旅時管曼晏西响恒
 AED0 冕書朔朕朗校核案框框根根挂枯羽梳栗
 AEE0 桌桑栽柴桐架格桃株樅柱移移殊殉殷
 AEF0 氣氣氦氦氦氦氦氦氦氦氦氦氦氦氦氦氦氦氦

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B040 虔虔料料料料料料料料料料料料料料料料料料
 B050 計計計計計計計計計計計計計計計計計計計計
 B060 躬躬躬躬躬躬躬躬躬躬躬躬躬躬躬躬躬躬躬
 B070 郡郡郡郡郡郡郡郡郡郡郡郡郡郡郡郡郡郡郡郡
 B080
 B090
 B0A0 附狹除際際雙飢馬骨高門鬲鬼乾僭
 B0B0 偽停假偃偃倣倣倣倣倣倣倣倣倣倣倣倣倣倣倣
 B0C0 儂儂儂儂儂儂儂儂儂儂儂儂儂儂儂儂儂儂儂儂
 B0D0 匾參曼商商商商商商商商商商商商商商商商商
 B0E0 啣啣念售噉噉噉噉噉噉噉噉噉噉噉噉噉噉噉噉噉
 B0F0 埠埠埠埠埠埠埠埠埠埠埠埠埠埠埠埠埠埠埠埠

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AD40 耐要需耶耶胛胛胛胛胛胛胛胛胛胛胛胛胛胛胛胛胛
 AD50 致致船船范范茅菴菴苛苛苛苛苛苛苛苛苛苛苛苛
 AD60 苜苜荅荅荅荅荅荅荅荅荅荅荅荅荅荅荅荅荅荅
 AD70 計計計計計計計計計計計計計計計計計計計計
 AD80
 AD90
 ADA0 迭迫迫迫迫迫迫迫迫迫迫迫迫迫迫迫迫迫迫迫
 ADB0 降面革革非音真風飛食首香乘毫信倍
 ADC0 傲俯倦倦倦倦倦倦倦倦倦倦倦倦倦倦倦倦倦倦
 ADD0 倨俱俱俱俱俱俱俱俱俱俱俱俱俱俱俱俱俱俱俱
 ADE0 冢冢冢冢冢冢冢冢冢冢冢冢冢冢冢冢冢冢冢冢冢冢
 ADF0 唐唐唐唐唐唐唐唐唐唐唐唐唐唐唐唐唐唐唐唐

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AF40 漉漉漉漉漉漉漉漉漉漉漉漉漉漉漉漉漉漉漉漉
 AF50 烈烈烏參特狼狽狽狽狽狽狽狽狽狽狽狽狽狽狽狽狽
 AF60 畔畔畝畝畝畝畝畝畝畝畝畝畝畝畝畝畝畝畝畝畝
 AF70 炮炮益益益益益益益益益益益益益益益益益益益
 AF80
 AF90
 AFA0 砥砥砥砥砥砥砥砥砥砥砥砥砥砥砥砥砥砥砥砥砥
 AFB0 秣秣秣秣秣秣秣秣秣秣秣秣秣秣秣秣秣秣秣秣
 AFC0 素素素素素素素素素素素素素素素素素素素素
 AFD0 耘耘耘耘耘耘耘耘耘耘耘耘耘耘耘耘耘耘耘耘耘耘耘
 AFE0 能能脊脊脊脊脊脊脊脊脊脊脊脊脊脊脊脊脊脊脊脊
 AFF0 荊荊荊荊荊荊荊荊荊荊荊荊荊荊荊荊荊荊荊荊荊

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B140 媚媚媚媚媚媚媚媚媚媚媚媚媚媚媚媚媚媚媚媚
 B150 屨屨屨屨屨屨屨屨屨屨屨屨屨屨屨屨屨屨屨屨屨
 B160 常常常常常常常常常常常常常常常常常常常常
 B170 徒徒徒徒徒徒徒徒徒徒徒徒徒徒徒徒徒徒徒徒
 B180
 B190
 B1A0 情悻悻悻悻悻悻悻悻悻悻悻悻悻悻悻悻悻悻悻悻
 B1B0 掠掠掠掠掠掠掠掠掠掠掠掠掠掠掠掠掠掠掠掠掠掠
 B1C0 推推推推推推推推推推推推推推推推推推推推推
 B1D0 教教教教教教教教教教教教教教教教教教教教
 B1E0 唔唔唔唔唔唔唔唔唔唔唔唔唔唔唔唔唔唔唔唔
 B1F0 梗梗梗梗梗梗梗梗梗梗梗梗梗梗梗梗梗梗梗梗梗

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B240 毫毳氤氳涼淳涼液淡淌滂添淺清淇淋
 B250 涯淑漣淙淹涸混淵浙淩渚涵淚淫洶淪
 B260 深淮淨滄滄滄滄滄滄滄滄滄滄滄滄滄
 B270 犁猜猛猖獗淨率瓊瑤玳瑁現瓊瓊瓊
 B280
 B290
 B2A0 瓷甜產略哇畢異疏痔痕痂空痲咬盜
 B2B0 盒盛眷眾眼眶眸眺疏硃硃硃硃硃硃硃
 B2C0 窳笠笨笛第符笙管竿粒粗粗粗粗粗粗粗
 B2D0 紹緋絀細細紳組累終繼絀絀絀絀絀絀絀
 B2E0 精柳明令脯孺孺脫脩脩脩脩脩脩脩脩
 B2F0 莞莘萃莢莢莢莢莢莢莢莢莢莢莢莢莢

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B440 婷嫻嫻嫻嫻嫻嫻嫻嫻嫻嫻嫻嫻嫻嫻
 B450 嵐嵐嵐嵐嵐嵐嵐嵐嵐嵐嵐嵐嵐嵐嵐嵐
 B460 循徨惑惑惑惑惑惑惑惑惑惑惑惑惑惑
 B470 懷惶愉愉愉愉愉愉愉愉愉愉愉愉愉愉
 B480
 B490
 B4A0 插揣提握摺摺摺摺摺摺摺摺摺摺摺摺
 B4B0 敦敦敦敦敦敦敦敦敦敦敦敦敦敦敦敦
 B4C0 替期朝棺棕棠棘棗椅棟棵森棧棧棧棧
 B4D0 隸棋棍植椒推棉棚榻棗款款款款款款
 B4E0 毳氣氤氳港游滄滄滄滄滄滄滄滄滄滄
 B4F0 湘渤湖溼潤涸湯湯湯湯湯湯湯湯湯湯

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B640 詔詔詔詔詔詔詔詔詔詔詔詔詔詔詔詔
 B650 賀貴賤賤賤賤賤賤賤賤賤賤賤賤賤賤
 B660 踏鞞軸軼辜達達達達達達達達達達達
 B670 酥量鈔鈔鈔鈔鈔鈔鈔鈔鈔鈔鈔鈔鈔鈔
 B680
 B690
 B6A0 間間間間間間間間間間間間間間間間
 B6B0 集雇受雲朝頁頂須餉餉飯飯飯飯飯飯
 B6C0 黃黍黑亂備債傲傳僅傾催傷優優優優
 B6D0 劑劑劑劑劑劑劑劑劑劑劑劑劑劑劑劑
 B6E0 副副副副副副副副副副副副副副副副
 B6F0 塔墳墳墳墳墳墳墳墳墳墳墳墳墳墳墳

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B340 甯莫處處處處處處處處處處處處處處
 B350 袈被袒袖袍袋覓規訪訪訪訪訪訪訪訪
 B360 訖波豚販責貫貫貫貫貫貫貫貫貫貫貫
 B370 道通通通通通通通通通通通通通通
 B380
 B390
 B3A0 部鄂都鄂煙煙煙煙煙煙煙煙煙煙煙煙
 B3B0 陸陰陴陶陶陶陶陶陶陶陶陶陶陶陶陶
 B3C0 鹿姿麻傢傍傳備傑愧儂傘傲最凱割割
 B3D0 創剩勞勝助博歐管喀喀喀喀喀喀喀喀
 B3E0 喪喪喪喪喪喪喪喪喪喪喪喪喪喪喪喪
 B3F0 喫喫喫喫喫喫喫喫喫喫喫喫喫喫喫喫

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B540 灑澗潤潛潛潛潛潛潛潛潛潛潛潛潛潛
 B550 牌騎犀獨猥猴猴猴猴猴猴猴猴猴猴
 B560 琛琦瑰瑰瑰瑰瑰瑰瑰瑰瑰瑰瑰瑰瑰瑰
 B570 儂皓皚盜盜盜盜盜盜盜盜盜盜盜盜盜
 B580
 B590
 B5A0 窗窗窗窗窗窗窗窗窗窗窗窗窗窗窗窗
 B5B0 彌絃結絃絃絃絃絃絃絃絃絃絃絃絃絃
 B5C0 臺貼肅肅肅肅肅肅肅肅肅肅肅肅肅肅
 B5D0 菩萃菸菸菸菸菸菸菸菸菸菸菸菸菸菸
 B5E0 菽菲菊莢葵菊葵葵葵葵葵葵葵葵葵葵
 B5F0 蛤蚶蚶蚶蚶蚶蚶蚶蚶蚶蚶蚶蚶蚶蚶蚶

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B740 媳嫂媿媿媿媿媿媿媿媿媿媿媿媿媿媿
 B750 感感感感感感感感感感感感感感感感
 B760 甚媚媚媚媚媚媚媚媚媚媚媚媚媚媚
 B770 構構構構構構構構構構構構構構構構
 B780
 B790
 B7A0 楚楷榭榭榭榭榭榭榭榭榭榭榭榭榭榭
 B7B0 楣楷歇歇歇歇歇歇歇歇歇歇歇歇歇歇
 B7C0 滅滅滅滅滅滅滅滅滅滅滅滅滅滅滅滅
 B7D0 煩煩煩煩煩煩煩煩煩煩煩煩煩煩煩煩
 B7E0 獅獅獅獅獅獅獅獅獅獅獅獅獅獅獅獅
 B7F0 痰痰痰痰痰痰痰痰痰痰痰痰痰痰痰痰

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EE40 預預歲歲屏屏意意適適路路棧棧 蕩蕩商商決決街街嶺嶺嶺嶺
 EE50 管管菊菊葵葵蓬蓬菱菱葦葦 與與山山脚脚脚脚脚脚脚脚脚脚
 EE60 嶺嶺嶺嶺嶺嶺嶺嶺嶺嶺嶺嶺嶺嶺嶺嶺嶺嶺嶺嶺嶺嶺嶺嶺嶺嶺嶺嶺
 EE70 蝻蝻腐腐襪襪漂漂襪襪襪襪 慘慘現現觀觀覺覺解解設設
 EE80
 EE90
 EEA0 誦誦誦誦誦誦誦誦誦誦誦誦誦誦 誦誦誦誦誦誦誦誦誦誦誦誦誦誦
 EEB0 誌誌誦誦猓猓猓猓猓猓猓猓猓猓 誌誌誦誦誦誦誦誦誦誦誦誦誦誦
 EEC0 榛榛溫溫迨迨迨迨迨迨迨迨迨迨 榛榛溫溫迨迨迨迨迨迨迨迨迨迨
 EED0 鋪鋪甚甚鋪鋪鋪鋪鋪鋪鋪鋪鋪鋪 鋪鋪甚甚鋪鋪鋪鋪鋪鋪鋪鋪鋪鋪
 EEE0 銷銷鐘鐘柔柔鐘鐘鐘鐘鐘鐘鐘鐘 銷銷鐘鐘柔柔鐘鐘鐘鐘鐘鐘鐘鐘
 EEF0 關關關關關關關關關關關關關關 關關關關關關關關關關關關關關

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F040 瓊瓊需需吸吸雙雙齊齊瓊瓊瓊瓊 瓊瓊需需吸吸雙雙齊齊瓊瓊瓊瓊
 F050 瘡瘡激激吸吸監監監監監監監監 瘡瘡激激吸吸監監監監監監監監
 F060 穉穉莠莠莠莠莠莠莠莠莠莠莠 穉穉莠莠莠莠莠莠莠莠莠莠莠
 F070 繾繾繾繾繾繾繾繾繾繾繾繾繾 繾繾繾繾繾繾繾繾繾繾繾繾繾
 F080
 F090
 F0A0 腫腫腫腫腫腫腫腫腫腫腫腫腫 腫腫腫腫腫腫腫腫腫腫腫腫腫
 F0B0 蓋蓋瓊瓊封封鍾鍾鍾鍾鍾鍾鍾鍾 蓋蓋瓊瓊封封鍾鍾鍾鍾鍾鍾鍾鍾
 F0C0 爐爐爐爐爐爐爐爐爐爐爐爐爐爐 爐爐爐爐爐爐爐爐爐爐爐爐爐爐
 F0D0 壓壓壓壓壓壓壓壓壓壓壓壓壓壓 壓壓壓壓壓壓壓壓壓壓壓壓壓壓
 F0E0 諧諧諧諧諧諧諧諧諧諧諧諧諧諧 諧諧諧諧諧諧諧諧諧諧諧諧諧諧
 F0F0 獵獵獵獵獵獵獵獵獵獵獵獵獵獵 獵獵獵獵獵獵獵獵獵獵獵獵獵獵

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F240 銷銷實實實實實實實實實實實實 銷銷實實實實實實實實實實實實
 F250 楹楹楹楹楹楹楹楹楹楹楹楹楹楹 楹楹楹楹楹楹楹楹楹楹楹楹楹楹
 F260 澱澱澱澱澱澱澱澱澱澱澱澱澱澱 澱澱澱澱澱澱澱澱澱澱澱澱澱澱
 F270 懼懼懼懼懼懼懼懼懼懼懼懼懼懼 懼懼懼懼懼懼懼懼懼懼懼懼懼懼
 F280
 F290
 F2A0 碑碑碑碑碑碑碑碑碑碑碑碑碑碑 碑碑碑碑碑碑碑碑碑碑碑碑碑碑
 F2B0 緇緇緇緇緇緇緇緇緇緇緇緇緇緇 緇緇緇緇緇緇緇緇緇緇緇緇緇緇
 F2C0 則則則則則則則則則則則則則則 則則則則則則則則則則則則則則
 F2D0 豸豸豸豸豸豸豸豸豸豸豸豸豸豸 豸豸豸豸豸豸豸豸豸豸豸豸豸豸
 F2E0 蠟蠟蠟蠟蠟蠟蠟蠟蠟蠟蠟蠟蠟蠟 蠟蠟蠟蠟蠟蠟蠟蠟蠟蠟蠟蠟蠟蠟
 F2F0 檢檢檢檢檢檢檢檢檢檢檢檢檢檢 檢檢檢檢檢檢檢檢檢檢檢檢檢檢

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EF40 鞞鞞鞞鞞鞞鞞鞞鞞鞞鞞鞞鞞鞞 鞞鞞鞞鞞鞞鞞鞞鞞鞞鞞鞞鞞鞞
 EF50 食食食食食食食食食食食食食食 食食食食食食食食食食食食食食
 EF60 駝駝駝駝駝駝駝駝駝駝駝駝駝 駝駝駝駝駝駝駝駝駝駝駝駝駝
 EF70 駘駘駘駘駘駘駘駘駘駘駘駘駘 駘駘駘駘駘駘駘駘駘駘駘駘駘
 EF80
 EF90
 EFA0 鴿鴿鴿鴿鴿鴿鴿鴿鴿鴿鴿鴿鴿 鴿鴿鴿鴿鴿鴿鴿鴿鴿鴿鴿鴿鴿
 EFB0 敲敲敲敲敲敲敲敲敲敲敲敲敲敲 敲敲敲敲敲敲敲敲敲敲敲敲敲敲
 EFC0 奕奕奕奕奕奕奕奕奕奕奕奕奕奕 奕奕奕奕奕奕奕奕奕奕奕奕奕奕
 EFD0 懷懷懷懷懷懷懷懷懷懷懷懷懷懷 懷懷懷懷懷懷懷懷懷懷懷懷懷懷
 EFE0 檮檮檮檮檮檮檮檮檮檮檮檮檮 檮檮檮檮檮檮檮檮檮檮檮檮檮
 EFF0 澱澱澱澱澱澱澱澱澱澱澱澱澱澱 澱澱澱澱澱澱澱澱澱澱澱澱澱澱

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F140 蹀蹀蹀蹀蹀蹀蹀蹀蹀蹀蹀蹀蹀蹀蹀 蹀蹀蹀蹀蹀蹀蹀蹀蹀蹀蹀蹀蹀蹀蹀
 F150 脣脣脣脣脣脣脣脣脣脣脣脣脣脣 脣脣脣脣脣脣脣脣脣脣脣脣脣脣
 F160 銚銚銚銚銚銚銚銚銚銚銚銚銚銚銚銚 銚銚銚銚銚銚銚銚銚銚銚銚銚銚銚銚
 F170 韃韃韃韃韃韃韃韃韃韃韃韃韃韃韃韃 韃韃韃韃韃韃韃韃韃韃韃韃韃韃韃韃
 F180
 F190
 F1A0 駉駉駉駉駉駉駉駉駉駉駉駉駉駉駉 駉駉駉駉駉駉駉駉駉駉駉駉駉駉駉
 F1B0 馱馱馱馱馱馱馱馱馱馱馱馱馱馱馱 馱馱馱馱馱馱馱馱馱馱馱馱馱馱馱
 F1C0 馱馱馱馱馱馱馱馱馱馱馱馱馱馱馱 馱馱馱馱馱馱馱馱馱馱馱馱馱馱馱
 F1D0 馱馱馱馱馱馱馱馱馱馱馱馱馱馱馱 馱馱馱馱馱馱馱馱馱馱馱馱馱馱馱
 F1E0 夥夥夥夥夥夥夥夥夥夥夥夥夥夥 夥夥夥夥夥夥夥夥夥夥夥夥夥夥
 F1F0 噸噸噸噸噸噸噸噸噸噸噸噸噸噸 噸噸噸噸噸噸噸噸噸噸噸噸噸噸

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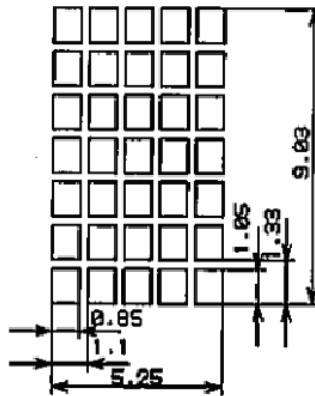
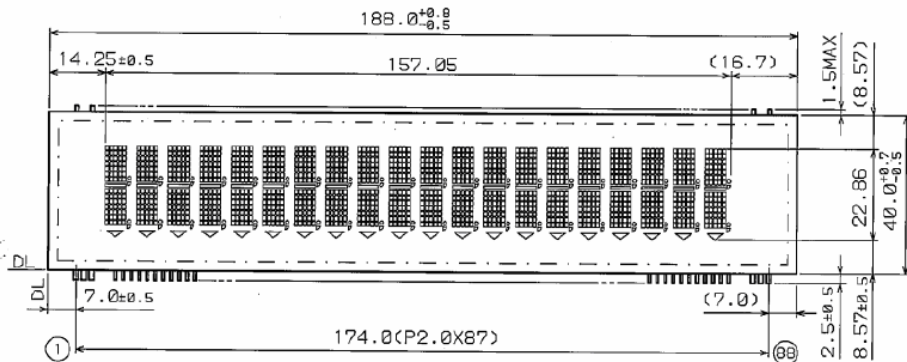
F340 譚譚譚譚譚譚譚譚譚譚譚譚譚譚 譚譚譚譚譚譚譚譚譚譚譚譚譚譚
 F350 踞踞踞踞踞踞踞踞踞踞踞踞踞踞 踞踞踞踞踞踞踞踞踞踞踞踞踞踞
 F360 鋪鋪鋪鋪鋪鋪鋪鋪鋪鋪鋪鋪鋪鋪 鋪鋪鋪鋪鋪鋪鋪鋪鋪鋪鋪鋪鋪鋪
 F370 鋪鋪鋪鋪鋪鋪鋪鋪鋪鋪鋪鋪鋪鋪 鋪鋪鋪鋪鋪鋪鋪鋪鋪鋪鋪鋪鋪鋪
 F380
 F390
 F3A0 駉駉駉駉駉駉駉駉駉駉駉駉駉駉駉 駉駉駉駉駉駉駉駉駉駉駉駉駉駉駉
 F3B0 在在在在在在在在在在在在在在 在在在在在在在在在在在在在在
 F3C0 駉駉駉駉駉駉駉駉駉駉駉駉駉駉駉 駉駉駉駉駉駉駉駉駉駉駉駉駉駉駉
 F3D0 養養養養養養養養養養養養養養 養養養養養養養養養養養養養養
 F3E0 來來來來來來來來來來來來來來 來來來來來來來來來來來來來來
 F3F0 東東東東東東東東東東東東東東 東東東東東東東東東東東東東東

3-2-2. VFD Board

3-2-2-1. Customer Display Specification

1. Panel Specification

Item	Spec criteria	Description
Display Method	Vacuum Fluorescent Display	
Display Pattern	5x7 Dot Matrix	
Character Size	5.25 mm(W) x 9.03 mm(H)	
Dot Size (X*Y)	0.85 mm(X) x 1.05 mm(Y)	
Character Number	40 (20 columns x 2 lines)	



3-2-2-2. Commands

1. LD220 / P4000

Command	Sub-Item (Hex)	Description
HT	09	Move cursor right (Only valid in overwrite mode)
BS	08	Move cursor left (Only valid in overwrite mode)
CR	0D	Move cursor to left-most position (Only valid in overwrite mode)
ESC @	1B 40	Initialize customer display to initial state, clears display buffer, set display mode to shift and sets current display row to upper row
ESC U	1B 55	Select upper row as current row (Initial default)
ESC D	1B 44	Select lower row as current row
ESC A n	1B 41 n	Sets customer display disable or enable n=D, Disable ; n=E, Enable
ESC C r c	1B 43 r c	Move cursor to specified position (Only valid in overwrite mode) r = U, upper row ; r = D, lower row 1 c 20 (column number)
ESC R n	1B 52 n	Set international font sets (Please refer International Font Set Table)
ESC % n	1B 25 n	Set font pattern N=0, selected; n=1, canceled
ESC & n s [p]	1B 26 n s data	Define user font pattern N=code for first character S=code for last character Data= 5 bytes required for each character

International Font Set Table

n(Hex)	Font Set
30h	U.S.A.
31h	GERMANY
32h	FRANCE
33h	JAPAN

2. EPSON POS D101 (Default)

Command	Sub-Item (Hex)	Description
HT	09	Move cursor right
BS	08	Move cursor left
US LF	1F 0A	Move cursor up
LF	0A	Move cursor down
US CR	1F 0D	Move cursor to right-most position
CR	0D	Move cursor to left-most position
HOM	0B	Move cursor to home position
US B	1F 42	Move cursor to bottom position
US \$ x y	1F 24 x y	Move cursor to specified position 1 x(column) 20 ; 1 y(row) 2
US C n	1F 43 n	Select/cancel cursor display n=0, canceled ; n=1, selected
CLR	0C	Clear display screen
CAN	18	Clear cursor line
US X n	1F 58 n	Brightness adjustment, 1 n 4
US E n	1F 45 n	Blink display screen 0 n 255 (n*50msec) ON / (n*50msec) OFF n=0, blinking is canceled n=255, display is turned off
ESC @	1B 40	Initialize display
ESC t n	1B 74 n	Select character code table 0 n 5 (Please refer Chapter 5)
ESC R n	1B 52 n	Select international character set (Please refer International Font Set Table)
US r n	1F 72 n	Select/cancel reverse character n=0, canceled ; n=1, selected
US MD1	1F 01	Specify overwrite mode
US MD2	1F 02	Specify vertical scroll mode
US MD3	1F 03	Specify horizontal scroll mode
US . n	1F 2E n	Specify period display n=display character code
US , n	1F 2C n	Specify comma display n= display character code
US ; n	1F 3B n	Specify semicolon (period+comma) display n= display character code
US # n m	1F 23 n m	Specify display annunciator, turn the annunciator at "m" column on or off n=0,1 (Off, On) ; 0 m 20
ESC & s n m [a(pl..p7) (m-n+1)	1B 26 s n m[a(p1..p5)](m- n+1)	Define download characters, S=1; 32 n m 126 ; a=5 (p1..p5 = pattern1..pattern5)
ESC ? n	1B 3F n	Cancel user-defined characters, 32 n 126 (n=character code)
ESC % n	1B 25 n	Select/cancel download character set n=0, canceled ; n=1, selected
ESC W n s (x1 y1 x2 y2)	1B 57 n s (x1 y1 x2 y2)	Specify/cancel the window range n=1,2,3,4 (four windows) ; s=0,1 (disable, enable) 1 x1 x2 20 (column) ; 1 y1 y2 2 (row)
US @	1F 40	Execute self-test
US T h m	1F 54 h m	Display time : 0 h 23 ; 0 m 59
US U	1F 55	Display of time counter

***International Font Set Table**

n(Hex)	Font Set
00h	U.S.A.
01h	FRANCE
02h	GERMANY
03h	U.K.
04h	DENMARK I
05h	SWEDEN
06h	ITALY
07h	SPAIN
08h	JAPAN
09h	NORWAY
0Ah	DENMARK II
	SLAVONIC/RUSSIA

3. AEDEX

Command	Sub-Item (Hex)	Description
!# 1..CR	21 23 31 [data x 20] 0D	Upper line display
!# 2..CR	21 23 32 [data x 20] 0D	Bottom line display
!# 4..CR	21 23 34 [data x 45] 0D	Upper line message scroll continuously
!# 5..CR	21 23 35 hh ':' mm 0D	Set and display 24 hour time 0 h, m 9
!# 5 CR	21 23 35 0D	Display 24 hour time
!# 6..CR	21 23 36 [data x 45] 0D	Upper line message scroll once pass
!# 9..CR	21 23 39 [data x 40] 0D	Two line display

4. UTC/S

Command	Sub-Item (Hex)	Description
BS	08	Back space
HT	09	Horizontal tab
LF	0A	Line feed
CR	0D	Carriage return
DC0 p	10 p	Move cursor to specified position, 0 p 39 (Please refer Row Character Position Chart)
DC1	11	Over write display mode
DC2	12	Vertical scroll mode
DC3	13	Cursor on
DC4	14	Cursor off
ESC d	1B 64	Change to UTC enhanced mode
US	1F	Clear display

Row Character Position Chart (Decimal)

Row1	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
Row2	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39

Row Character Position Chart (Hex)

Row1	00	01	02	03	04	05	06	07	08	09	0A	0B	0C	0D	0E	0F	10	11	12	13
Row2	14	15	16	17	18	19	1A	1B	1C	1D	1E	1F	20	21	22	23	24	25	26	27

5. UTC/E

Command	Sub-Item (Hex)	Description
ESC u A..CR	1B 75 41 [data x 20] 0D	Upper line display
ESC u B..CR	1B 75 42 [data x 20] 0D	Bottom line display
ESC u D..CR	1B 75 44 [data x 20] 0D	Upper line message scroll continuously
ESC u E..CR	1B 75 45 hh mm 0D	Set and display 24 hour time 0 h , m 9
ESC u F..CR	1B 75 46 [data x 20] 0D	Upper line message scroll once pass
ESC u 1..CR	1B 75 49 [data x 40] 0D	Two line display
ESC RS..CR	1B 0F 0D	Change to UTC standard mode

6. ADM788

Command	Sub-Item (Hex)	Description
CLR	0C	Clear display
CR	0D	Carriage return
SLE1	0E	Clear up line and move cursor to upper line left most end
SLE2	0F	Clear low line and move cursor to lower line left most end

7. DSP800

Command	Sub-Item (Hex)	Description
EOT SOH I n ETB	04 01 49 n 17	Select international character set (Please refer International Font Set Table)
EOT SOH P n ETB	04 01 50 n 17	Move cursor to specified position 49 n 48
EOT SOH C n m ETB	04 01 43 n m 17	Clear display range from n position to m position and move cursor to n position 49 n m 88
EOT SOH S n ETB	04 01 53 n 17	Save the current displaying data (40 characters) to n'th layer for demo display 1 n 3 (n specify the layer 1, 2, or 3)
EOT SOH D n m ETB	04 01 44 n m 17	Display the saved data 1 n 3 (n specify the layer 1, 2, or 3) "m" can be ignored
EOT SOH A n ETB	04 01 41 n 17	Brightness adjustment 1 n 4
EOT SOH % ETB	04 01 25 17	Initialize display

*International Font Set Table

n(Hex)	Font Set
30h	U.S.A.
31h	FRANCE
32h	GERMANY
33h	U.K.
34h	DENMARK I
35h	SWEDEN
36h	ITALY
37h	SPAIN
38h	JAPAN
39h	NORWAY
3Ah	DENMARK II

8. CD5220

Command	Sub-Item (Hex)	Description
ESC DC1	1B 11	Overwrite mode
ESC DC2	1B 12	Vertical scroll mode
ESC DC3	1B 13	Horizontal scroll mode
ESC Q A CR	1B 51 41 [N]20 0D	Set string display mode, write string to upper line
ESC Q B CR	1B 51 42 [N]20 0D	Set string display mode, write string to lower line
ESC Q D CR	1B 51 44 [N]m20 0D	Upper line message scroll continuously m<40
ESC [D	1B 5B 44	Move cursor left
BS	08	Move cursor left
ESC [C	1B 5B 43	Move cursor right
HT	09	Move cursor right
ESC [A	1B 5B 41	Move cursor up
ESC [B	1B 5B 42	Move cursor down
LF	0A	Move cursor down
ESD [H	1B 5B 48	Move cursor to home position
HOM	0B	Move cursor to home position
ESC [L	1B 5B 4C	Move cursor to left-most position
CR	0D	Move cursor to left-most position
ESC [R	1B 5B 52	Move cursor to right-most position
ESC [K	1B 5B 4B	Move cursor to bottom position
ESC I x y	1B 6C x y	Move cursor to specified position 1 x 20(column); y=1,2(row)
ESC @	1B 40	Initialize display
ESC W s x1 x2 y	1B 57 s x1 x2 y	Enable or disable the window range at horizontal scroll mode s=0,1 (disable, enable) 1 x1 x2 20(column);y=1,2(row)
CLR	0C	Clear display screen, and clear string mode
CAN	18	Clear cursor line, and clear string mode
ESC * n	1B 2A n	Brightness adjustment 1 n 4
ESC & s n m [a(pl..p5)] (m-n+1)	1B 26 s n m [a(pl..p5)] (m-n+1)	Define download characters S=1; 32 n m 126; a=5 (p1..p5=pattern 1 .. pattern 5)
ESC ? n	1B 3F n	Delete download characters 32 n 126(n=character code)
ESC % n	1B 25 n	Select / cancel download character set. n=0, canceled ; n=1, selected
ESC _ n	1B 5F n	Set cursor ON/OFF n=0,1 (Off,On)
ESC f n	1B 66 n	Select international fonts set
ESC c n	1B 63 n	Select fonts, ASCII code or JIS code

9. EMAX

Command	Sub-Item (Hex)	Description
ESC DC1	B 11	Overwrite mode
ESC DC2	1B 12	Vertical mode
ESC DC3	1B 13	Horizontal scroll mode
ESC [D	1B 5B 44	Move cursor left
BS	08	Move cursor left
ESC [C	1B 5B 43	Move cursor right
HT	09	Move cursor right
ESC [A	1B 5B 41	Move cursor up
ESC [B	1B 5B 42	Move cursor down
ESC [H	1B 5B 48	Move cursor to home position
HOM	0B	Move cursor to home position
ESC [L	1B 5B 4C	Move cursor to left-most position
CR	0D	Move cursor to left-most position
ESC [R	1B 5B 52	Move cursor to right-most position
ESC [K	1B 5B 4B	Move cursor to bottom position
ESC I x y	1B 6C x y 1 x 20, y = 1,2	Move cursor to specified position
ESC @	1B 40	Initialize display
CLR	0C	Clear display screen, and clear string mode
CAN	18	Clear cursor line, and clear string mode
ESC * n	1B 2A n 1 n 4	Brightness mode
ESC _ n	1B 5F n n = 0,1	Set cursor ON/OFF
ESC f n	1B 66 n	Select international fonts
ESC c n	1B 63 n	Select fonts, ASCII code or JIS code
ESC = n	1B 3D	Select peripheral device, display or printer n = 1; enable printer, disable display n = 2; disable printer, enable display n = 3; enable printer, enable display

*International Font Set Table

n(Hex)	Font Set
41h	U.S.A.
47h	GERMANY
49h	ITALY
4Ah	JAPAN
55h	U.K.
46h	FRANCE
53h	SPAIN
4Eh	NORWAY
57h	SWEDEN
44h	DENMARK I
45h	DENMARK II
4Ch	SLAVONIC
	RUSSIA
52h	Reserved

*Select Code Table

n(Decimal)	International Code
41h	Compliance with ASCII code
4Ah	Compliance with JIS code

10. LOGIC CONTROL

Command	Sub-Item (Hex)	Description
^Q	11	Overwrite mode
^R	12	Vertical mode
^I	09	Horizontal tab
^H	08	Back space
^J	0A	Line feed
^M	0D	Carriage return
^S	13	Cursor on
^T	14	Cursor off
^P	10	Digital select
		e.g.10 00 MSD of top row
		10 13 LSD of top row
		10 14 MSD of bottom row
^	1F	Reset
^D n	04 n	Brightness mode
		04 FF – 100% Brightness mode
		04 60 – 60% Brightness mode
		04 40 – 40% Brightness mode
	04 20 – 20% Brightness mode	

Software Utility Specification (Protech's in-house utility)

Item Sub-Item
Baud Rate Setting
Command Type Setting
Internation Character Set
Code Page update Utility
Firmware update Utility
MP Testing Utility

1.Baud Rate Setting

Item Sub-Item	Sub-Item	Description
Baud Rate	-	9600/19200

2.Command Type Setting

Hex Code	Command Type
00h	EPSON POS D101
01h	LD220(P4000)
02h	ADM788
03h	LOGIC CONTROL
04h	UTC/S
05h	UTC/E
06h	DSP800
07h	CD5220
08h	EMAX
09h	AEDEX

3.Language Support & International Character Set

International Character Set (Code 20H~7FH)	Code Table (Code 80H~FFH)
U.S.A.	PC-437
FRANCE	PC-850
GERMANY	PC-850
U.K.	PC-850
DENMARK I	PC-850
SWEDEN	PC-850
ITALY	PC-850
SPAIN	PC-850
JAPAN	Katakana
NORWAY	PC-865
DENMARK II	PC-850
SLAVONIC/RUSSIAN	PC-437
TURKISH	PC-857

3-2-2-3. Character Set

1. U.S.A (Standard Character Set) (20h~7Eh)

	_0	_1	_2	_3	_4	_5	_6	_7	_8	_9	_A	_B	_C	_D	_E	_F
2_		!	"	#	\$	%	&	'	()	*	+	,	-	.	/
3_	0	1	2	3	4	5	6	7	8	9	:	;	<	=	>	?
4_	@	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
5_	P	Q	R	S	T	U	V	W	X	Y	Z	[\]	^	_
6_	`	a	b	c	d	e	f	g	h	i	j	k	l	m	n	o
7_	p	q	r	s	t	u	v	w	x	y	z	{		}	~	

2. International Character Selection

No.	International	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	#	\$	§	Ä	Ö	Ü	^	`	ä	ö	è	β
3	U.K.	£	\$	@	[\]	^	`	{		}	~
4	DENMARK I	#	\$	@	Æ	Φ	Â	^	`	æ	ø	â	~
5	SWEDEN	#	α	É	Ä	Ö	Å	Ü	é	ä	ö	å	ü
6	ITALY	#	\$	@	°	\	é	^	ù	à	ò	è	ì
7	SPAIN	R	\$	@	i	Ñ	¿	^	`	¨	ñ	}	~
8	JAPAN	#	\$	@	[¥]	^	`	{		}	~
9	NORWAY	#	α	É	Æ	Ø	Å	Ü	é	æ	ø	å	ü
10	DENMARK II	#	\$	É	Æ	Ø	Å	Ü	é	æ	ø	å	ü
11	SLAVONIC	#	\$	@	[\]	^	`	{		}	~
12	RUSSIA	#	\$	@	[\]	^	`	{		}	~

3. Code Page

CP-437

	_0	_1	_2	_3	_4	_5	_6	_7	_8	_9	_A	_B	_C	_D	_E	_F
0_																
1_																
2_		!	"	#	\$	%	&	'	()	*	+	,	-	.	/
3_	0	1	2	3	4	5	6	7	8	9	:	;	<	=	>	?
4_	@	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
5_	P	Q	R	S	T	U	V	W	X	Y	Z	[\]	^	_
6_	`	a	b	c	d	e	f	g	h	i	j	k	l	m	n	o
7_	p	q	r	s	t	u	v	w	x	y	z	{		}	~	
8_	Ç	ü	é	â	ä	à	á	ç	ê	ë	è	ï	î	ì	Ä	Å
9_	É	æ	Æ	ô	ö	ò	û	ù	ÿ	Ö	Ü	¢	£	¥	Ɔ	f
A_	á	í	ó	ú	ñ	Ñ	ª	º	¿	¬	½	¼	¡	«	»	
B_	▒	▒	▒		┌	┐	└	┘	┌	┐	└	┘	┌	┐	└	┘
C_	┌	┐	└	┘	┌	┐	└	┘	┌	┐	└	┘	┌	┐	└	┘
D_	┌	┐	└	┘	┌	┐	└	┘	┌	┐	└	┘	┌	┐	└	┘
E_	α	β	Γ	π	Σ	σ	μ	τ	Φ	Θ	Ω	δ	∞	φ	ε	∩
F_	≡	±	≥	≤		J	÷	≈	°	·	·	√	n	²	■	










Japanese Katakana

	_0	_1	_2	_3	_4	_5	_6	_7	_8	_9	_A	_B	_C	_D	_E	_F
8_	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
9_	■	■	■	■	■	■	■	→	←	↑	↓	×	÷	±	≤	≥
A_		・	「	」	、	・	ヲ	フ	イ	ウ	エ	オ	ヤ	ユ	ヨ	ツ
B_	■	ア	イ	ウ	エ	オ	カ	キ	ク	ケ	コ	サ	ツ	ス	セ	ソ
C_	タ	チ	ツ	テ	ト	ナ	ニ	ヌ	ネ	ノ	ハ	ヒ	フ	ヘ	ホ	マ
D_	ミ	ム	メ	モ	ヤ	ユ	ヨ	ラ	リ	ル	レ	ロ	ワ	ン	“	°
E_	□	■	■	○	●	◇	◆	◆	▶	◀	▲	▼	《	》	½	¼
F_	°C	〒	小	中	大	人	分	円	年	土	金	木	水	火	月	日

CP-850

	_0	_1	_2	_3	_4	_5	_6	_7	_8	_9	_A	_B	_C	_D	_E	_F
8_	Ç	ü	é	â	ä	à	å	ç	ê	ë	è	ï	î	ì	Ä	Å
9_	É	æ	Æ	ô	ö	ò	û	ù	ÿ	Ö	Û	ø	£	Ø	×	f
A_	á	í	ó	ú	ñ	Ñ	ª	º	¿	®	¬	½	¼	¡	«	»
B_	■	■	■		├	Á	Â	À	©	¶		⌋	⌌	¢	¥	⌋
C_	└	┌	┐	└	┌	ã	Ã	└	┌	┐	└	┌	┐	┌	┐	¤
D_	ð	Ð	Ê	Ë	È	Ì	Í	Î	Ï	└	┌	■	■	:	Ï	■
E_	Ó	ß	Ô	Õ	õ	Õ	µ	þ	Þ	Ú	Û	Ü	ý	Ý	˘	˙
F_		±	■	¾	¶	§	÷	¸	°	¨	·	¹	³	²	■	

CP-865

	_0	_1	_2	_3	_4	_5	_6	_7	_8	_9	_A	_B	_C	_D	_E	_F
8_	Ç	ü	é	â	ä	à	å	ç	ê	ë	è	ï	î	ì	Ä	Å
9_	É	æ	Æ	ô	ö	ò	û	ù	ÿ	Ö	Ü	ø	£	Ø	Ɔ	f
A_	á	í	ó	ú	ñ	Ñ	ª	º	¿	¬	½	¼	¡	«	¸	
B_					├	┤	├	┤	├	┤	├	┤	├	┤	├	┤
C_	L	└	┘	┌	┐	┌	┐	L	└	┘	┌	┐	┌	┐	┌	┐
D_	┌	└	┘	L	L	└	┘	┌	┐	┌	┐					
E_	α	β	Γ	π	Σ	σ	μ	τ	Φ	Θ	Ω	δ	∞	φ	ε	∩
F_	≡	±	≥	≤	∫	J	÷	≈	°	·	·	√	n	²		

3-2-3. MSR Board

ISO Format:

Track 1 (IATA)

%	210bpi, 79 ALPHA, 7-bits/characters	?
---	-------------------------------------	---

Track 2 (ABA)

;	75bpi, 40 ALPHA, 5-bits/characters	?
---	------------------------------------	---

Track 3 (THRIFT-TTS)

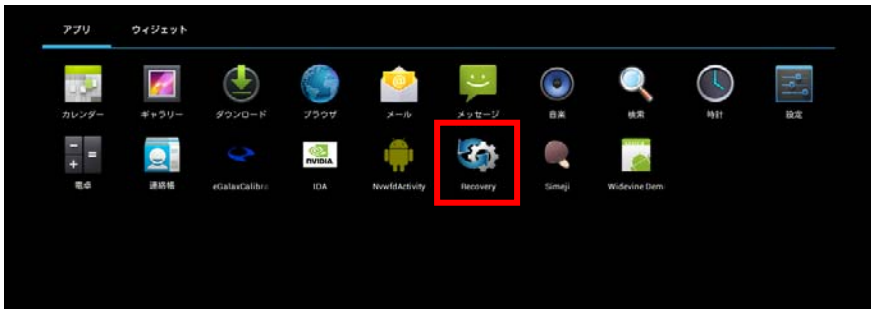
;	210bpi, 107 ALPHA, 5-bits/characters	?
---	--------------------------------------	---

3-3. UTILITY UPDATE

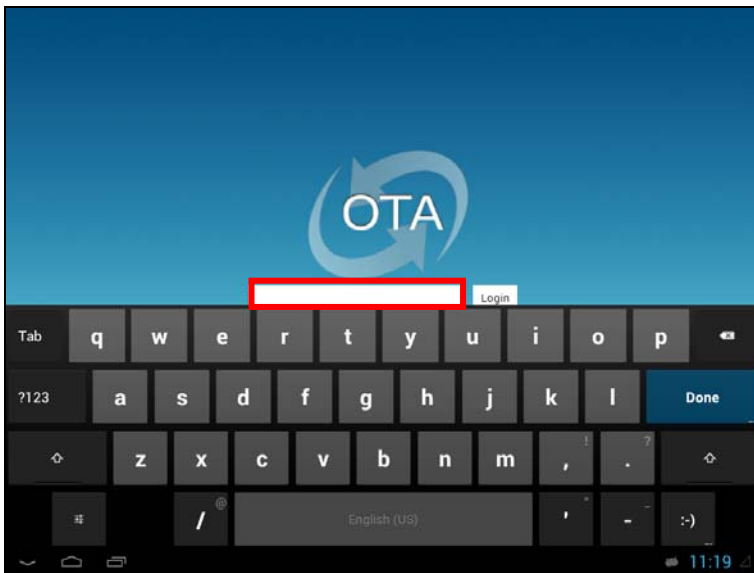
3-3-1. OS

3-3-1-1. Update Android via OTA

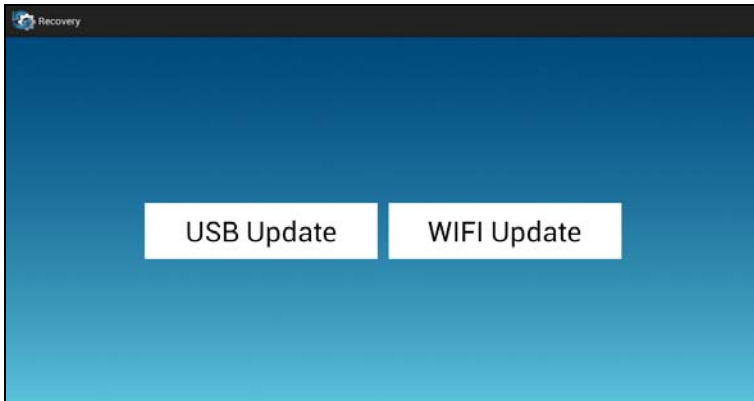
1. Select **Recovery** icon.



2. Type the password “prox” to login.

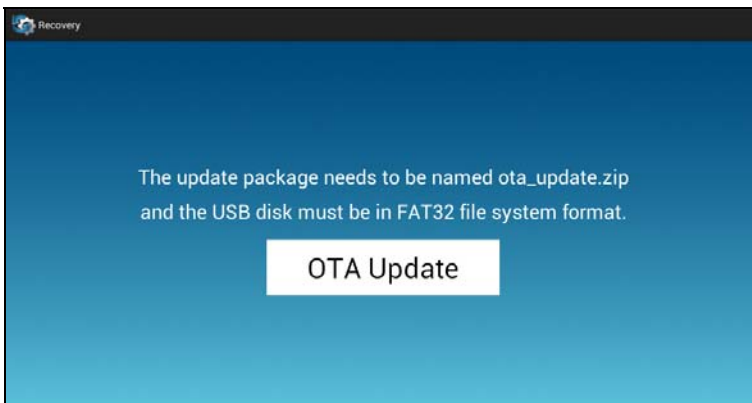


3. There are two ways available for OTA update.



I. With USB

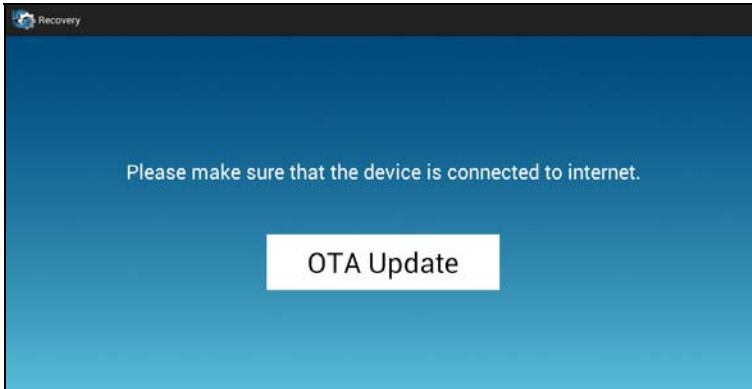
1. Confirm two things in your USB disk. The update package needs to be named *ota_update.zip* and USB disk must be in FAT32 file system format.



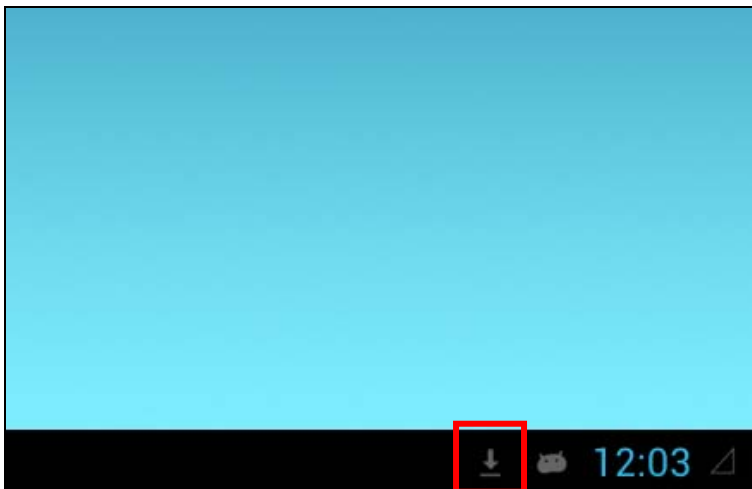
2. Put *ota_update.zip* in USB disk and plug into device.
3. Click OTA Update button.

II. With WiFi

1. Firstly make sure the device is connected to Internet.

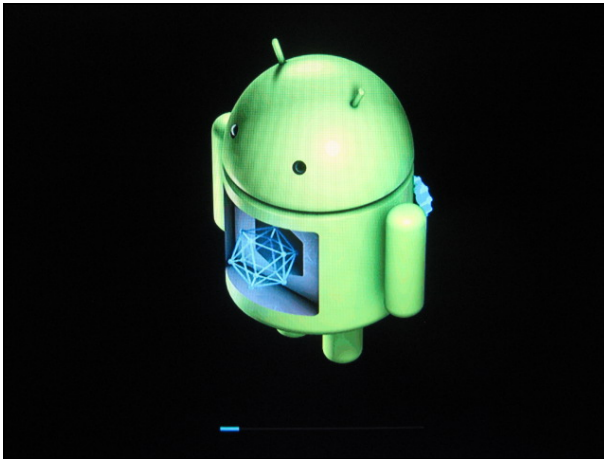


2. Click OTA update button.
3. Wait for a few minutes and the system will download the update package.



III. Update Progress

1. When the *ota_package.zip* is ready, system will re-boot in recovery mode and update package.
2. Below picture would show up during the update progress.



3. When it finishes, the system will re-boot again to Android.
4. Finished.

3-3-1-2. Update Android Image by Linux PC

Follow below process **carefully**. Before updating starts, make sure you have the same hardware and software environment as follows:

Hardware environment:

- Micro USB to USB:

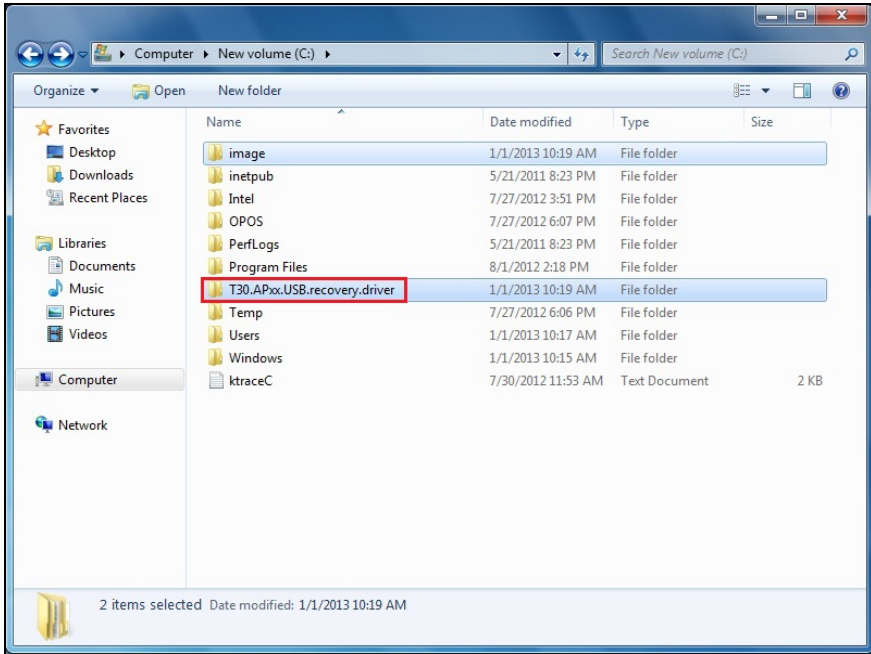


Software environment:

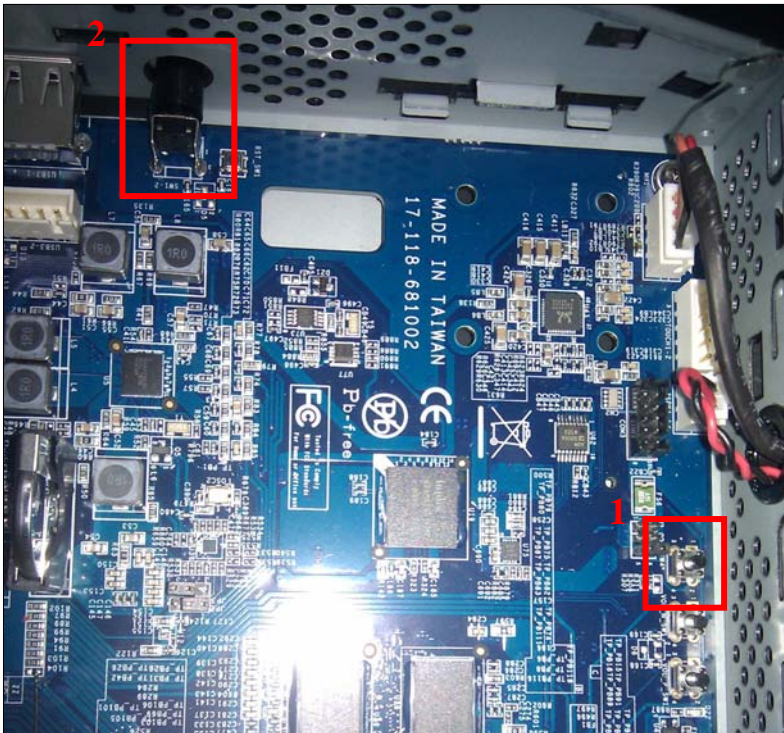
- Operating System: Windows 7
- USB Recovery Driver (Protech will provide)

I. Install USB Recovery Driver

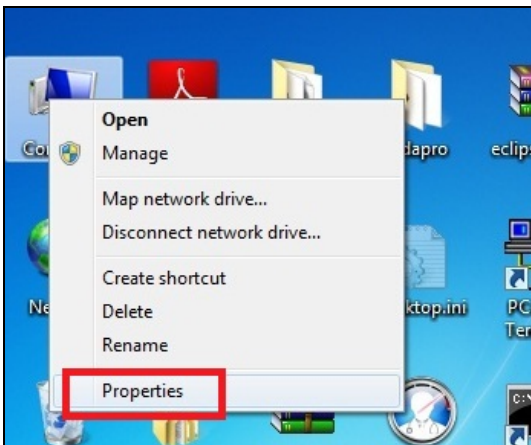
1. Copy the *T30.APxx.USB.recovery.driver* folder to C:\



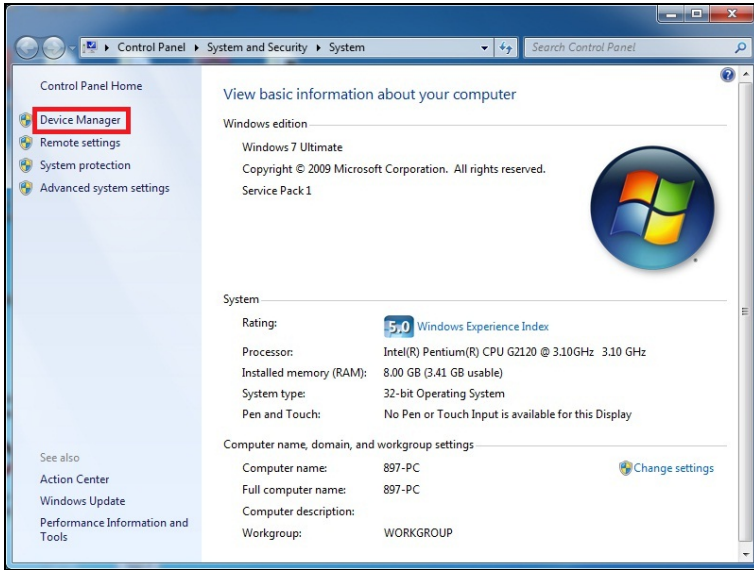
2. Connect power to the board PA-6810. Use micro-USB to connect PA-6810 and computer. Then press **botton 2** for 20 seconds. Then press **botton 1** and hold it. (Do not release your finger from **botton 1**) Then press **botton 2**. Then release your finger from **botton 1**.



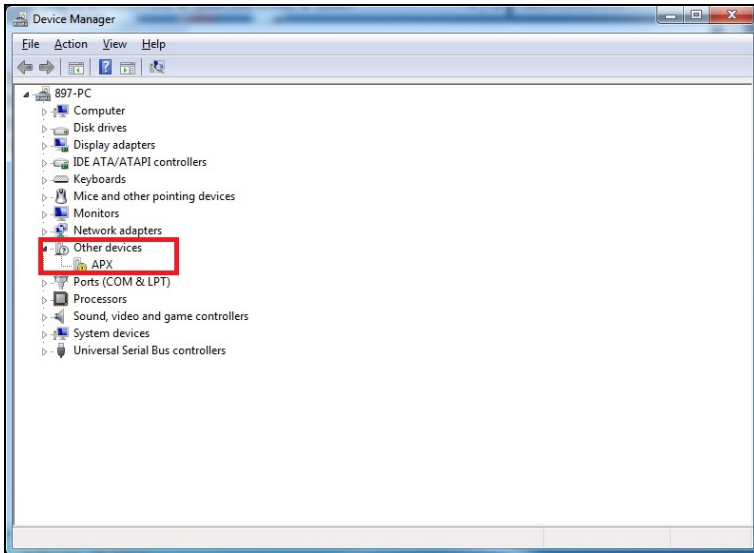
3. Right click on **Computer** icon. Then click **Properties**.



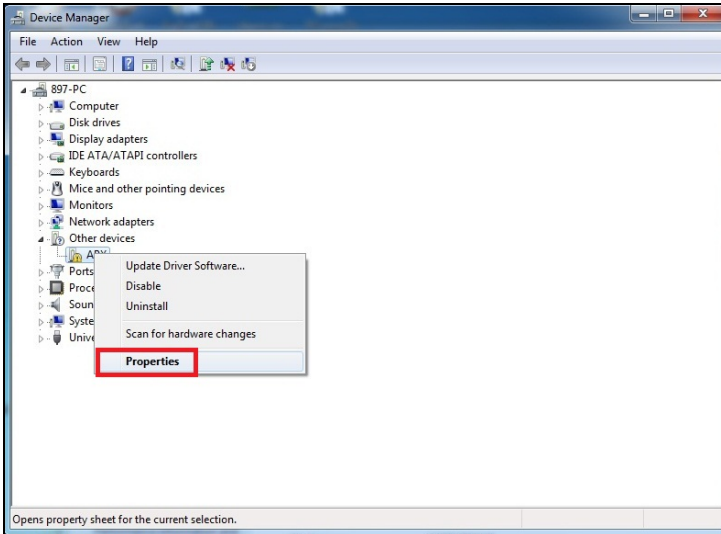
4. Click **Device Manager**.



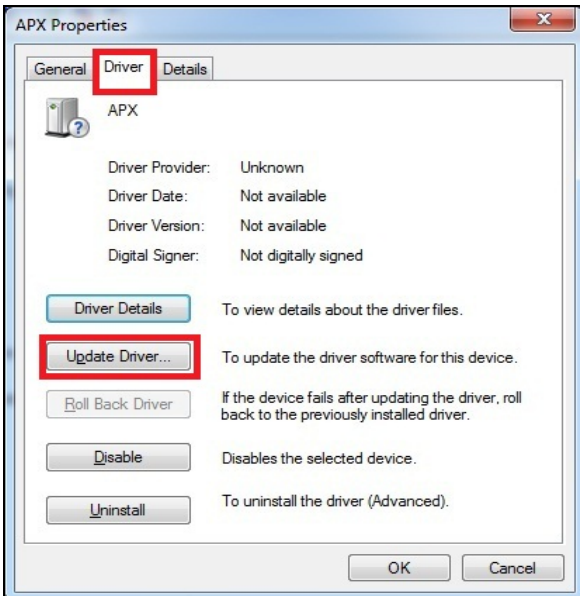
5. You will see the following picture.



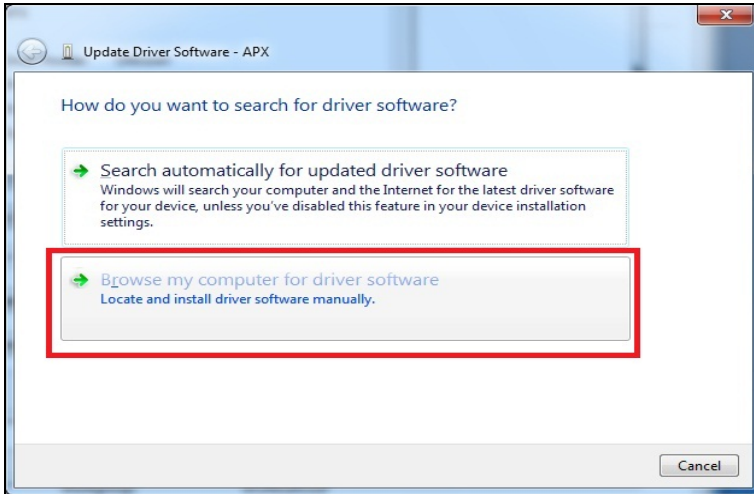
6. Right click **APX**. Then click **Properties**.



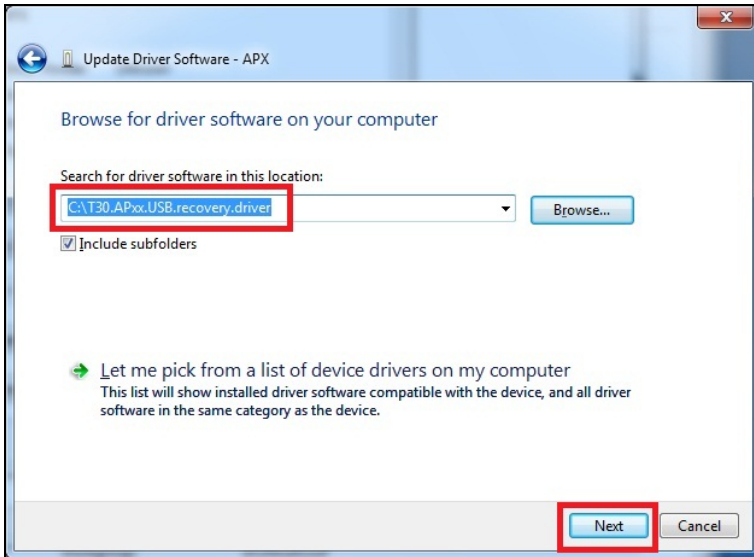
7. Click **Driver** then **Update Driver**.



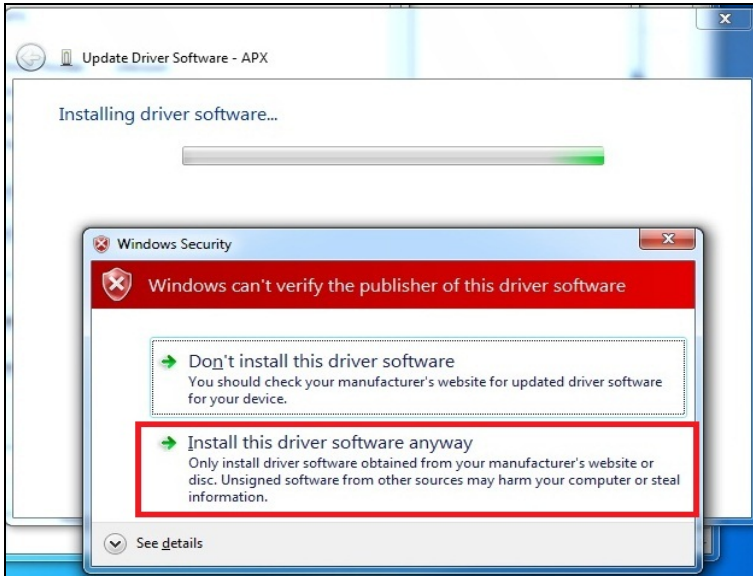
8. Click “Browse my computer for driver software”



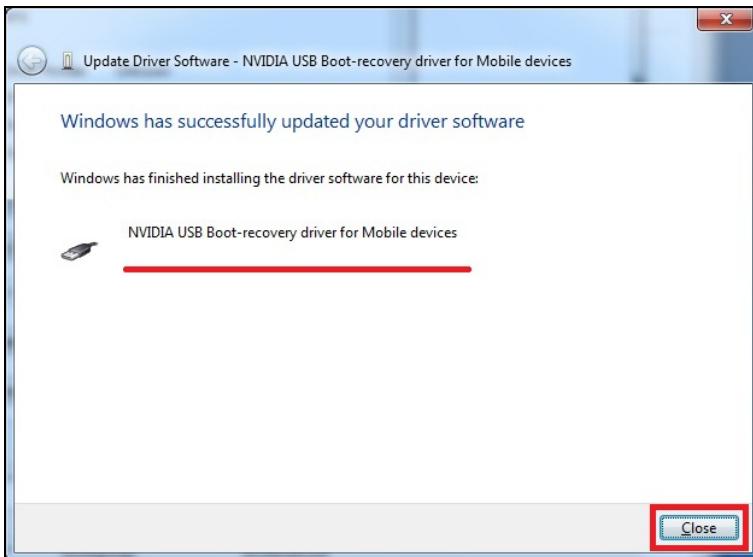
9. Enter “C:\T30.APxx.USB.recovery.driver” and click “Next”



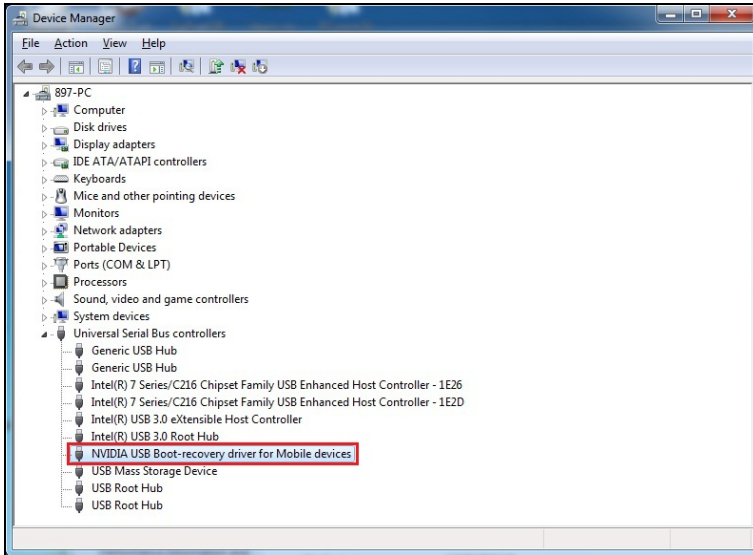
10. If you see the picture below, click **Install this driver software anyway**.



11. After a while, you will see the screen below.

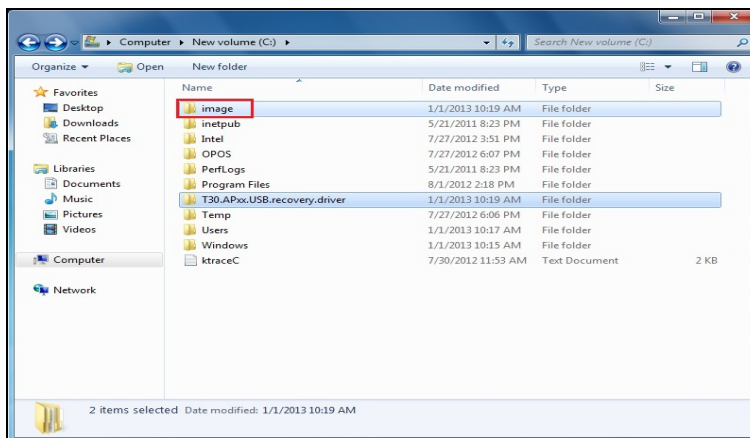


12. You can double check if your driver is successfully installed in **Device Manager**.

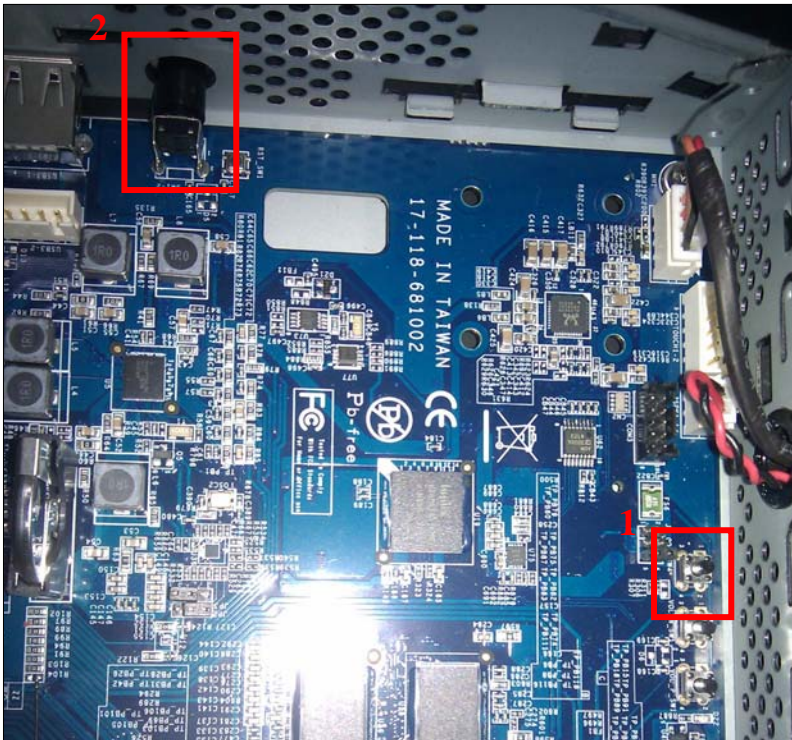


II. Update Android image

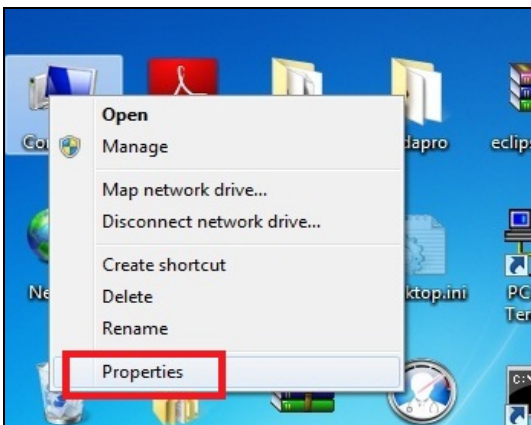
1. Copy “image” folder to “C:\”.



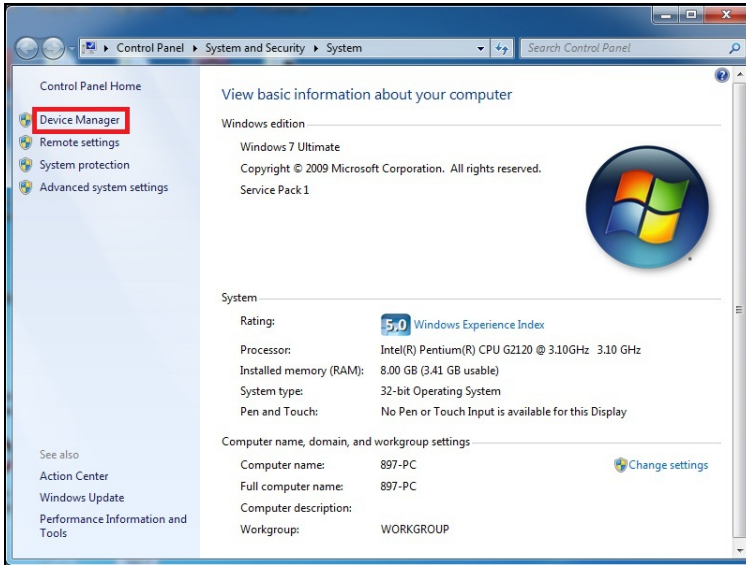
2. Connect power to PA-6810. Use micro-USB to connect PA-6810 and computer. Then press **botton 2** for 20 seconds. Then press **botton 1** and hold it. (Do not release your finger from **botton 1**) Then press **botton 2**. Then release your finger from **botton 1**.



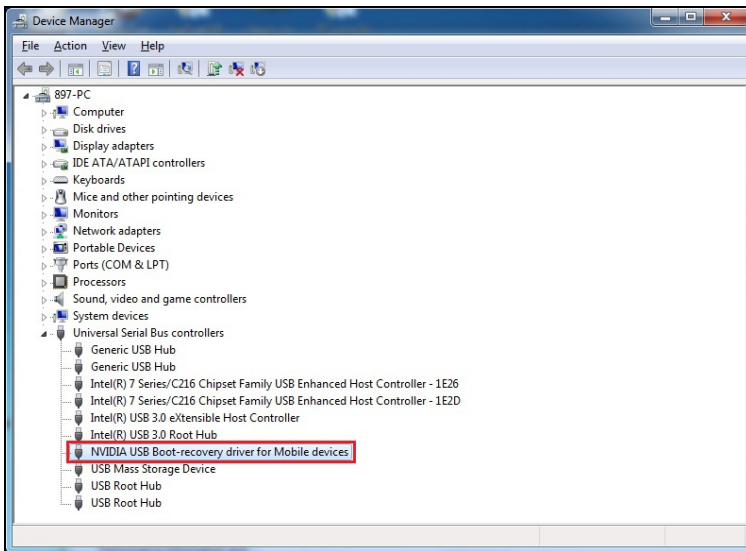
3. Right click on Computer. Then click **Properties**.



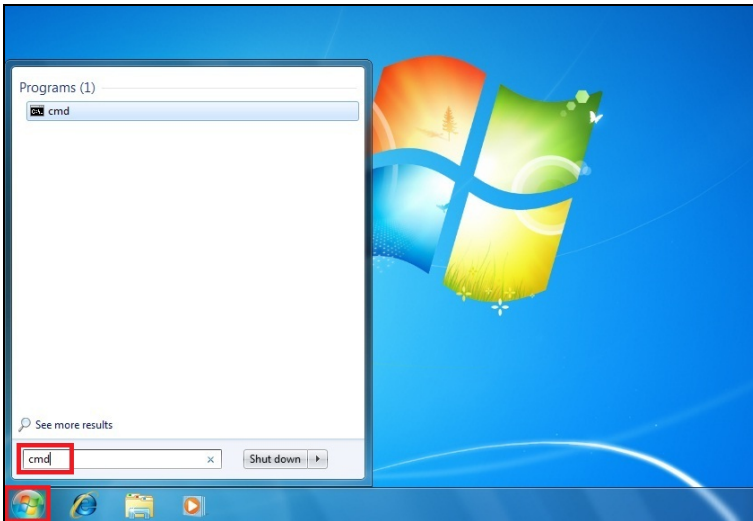
- 4. Click **Device Manager**.



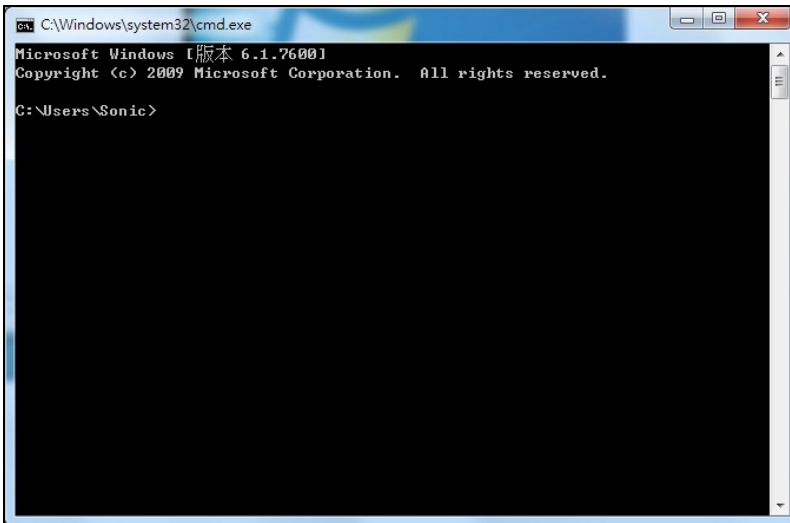
- 5. Check device status in **Device Manager**. If you don't see **NVIDIA USB Boot-recovery driver for Mobile devices** here, repeat step 2 to 4.



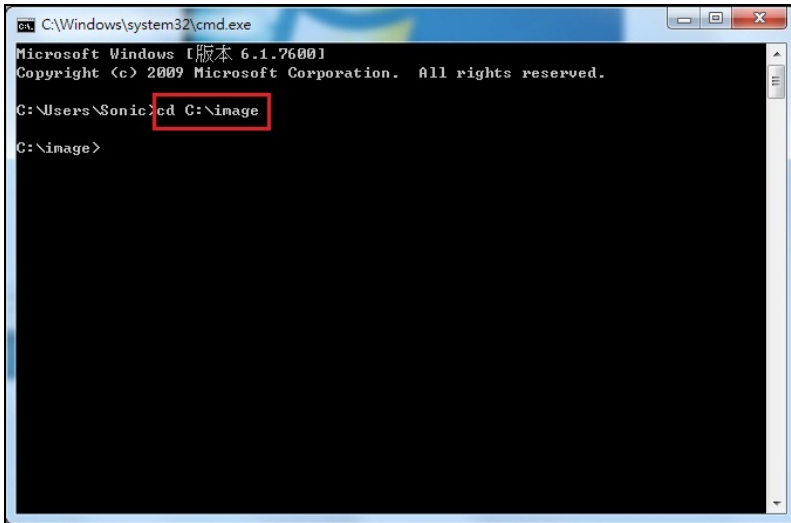
6. Click **Start** in Windows. Then type “cmd” as the picture shows below. Then press Enter.



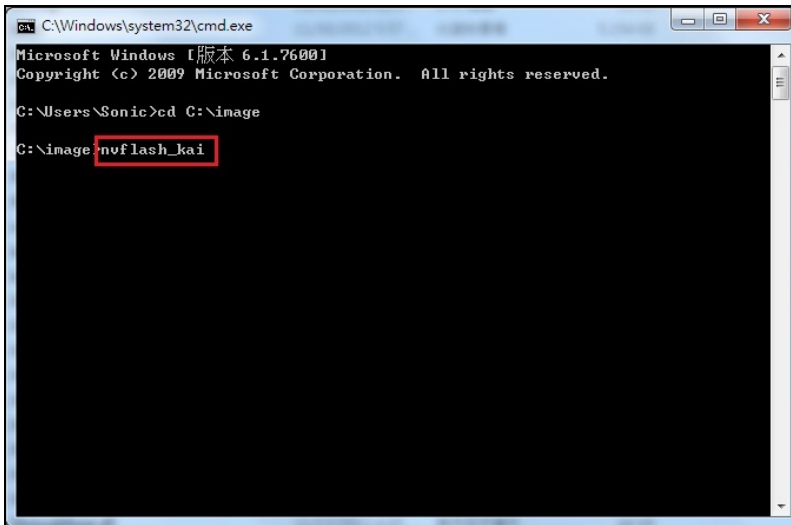
7. The window below will appear.



8. Type “**cd C:\image**”, then press Enter.



9. Type “**nvflash_kai**”, then press Enter.



10. Updating.

```

C:\Windows\system32\cmd.exe -nvflash_kai
Copyright (c) 2009 Microsoft Corporation. All rights reserved.

C:\Users\Sonic>cd C:\image
C:\image>nvflash_kai
C:\image>"nvflash.exe" --bct flash.bct --setbct --odmdata 0x40098000 --configfil
e flash.cfg --create --hl bootloader.bin --go
Nvflash v1.13.87285 started
chip uid from BB is: 0x000000000000000015d2a503f48140e
nv version 0x30801
System Information:
  chip name: unknown
  chip id: 0x30 major: 1 minor: 3
  chip sku: 0x83
  chip uid: 0x000000000000000015d2a503f48140e
  macrovision: disabled
  hdcp: enabled
  jtag: enabled
  sbk burned: false
  dk burned: false
  boot device: emmc
  operating mode: 3
  device config strap: 0
  device config fuse: 0
  sdram config strap: 1
sending file: flash.bct
- 6128/6128 bytes sent
flash.bct sent successfully
odm data: 0x40098000
downloading bootloader -- load address: 0x80108000 entry point: 0x80108000
sending file: bootloader.bin
! 953392/953392 bytes sent
bootloader.bin sent successfully
waiting for bootloader to initialize

```

11. When you see **Press enter to continue;**, press Enter.

```

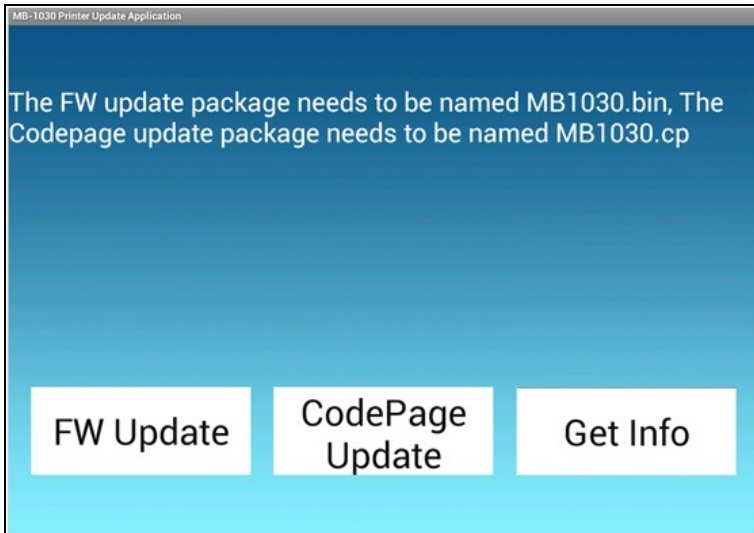
C:\Windows\system32\cmd.exe
deleting device partitions
creating partition: BCT
creating partition: PT
creating partition: EBI
creating partition: NUC
creating partition: EKS
creating partition: GPI
creating partition: SOS
creating partition: LMX
creating partition: APP
creating partition: CAC
creating partition: MSC
creating partition: USP
creating partition: MDA
creating partition: UDA
creating partition: GPT
sending file: bootloader.bin
! 953392/953392 bytes sent
bootloader.bin sent successfully
sending file: microboot.bin
\ 78736/78736 bytes sent
microboot.bin sent successfully
sending file: eks.dat
- 44/44 bytes sent
eks.dat sent successfully
sending file: recovery.img
\ 5629952/5629952 bytes sent
recovery.img sent successfully
sending file: boot.img
- 5277696/5277696 bytes sent
boot.img sent successfully
sending file: system.img
- 244108976/244108976 bytes sent
system.img sent successfully
Press enter to continue:
C:\image>

```

12. Then PA-6810 Android image has been updated completely.

3-3-2. Printer Board

1. Prepare Files:
Rename F00-1030-000-01-xxxxxx.bin as “MB1030.bin”.
Copy MB1030.bin to USB storage. Then insert this device into the USB socket.
2. Click **FW Update** button.

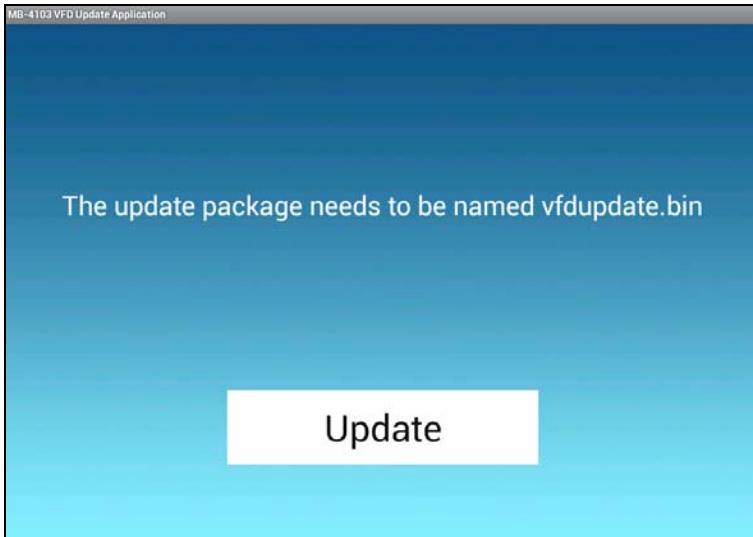


3-3-2-1. Update CGROM CodePage Font

1. Prepare Files:
Rename JPsjis-1030-001-03-xxxxxx.cp as “MB1030.cp”.
Copy MB1030.cp to USB storage. Then insert this device into the USB socket.
2. Click **CodePage Update** button on the same screen as above.

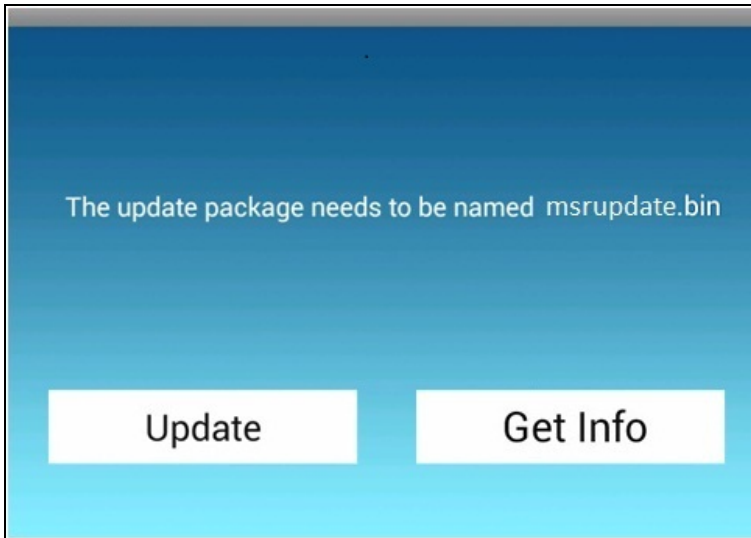
3-3-3. VFD Board

1. Prepare Files:
Rename F00-4103-000-01-xxxxxx.bin to “vfdupdate.bin”.
Copy vfdupdate.bin to USB storage. Then insert this device into the USB socket.
2. Click **Update** button.

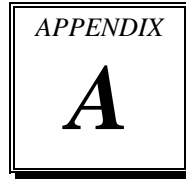


3-3-4. MSR Board

1. Prepare Files:
Rename F00-3013-000-01-xxxxxx.bin to “msrupdate.bin”.
Copy msrupdate.bin to USB storage. Then insert this device into the USB socket.
2. Click **Update** button.



SYSTEM ASSEMBLY

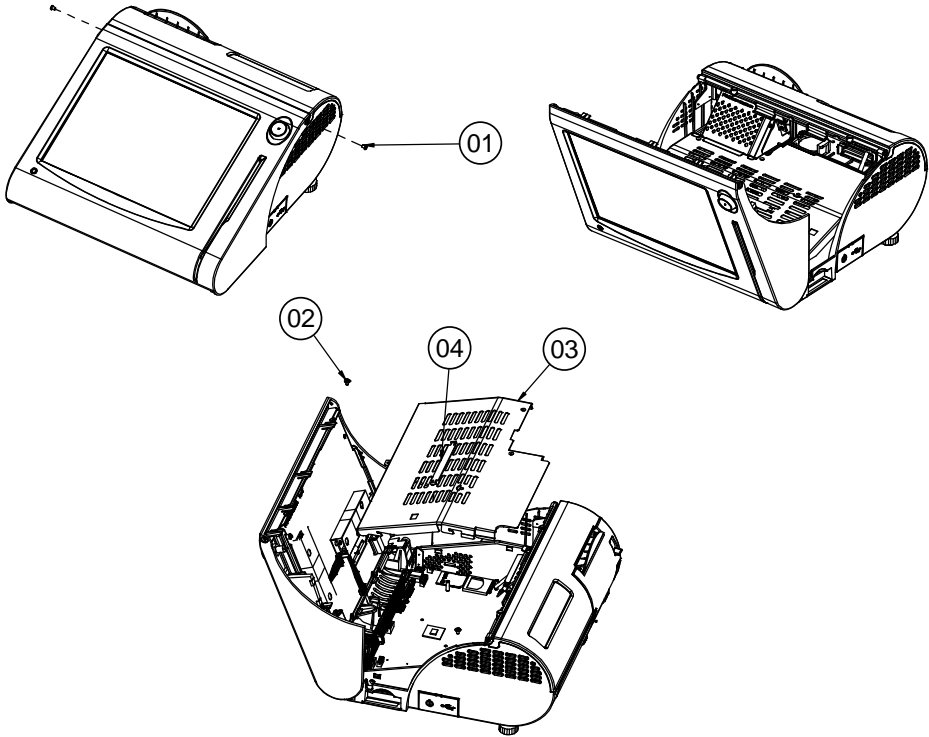


This appendix contains exploded diagrams and part numbers of the PA-3110 system.

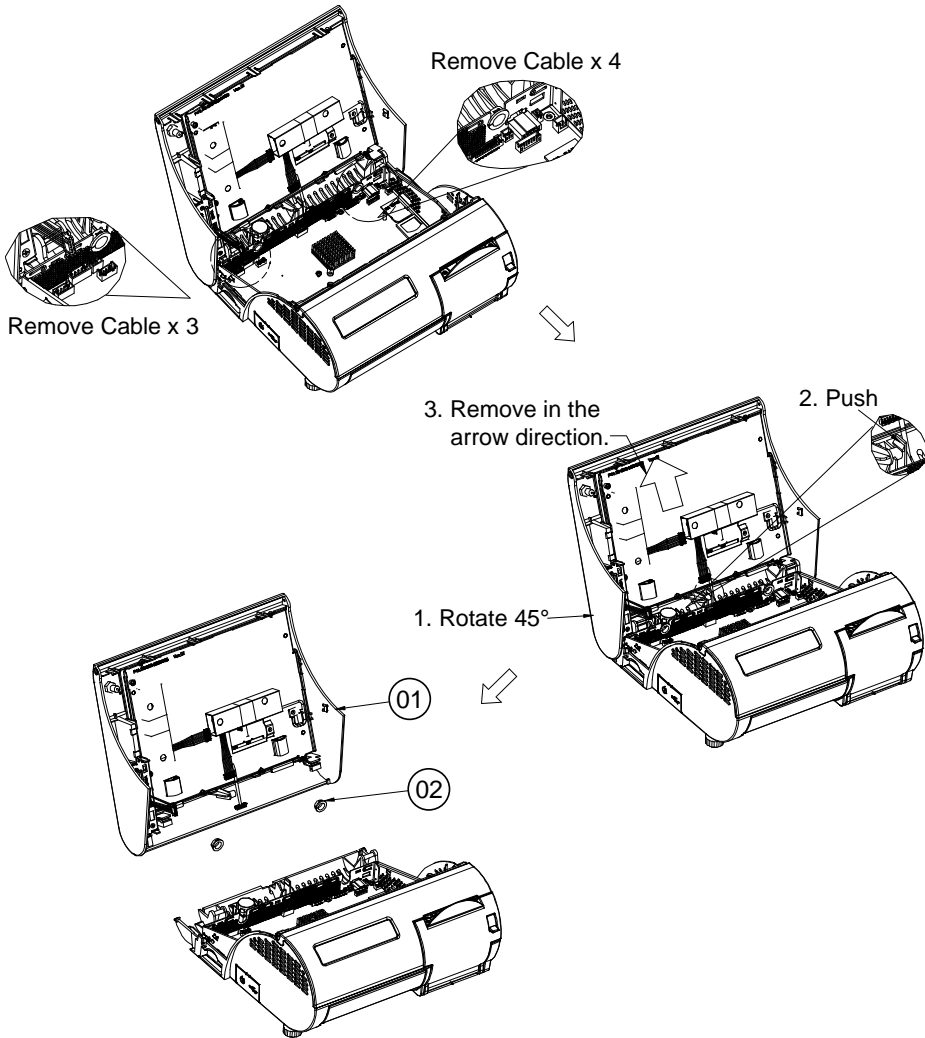
Sections included:

- Exploded Diagram for System Top Module
- Exploded Diagram for Printer
- Exploded Diagram for System Bottom Module
- Exploded Diagram for Main Board
- Exploded Diagram for MSR
- Exploded Diagram for VFD
- Exploded Diagram for Hard Disk Drive

EXPLODED DIAGRAM FOR SYSTEM TOP MODULE

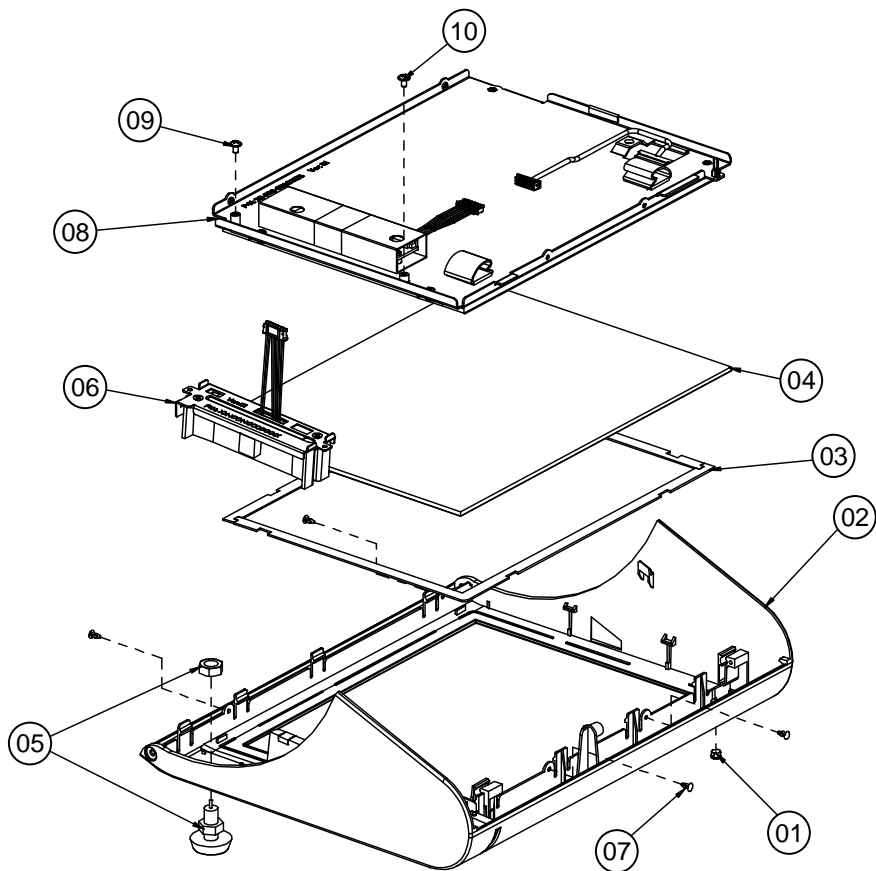


No.	Name	P/N No.	Qty
1	M3_L4_I_B	22-272-30004318	2
2	M3_L5_Washer_Ni	22-242-30005311	1
3	3520 Inside_top	20-040-03002210	1
4	PULLER	30-080-04100000	1



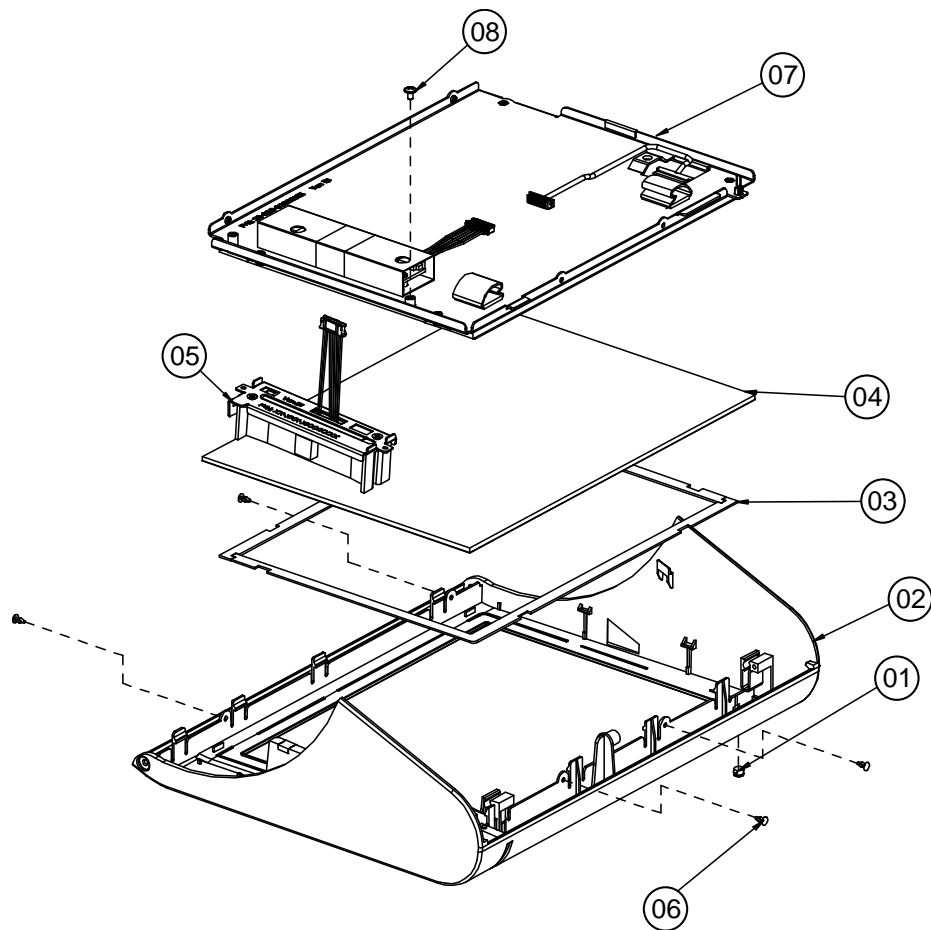
No.	Name	P/N No.	Qty
1	TOP Assembly	--	1
2	Open Closed Bushing	30-026-04300000	2

LCD Panel of i-Button Type



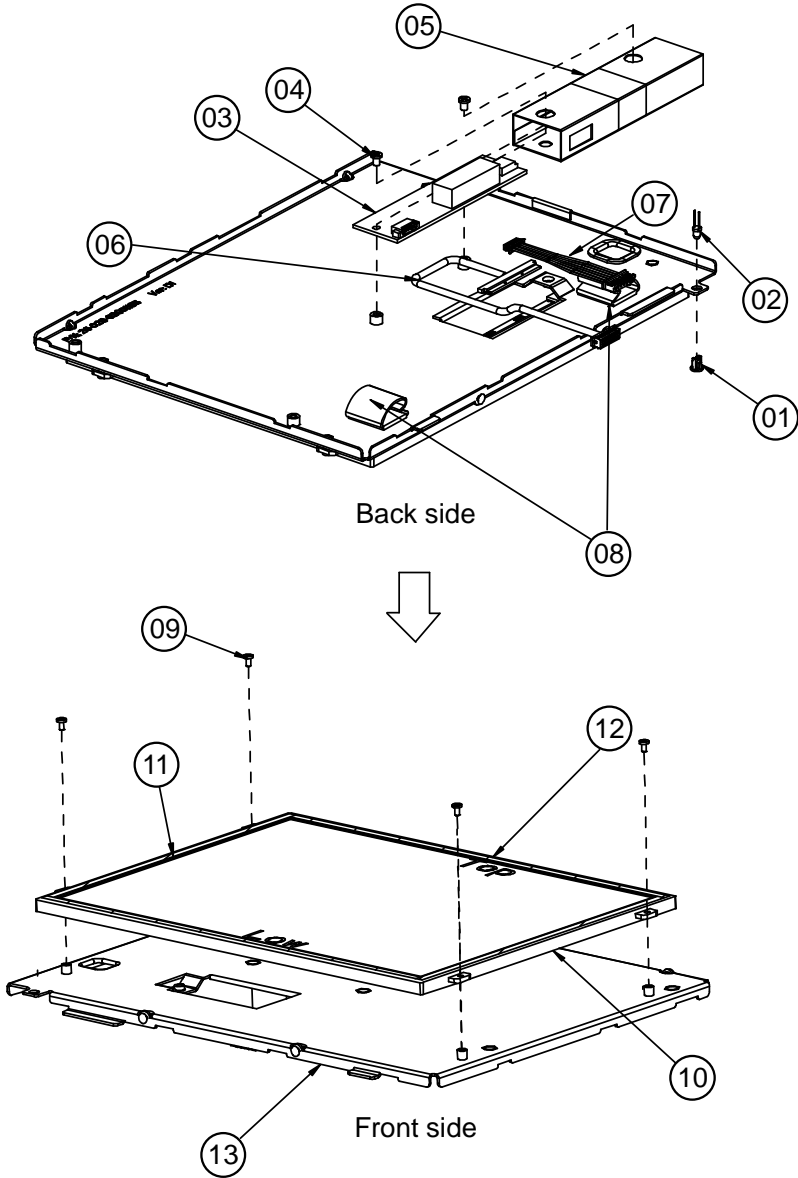
No.	Name	P/N No.	Qt'y
1	LED CAP	30-012-02100000	1
2	I-BOUNT TOP CASE(Blue)	30-003-28310165	1
	I-BOUNT TOP CASE(Red)	30-003-28610165	
	I-BOUNT TOP CASE(Wwhite)	30-003-28112165	
	I-BOUNT TOP CASE(Black)	30-003-28113165	
3	Touch_EVA	30-013-15100166	2
4	ELO 10.4" Touch	52-380-01510401	1
5	I Button	52-551-00100002	1
6	MSR Assembly	--	1
7	Plastic rivet	90-042-04100000	4
8	LCD Assembly	--	1
9	M3_L5_Washer_Ni (I-Button GND screw)	22-242-30005311	1
10	M3_L5_Washer_Ni (MSR GND screw)	22-242-30005311	1

LCD Panel of Empty Type



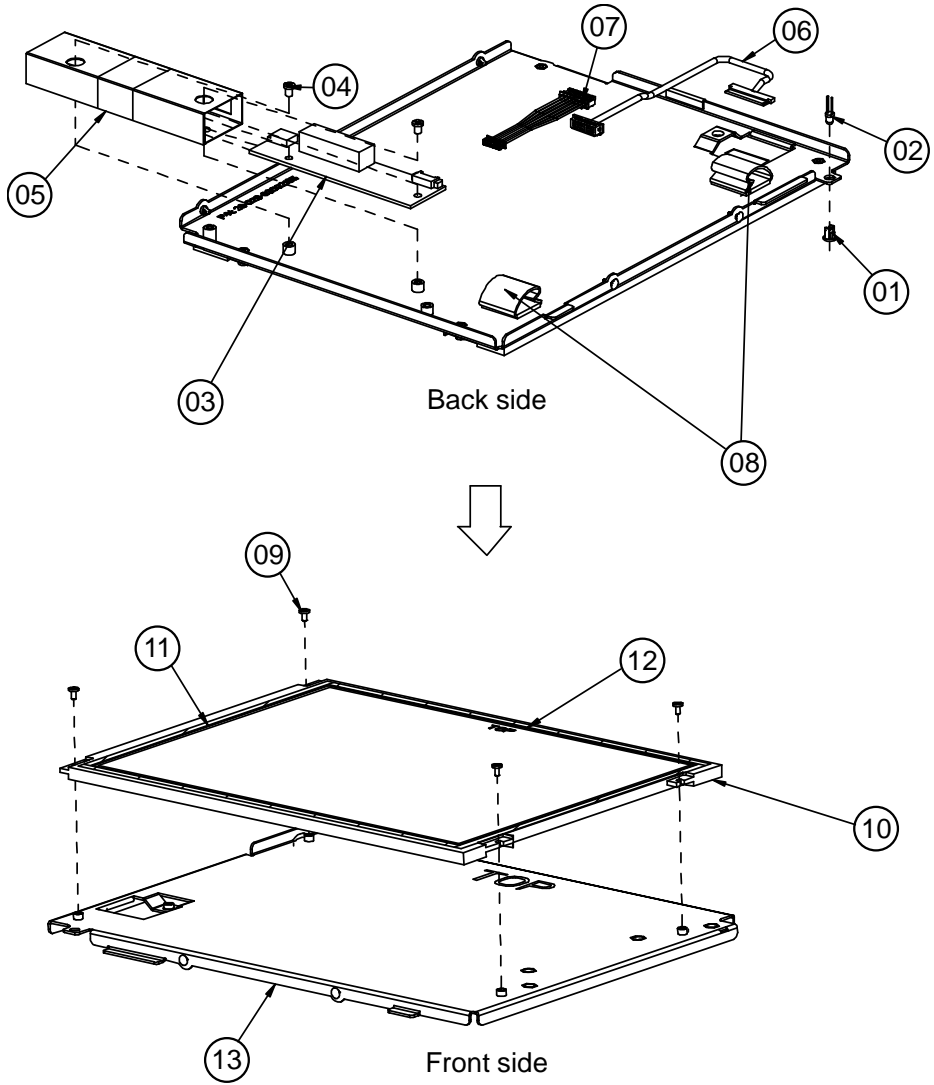
No.	Name	P/N No.	Qty
1	LED CAP	30-012-02100000	1
2	Empty TOP CASSE(Blue)	30-003-28110165	1
	Empty TOP CASSE(Red)	30-003-28410165	
	Empty TOP CASSE(White)	30-003-28710165	
	FINGER-PRINTER TOP CASE(Black)	30-003-28810165	
3	Touch_EVA	30-013-15100166	2
4	ELO 10.4" Touch	52-380-01510401	1
5	MSR Assembly	--	1
6	Plastic rivet	90-042-04100000	4
7	LCD Assembly	--	1
8	M3-L5_Washer_Ni (MSR GND screw)	22-242-30005311	1

LCD Panel for CPT



No.	Name	P/N No.	Qty
1	LED Housing	30-014-04100165	1
2	Led Cable	27-018-16503071	1
3	Inverter	52-101-08010003	1
4	M3_L4_I_B	22-272-30004318	2
5	Inverter Mylar	30-056-02100165	1
6	CPT LVDS cable	27-020-16505111	1
7	inverter cable	27-015-16506111	1
8	cable_clamp	30-023-04300010	2
9	M2_L4_I_Ni	22-272-20004011	4
10	CPT 10.4" LCD	52-351-01104019	1
11	167 X 4 X0.5T PORON	30-013-24700000	2
12	220 X 4 X0.5T PORON	30-013-24600000	2
13	CPT LCD Holder	20-029-03001165	1

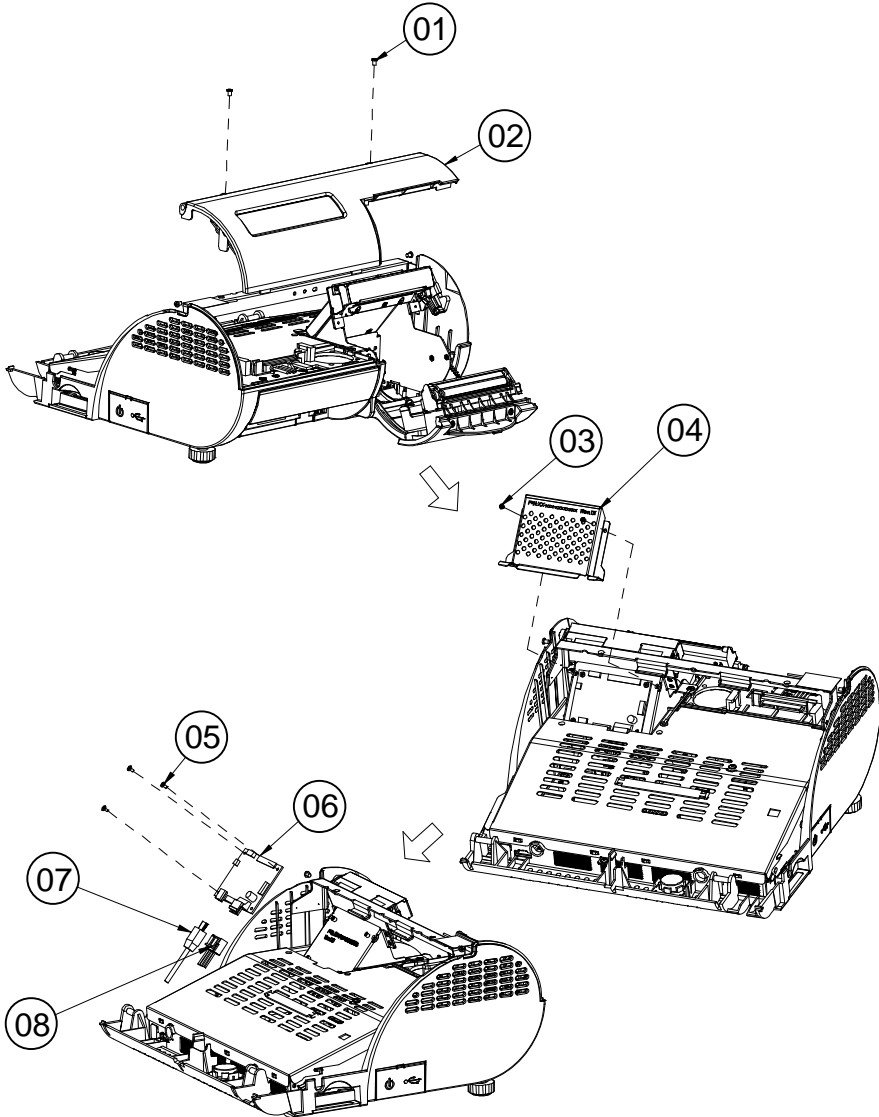
LCD Panel for TIANMA



No.	Name	P/N No.	Qt'y
1	LED Housing	30-014-04100165	1
2	Led Cable	27-018-16503071	1
3	Inverter	52-101-08010003	1
4	M3_L4_I_B	22-272-30004318	2
5	Inverter Mylar	30-056-02100165	1
6	LVDS cable	27-020-16505112	1
7	inverter cable	27-015-16506111	1
8	cable_clamp	30-023-04300010	2
9	M2_L4_I_Ni	22-272-20004011	4
10	TIANMA 10.4" LCD PANEL	52-351-01104228	1
11	167 X 4 X0.5T PORON	30-013-24700000	2
12	220 X 4 X0.5T PORON	30-013-24600000	2
13	LCD Holder	20-029-03002165	1

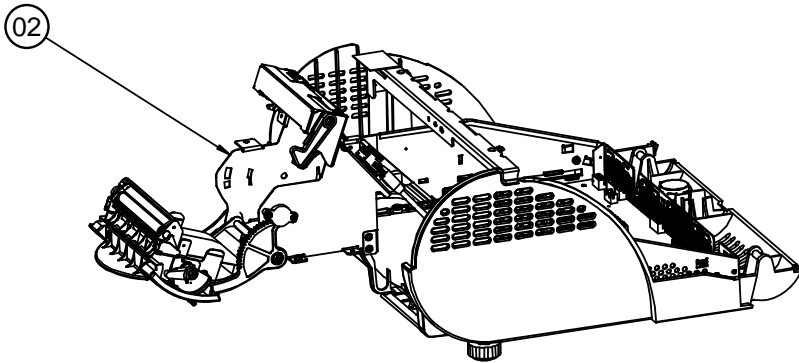
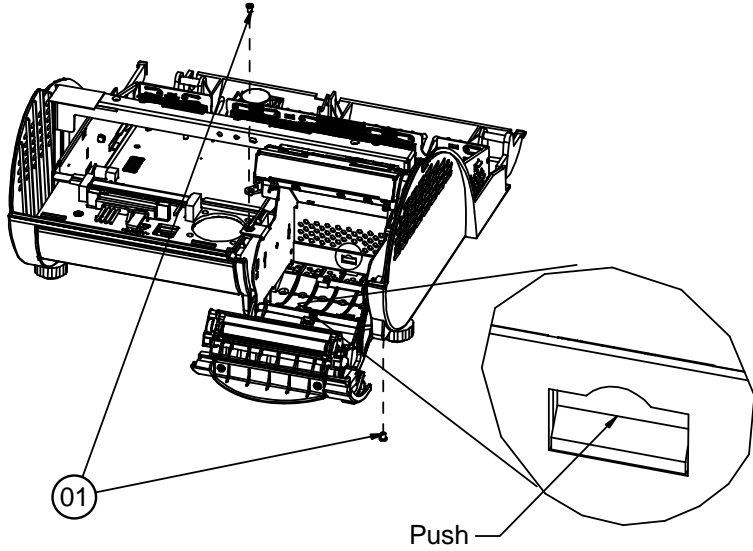
EXPLODED DIAGRAM FOR PRINTER

Printer board



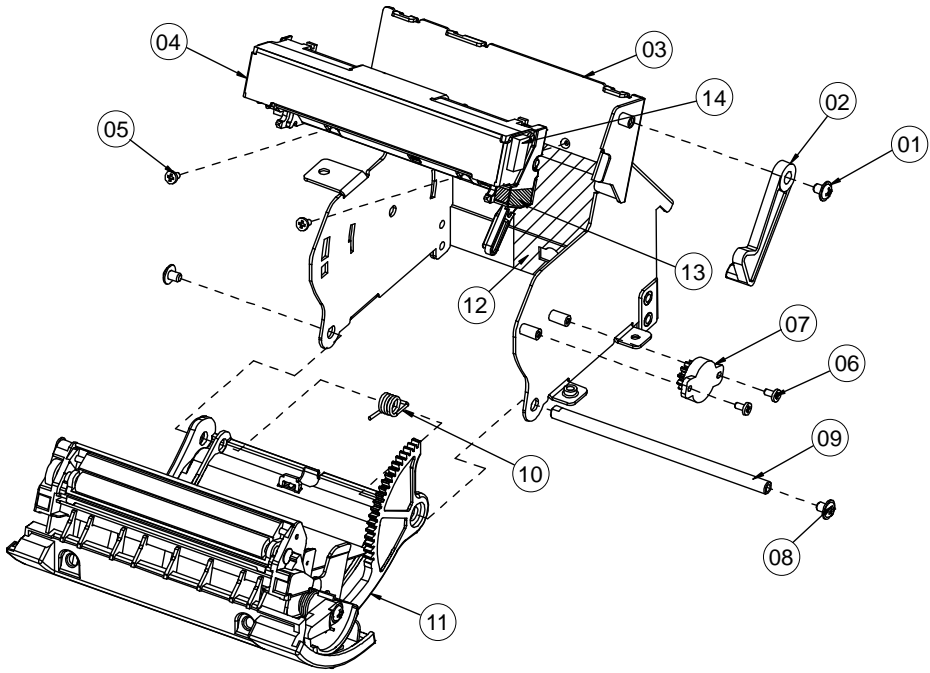
No.	Name	P/N No.	Qty
1	M3_L4_I_B	22-272-30004318	2
2	VFD Assembly	--	1
3	M2.5_L4_R_Ni	22-232-25004011	2
4	PCB_COVER	20-004-03001165	1
5	M2_L4_W_Ni	22-232-20004311	3
6	Printer PCB	MB-1030RA-11N	1
7	Printer USB cable	See order	1
8	Printer Power Cable	See order	1

Basic construction



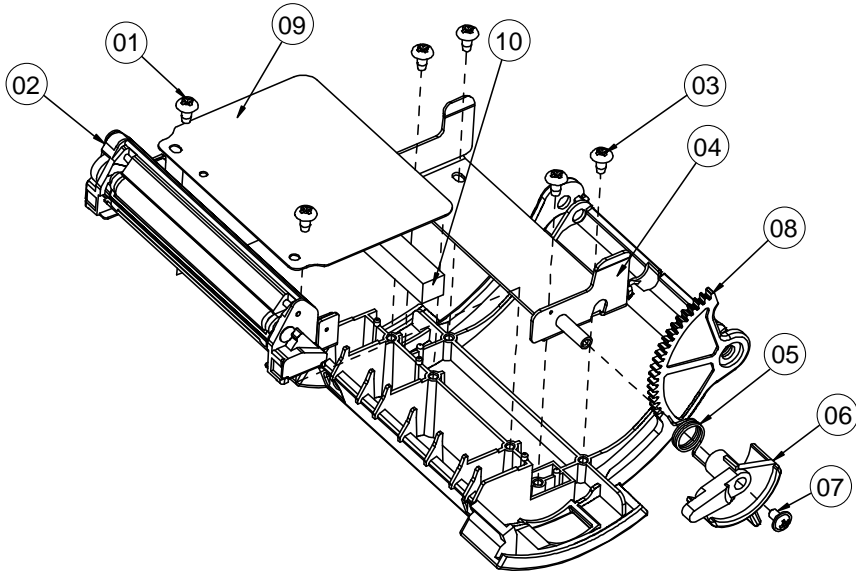
No.	Name	P/N No.	Qt'y
1	M3_L4_1_B	22-272-30004318	2
2	Printer Assembly	--	1

3 inch printer



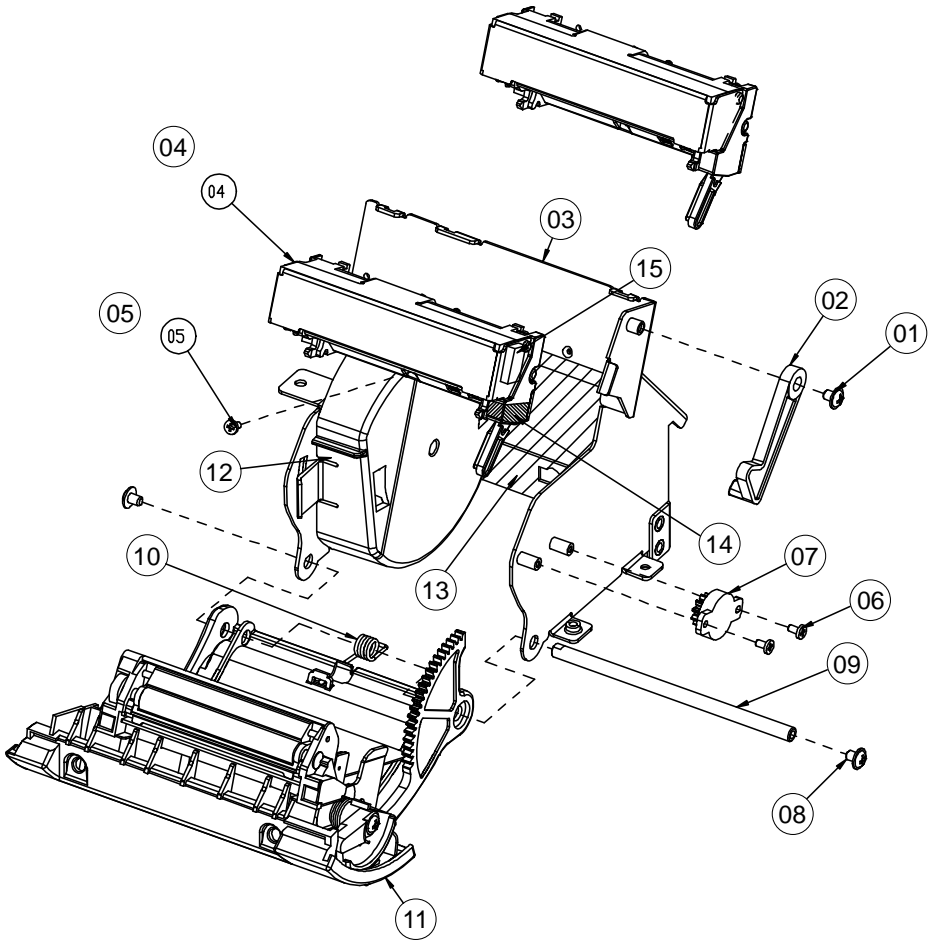
No.	Name	P/N No.	Qty
1	M3_I_L4_Black	22-272-30004318	1
2	Printer_add_arm(White)	30-002-09410165	1
	Printer_add_arm(black)	30-002-09110165	
3	PS3100_PRINTER_BOX_V2	20-040-03004165	1
4	CAPD34X_A_01 (3")	52-701-00017003	1/2
5	M2_I_L4_Ni	22-272-20004011	2
6	M2_I_L4_Ni	22-272-20004011	2
7	ROTARY DAMPER	30-022-09110000	1
8	M3_Washer_L5_Ni	22-242-30005311	2
9	Paper_cover_pin	20-004-10011165	1
10	PS3100-SPRING-1	23-002-00000701	1
11	Paper_cover_Assembly	--	1
12	myler	90-056-02200165	1
13	Shielding Gasket_A	90-050-31200165	1
14	Shielding Gasket_B	90-050-31300165	1

3 inch printer cover



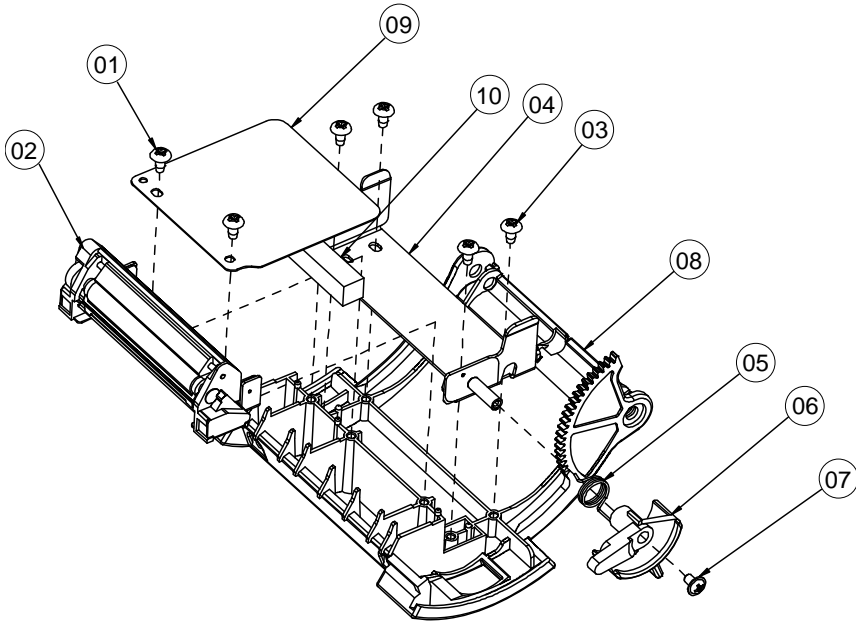
No.	Name	P/N No.	Qt'y
1	T3_R_L8_Black	22-122-30080011	2
2	CAPD34X_A_01 (3')	52-701-00017003	1/2
3	T3_R_L6_Ni	22-132-30060011	4
4	PS-3100 INCLUDE HOLDER	20-029-03006165	1
5	PS3100-SPRING-FDR_EJECTOR	23-002-00001021	1
6	PRINTER_COVER_EJECTOR(White)	30-002-09310165	1
	PRINTER_COVER_EJECTOR(Black)	30-002-09210165	
7	M3_I_L4_Black	22-272-30004318	1
8	PS3100_PAPER_COVER_V2(White)	30-002-02630165	1
	PS3100_PAPER_COVER_V2(Black)	30-002-02530165	
9	3INCH_ADD_MYLAR2	90-056-02600165	1
10	2inch_add_EVA	90-013-15200165	1

2 inch printer



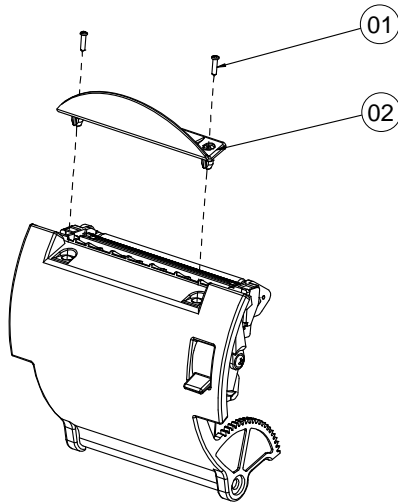
No.	Name	P/N No.	Qty
1	M3_I_L4_Black	22-272-30004318	1
2	Printer_add_arm(white)	30-002-09410165	1
	Printer_add_arm(black)	30-002-09110165	
3	PS3100_PRINTER_BOX_V2	20-040-03004165	1
4	CAPD24X_A_03 (2')	52-701-00020003	1/2
5	M2_I_L4_Ni	22-272-20004011	1
6	M2_I_L4_Ni	22-272-20004011	2
7	ROTARY DAMPER	30-022-09110000	1
8	M3_Washer_L5_Ni	22-242-30005311	2
9	Paper_cover_pin	20-004-10011165	1
10	PS3100-SPRING-1	23-002-00000701	1
11	Paper_cover_Assembly	--	1
12	ADD_PAPER_WALL	30-002-28310165	1
13	Mylar	90-056-02200165	1
14	Shielding Gasket_A	90-050-31200165	1
15	Shielding Gasket_B	90-050-31300165	1

2 inch printer cover

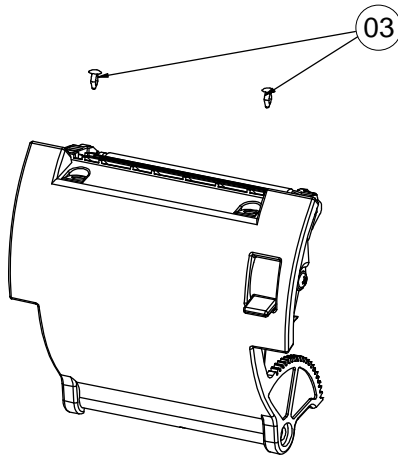


No.	Name	P/N No.	Qt'y
1	T3_R_L8_Black	22-122-30080011	2
2	CAPD24X_A_03 (2")	52-701-00020003	1/2
3	T3_R_L6_NI	22-132-30060011	4
4	PS-3100 INCLUDE HOLDER	20-029-03006165	1
5	PS3100-SPRING-FOR_EJECTOR	23-002-00001021	1
6	PRINTER_COVER_EJECTOR(White)	30-002-09310165	1
	PRINTER_COVER_EJECTOR(Black)	30-002-09210165	
7	M3_I_L4_Black	22-272-30004318	1
8	PS3100_PAPER_COVER_V2(White)	30-002-02630165	1
	PS3100_PAPER_COVER_V2(Black)	30-002-02530165	
9	2INCH_ADD_MYLAR2	90-056-02300165	1
10	2Intch_add_EVA	90-013-15200165	1

With paper holder



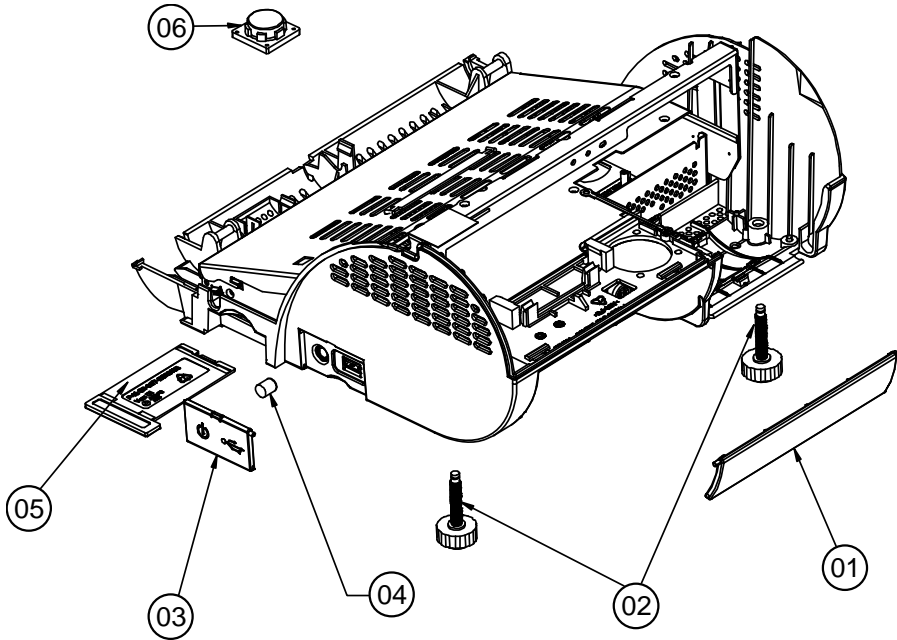
Without paper holder



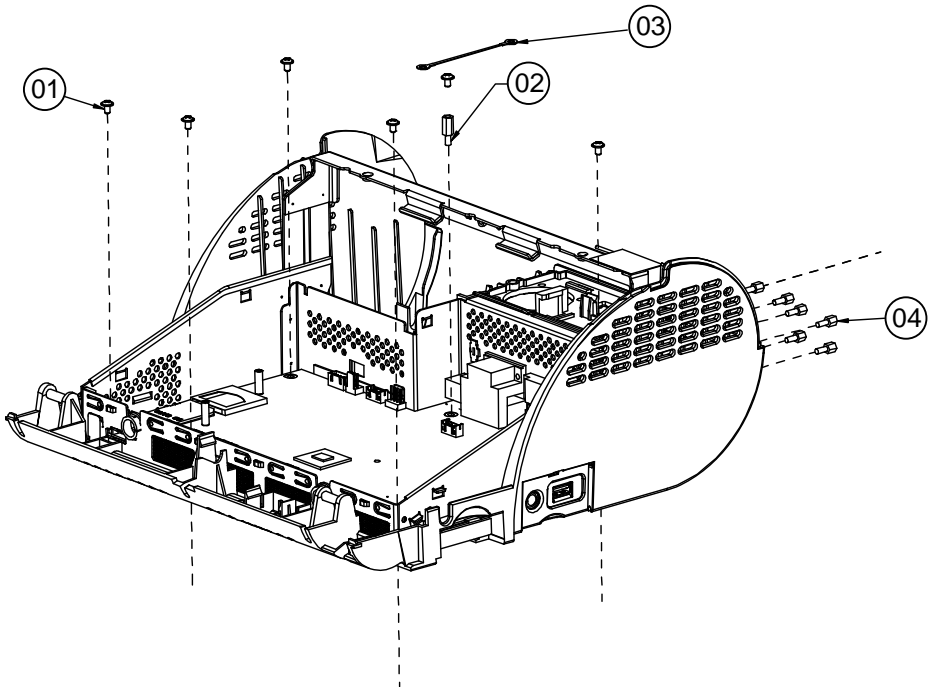
Appendix A System Assembly

No.	Name	P/N No.	Qty
1	T2_L8_Black	22-125-20008011	2
2	PAPER HOLDER(Transparent)	30-012-02210165	1
	PAPER HOLDER(Black)	30-012-02110165	
3	Ø4 Plastic rivet	90-076-04110000	2

EXPLODED DIAGRAM FOR SYSTEM BOTTOM MODULE

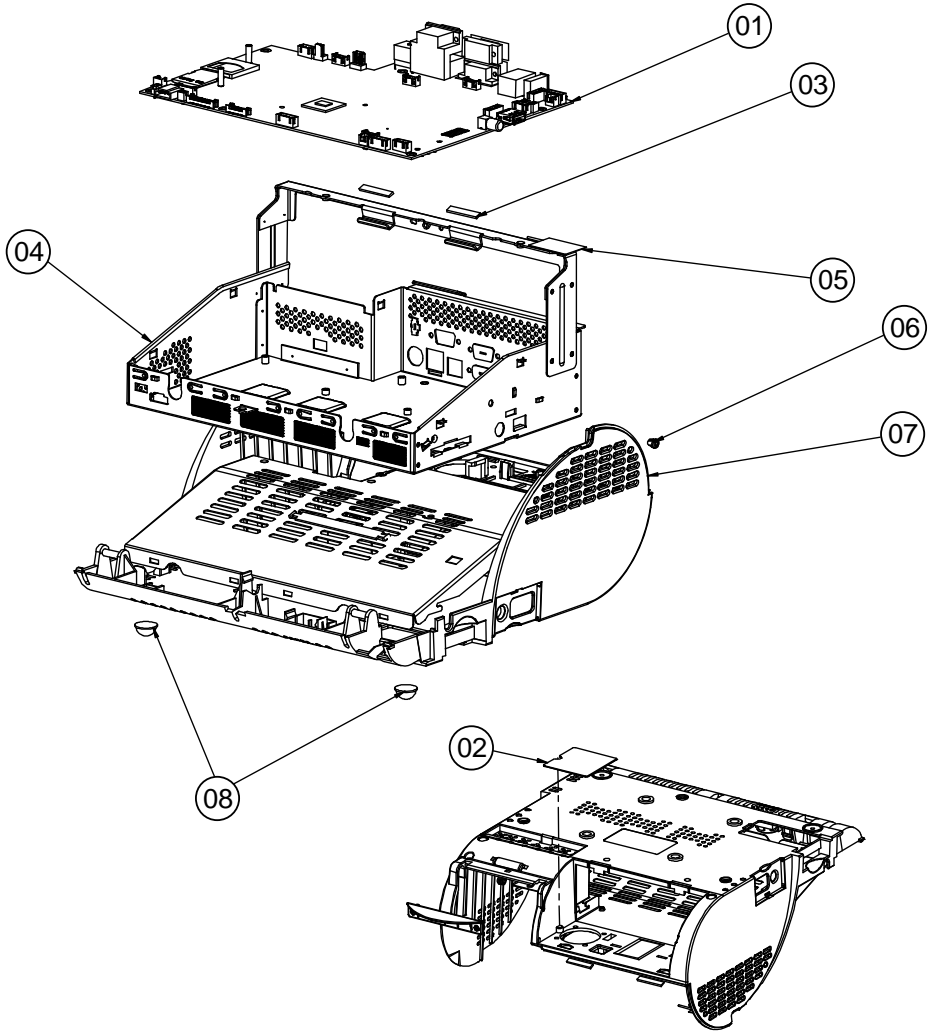


No.	Name	P/N No.	Qt'y
1	IO Cover(white)	30-002-28810165	1
	IO Cover(black)	30-002-28110165	
2	Foot	22-289-60035007	2
3	side Door(white)	30-007-28410165	1
	side Door(black)	30-007-28120165	
4	Switch cap	30-001-28100099	1
5	MINI_Pcie_Door(white)	30-007-28310165	1
	MINI_Pcie_Door(black)	30-007-28110165	
6	Speaker	13-500-08280018	1



No.	Name	P/N No.	Qt'y
1	M3_L5_Washer_Ni	22-242-30005311	6
2	Printer ground cable	27-030-16504071	1
3	M3_H10_BOSS	22-290-30010001	1
4	No.4 Boss	22-692-40048051	6

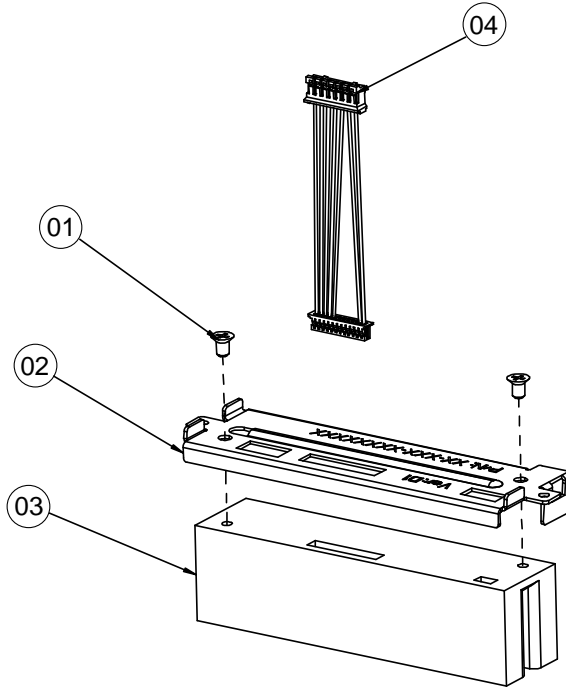
EXPLODED DIAGRAM FOR MAIN BOARD



No.	Name	P/N No.	Qt'y
1	PB-6810	PB-6810	1
2	PC Sheet	90-056-02100254	3
3	EMI SPONGE	30-050-31200000	2
4	3110 inside box	20-040-03001277	1
5	WIRELESS_ANTENNA	27-029-16506071	1
6	SB-0305	30-026-04100008	1
7	PS3100 BOT CASE(White)	30-002-12110210	1
	PS3100 BOT CASE(Black)	30-002-12210210	
8	Rubber Foot	30-004-01500000	1

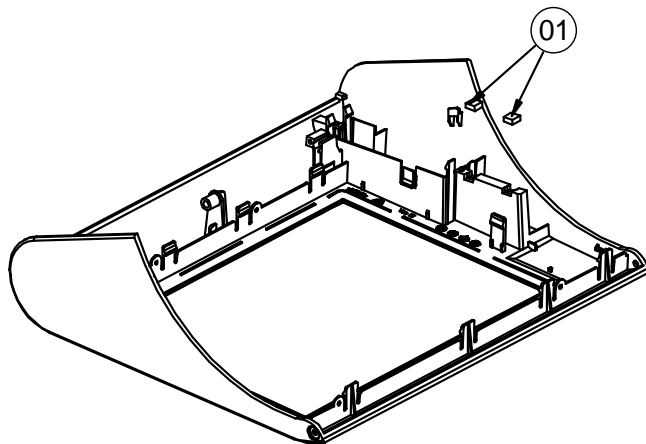
EXPLODED DIAGRAM FOR MSR

MSR module

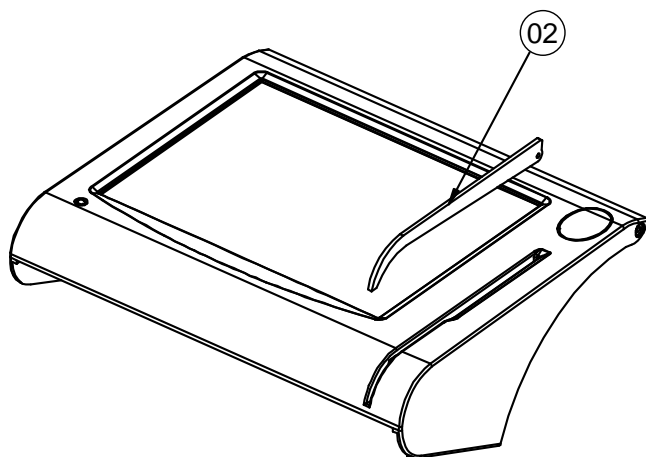


No.	Name	P/N No.	Qt'y
1	M6_L6_F_B	22-215-30060011	2
2	MSR HOLDER	20-029-03004165	1
3	MSR MODULE	MB-3013RA-11N	1
4	MSR CABLE	27-014-27004111	1

Top case with MSR



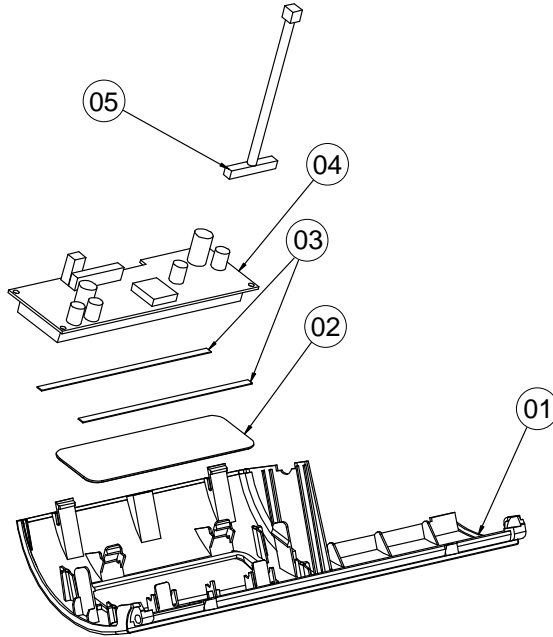
Top case without MSR



No.	Name	P/N No.	Qt'y
1	EVA BLOCK	30-013-15100165	2
2	MSR EVA	30-013-15200165	1

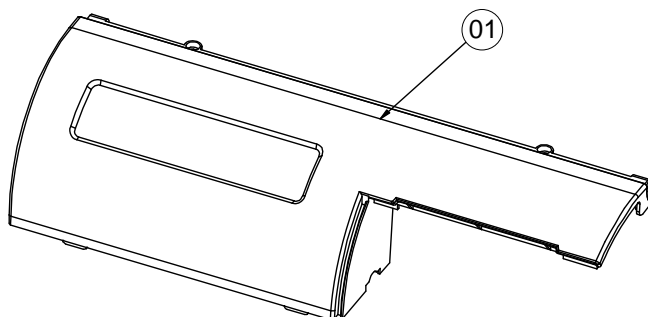
EXPLODED DIAGRAM FOR VFD

VFD module



No.	Name	P/N No.	Qty
1	VFD_COVER(White)	30-002-28113165	1
	VFD_COVER(Black)	30-002-28114165	
	VFD_COVER(Blue)	30-002-28410165	
	VFD_COVER(Red)	30-002-28610165	
2	VFD_WINDOWS	30-002-02230165	1
3	PORON	90-013-24100165	2
4	VFD_MODULE	MB-4103RA-11N	1
5	VFD CABLE	27-051-26805111	1

Cover without VFD



No.	Name	P/N No.	Qt'y
1	WITHOUT VFD_COVER(White)	30-002-28111165	1
	WITHOUT VFD_COVER(Black)	30-002-28112165	
	WITHOUT VFD_COVER(Blue)	30-002-28510165	
	WITHOUT VFD_COVER(Red)	30-002-28710165	